Atlantic States Marine Fisheries Commission

Atlantic Striped Bass Management Board

November 7, 2022
3:00 – 5:30 p.m.
Hybrid Meeting

Draft Agenda

The times listed are approximate; the order in which these items will be taken is subject to change; other items may be added as necessary.

1.	Welcome/Call to Order *(M. Gary)*	3:00 p.m.
2.	Board Consent • Approval of Agenda • Approval of Proceedings from August 2022	3:00 p.m.
3.	Public Comment	3:05 p.m.
4.	Consider 2022 Atlantic Striped Bass Stock Assessment Update • Presentation of Stock Assessment Report *(G. Nelson)* • Consider Management Response, If Necessary **Possible Action**	3:15 p.m.
5.	Consider Draft Addendum I on Quota Transfers for Public Comment *(E. Franke)* **Action**	4:25 p.m.
6.	Review and Populate Advisory Panel Membership *(T. Berger)* **Action**	5:25 p.m.
7.	Other Business/Adjourn	5:30 p.m.

The meeting will be held at The Ocean Place Resort (1 Ocean Boulevard Long Branch, NJ; 732.571.4000) and via webinar; click here for details

MEETING OVERVIEW

Atlantic Striped Bass Management Board
November 7, 2022
3:00 p.m. – 5:30 p.m.
Hybrid

Chair: Marty Gary (PRFC) Assumed Chairmanship: 01/22	Technical Committee Chair: Nicole Lengyel Costa (RI)	Law Enforcement Committee Rep: Kurt Blanchard (RI)
Vice Chair: Megan Ware (ME)	Advisory Panel Chair: Louis Bassano (NJ)	Previous Board Meeting: August 2, 2022
Voting Members: ME, NH, MA, RI, CT, NY, NJ, PA, DE, MD, DC, PRFC, VA, NC, NMFS, USFWS (16 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from August 2022

3. Public Comment – At the beginning of the meeting, public comment will be taken on items not on the agenda. Individuals that wish to speak at this time must sign-in at the beginning of the meeting. For agenda items that have already gone out for public hearing and/or have had a public comment period that has closed, the Board Chair may determine that additional public comment will not provide additional information. In this circumstance, the Chair will not allow additional public comment on an issue. For agenda items that the public has not had a chance to provide input, the Board Chair may allow limited opportunity for comment. The Board Chair has the discretion to limit the number of speakers and/or the length of each comment.

4. 2022 Stock Assessment Update for Atlantic Striped Bass (3:15-4:25 p.m.) Possible Action

Background

- The 2022 stock assessment update was completed in October 2022 **(Briefing Materials)**.

Presentations

- Assessment overview by G. Nelson

Board actions for consideration at this meeting

- If necessary, consider management response to the 2022 stock assessment update.

5. Draft Addendum I on Quota Transfers (4:25-5:25 p.m.) Action

Background

- In August 2021, the Board initiated the draft addendum to consider allowing voluntary transfers of commercial striped bass quota in the ocean region between states that have commercial quota.
- The draft addendum was initiated as a way to consider providing more immediate relief for states instead of pursuing a full quota allocation discussion.

- In August 2022, the Board provided additional guidance to the Plan Development Team (PDT) to address concerns previously raised regarding transfers, and to add provisions that would allow the Board to set certain parameters for quota transfers each year.
- The PDT developed a revised Draft Addendum I for Board review and provided a memo outlining PDT updates and considerations **(Supplemental Materials).**

Presentations

- Overview of Draft Addendum I for public comment by E. Franke

Board actions for consideration at this meeting

- Approve Draft Addendum I for public comment.

6. Advisory Panel Membership (5:25-5:30 p.m.) Action

Background

- Craig Poosikian, a commercial rod and reel fisherman from Massachusetts, has been nominated to the Atlantic Striped Bass Advisory Panel.

Presentations

- Nomination by T. Berger

Board actions for consideration at this meeting

- Approve Atlantic Striped Bass Advisory Panel nomination.

7. Other Business/Adjourn (5:30 p.m.)

Atlantic Striped Bass

Activity level: High

Committee Overlap Score: Medium (TC/SAS/TSC overlaps with BERP, Atlantic menhaden, American eel, horseshoe crab, shad/river herring)

Committee Task List

- SAS/TC – Conducting the 2022 stock assessment update
- TC – June 15th: Annual compliance reports due

TC Members: Michael Brown (ME), Kevin Sullivan (NH), Gary Nelson (MA), Nicole Lengyel Costa (RI), Kurt Gottschall (CT), Caitlin Craig (NY), Brendan Harrison (NJ), Tyler Grabowski (PA), Margaret Conroy (DE), Alexei Sharov (MD), Luke Lyon (DC), Ingrid Braun (PRFC), Joshua McGilly (VA), Charlton Godwin (NC), Jeremy McCargo (NC), Peter Schuhmann (UNCW), Tony Wood (NMFS), Steve Minkkinen (USFWS), John Ellis (USFWS), Katie Drew (ASMFC)

SAS Members: Michael Celestino (NJ, Chair), Gary Nelson (MA), Alexei Sharov (MD), Hank Liao (VMRC), John Sweka (USFWS), Margaret Conroy (DE), Katie Drew (ASMFC)

Tagging Subcommittee (TSC) Members: Angela Giuliano (MD), Beth Versak (MD), Brendan Harrison (NJ), Chris Bonzek (VIMS), Gary Nelson (MA), Ian Park (DE), Jessica Best (NY), Josh Newhard (USFWS), Julien Martin (USGS), Katie Drew (ASMFC)

DRAFT PROCEEDINGS OF THE

ATLANTIC STATES MARINE FISHERIES COMMISSION

ATLANTIC STRIPED BASS MANAGEMENT BOARD

Westin Crystal City
Arlington, Virginia

August 2, 2022

TABLE OF CONTENTS

INDEX OF MOTIONS

1. **Approval of Agenda** by consent (Page 1).

2. **Approval of Proceedings of May 4, 2022** by consent (Page 1).

3. **Move to approve the Atlantic Striped Bass FMP Review and state compliance for the 2021 fishing year** (Page 12). Motion by Mike Luisi; second by Emerson Hasbrouck. Motion carried (Page 12).

4. **Move to add the following provisions to Draft Addendum I to Amendment 7 under Option B Commercial quota transfer provision of the coastal commercial quota:**
   - **The Board will decide by their final meeting of the year, based on the information the Board has available on the status of the striped bass stock and performance of the commercial fishery, whether to allow commercial quota transfers in the next year.**
   - **If the Board approves commercial quota transfers, the Board may decide to limit the transferable amount of quota to a set poundage or a set percentage of the total commercial quota.**
   - **The Board may also choose to specify the following criteria:**
     - **The eligibility of a state to receive a transfer based on percentage of that state's quota landed (e.g., state may not request quota until it has landed 90% of its annual quota).**
     - **The allocation of allowed transferable quota among seasonal fisheries (e.g. 50% reserved for states that have spring fisheries, 50% reserved for states with summer or fall fisheries).**

   Motion by John Clark; second by Eric Reid (Page 46). Motion approved by consent (15 in favor, 1 abstention) (Page 49).

5. **Move to adjourn** by consent (Page 49).

ATTENDANCE

Board Members

Megan Ware, ME, proxy for P. Keliher (AA)
Steve Train, ME (GA)
Cheri Patterson, NH (AA)
Ritchie White, NH (GA)
Dennis Abbott, NH, proxy for Sen. Watters (LA)
Nichola Meserve, MA, proxy for D. McKiernan (AA)
Dan McKiernan, MA (AA)
Raymond Kane, MA (GA)
Sarah Ferrara, MA, proxy for Rep. Peake (LA)
Jason McNamee (AA)
David Borden, RI (GA)
Eric Reid, RI, proxy for Sen. Sosnowski (LA)
Justin Davis, CT (AA)
Bill Hyatt, CT (GA)
Sen. Craig Miner, CT (LA)
Jim Gilmore, NY (AA)
Emerson Hasbrouck, NY, (GA)
Joe Cimino, NJ (AA)
Tom Fote, NJ (GA)
Kris Kuhn, PA, proxy for T. Schaeffer (AA)
Loren Lustig, PA (GA)
G. Warren Elliott, PA (LA)
John Clark, DE (AA)
Roy Miller, DE (GA)
Craig Pugh, DE, proxy for Rep. Carson (LA)
Mike Luisi, MD, Administrative proxy
Robert Brown, MD, proxy for R. Dize (GA)
David Sikorski, MD, proxy for Del. Stein (LA)
Pat Geer, VA, proxy for J. Green (AA)
Bryan Plumlee, VA (GA)
Chris Batsavage, NC, proxy for K. Rawls (AA)
Jerry Mannen, NC (GA)
Marty Gary, PRFC
Dan Ryan, DC, proxy for C. Rese
John Coll, USFWS
Max Appelman, NMFS

(AA = Administrative Appointee; GA = Governor Appointee; LA = Legislative Appointee)

Ex-Officio Members

Mike Celestino, Stock Assmnt. Subcommittee Chair

Staff

Bob Beal
Toni Kerns
Tina Berger
Kristen Anstead
Lisa Carty
Katie Drew
Maya Drzewicki
Emilie Franke
Lisa Havel
Chris Jacobs
Jeff Kipp
Adam Lee
Sarah Murray

Guests

Mike Armstrong, MA DMF
Jerry Audet, InDeepOutdoors
Pat Augustine, Coram, NY
Megan Barrow, NYS DEC
John Bello
Susan Bertoline
Jessica Best, NYS DEC
Alan Bianchi, NC DENR
Christopher Borgatti
Ingrid Braun, PRFC
Andrew Briggs
James Burns
Craig Cantelmo
Michael Celestino, NJ DEP
Matt Cieri, ME DMR
Germain Cloutier
Margaret Conroy, DE DFW
Heather Corbett, NJ DEP
Nicole Lengyel Costa, RI DEM
Caitlin Craig, NYS DEC
Brendon Curley
Christopher Davis, VMRC
Patrick Denno
Greg DiDomenico
Evan Dintaman
Russell Dize, MD (GA)
Paul Eidman, NJ

Guests (continued)

John Ellis, US FWS
James Fletcher
Anthony Friedrich
Tony Friedrich, ASGA
Tom Fuda
John Gans, TRCP
Shaun Gehan, Gehan Law
Lewis Gillingham, VMRC
Angela Giuliano, MD DNR
Alixandra Godar, USGS
Kurt Gottschall, CT DEEP
Pam Lyons Gromen, WildOceans
Brendan Harrison, NJ DEP
Helen Takade-Heumacher, FWS
Jaclyn Higgins, TRCP
Greg Hinks, NJ DEP
Carol Hoffman
Brett Hoffmeister, MA
Jeffrey Horne, MD DNR
Jesse Hornstein, NYS DEC
Edward Houdee, UMD CES
Jacob Jaskiel
Gary Jennings, FL, (AA)
Aidan Kaiser-Bulmash
Brian Kelly, MA DMF
Gregg Kenney, NYS DEC
Dale Kirkendall
Thomas Kosinski
Nils Larson
Brooke Lowman, VMRC
J A Macfarlan, RI DEM
Shanna Madsen, VMRC
John Maniscalco, NYS DEC
Genine McClair, MD DNR
Joshua McGilly, VMRC
Kevin McMenamin
Steve Meyers
Mike Millard
Henry Millken, NOAA
Steve Minkkinen, US FWS
Jack Molmud, NewsCenter ME
Chris Moore, CBF
Timothy Murphy
Allison Murphy, NOAA
Brian Neilan, NJ DEP
Lindsey Nelson, NOAA
Robert Newberry
Thomas Newman, NC
George O'Donnell, MD DNR
Virginia Olsen, Local 207
Scott Olszewski, RI DEM
Derek Orner, NOAA
Patrick Paquette
Nick Popoff, US FWS
Will Poston, ASGA
Jill Ramsey, VMRC
Harry Rickabaugh, MD DNR
Courtney Roberts
Jason Rock NC DENR
Mike Ruccio, NOAA
Zachary Schuller, NYS DEC
Ethan Simpson, VMRC
Melissa Smith, ME DMR
Ross Squire
Michael Stangl, DE DFW
Lauren Staples, NH F&G
Anthony Stefanski
David Stormer, DE DFW
Kevin Sullivan, NH F&G
John Sweka, US FWS
Colin Temple
Lou Tirado
Andrea Tomlinson
Chris Uraneck, ME DMR
Taylor Vavra, Stripers Forever
Beth Versak, MD DNR
Mike Waine, ASA
Craig Weedon, MD DNR
Peter Whelan
Meredith Whitten, NC DENR
Kate Wilke, TNC
John Page Williams
Wally Williams
Joseph Wilson, Endicott, NY
Charles Witek, NY
Rich Wong, DE DFW
Michael Woods
Chris Wright, NOAA
Dan Zapf, NC DENR
Jordan Zimmerman, DE DFW
Erik Zlokovitz, MD DNR
Renee Zobel, NH F&G

The Atlantic Striped Bass Management Board of the Atlantic States Marine Fisheries Commission convened in the Jefferson Ballroom of the Westin Crystal City Hotel, Arlington, Virginia, via hybrid meeting, in-person and webinar; Tuesday, August 2, 2022, and was called to order at 2:00 p.m. by Chair Martin Gary.

CALL TO ORDER

CHAIR MARTIN GARY: Welcome everyone! Welcome to the Atlantic States Marine Fisheries Commission Atlantic Striped Bass Management Board. My name is Marty Gary; I'm your Board Chair, and our Vice-Chair is Ms. Megan Ware from Maine, and we are joined on my right by our fishery management plan coordinator, Emilie Franke, and Dr. Katie Drew for ASMFC staff.

This is a hybrid meeting of the Striped Bass Management Board. Before we get going in earnest here, just wanted to recognize Mr. John Coll from the U.S. Fish and Wildlife Service. John, welcome, you are proxy for Rick Jacobson, so welcome and thanks for joining us. Also, before we get going, I know at our last meeting in May we got through Amendment 7, thanks to the greats work by Emilie and Katie and all the ASMFC staff.

But, Emilie wasn't able to join us and it was such an incredible effort she put on through, all the work that went into the hearings and all. I just wanted to revisit that one more time. Emilie, thank you so much for a great job. Thank you!

APPROVAL OF AGENDA

CHAIR GARY: We'll go ahead and get started, and our first order of business is Approval of the Agenda.

I would ask if there are any additions or modifications to the agenda. Seeing none; the agenda is approved by consent.

APPROVAL OF PROCEEDINGS

CHAIR GARY: Next, we'll approve the proceedings from the May 2022 meeting. I will note that staff was notified that a Board member's name needed to be corrected under the Index of Motions on Page 3 of the proceedings.

I believe that change has been made, and I would ask, are there any other edits to the proceedings from the May, 2022 meeting? Seeing none; the proceedings from May, 2022 are approved.

PUBLIC COMMENT

CHAIR GARY: Next, we'll go to Public Comment for items that are not on the agenda, and I'm going to go ahead and look to see if there are any raised hands from the public that are in attendance.

Would anybody like to make comments for items not on the agenda? Not seeing anyone, and I would look to Emilie and Katie if there is anybody online that would like to. None, okay.

CONSIDER OF FISHERY MANAGEMENT PLAN REVIEW AND STATE COMPLIANCE FOR THE 2021 FISHING YEAR

CHAIR GARY: All right, we'll move right along. Our next item is Item Number 4 in your agenda. It's Consideration of Fishery Management Plan Review and State Compliance for the 2021 Fishing Year**,** and I'll turn it over to Emilie.

MS. EMILIE FRANKE: It's great to meet so many of you in person today. I will provide an overview of the Fishery Management Plan Review for Fishing Year 2021, and the PRT Review, State Compliance Reports and compile this FMP Review, and those were included in the supplemental materials.

There is a lot of detail in the written report. In today's presentation I'll highlight some of the main points on the status of the stock, the status of the FMP, the status of the fishery, the status of current management measures, as well as the Plan Review Team's comments and recommendations.

The Board action for consideration today is to approve the FMP Review for Fishing Year 2021 and the State Compliance Reports. Starting with the

status of the stock. Based on the results of the 2018 benchmark stock assessment the stock is overfished, and experiencing overfishing. The 2018 assessment included data through 2017, and included the recalibrated MRIP estimates.

In 2017 female SSB was estimated at just over 68,000 metric tons, which was below both the target and the threshold, and fishing mortality was estimated at 0.31, which was above both the target and threshold for fishing mortality. As we'll talk about a little bit later, the next stock assessment, the 2022 assessment update is currently in progress, and those results are expected in October of this year.

This figure shows the spawning stock biomass in blue, and Age 1 recruitment in the orange bars. You can see that female SSB has declined since the high in 2003, and has been below the threshold since 2013. For recruitment there has been a period of low recruitment since about 2005, but there have been some strong year classes, including the 2011-, 2014-, and 2015-year classes.

Then for fishing mortality on the next slide, you can see that fishing mortality was estimated to be at or above the threshold, which indicates overfishing is occurring in 13 out of the last 15 years. Moving on to the status of the fishery management plan. Fishing Year 2021 was the second year of Addendum VI implementation.

Addendum VI implemented measures to reduce total removals by 18 percent relative to 2017, in order to achieve the fishing mortality target. Those Addendum VI measures were implemented by April 1, 2020. They reduced commercial quota levels by 18 percent, implemented a 1-fish bag limit, and a 28 to less than 35-inch slot limit for ocean recreational fisheries, and a 1-fish bag limit and 18-inch minimum size for Chesapeake Bay recreational fisheries.

Some states did implement alternative regulations through conservation equivalency, which were designed to achieve an 18 percent reduction at the state level. Addendum VI also requires the mandatory use of circle hooks when fishing recreationally for striped bass with bait, to address recreational release mortality. Those Addendum VI measures were required to be implemented by January, 2021. Then in March 2021 last year, the Board clarified the definition of bait and methods of fishing when circle hooks are required. This is a compliance criterion for Addendum VI. The Board also provided guidance on the incidental catch of striped bass when targeting other species with non-circle hooks with bait attached. Then as far as updates to the FMP, as was discussed last meeting, Amendment 7 was approved just a few months ago in May.

Amendment 7 builds on this Addendum VI action to address overfishing, and initiate stock rebuilding. Amendment 7 establishes new requirements for management triggers, conservation equivalency, measures to address recreational release mortality, and the stock rebuilding plan. All the Amendment 7 provisions were effective immediately, May 5, 2022, except for the gear restrictions addressing release mortality.

States have to implement those new gear restrictions by January 1, 2023. Moving on to the fisheries. This figure shows fishery removals over time in numbers of fish by sector. You can see at the bottom, commercial harvest in blue and commercial discards in red. Those have been relatively stable over time.

You can see most removals are coming from the recreational sector, including recreational harvest in green, and recreational release mortality in purple. In 2021 total striped bass removals were estimated at 5.1 million fish, which is about the same as removals in 2020. It was less than a 1 percent increase from the removals we saw in 2020.

Here on the screen here is the proportion of total removals by sector over the past few years. In 2021 commercial harvest accounted for 12 percent of removals. Commercial dead discards accounted for less than 2 percent of total removals, and on the recreational side harvest accounted for 36 percent of total removals and recreational release mortality

accounted for 50 percent of total removals.

To the commercial fishery specifically, in 2021 the commercial fishery harvested an estimated 4.29 million pounds, just over 577,000 fish, which was an 18 percent increase by weight relative to commercial harvest in 2020. The Chesapeake Bay accounted for about 57 percent of that commercial harvest by weight.

Commercial discards overall, as I mentioned, were less than 2 percent of total striped bass removals. The PRT noted that the ocean commercial quota utilization increased to 76 percent of the quota used in 2021. This is the highest ocean quota utilization in the past five years. Here on the screen and in the report is the state-by-state quota and harvest accounting.

In 2021 about 1.8 million pounds were commercially harvested in the ocean, which is less than the 2.4 million pounds total ocean quota. In the Chesapeake Bay about 2.4 million pounds were commercially harvested, which is less than the about 3-million-pound Chesapeake Bay quota. In the last column highlighted in orange, you can see the quota utilization for each state.

I highlighted in orange here those ocean states that used a very high percent of their commercial quota this year. You can see a lot of states used up to 98 or 99 percent of their quota this year, except for North Carolina, which had zero harvest again in 2021. On the recreational side, total recreational harvest in 2021 was 1.82 million fish, which was about 15.7 million pounds. This is about a 6 percent increase in numbers of fish harvested relative to 2020. As we've discussed, the vast majority of recreational striped bass catch is released alive, and the assessment assumes 9 percent of those fish released die as a result of that interaction. In 2021 an estimated 28.6 million fish were caught and released alive, and of those 2.6 million are assumed to have died.

Overall, the number of live releases in 2021 was about a 7 percent decrease coastwide as compared to 2020. The PRT did note that there were different trends by region. In 2021 the ocean region saw an increase in recreational harvest, live releases, and a slight increase in striped bass directed trips relative to 2020.

On the other hand, the Chesapeake Bay saw a decrease in all of those categories in 2021 relative to 2020. Overall, in the report there are some more detailed discussion. But the PRT noted that there are several factors likely contributing to the levels of harvest, catch and effort, and those factors include year class availability, particularly as the relatively strong 2014 and 2015 fish have been moving out of the Chesapeake Bay and into the ocean.

Also, factors like near-shore availability, angler behavior, and the impacts of COVID-19, which likely impacted each sector and each state differently. Moving on to the management measures. If we're looking at the Addendum VI, 18 percent required reduction, in 2021 we saw a 27 percent reduction in total removals relative to 2017.

This was about the same reduction that we saw last year comparing 2020 to 2017, again, because we had about the same removals in 2020 and 2021. The FMP Review Report includes the state-by-state realized change in recreational removals. Here on the screen here is the change comparing 2021 to 2017. You can also see the predicted reduction based on state conservation equivalency plans.

The PRT noted that again, you know differences in performance from state to state are influenced by a lot of factors, including changes in effort, fish availability and environmental factors. Some states saw increased recreational releases, which contributed to some states having a less than predicted reduction. The PRT also noted that there is a lot of year-to-year variability, even under consistent regulations, again due to things like changes in effort and fish availability.

The report also includes a state-by-state percent changes in commercial harvest. Here on the screen is, comparing by weight 2021 to 2017, and comparing that to the percent change in

commercial quota implemented through Addendum VI. The report also includes those changes comparing 2020 to 2017 as well. Then moving on to the current recruitment trigger. As of May 2022, the new Amendment 7 recruitment trigger is effective.

For that new trigger, if any of the four juvenile abundance indices used in the stock assessment, so that's New York, New Jersey, Maryland, or Virginia shows an index value that is below 75 percent of all values from the high recruitment period for three consecutive years, then interim F reference points are calculated using the low recruitment assumption. For this year's review of the juvenile abundance indices, we evaluated 2019, 2020, and 2021, and the Maryland JAI for those three years did meet the recruitment trigger criteria, so this trips the recruitment trigger in 2022. Per our new trigger in Amendment 7, this means that this upcoming assessment this year will calculate the fishing mortality reference points using a low recruitment assumption. You can see here the four juvenile abundance indices. The top left, New York, has been above their trigger level for the past two years. New Jersey, the top right, was below its trigger level this past year. On the bottom left you can see Maryland with those three years below the trigger level, and then Virginia was below its trigger level as well this past year.

I'll finish up with the Plan Review Team's comments and recommendations. The PRT noted that in 2021 all states implemented management and monitoring programs consistent with the FMP, with three inconsistencies. The first one, as noted in the past two FMP reviews is New York's recreational regulations state a slot limit of 28 to 35 inches total length.

This does not explicitly indicate whether that upper limit of 35 is inclusive or not. The PRT noted that New York's implementation plan predicted a greater than the required 18 percent reduction, assuming a less than 35 inch upper bound, and the PRT noted that even assuming an inclusive upper bound of 35 that predicted reduction still would have been greater than the required 18 percent.

The PRT noted that the future reduction calculations would just need to recognize this New York regulation as being different than the current standard of less than 35 inches. Second, as noted in last year's FMP Review, Maryland's 2021 summer closure period, which is currently no targeting from July 16 through 31, is different from their approved closure period from their 2020 implementation plan, which was originally August.

Last year at the Board meeting, Maryland stated their intent to continue with this July closure. Then for the circle hook requirement the PRT noted that Pennsylvania implemented the circle hook requirement in the tidal portion of the Delaware River, which is downstream from the Calhoun Street Bridge, but not in the non-tidal waters upstream from that point.

This does align with Pennsylvania's approved implementation plan, which only specified a recommendation for the non-tidal waters, and Pennsylvania noted that the striped bass fishery in the non-tidal portion is very limited, and there are low numbers of fish using that upstream habitat.

Then for the circle hook requirements more generally, the PRT noted that there are differences among the definitions of bait. Some states have more restrictive definitions, and several states have already implemented the incidental catch guidance, which is now a requirement for implementation by 2023. Then finally, there were no requests for de minimis status. Then for PRT recommendations.

The PRT plans to update the striped bass compliance report template to request updated tag accounting information for unused commercial tags. The PRT recommends that Commission staff work with the Law Enforcement Committee and the PRT to follow up with states on any tag accounting questions. The PRT also recommends that the Board task the PRT with a specific review of the commercial tagging program at a regular interval, to review the program components, since it has been about ten years since that program was put into place, to review components like the biological metrics that are used to allocate tags. Then the

final recommendation is that the PRT recommends the Board consult with the Law Enforcement Committee on what type of enforcement information would be most helpful for states to include in their compliance reports.

Currently the compliance report template asks kind of a general question about enforcement, and the information that we're receiving is pretty widely varied. The PRT is wondering what type of information would be helpful for the Board to see in compliance reports. That's all I have, Mr. Chair, I'm happy to take any questions.

CHAIR GARY: Thank you, Emilie for an excellent presentation, and thank you and the PRT for all the supporting documentation. It was very thorough and it was put together extremely well. Any questions for Emilie from the Board? Oh, we've got one, Chris Batsavage.

MR. CHRIS BATSAVAGE: Thank you, Emilie, for the presentation. On the PRTs recommendation for the Law Enforcement Committee to review the enforcement information in the FMP Review, actually this question might be more for Toni. But would that be something of interest for the Law Enforcement Committee to review for multiple FMP reviews, or are these issues just specific to striped bass? I know it's kind of going beyond this Board, but I know our staff have asked questions about the kind of information regarding enforcement issues to include in compliance reports. I don't know if this might be a cross-cutting thing to look at.

MS. TONI KERNS: Thanks, Emilie. Chris, this is a tough question. We have brought it up with the Law Enforcement Committee before, and there is differing types of data that are collected and kept by a state when it comes to enforcement activities. If we go down to the lowest common denominator, it's not a lot of helpful information. It is a question that I can bring back to the Law Enforcement Committee.

But it may be helpful for either folk to think about, and then send me an e-mail with information that you're looking for, to give me something as a base to bring to the Law Enforcement Committee, so I have a better idea of how we might be able to tackle it, and see what we can get from the states. It's not going to be something consistent across the board though from every state, due to the lack of what I would say a data base for a lot of these states, in terms of enforcement activity, specific to a species or specific to a certain type of infraction.

CHAIR GARY: Go ahead, Emilie.

MS. FRANKE: Yes, just for some context there. You know some states provided specific numbers of violations. Some states provided a more qualitative overview of the types of violations they were seeing for striped bass. There is just a wide variety of information that we're getting.

CHAIR GARY: John Clark.

MR. JOHN CLARK: Thank you for the presentation, Emilie. I just had a question about the PRT recommendation about the Board task the PRT with a specific review of commercial tagging program at a regular interval. You know since the tag commercial fish are weighed also for quota compliance, was there a specific concern there coming from any one program, or was this just a general?

MS. FRANKE: Yes, so it was more a general observation that there hasn't been a closer look and sort of review of the tagging program since it's been implemented, and just looking at the different biological metrics that are used across the states, and if there are any issues that are arising. Just sort of a more holistic review of the tagging program would be helpful.

CHAIR GARY: Other questions for Emilie? Steve Train.

MR. STEPHEN TRAIN: Is it possible to get the slide up on number of fish caught, number of fish released mortality? I've got a question. Maybe it's been answered, maybe I missed it. But as we change these slot sizes around states, and some states are having closures for a time period, things

like that.

As we change the slot sizes, we saw that especially in the recreational fishery, they kill more fish releasing them than keeping them, that the mortality is higher with the releases. As we change the slot size, are we throwing more fish back and resulting in larger amounts of dead fish, or is that all taken into account when that slot is shifted, based on what we know the average size in that region is?

DR. KATIE DREW: The TC takes that into account when we do these reduction calculations. If you look at the reductions that we're predicting, and the reductions that we realize. You see that we have a bigger reduction in harvest to offset that reduction in releases. The fish that are thrown back, we know that obviously they don't get harvested now, because they're not within that slot, but it's not a 100 percent savings, essentially. Yes, release mortality does go up, but it's offset by that decrease in harvest, so that your overall total removals meet the reduction that you need for the stock. It just gets sort of shifted around into different components.

CHAIR GARY: Go ahead, Steve, you had a follow up?

MR. TRAIN: I'm just trying to figure this. Okay, so the net benefit is a gain, but we're killing more fish released than we were when we were keeping them.

DR. DREW: If you look at the number that you killed before hand, the number that are killed that you harvest and take back with you. The number that you killed by throwing them back add up to make a total removal, and we need to come down from that. When we did these calculations, we needed to take whatever it was, that 18 percent.

When we do the calculations, we figure out okay, here is what the size frequency is probably going to look like. If people can't harvest, they have to throw everything over 35 back.

Then we compare how many did you, so all those 35 instead of being kept are now released alive. You also release alive all the ones that you would have released alive anyway. The total number of fish that you release alive does go up. But only 9 percent of those are dying. The total number that you're killing, the ones that you throw back and die, plus the ones that you harvest. That total number meets that 18 percent reduction. But if you looked at like your number that you're harvesting, and just compare the 2017 harvest with the 2020 or the 2021 harvest, that is only the ones that you're landing. That is a greater than 18 percent reduction, because we know that some of those fish that we're throwing back are going to die, and count toward the total dead fish.

If we go back to maybe the slide, maybe if Maya can go to Slide 10. We're looking at 5.1 million fish, and you can see that the release mortality is a big component of that. But it's still 5.1 million fish, which is 27 percent less than it was in 2017. We're still getting that reduction; it's just now we've sort of shifted what proportion is in what category.

CHAIR GARY: Go ahead, Steve.

MR. TRAIN: I think you agreed with me. We are killing less fish in total, but we're killing more by throwing them back than we were before we changed the size. We're taking less fish, so we're killing less fish in total. But we know we're killing a larger portion for nothing but fun.

DR. DREW: If you compare it to what we were in 2017, we don't have the 2017 numbers up. But I think it was about, it was 49 percent in 2017 was the release mortality. Now it's at 50 percent, so there is virtually no change here. Like the total numbers of released alive dead fish have actually come down.

But now we're looking at more like 50 percent here, 50 percent of 5.1 is less than. I'm not guaranteeing this. I mean in a sense of like, I don't have the exact numbers, but we've shifted some of that mortality to the released alive fish. But all of those released alive fish that are in the slot, would have been killed, so you're talking about 9 percent of those versus 100 percent of those.

CHAIR GARY: Tom Fote.

MR. THOMAS P. FOTE: Yes, but I've been looking at Table 3, and the numbers on Table 3 have all the years listed, and it has only the catch. I'm looking at the figures, and what he's saying is true. I mean we're killing more fish from catch and release, and a higher percentage now from catch and release.

What we're regulating is what people can take home to eat, and we're reducing those numbers. But the numbers are increasing, because the catch and release numbers are going up, because they are greater than they were before, and it's a bigger percentage. I'm looking at, because we're looking at numbers like 21 with 1,824,000, and the catch and release numbers was 25 – 2,572,000.

When we go back and look at 2017, they were 29 and 34 – 3.4 to 2.7. I'm looking at a greater increase in the percentage of fish that we're killing from catch and release than we are taking home. We're actually doing a reduction that way, because the numbers steadily have dropped from where we were in 2017, we were at 2,937,000, where in '21 we're at 1,824,000. That is a dramatic drop. If I'm reading the tables right. Am I doing something wrong? I spent a lot of time looking at this table.

CHAIR GARY: You're asking a question, are you interpreting the table correctly?

MR. FOTE: I'm trying to interpret the table the way I'm looking at it. What Steve Train said, it jives with what Steve had stated. I'm not sure whether I understand it. But you're saying that because the releases are now increasing the number of killed fish, while the fish were taken home it's basically reducing it by a greater proportion.

It's really more than 49 percent if we look at the recreational catches. If I'm looking at these numbers when you go 1,824,000 to 2,572.000 that's more than a 49 percent, 50 percent. I don't have my calculator with me, and I'm not going to do that type of math in my head.

DR. DREW: The 49 percent is more for the total. Right, so it's for total removals. I was talking about total removals which includes the commercial stuff. I will say, I mean this actually does tie a little bit into our next agenda item, but size and bag limits are really, they are a good tool for reducing harvest, but that release mortality again, the releases are a combination of people who go out to harvest a fish and have to throw things back that are not legal.

But they are also the product of people who go out to fish to catch and release. We can control that harvest, but we need other measures to control the total effort, and that total effort is a big part of that release component. Yes, we've achieved our reductions, but we've achieved that mostly through reducing harvest, as opposed to reducing effort. COVID helped reduce effort, fortunately for us, but that is something going forward to control releases, we really need to be controlling effort with it.

MR. FOTE: Follow up on that, Marty. CHAIR GARY:

Go ahead, Tom.

MR. FOTE: Yes, that means that we basically take on the back of people who want to take home fish. We've reduced their catch, so the guys in catch and release could actually kill more fish. That's it in a nutshell. Now I'm not saying that's how we planned it, but that's exactly what has happened to fall within our quota. It's kind of what I pointed out three years ago. We're not addressing the real problem here; we're just basically restricting what people could take home to eat.

CHAIR GARY: Mike Luisi, did you have your hand up?

MR. MICHAEL LUISI: I did, Mr. Chairman. I wanted to say that you know I'm comfortable with the report that Emilie made, and if you're up for it I can make a motion to approve, if you're ready for that at this time.

CHAIR GARY: Thank you, Mike, and I'll give you first privilege. Just to put it out there one last time. Is there any more Board discussion on the PRTs comments and recommendations? All right, I'll

yield to you for the motion.

MR. LUISI: I move to approve the Atlantic Striped Bass Fishery Management Plan Review and state compliance for the 2021 fishing year.

CHAIR GARY: We have a second by Emerson Hasbrouck. All right, any discussion? **All right then, let's try to do this by consent.** Is there any opposition to the motion? Seeing none, the motion passes unanimously.

PROGRESS UPDATE AND BOARD GUIDANCE ON 2022 STOCK ASSESSMENT UPDATE

CHAIR GARY: All right, we'll go on to Item Number 5 in our Agenda, Progress Update and Board Guidance on 2022 Stock Assessment Update.

We're going to get a Technical Committee Report from Dr. Drew, and look to provide TC guidance, the Board's TC guidance for the management options to consider if the assessment indicates a reduction is needed for rebuilding. We'll also be discussing the timeline for that. Katie, I'll turn it over to you.

DR. DREW: Great, thank you, Mr. Chair. We can just jump right in to the next slide here. I'm going to start by talking about the outline, or basically what I'm going to tell you guys today. I'm going to go over some of our Amendment 7 requirements, in particular the fast-track response to the 2022 update, and the changes in the CE Plans provisions, which impact the assessment itself as well as the management response to the assessment.

I'm going to go over our current assessment update timeline, and then tell you guys what kind of guidance we need, in order to maintain this timeline. Basically, as I'm sure you all recall, Amendment 7 requires a fast-track response to the assessment update. If the 2022 assessment update indicates that one, there is a less than 50 percent chance of rebuilding the stock by 2029, and at least a 5 percent reduction in removals is needed to bring F down to that F rebuild.

Then the Board may adjust measures via Board action, i.e., voting on them as opposed to taking them out for public comment via the addendum process. In addition, there were also changes to the CE provisions within the FMP. Commercial and recreational measures from Addendum VI are maintained.

That includes that 18 percent reduction in quota from the Addendum IV quotas, as well as the 1-fish at 28 to less than 35 in the ocean, and the 1-fish at 18 inches minimum size in the Bay. These measures did not change in Amendment 7, and all approved Addendum VI, CE plans are maintained until the measures change.

But going forward, CE programs will not be approved for non-quota managed recreational fisheries when the stock is overfished, with exceptions for the Hudson River, the Delaware River, and the Delaware Bay recreational fisheries. With this new assessment update, I can't say what the results are going to be yet, we haven't seen them.

But we're not going to magically rebuild the stock in the last three years, I hate to break it to you. If we need to take a reduction, this provision will be in place that CE programs will not be approved.

DISCUSS TIMELINE FOR RESPONDING TO THE ASSESSMENT

DR. DREW: Where are we in the assessment update timeline? All of our data has been submitted, and we've been working on runs of the model and projections to answer these rebuilding questions. Next week the TC will have a call to review these preliminary runs and the projections, discuss what we think about these runs, and see if there are any additional runs, et cetera, so that we can have a call to approve the final document in September.

Then look at if we need a reduction, what kind of measures will achieve that reduction, and have those calculations done for the September meeting, so that we can make any changes or adjustments for October, and have the final report, including the assessment update, as well as any proposed

measures, if necessary to the Board October 24, as part of meeting materials.

Then, the week of November 7th will be the Board meeting, where you guys will get this official presentation. In order to maintain that timeline, basically in between now and November, we need to finish the assessment update and come up with potentially management measures for you to consider in November.

If the stock indicates that a 5 percent or greater reduction in removals is needed, the TC will provide the Board with a small, small set of potential options to achieve that reduction, along with the assessment report. You will have the option to approve a set of measures for 2023 at the annual meeting in November, or at a later meeting.

If you guys are ready in November when you see this report, and our beautiful suite of curated options, if necessary, you can approve them in November or we could have a separate standalone webinar in late 2022 or early 2023, or at the winter meeting February of 2023. This is one of the things we need Board guidance on, which is when are you guys going to be ready to make this decision?

Basically, we need you guys to tell us when you will be ready to make this decision now, so that we can plan out the future of this process. Basically, we don't want to hear in November, oh actually we need another board meeting here. That is one of our areas that we need guidance for. The other question is, how do we handle existing CE plans when we start these reduction calculations, and details on the preferred management options for the Bay and the ocean?

I'm going to go into more detail on both of these right now. Currently there are a number of CE plans in place in both the ocean and the Bay. The details on what the actual plans are, are in the TC memo, so you can look at those. But this is basically the ocean, and next slide we can go to the Bay. There are a number of CE plans in place right now.

What do we do with those plans going forward? We've already said we won't approve new ones, but what do we do with the existing ones? The TC recommends using the current set of management measures, and the resulting level of 2021 removals as the starting point for calculating the potential reduction of any new measures.

PROVIDE TC GUIDANCE FOR MANAGEMENT OPTIONS TO CONSIDER IF THE ASSESSMENT INDICATES REDUCTION IS NEEDED FOR REBUILDING

DR. DREW: Basically, from a technical standpoint, the 2021 removals were the product of the 2021 measures, including all of those CE plans. What the TC recommends doing from a technical standpoint is developing a new set of management measures that would achieve the required reduction relative to 2021, for both the commercial quotas and the recreational quotas, and sort of leave that structure as it is in place, and make changes to the existing structure. That means that some CE measures could be retained under the new regulations. For example, new quotas would be based on the 2021 CE quotas.

Some states are using CE in order to adjust the size limits within their commercial fishery, which adjust the average size of the fish, which adjust your total quota, and some states used CE to take a lower reduction to their quota on the commercial side, and made it up with extra reduction on the recreational side.

If we need to take a reduction, we would take that reduction from the 2021 CE quotas. Essentially, you're leaving that in place and taking a step forward. We could also do things like maintain current seasons if the new regulations only change the size limits or the bag limit. Depending on what the final regulations are, essentially you could be leaving little bits and pieces of these CE plans in place, and just sort of moving on from there.

Alternatively, the Board could require all states to revert to the FMP standard and calculate a reduction from there. The TC does not recommend this, because this would increase the uncertainty in

any of the reduction calculations, since we don't know what removals would have been under the FMP standard, and sort of reverting back to that and then trying to move forward from that is just going to add extra layers of uncertainty.

But that would get rid of all of the sort of extra little bits and pieces of those CE plans that are in place. The final decision on what to do with those existing CE measures belongs to the Board, and this is kind of where we would look to you guys for guidance, in terms of do you want to go with the Technical Committee's recommendation of just start where we are now and tweak it, or do you want to completely clear the board, revert to the FMP standard, and make changes from there?

That is question one. Well, actually I guess at this point we're at question two, what with the timeline and all. I think the plan is we're going to put all these questions back up at the end. But this is question two. The next kind of questions that we're looking at you guys for guidance on is some specifics on the options that we're going to bring back to you in November.

We want to make sure that the options that we bring to you in November are things that you would legitimately consider enacting. We want to bring things that you are interested in, and that you are at least open to hearing about. But we also want to keep these options limited, in order to make sure that we have enough time to complete this work going forward.

Question one, I guess actually 3A, let's say, is how should the reduction be split among the commercial and the recreational sectors? Prior to the last addendum each sector had taken the same percent reduction, so if we needed an 18 percent reduction, we would take that 18 percent reduction on the commercial side and on the recreational side.

With Addendum VI, some states chose to go down a conservation equivalency plan where that split was different. The commercial sector took a smaller cut, and the recreational sector took a larger percent cut, and together they gave you the 18 percent reduction in total removals overall. We want to know from the Board what options are you considering for this question this time around. Do you want the split to be the same for both sectors? Do you want one sector to take a different percent cut than the other?

That is one question. What recreational measures are you interested in seeing for the ocean and the Bay? I guess this would be more, also you could think of it as what kinds of things do you not want to see. Again, we don't want to bring you back things that you're not interested in. Are you interested in a minimum size limit?

Basically, do you want to get rid of a slot and go to a different minimum size? Do you want to adjust the slot? Are you interested in trying to get seasonal closures to make up some of these reductions? Are there other things that you would like us to look at and bring back to you as options? If you are interested in the seasonal closures, do you want a consistent coastwide closure, or do you want more flexibility for states to pick their own closure dates, say within a particular wave, in order to achieve that overall reduction?

These are the kinds of question we need specifically on the options as we are prepared to develop them if necessary. Again, in conclusion, the Board discussion today has sort of three parts that we need information on. What is the timing for when you will actually vote on these measures, if necessary?

Are you going to be ready to take this vote in November, or do you need more time? Do we need a special webinar? Do we want to have the February meeting be the next time that we vote on this, as well as guidance for us on what are reasonable implementation timelines for a 2023 season, which I think obviously would inform that first question on timing?

Second of all, what do we do with those existing CE measures when we develop the new plans? Do we start from where we are now, or do we revert to the FMP standard, clear the slate completely, and

build from there? Recognizing that that second option will increase the uncertainty in any reduction calculations.

Then Number 3, guidance on the preferred measures, so that we can bring you back a curated set of options that you are actually interested in looking at further. We don't need consensus on, we want Option A at this point. You know if there is division amongst the Board about things you would like to see, you know definitely we can look at things that don't have 100 percent consensus.

But the key is to bring back a limited number of options that are something you would legitimately consider. That's it. We can leave this slide up to guide the discussion, and if you have any questions, I'm happy to answer them, as well as Emilie can provide guidance on how all this is going to play out from an FMP standard.

CHAIR GARY: All right, thank you, Katie for your presentation. That was a lot of information to process. We're going to be lighting a pretty short fuse, depending on the timing, as Katie mentioned, so we'll start with questions for Katie. We'll go with Bill Hyatt.

MR. WILLIAM HYATT: Just a quick question in regards to conservation equivalency. If the stock assessment indicates that adjustments need to be made, and I think one of the items that you mentioned was that under certain circumstances, existing CE measures could be carried forward. Under that circumstance, do the requirements for conservation equivalency that are in Amendment 7, for example the buffer requirement. Do those get layered on top, even if it's the existing measure being carried forward?

MS. FRANKE: The answer is no. The Amendment 7 provision, not allowing CE, is for any new CE plans resulting from any changes to the measures. The existing components of past CE plans aren't affected by the new provision.

MR. HYATT: Just a follow up. Does that prohibit, however, us taking and making a decision that if changes are necessary any existing CE should incorporate those changes, or does it prohibit us from that option?

MS. FRANKE: Toni can jump in here if needed, but because the Amendment 7 provision applies to any new CE plans that doesn't affect how this question of where do we start the reduction calculations from? Are we starting from just where we are in 2021, which includes some past CE measures, or are we starting from sort of the blank slate.

You know starting that calculation assuming everyone had implemented the past FMP standard. No, I think the Board can make the choice here of providing guidance to the TC of where to start that reduction from, either that TC recommendation of start from where we are, or revert back and then calculate down.

CHAIR GARY: Dave Sikorski.

MR. DAVID SIKORSKI: I'm uncertain in what I'm even asking here, because it's a lot of uncertainty. I'm thinking back to the Addendum VI measures that my state implemented, and some of the uncertainty in doing those. Those were measures that like short closures were not recommended by the Technical and Law Enforcement advisors at that time because of uncertainty.

If you think about just the technical side of things. We had uncertainty in implementing Addendum VI CE plans. Now we're being asked to potentially carry them forward as our baseline. But being told that to go back to what's in the plan, one at 18 for the Chesapeake Bay that that would be uncertain. I'm trying to balance the two levels of uncertainty. Can you provide any clarity there? I may have a follow up or a question later on here.

DR. DREW: I think the issue is, what's uncertain, we know what happened in the past, and so what's uncertain is what's going to happen in the future. You know we had concerns about, or the TC had concerns about how well you can predict those removals based on a short amount of time, a short seasonal closure.

Going forward, we know what happened under that plan. We have more certainty in knowing what happened in the past with those measures. Going forward, if you want us to say okay, you would not have had those closures, or you would have done something differently, and trying to predict what would have happened in the past, and then what's going to happen in the future from that? It's essentially adding on two layers of uncertainty. If you say go back to the FMP standard, we need to predict then what would have happened in the past, and what will happen in the future.

Whereas, if you sort of start from where we are right now, we're only predicting what's going to happen in the future. You're sort of only putting on one layer of that. Obviously, you still do have, we always have this uncertainty from year to year of, just because it happened this way in the past doesn't mean that's the way it's going to play out in the future.

You know we see catch goes up and down, even though regulations stay the same. But I think the TCs concern is that you know we're trying to predict what would have happened, as well as what will happen. Why add that extra layer of uncertainty, when we can just start from, well this is what we actually observed?

CHAIR GARY: Okay, I have Jason McNamee and then Dennis Abbott.

DR. JASON McNAMEE: Nice job getting through all of this. That's a lot of stuff. I do have a question. On the first bullet up there, you know thinking about. I would love for there to be some way to have a single iteration not multiple. But to be able to kind of you know, we'll provide some guidance, you guys go sharpen your pencils, create a suite of options, and then an opportunity to see those with still a little time left to make any last-minute modifications.

You can never kind of judge exactly what might come up when you see the options and go from there. That's my kind of lead in to the question is, if we were to delay into early 2023, clearly the intent is to have. The whole point of this motion was to not delay it, to get some action done for the next possible fishing year.

Does early 2023 allow for that? Is there a mechanism to get, so like for Rhode Island it's possible. Fish don't show up until you know May, so we would have time to get a regulatory process in time. But I wonder, maybe it's a question to other states and not to you guys, now that I think about it. But I wonder if there is any, I think folks should speak up if an early 2023 action would be problematic for them to be able to take action in time for that fishing year.

CHAIR GARY: Go ahead, Emilie.

MS. FRANKE: Yes, thanks, Jay. That is exactly why we're asking this question. There were a couple questions, both at the last board meeting in May, and at the January board meeting of how exactly this fast-tracks response would work. Some folks had mentioned, you know concerned about voting at the November meeting.

When they receive the assessment results, wanting at least a couple weeks to sort of process the options. That is exactly why we're bringing it back, to hear from folks as to when they would be comfortable taking that vote, and what that would mean for how quickly each state could implement new regulations.

CHAIR GARY: Okay, I have Dennis and then Jim Gilmore and Mike Luisi. Go ahead, Dennis.

MR. DENNIS ABBOTT: Thank you, Katie, for the presentation. You're always on top of things way ahead of us. On the first bullet, the first question I have is, are we making the assumption that we're going to need a reduction next year? That seems to be.

DR. DREW: I think we're in a situation of, plan for the worst but hope for the best. The TC has not seen any model results yet, so I think we can't say what we're going to actually see. But I think we also don't want to be just hoping that we don't

need to do anything, and not have any of this in place. None of this is guaranteed. But again, we want to sort of plan for the worst and be prepared.

MR. ABBOTT: Yes, and I do like that approach. I think that was a requirement of Amendment 7, to make us do this. I'm all in favor of whatever we have to do that we do it to be implemented in the 2023 season, as we've committed ourselves to do whatever that may be. That is my question and my comment on the matter.

CHAIR GARY: Thank you, Dennis, and one correction to the queue. John, I think you were up next, and then we'll go to Jim, and then Mike Luisi.

MR. CLARK: I was just going to respond when Jay asked about an early 2023 decision being made that I know our season starts in February, so yeah that would be really difficult to change things from a regulation standpoint. I mean even November would be pretty aggressive, to get some of these things done. I'm sure other states with early seasons might be facing the same difficulties.

CHAIR GARY: Jim.

MR. JAMES J. GILMORE: Just a suggestion. First off, if this works out, remember in terms that we have the November meeting, which is the beginning of November, and then we have the joint meeting with the Commission the second week of December, and it's becoming a regular occurrence now.

Where we used to have only one a year, now we have like four or five. We could possibly add on a striped bass thing to that meeting, which is in Annapolis, so I don't know if that helps us or not. But at least we're not to the end of the year, we're in the middle of November at that point. Mike, you would love to host another ASMFC joint meeting too, right?

MR. LUISI: We can have every Striped Bass meeting from here on out in Annapolis if you would like.

MR. GILMORE: Again, so we back to our plug. Even if it was delayed until February, New York could get its rules in place. But that scares the hell out of me, because if we get there and we're suddenly down the rabbit's hole, and we don't have a lot of answers, then we're all going to be in a lot of trouble. I think either if we can't get it resolved by that November meeting, we've got that other Council meeting in December that we might be able to piggyback on. I'm not even going to touch CE, because that one, Katie, you said it really good, and I think you're in New York. The speed you went through that. That was pretty impressive. You're an honorary New Yorker now, in terms of talking fast. Just on the sector split though, the question I had. It really comes down to two. It was either going to be a 50/50 or it was based upon the recreational versus commercial, if you went 85/15, so it would only be two options at that point.

Then you would calculate size limit, seasons, essentially based upon those two options, or does it get to be you put more options in there, is it linear any longer? It's like rhythmic, in terms of the amount of work you have to do. How much work does adding a third option in actually going to cost you guys.

DR. DREW: It depends on what kind of an option you're talking about. Obviously, if you want different splits for a commercial versus recreational, or different reductions for each sector, then we basically start multiplying out from there, because we'll need the recreational options. You know if you want to add an extra size limit that is just one extra option.

If you want to add an extra percent split that is two extra options you have to add on top. You start having to multiply that through, because then you need the different size limits for the ocean and the Bay under one split, the different size limits for the other, et cetera. Yes, it depends on basically choosing different splits or different sector reductions is a multiplicative effect. Adding an extra size limit consideration is more of an additive process.

CHAIR GARY: All right, next we'll go to Mike Luisi,

and then we have Nichola Meserve.

MR. LUISI: I'm trying to figure out what we're actually going to see in November. The way I'm thinking it through, the suggestions we make today on guidance to the Technical Committee will produce something that we'll have a first look at based on the updated assessment information that is used in calculating whatever it is we're looking at in November.

I would agree with Jim that I think there are two possible ways to get to a reduction if it's needed, if it's the worst-case scenario that we're planning for. One would be an equal sector split so the reduction is taken equally, and the other is the one that was presented where it's like an 85/15 based on the proportion of removals.

What I envision seeing in November is not just one selected result of the guidance that we're giving. We may have two or three different views at ocean and Chesapeake Bay, and maybe within some of the other systems, options to consider for implementation in 2023. To the first point.

If that is accurate as to what we're going to be looking at for the first time, I would have a very difficult time supporting making a decision at that November meeting as to what we're going to implement, without spending some time, taking what we get that is supported and approved by the Board out to the public.

Even if it's a state-run hearing a couple weeks after the board meeting so we can generate some public feedback and comment in making our final decision, sometime either right before the turn of the year, or early into the next year. I would be very uncomfortable going into November thinking I'm going to have to decide on what option I'm going to select, having seen it for the first time and not having had an opportunity to talk to any of my stakeholders in Maryland.

I'll stop there, Mr. Chairman, I do have comments as we go through the questions, so hopefully I'll have a second chance to provide those thoughts.

CHAIR GARY: We're going to go with two more, and then I'm going to bring the Board back to the timing issues, and we'll go through those sequentially. Max, I'll let you, so we'll have three, Max will be last-say. We're going to bring it back to each of these incrementally. We'll start with the timing. I do want to hear from the public as well, both in-person and online. You'll have an opportunity, some limited comment. We'll go to Nichola first.

MS. NICHOLA MESERVE: Even for a state that has a later season start than many others, I think a February decision point is problematic from an implementation rulemaking process and getting the word out to stakeholders. November would be ideal, but I do agree with Mike about a need to provide a little bit of time for states to get some input on measures that we may see for the first time in November.

My viewpoint would be to hopefully plan on a December meeting as Jim suggested, for decision making at that point. Even that timeline I think hinges on the guidance that we give to the Technical Committee today, and being pretty narrow in the range of options that we're requesting.

To I guess, begin to delve into that discussion a little bit, you know I would be looking for equal cuts between the two sectors and a limited range of options, commercial quota cuts and on the recreational side looking at the size limits. I think seasons is a much thornier issue to get done quickly.

Then kind of our standard measures, something that is already in the FMP with minimum sizes and maximum sizes, and just looking at perhaps narrowing the spot on the coast, perhaps implementing a slot in the Bay, those types of measures that the Technical Committee can likely turnaround more quickly and with less initial thorns in them than looking at something like seasons.

CHAIR GARY: Emerson.

MR. EMERSON C. HASBROUCK: I agree with what

Mike said a few minutes ago on timing. I also think that timing in our decision in reaction to the assessment, is going to be based on what the reduction is going to be. If after the assessment we see that it's a relatively minor reduction, we can probably make that decision a little bit quicker and easier than if it's a larger reduction that has to be taken. I think we need to leave ourselves the opportunity there to have more time if there is a larger reduction.

CHAIR GARY: Max, you have the last word before we move on to timing.

MR. MAX APPELMAN: I appreciate that. Thank you. I was going down the same line of thinking as Dave Sikorski over there with uncertainty, and was trying to reconcile all the information that I'm hearing. With the CE measures, you know if the intent of Amendment 7 is to not allow CE moving forward, while we're still in an overfished scenario.

But the TC is also saying we need to sort of grandfather in these CE programs, or else we're adding uncertainty. I'm just wondering how the Board can get out and clear the slate without having to deal with all this uncertainty. Is there a way for the Board to do that or is this just, you know at some point we're going to have to accept what we decided and accept that uncertainty at some point. Anything to just help me understand that a little bit better?

MS. FRANKE: Yes, I'll just start off there. I think, you know as Katie mentioned from a technical standpoint. Starting where we are, you know those 2021 measures, no matter if they were the result of CE or not, is what resulted in the 2021 removals. That is just kind of where we are in terms of what led to the level of removals we saw, and what we're basing that percent reduction calculation off of.

I think what you're saying is, you know the Board is having to reconcile with, how do we move forward from what was implemented through Addendum VI CE? And, this is a question to the Board as we have all of these CE programs in place. It's now the time, if we're thinking about a potential reduction, the Board is having to address what happened with the last management action when trying to figure out how to move forward.

DR. DREW: Yes, I don't think there is anything technically we can do about it. I think it's more like when and where is the Board willing to accept some uncertainty going forward, in order to get to clear the slate or get back to where you want to go. You'll have to accept some degree of uncertainty in that if that is what you want.

CHAIR GARY: Does that help, Max? Good, okay. All right, what I would like to do now is go to the public for some comment on the timing component, and if we could do a show of hands for the public that's here in Arlington in the room, and also a show of hands. I think there is a hand raise feature.

Emilie is indicating yes, so those of you that are listening online, raise your hands if you would like to comment. Let's see what kind of feedback we get and we'll determine the time allotment. We have one hand here in person and two on the webinar. Let's see if we can do this in five minutes, so Mike, do you want to come up first? A minute or two, Mike, if you can.

MR. MIKE WAINE: Thank you, Mr. Chairman, Mike Waine with the American Sport Fishing Association. Are you just looking for comments on the timing, or can I comment on some of the other topics discussed by the Board?

CHAIR GARY: We would like to do the timing if possible. Yes, go ahead.

MR. WAINE: Are we going to get another shot at the other topics?

CHAIR GARY: Yes.

MR. WAINE: Okay, well for the timing I think the Plan Amendment 7 is pretty clear that the Board has to act quickly. I guess if that is the Board needs a little bit more time administratively, as long as the implementation stays 2023, I think that is to the Board's purview. But I think the Plan is pretty clear

that the Action needs to happen quickly if the assessment says something needs to be done. Thanks.

CHAIR GARY: Thank you, Mike, and so who do we have online? All right, Dale Kirkendall. Captain Kirkendall. A minute or two if you could, please.

MS. FRANKE: Dale, if you're speaking, we can't hear you. We'll come back to you in a moment.

CHAIR GARY: All right, Patrick Paquette, you have the floor.

MS. KERNS: Patrick, you need to unmute yourself.

MR. PATRICK PAQUETTE: I believe I am unmuted now. Thank you, Patrick Paquette, Massachusetts Striped Bass Association. Specific to the timing, I believe that a large number of the public here in Massachusetts would prefer a decision made closer to the scenarios that were described regarding special meetings prior to the end of the year, as opposed to February.

I would just give for some reasoning for that. I would ask you to remember that February is the middle of what I will call sportsmen show season, when charter captains and the public are both booking charters and selling charters for the upcoming season. I live on Cape Cod. Striped bass is a major tourism draw, and striped bass charters are a major tourism draw.

It would be much more convenient to the public, although I believe the public absolutely supports getting this done this year as opposed to next. It would be regulations that come out in February for this fishery for the immediate upcoming season, would be made much easier if they came out just a few months before, and it would make the industry and the general members of the public trying to book with the industry. It would put them in a much better place.

CHAIR GARY: Thank you, Patrick, we're going to go back to Captain Kirkendall, if you are able to unmute yourself.

MS. FRANKE: Dale, it looks like we still can't hear you. We'll try to come back to you perhaps later in the meeting. But otherwise, I can follow up with you after the meeting.

CHAIR GARY: All right, thank you. We're going to bring this back to the Board. I would like to conclude our feedback for general guidance to the TC on timing. You've already had significant input, so we'll come back. Ritchie.

MR. G. RITCHIE WHITE: I think we pretty clearly told the public that we were going to act in November, when we passed this. The purpose was to act in November, and we asked all the states, if we do that can you implement for 2023? The answer was yes. We've already told the public what the intent is, and I think we must do this in November. Therefore, I think with that. If we decide that first then the rest, we have to back into it. Then we can't have options that are so complicated that we can't make the decision in November. That is the way I would look at this process.

CHAIR GARY: I know Mike had his hand up, but I'm looking for folks that haven't commented. Justin, we'll go to you and then over to Tom, and then to Mike.

DR. JUSTIN DAVIS: From my standpoint, I think I've been pretty clear about this on the record every time we've had this discussion. I was only comfortable with this new approach that we adopted in Amendment 7 of allowing Board action, if there was going to be enough time between when the Board received the candidate set of regulation options and when we had to make the decision, such that states had a time to do their own state-specific abbreviated, but state-specific outreach.

In good conscience I can't sit here and say that I would look at a set of options one week and make a decision the next week at a meeting about what we would be willing to adopt in Connecticut. From my standpoint, I'm liking the consensus that I think is emerging here around doing a meeting in December to take action, which to me doesn't at all

I think jeopardize 2023 implementation.

CHAIR GARY: Tom Fote, and then Mike Luisi.

MR. FOTE: Yes, I agree with Justin, just the same, we have a problem. I mean we have a fishery now in January that we never had before, and into February people are still fishing, because the water is still warm so it's going right through the season. Party and charter boats are still going out fishing for striped bass in January. I'm not, because I'm in Hawaii then.

But anyway, that is what is going on. The other problem I have here, because I'm not sure what the public wants us to do at that point with the information we get. One of the concerns I have, and I don't know if Katie, we have a bunch of catch and release studies on warm water, on how you basically handle fish and things like that.

I don't remember, and I'm wondering if in our files we have a catch and release study on older fish versus younger fish. Now I know, because I've done a lot of striped bass fishing over the years. When you're basically bring in young fish, because you're fishing with heavy tackle now, you don't want to stress anybody out. You get them in right away and you release them, they just go swimming off.

When you get the big females and they come in there, 41 inches, 51 inches or 52 inches, which has been a lot of fish this year. You've got to spend a lot of time reviving them, and they move away very slowly. If we shorten the size limit again and we don't raise it up, say go from 28 inches to a 30 inch, and make the size limit that. We're going to begin targeting bigger fish to basically get back to catch and release, if you start narrowing the slot even more than 35 inches. You're basically going to kill more fish. Again, with catch and release, because that is what you're doing. I don't know what the answer is, but I just have that question. Are there any studies that basically tell us what happens, so I can help my decision-making process?

CHAIR GARY: All right, thanks Tom. We're going to go to Mike, and then I would like to kind of wrap this up if somebody else hasn't spoken we'll entertain that. Otherwise, we're going to try to see if we can get some consensus here, and I think Dr. Davis indicated that is at least what I'm hearing and what my notes reflect. But hopefully we'll find out. Mike, you may or may not have the last word. Go ahead.

MR. LUISI: I'll be really quick. I just want to remind the public that the traditional way that we would handle this type of action would be to hear the assessment results in November, and depending on whether or not we agreed with those results, we may or may not initiate an addendum, which would start a process that could take up to a half a year or longer to put new management actions in place, which would take us to 2024 at the earliest.

Now this Board made every attempt during the Amendment 7 discussions to make the appropriate decisions and comments on the record that we feel that we need to take action more quickly than that. This concession that we're making here to speed up the train, I still believe we are going to meet those expectations of the public to have measures in place early in 2023.

But there is a public process that I still feel very strongly that I certainly need some time with my stakeholders, as Justin mentioned, before I make a final decision on measures. I just want the public to be aware that it's not that we're moving any more slowly than we normally would. This could take a very long time, but we're making the attempts in the manner that we're discussing today to get this done very quickly.

CHAIR GARY: Nichola.

MS. MESERVE: I just wanted to double check that the timeline, I think Katie presented it earlier. But it doesn't allow for the stock assessment results, the projections and options, provided we give guidance today, to be provided, you know a month before the annual meeting, such that states could kind of front load public input before the annual meeting. What is the soonest all of that could be ready?

DR. DREW: I think it depends a little bit on the results and how much additional work we would need. We do intend to present the results to the TC next week. Then depending on how much feedback there is from the TC about, is this the right base run, do we need to see additional sensitivity runs?

Are there concerns with some of the data, et cetera? That could propagate through, and similarly with the calculating any necessary reductions, how much back and forth does the TC need amongst itself to get some of this stuff done? We sort of planned it out so that we would have it to you guys no later than those two weeks ahead of time.

But there is the potential for, if things go well and we don't have a lot of technical back and forth on these issues, we could compress that timeline and release it sooner than Board materials. If that is something the Board is very interested in, I think we could look at compressing that timeline. But I also don't want to offer that up as something that we can definitely do, if it turns out there is more complicated technical questions with how the assessment and the projections play out.

CHAIR GARY: Justin.

DR. DAVIS: I appreciate the second opportunity. I think I would like to return back to, I think a question or a comment Jason McNamee brought out earlier. Is there any state around the table that feels like if we made a decision in December that that would pose a real problem for implementing rules ahead of the 2023 fishing season?

CHAIR GARY: It's a good question. Anybody have an issue with that? You've got your answer, Justin. We'll go ahead and bring this back now. Are there any Commissioners that haven't had a chance to weigh in that would like to, if you haven't spoken? I think we're ready. My notes indicate, and it looks like it's pretty clear.

There has been a coalescing around having a meeting sometime in December. Emilie and Katie, does that match up with what you all are seeing in your assimilation of feedback? We're looking for guidance through consent, without a motion if possible. I'll go ahead and reach out to the Board. Is there any objection to going ahead with the idea of a December meeting for our timing? No objection to that? Go ahead, Eric.

MR. ERIC REID: Is this going to be a standalone meeting, or is it going to be essentially a standalone meeting in conjunction with the Mid-Atlantic Council, because it would be a Striped Bass only meeting, so it's a standalone meeting in conjunction with the Mid-Atlantic? I'm getting noes over there, so I just want some clarification on what we're thinking about this.

CHAIR GARY: Thanks, Eric, I'll go to Toni.

MS. KERNS: I think we would have a virtual meeting. We would poll the states, well the Board to see what day works best for the Board. My guess is that it will have to be outside of the two Council meetings that occur. New England is the first week in December, and the Mid-Atlantic Council is usually the second week in December, so likely it would be sometime in the third week, unless we did it on a Friday or a Monday. But it would be virtual.

CHAIR GARY: Go ahead, Emerson.

MR. HASBROUCK: I had a question for the TC. Can we put that calendar back up again? It was just up a couple minutes ago? I'm guessing then that the week of September 19th the final assessment report is going to be available. Is that correct?

DR. DREW: That's the assessment goes to the TC and the TC, so basically in August 10, the TC may or may not ask for additional runs, additional things like that. We would do those; we would put that in the report. Then the TC is going to see the report. There is the possibility that the TC is going to want to make adjustments to the report on the basis of whatever came out of those additional runs, or however it is. In theory, yes, we would love it to be like check we're done. But we always do build in a little extra time, in case people have concerns about the results or the way they are presented in the

assessment report.

MR. HASBROUCK: Okay, thank you for that. Then on the week of October 10, a TC call to approve final proposed measures if necessary. Is that where the TC is going to review whatever guidance we give you today against the results of the assessment? Is that what's going to happen that week?

DR. DREW: Essentially, basically we will come to that September 19 meeting with projections that they either everything is great, we don't need a reduction, or our base run says we need a 5 plus percent reduction. In which case, we'll need to set, the TC will assign people to work on what kind of measures will get you that reduction for the ocean, what kind of measures will get you that reduction for the Bay.

We need to know what the approved base run of the model is, which is that September 17, in order to then know what percent reduction we need to take. The TC will run all the measures and figure out what will get you to that listening to the guidance of the Board.

MR. HASBROUCK: Thanks. That is what I thought the timeline was going to be, and the steps. What I'm wondering here is, will that assessment be shared with the Board before you go through the activities of the week of October 10? If the answer is yes, great. If the answer is no, I would ask that you share the assessment with the Board, so we have some sense of where we're going with this as soon as possible.

CHAIR GARY: Last call for any feedback. I think staff is agreeing that they've got the feedback that they need, and we have the consent for a December meeting. Is there any resolution? I know we have the Council meeting, I guess in December. We'll try to work around that.

But, any other thoughts about when that might occur, or is not that important to drill down to specifics?

MS. KERNS: Like I said before, Marty, it would either be sometime the third week in December, or we'll put in the doodle poll the Mondays and Fridays of the Council meetings, knowing that the Councils typically do not meet on those days. If they extend their meetings for some reason, we will avoid those.

CHIAR GARY: Thanks, Toni. All right, Jim, you have the last word.

MR. GILMORE: Just quick. The only reason I suggested tagging it on is because that following week is Christmas week. You know trying to do a meeting Christmas week is going to be a nightmare. If we could tag it onto the Council week would be, I think ideal.

CHAIR GARY: Emilie and Katie, we have what we need on timing, right? All right, so I would like to next go to the other two items and bundle those two together. This is how to handle existing Addendum VI conservation equivalency measures when developing new options. Remember the two choices were to use the TC recommendation, use 21 measures as a starting point, or use the FMP standard as a starting point. Then we're going to bundle that also in this discussion with the other option, which is preferred management options to achieve the new reduction. For instance, looking at things like sector split, size limit changes, season changes in the Chesapeake and coastal options.

What I would like to do is go to the public first, because we had a little bit of discussion already at the Board level on this, and get again a show of hands both in the room here in Arlington, and online, as to who would like to comment. Go ahead and raise your hand online, and I see Mike you want to comment. We have one person here in Arlington that would like to comment, and we have two online. Mike, go ahead and take the podium.

MR. WAINE: Thank you, Mr. Chairman. Mike Waine, with American Sport Fishing Association. I'm trying to kind of understand how the Board is going to navigate this with some of those preferred management options listed on the slide. The reason I say that is, I'll just take the sector split one

for example.

To my knowledge that id part of one of the conservation-equivalency plans from one of the states. What I'm trying to reconcile here is, it was clear in Amendment 7 that the Board needs to act quickly to address a mortality issue if there is one from the assessment. But I think there was some understanding by the public that you would likely use management measures that you've used in previous plans, or technically in Amendment 7 right now, which was both Bay wide and coastwide measures as the baseline.

You know I think that it is somewhat of a disservice to use some of these less used CE specific regulations as a coastwide or Bay wide management response if you're going to act quickly. If you were to do that, use some of those CE proposal regs, I think you should do that through a longer public comment process in a management document, personally.

To just kind of summarize my input here. I think the goals and objectives of the FMP were to bring some uniformity to the regulations. The data suggests that when you use it across a broader geographic region it is more reliable. My suggestion would be to use Bay wide and coastwide measures as part of the management response. That would be essentially bag and size limits for the recreational sector. I guess my time is up.

CHAIR GARY: Go ahead, Mike, I'll give you another minute.

MR. WAINE: The other thing that I wanted to address was this decision to take the reduction between the recreational sector and the commercial sector. I'll just remind everybody that this was discussed in Addendum VI at the New Hampshire annual meeting in 2019. Specifically, this was a question, should the reductions be taken equally between the sectors. There was a vote on that. The ultimate decision was to do equal reductions.

There were some states that used conservation equivalency to not follow the decision of the Board.

I guess seeing the presentation this morning from Emilie with an FMP review, and seeing that that commercial quota is being more utilized in recent years. I think it's reasonable to not revisit the decision about equal percent reductions. Leave it at equal percent reductions, and take that as a way forward right now. I appreciate the extra time, Mr. Chairman.

CHAIR GARY: Thank you, Mike, so we're going to go online now and we only have two other commenters from the public, so approximately I'll give you three minutes. It's Ross Squire, you'll go first. Ross, if you could unmute yourself.

MR. ROSS SQUIRE: All right, can you hear me? MS.

FRANKE: Yes, we can.

MR. SQUIRE: Okay, great, thanks. My name is Ross Squire. I'm with the New York Coalition for Recreational Fishing, and my comment is in regard to going with either the existing CE options or considering new management measures. I'm wondering if a third option should be added, and that is to only consider continuing CE measures if they are meeting or coming close to meeting the goals and reductions that they were intended.

I don't know if the Board has been provided with that information, but it seems inconsistent that the Board would approve CE measures going forward, if they've shown that they haven't met the original objective that they were supposed to. I think back on earlier addendums where CE proposals were approved by the Technical Committee, and they grossly underperformed. It just seems inconsistent that the Board would permit that to happen going forward. Thank you for allowing me to speak.

CHAIR GARY: All right, Ross, I appreciate your comments. Next, we'll go to Dale Kirkendall. Dale, I'm hoping you've solved your mute on the microphone.

MR. DALE KIRKENDALL: I am too. Yes, I had to

switch devices. The last comments made by the fellow from New York on the recreational side. That makes sense to me. When we have conservation equivalency in place that demonstrates that it is meeting the objective, I think it should remain, especially if it reduces the uncertainty of going back to the original FMP plan to make the reductions.

Additionally, I do have an issue with the CE not being able to use it to distribute within a state. I believe each state has the right to whatever number of fish the Atlantic States Marine Fisheries is giving them to catch. However, they want to catch them and preserve them, they should have that right. If New Jersey wants to use its commercial fish as recreational fish, or if a state wants to split their fish differently between their commercial and recreational sectors, they should be allowed to use CE as a states' rights issue to come to that conclusion.

The Board, I understand they have some penalty process in place, but I'm not sure that that is legal, number one, to have that when it is the fish within the state and how they are being split. Additionally, I didn't get to comment on the timing thing. But in Maryland we are issued our tags prior to the upcoming season for commercial fishing. That starts in January 1. I'm not sure with a December timeline that we could be issued the appropriate number of tags if there were reductions or not, or how it would be managed as they're returning tags and such, so that we get the right number. As well as, the commercial fishermen have a card that is issued to them just prior to the season, there is no way that that window can be completed, if we're not making decisions until December, and unlikely it could be completed if we were making a decision in November. The fishermen of course, they want to fish when the fish are there, which is likely the first week or two of January for our gillnet season. Those are my comments.

CHAIR GARY: Thank you, Dale, I appreciate that. All right, we'll bring the conversation, the discussion back to the Board, and we'll go ahead and tackle these one at a time. We had a bundle from the public, comments. Katie.

DR. DREW: I think just to clarify. I think on the existing CE measures or CE plans, we would not be retaining an entire plan from a state. It would be more like there would be certain measures in place that if the final options didn't affect them, they would stay in place. For example, in the Bay.

The Bay used seasonal closures in some places to get to that reduction. If for this Board action the Bay put in, for example let's say a slot limit, and that slot limit got you the reduction with the existing seasonal closures they wouldn't have to change those seasonal closures in the approach that the TC is proposing.

The other option would be to take those closures away, and go back to whatever seasons were in place before that CE plan, and then put new measure in. We're not proposing that we keep entire plans, we are saying that it would be easier to keep sort of the little leftover bits of CE that are not affected by the final measures that the Board approved.

That includes for example on the commercial side, several states took a smaller reduction in quota, and offset it with a change on the recreational side. If we got rid of those CE plans, they would have to take that full 18 percent cut to their quota that was specified by Addendum VI, and then what do you do?

They've taken an 18 percent reduction on that side, do they get to go back up in order to balance it out, if we don't need a full 18 percent reduction? That is kind of like what we're talking about with these little leftover bits of CE, or just wipe the board clean and then go back? We're not talking about keeping full existing CE plans, it's just little leftover regulations.

CHAIR GARY: John, did you have a question about that?

MR. CLARK: Yes, I'm just a little confused there, Katie. We're one of the states that did that. You're saying that even if we, and I'm strongly in favor of keeping the CE measure, just working off of that.

But you're saying that if we did that our sector split that resulted in, if there is a different sector split that is voted on by the Board, then we would have to change pretty much everything?

DR. DREW: No. That would be if the Board decides on a different sector split, then we would take that so under the TCs approach, you know you would take it from whatever your quota is now, and then you would just take the whatever split you need, whatever split the Board decides on, and whatever reduction you need from what your quota is now. The other approach, which is to wipe the slate clean, means we have to go back and take away those CE adjustments to the commercial quota, and basically go back to the FMP standard of everybody takes the same cut, ant that is that 18 percent from the commercial and the 18 percent from the recreational, if you wipe the slate clean of the CE.

MR. CLARK: Do not want to do that. Thank you.

CHAIR GARY: If it's all right, we have a ton of hands that are going up, but could we go ahead and tackle these one at a time and try to achieve consent from the Board to give guidance to Katie to take back to the TC. We're now going to try to focus on how to handle the existing Addendum VI conservation equivalency measures. If everybody could focus on that. Jason. Let's see, let's queue this up. Jason, Megan, Emerson.

DR. McNAMEE: I think I'm going to be brief here. I'm in complete agreement with the Technical Committee, I think that's who said it, who recommended it. It would be, I think, extremely difficult. I guess you would have to perform a bunch of simulations or something to reinvent what might have been.

It makes perfect sense to me that the baseline is 2021 or whatever year we're talking about, it was 2021. I'm in complete agreement with their recommendation from the Technical Committee, and think we would be injecting a bunch of unnecessary uncertainty as was discussed earlier, if we did anything different.

CHAIR GARY: Megan.

MS. MEGAN WARE: You just want the second bullet, comments on that? Okay, I'll agree. I think the TC has strong rationale for using the existing measures as the basis for the 2021 removals. As Katie has explained it, my understanding is that means there may be some elements of CE proposals that move forward into whatever our next set of regulations are, but that the measures that are changed, those will be uniform in whatever region we're talking about.

I'll go back to our discussion on Amendment 7. I think the underlying reason that the Board voted not to have CE when the stock is overfished is there was concern that the disparate measures are undermining our ability to rebuild the stock. I think this gets at kind of an aligning of measures down the road here, so that as we're making changes, we start to see greater alignment of measures between states.

I think that is achieving one of the goals that we heard from the public out of Amendment 7. I do want to be clear though what I'm not comfortable with is a situation in which each state, I'll make up numbers here. Let's say it's a 10 percent reduction we need. Each state gets a 10 percent reduction, and kind of has the freedom to make up its own package of measures. To me that is CE, so that is something I would not be comfortable with.

CHAIR GARY: We're going to go to Emerson Hasbrouck, Dave Sikorski, and Justin Davis.

MR. HASBROUCK: Jason said exactly what I was going to say, so I have nothing further to add. When I was leaning forward with my hand up, I blocked Joe, who also had his hand up. I'll yield my time to my colleague from New Jersey.

CHAIR GARY: Go ahead, Joe, take advantage of that.

MR. JOE CIMINO: I will, thanks, Mr. Chair. I agree with Jay also that I don't see how the TC would even come up with a different option. But it was

something that Emilie said that concerns me, and it makes me feel like striped bass is once again moving towards our black sea bass management.

That is the assumption that we're going to have to make, all of us, that the measures that were put in place are the reason why the harvest estimates were what they were. As if we had those same measures in place in a different year, and we wouldn't see incredibly different harvest estimates. I just want everyone to keep that in mind as we move forward.

CHAIR GARY: Go ahead, Dave.

MR. SIKORSKI: I appreciate all this conversation around the uncertainty in the CE measures, and I think Megan just hit the nail on the head. I agree with what she just stated. We're trying to align consistency amongst our regulations that hit the water for the recreational sector or for commercial is different of course. But I think that consistency is key.

That is why, not only did this Board decide in Addendum VI that reductions should be equal, even though they weren't in many states. Back in Amendment 7 there is consistent measures for coast and for Bay, and I think that is key moving forward. Without that we're ignoring the public, and the desire to find some more consistency. When we're on the third bullet point, I would like to offer one concept in regard to that down the road. But thank you, I agree with Megan.

CHAIR GARY: Justin.

DR. DAVIS: Quickly, I'll just echo the comments around the table that I think the only workable solution is to use 2021 as the baseline going forward to develop new measures. To put a finer point on the discussion about how interjurisdictional inconsistencies in measures that were brought about through CE could potentially perpetuate forward here.

For the ocean fishery, the only way we could have an inconsistent length limit as a result of this process would be, is if we chose to achieve reductions only through season. As soon as we decide that we're going to use length limits as a tool for achieving reductions on the ocean fishery that means we're going to have a consistent length limit for all states in the ocean fishery, correct?

DR. DREW: Yes, that would be unless the Board decided to go some other kind of regional approach or what have you. Once we decide on a length limit for the ocean, and we do not permit conservation equivalency for the ocean, then that is it you're set. CHAIR GARY: John.

MR. CLARK: Just to clarify this. I'm sorry I'm just not really grasping exactly what you're getting at here. Take a state, using a concrete example of Delaware, where we have a slot season on resident fish in the summertime. We've taken two reductions on that already in Addendum IV and Addendum VI. Under Addendum VI, we partitioned the cutback between the recreational and the commercial. We gave commercial only about a 2 percent cut.

As the results show, we've hit the marks perfectly both years, we've exceeded them in the past year. I'm just still not grasping exactly what you're saying here now. Whatever the cut is, we're going to keep the slot season on resident fish in July and August in Delaware, and the commercial side though, depending on what that works out to, will that let us know how much we need to reduce the commercial side, or how will this work?

DR. DREW: The Delaware Bay is one of the special cases for CE, where CE is still permitted under Amendment 7. In order to accommodate those smaller, resident fish, similar to the way the Bay is explicitly accommodated. I think if the Board decides to revert to the FMP standard, which is seems like the Board is not going that direction.

But if the Board were to do that what would happen is all of those CE plans would be wiped out, everybody's quota would go to the 18 percent reduction from Addendum IV, and then that would be our starting point. I think it's extremely unclear

how you would adjust that quota if you needed to take a reduction from there, when you've already taken an 18 percent reduction.

But in theory, everybody would take the 18 percent reduction from Addendum IV, and then that 5 percent, 10 percent, whatever reduction would be applied to the commercial quota and to the recreational fishery, with whatever set of measures for the ocean, and just the reduction on the commercial side.

Because the Delaware Bay is explicitly exempted under Amendment 7, as is the Hudson River and the Delaware River in Pennsylvania. You could then do a CE plan for that specific region to achieve the same measures. But it would not affect ocean measures. If the Board were to go with the TCs recommendation, everybody would keep their commercial quotas as they are now.

Everybody would adjust the ocean measures to match whatever option gives you the necessary reduction. Then Delaware Bay and Hudson River and the Delaware River would be permitted to provide conservation equivalency plans to make that same reduction, if that is the will of the Board.

MR. CLARK: Thanks, okay, so it is more of what we have now going forward if we continue with CE.

DR. DREW: Yes, it's more like we're going to start from what we have now, and adjust it as opposed to trying to roll back and go in a different direction.

CHAIR GARY: Thank you, John, thank you, Katie. If I could be so bold, I think what we're hearing, and staff concurs, we have it highlighted. I seek to find if there is any objection to the TC recommendation.

Hearing none, then that is what we'll go with. All right, so we're ready to move on to the last piece of this puzzle, not the last part of the agenda but the last piece of this puzzle.

This is the preferred management options to achieve the new reduction, which include options like sector split, size limit changes, season changes and the ocean and Chesapeake Bay specific options. We'll open this up to discussion, and hopefully we can form a consensus on this. We'll go ahead, I've got Justin, Mike, and Megan. Let's start there. Go ahead, Justin.

DR. DAVIS: I think I would like to invite a conversation for states around the table about the potential size limits to look at for the ocean fishery, and whether there is any interest around the table in taking a minimum size limit off the board at this point. I've been a big proponent of the slot limit from the start.

I think there is really good reasons to believe that is a great regulation and a great management approach for striped bass. I've heard nothing but support really from stakeholders in our state, including from the for-hire fishery that were really reticent about it at first, but now feel like for a couple years here they've really been able to talk to their customers about the benefits of releasing these older, larger fish.

I just think it's a regulation that is working well, and I also view that regulation as a long-term investment. We've had it in place for a few years. We're starting to get some size classes through that slot and into the protected portion of the regulation. I just think it will be a poor choice at this point, a few years into it, to reverse course and adopt a minimum size limit, and go back to that and sort of expose those year classes we just got through the slot to exploitation again.

You know in the interest of potentially saving the Technical Committee some work, if there is consensus around the table that we should stick with the slot limit. I would just throw that out there that maybe that is a decision we can make today that we don't want to take a look at minimum size options for the ocean fishery.

CHAIR GARY: Next we'll go to Mike Luisi, then Megan, then Dave Sikorski.

MR. LUISI: I'm going to defer my comment on the question that Justin asked to Dave Sikorski. But I

thought before I do that, I thought I would at least provide you some thoughts about where I stand regarding the question before us here. It's been said a few times around the table this consideration of a sector split with potential reductions that would come from an analysis of the assessment update is an unknown.

We're planning for the worst but we're not sure what it's going to look like, and we don't have any idea today what that looks like moving forward. With that known, I would like to see the Technical Committee move forward and prepare options for consideration by the states, which looks at the commercial and the recreational fishery, and if reductions are needed to take each sector and assign a certain percent reduction to that sector, based on the overall removals of that sector, based on the most recent update of the assessment. It gets back to that table we discussed an hour ago, an hour and a half ago, related to removals. Because there comes a point with a commercial fishery, and I know not every state here has one.

But there is a point with a commercial fishery where it's almost not even worth operating any more. If this reduction that we're facing, this potential reduction is large, the state of Maryland may want to consider how to assign that reduction in fishing mortality based on the commercial and recreational fisheries, as an impact to those different fisheries.

I would like that to be analyzed. I think that's the information that you're looking for, Mr. Chairman, as far as not just a 50/50 split, but a disproportionate split of reductions based on the overall removal percentage. As far as size limits and seasons, in the Chesapeake Bay, I won't speak for the ocean, but for Chesapeake Bay I don't think an increase in size limits should be considered. That's just my opinion.

I think if we are to try to attempt reductions we should focus on effort to some degree, which would include seasonal modifications on harvest. I think by increasing size limits in Chesapeake Bay, we're only exacerbating the issue that we've been working for five or six years to try to reduce, which are the dead discards associated with a larger size limit. That is just some feedback, Mr. Chairman, from what is presented before us. If Dave, I don't know if you want to go to Dave on Justin's question, but I was going to ask him to respond.

CHAIR GARY: Dave is on deck. He can comment on it then, but I would say we're taking some notes, staff and myself, so we have a couple concepts that are formed. Justin put out the idea of maintaining the slots, and taking off the books the minimum size shift. Then yours is the sector split, right, Mike. We'll come back to those two and see if there is any more support for either one of those. Next, I think we have Megan and then Dave Sikorski.

MS. WARE: I guess I'll start with the measures. Justin, I think what you said makes a lot of sense about maintaining the slot, so I would be open to that in considering adjustments to the slot, as opposed to just a higher minimum size. I think we need to think about where that 2015-year class is within that slot, so that might be something helpful for the TC to bring back to the Board to help us figure out the best way to go there.

But I think that makes sense, and I would prioritize a change in the slot over closures. I think it was previously mentioned, but I think closures you get into some questions about is it a harvest closure or a no-targeting closure. My understanding is I don't think we yet have TC analysis looking at the removals from no targeting closures.

I don't think we've tasked you guys with that, so that is kind of another component there. I just think we start to get down a rabbit hole pretty quick with that. In terms of the sector split, for the ocean I would be interested in the 50/50 split between the recreational and the commercial. Mike, if I'm understanding your suggestion, it was that each state would select its split in sectors, and you can let me know if that I'm understanding that correctly. But I think that inherently results in measures that are going to be different in each state. I don't see how that is not resulting in something that looks pretty similar to CE. But if I've misunderstood you, please speak up.

CHAIR GARY: All right, thanks, Megan. We'll go to Dave Sikorski.

MR. SIKORSKI: First to Justin's question. I think it's a great idea. I think I've heard from a lot of stakeholders in Maryland that question why we have a trophy season any longer, and that has kind of lived on under this minimum size of, I think 35 inches. But I think our impact on the coastal stock being consistent with the other states is a great idea.

Frankly, I think it's time we talk about a max size limit across the board in all fisheries. I would like to see that option for both ocean and Chesapeake Bay, and when I say all fisheries, I mean commercial and recreational. This has been something that the public has called for a long time, it relates to the consistency and our ultimate goal of rebuilding, right.

Fish above a certain size are all SSB, and we want to maintain them. At a later date we'll talk about at what level, but we want to maintain them and grow them. I think that max size piece also brings some parity amongst the differing harvest that occurs in the Chesapeake Bay. Our Maryland commercial fishery has a 36-inch maximum, and has had that in place for quite some time, so I think matching that with the recreational fishery makes some sense.

I think it makes a lot of sense for our friends to the south to stop harvesting fish above a certain size in any fishery. Again, that's planning for the future, and it meets a lot of our goals and objectives of our management plan. When it comes to these percent reductions, God, this is bringing up all sorts of memories and hair falling out onto my keyboard throughout the Addendum VI process, because it reminded me why so many people find statistics so difficult in school.

You take a percentage of a whole, and that is the percentage right, and that accounts for the balance between two sectors. We had a lot of trouble with that in Maryland, and a lot of the other states you can see that chose to place their reductions unequally, reductions that are actually reallocation. I sat through enough fisheries meetings to hear; oh, allocation is tough. We don't like allocation. We do it all the time, and actually we're doing it right now. I think in order to conserve a fishery, you must reduce removals where they exist. I think the only fair and equitable way to approach any allocation in this fishery is to reduce somebody who is harvesting them.

I think unfortunately we've been going down these worm holes for the last many years, especially because of what my state has done with ad hoc reallocation. I do respect the idea that there is a certain level of harvest which, once you go below it maybe it's not economically viable to operate a fishery.

But that conversation has to be done more holistically, and it of course should be done back in Annapolis, where all of us can maybe be accountable to the people we serve. I'm a little stuck on that, but ultimately, I think the split based on a proportion of removals is all that we should be moving forward with. Otherwise, you're reallocating within this body, which should not happen.

MS. FRANKE: I just wanted to clarify here for the sector split question. I've heard a couple folks say that they are looking for the equal split, so commercial and recreational share the split evenly, and then based on Dave, what you and Mike have said, you are potentially interested in options that would split the reduction based on the proportion of removals, and so that would mean that the recreational sector would take more of a burden of the reduction. Is that what you're saying?

MR. SIKORSKI: No. If the reduction is let's say 10 percent, and both sectors take a million fish. Then both sectors were taking 100,000 less fish, right?

MS. FRANKE: You're saying equal split.

MR. SIKORSKI: The 50/50 is what throws me off here. It's not 50/50, because you have to know the number that we're multiplying 50 by, or 0.5 by.

DR. DREW: Right, are we talking equal in terms of percentages, in term so both sectors take the same percent removal or like in my mind 50/50 would imply that if we need to reduce by a million fish, then each sector takes 500,000, which would be different proportions.

MR. SIKORSKI: Very different.

DR. DREW: I just to be clear, and we struggled with this last time. The options are equal percentages, so both sectors take the same percent reduction versus each sector takes a different percent reduction. Last time it was based on sort of the proportion of removals, and so we could do something different or the same in this case.

But yes, the recreational would take essentially, I mean I don't think we're proposing that the commercial side would take a higher split, but if that is the prerogative of the Board. But essentially one sector would take a higher reduction and one sector would take a lower percent reduction on paper. Obviously, that carries through to different numbers of fish total, but the question is really about what percent we're applying here.

MR. SIKORSKI: My preference would be to take the total removals, decide upon the reduction necessary to meet our rebuilding plan, and then take that percent reduction and apply it to the total removals, and not move any across sectors in any way, shape or form. Last time, like the Board wanted in Addendum VI, but then states were able to use through this process.

The Board agreed that there would be equal split among sectors, and then some states chose to change that through the CE process. My preference is that moving forward, states could not change that through any process, and that all removals are reduced at the level that we decide is necessary. Therefore, we're not reallocating.

CHAIR GARY: Staff and I are compiling these concepts that everyone is advocating for. Next is Jason, so please continue to add to the existing or new ones, and then we'll try to come back to staff and summarize if that's okay. Are you all good with that? We've got Jason and then Joe and Jim. Go ahead, Jason.

DR. McNAMEE: Just right up front. I'm in agreement with Justin's comment as well, so just to add a little more support for that. I have a question. I recall the Technical Committee did an analysis where, so one of the ideas with a slot limit is you're trying to protect a particular cohort or a couple of cohorts.

By its nature, you have to chase it, and so you would potentially have to move it up over time. I thought the Technical Committee looked at doing that. I think it was with the 2015-year class, and found that there really wasn't a need to kind of shift the slot. I could be misremembering or whatever the right word is for that.

What I'm trying to get to is, if that is not, you know shifting the slot, kind of keeping the slot the same size and shifting it. If that is not a worthwhile exercise, then maybe we should focus on shrinking the slot limit from either one side or the other, just to kind of limit the number of the sort of continuum of possible slot limits that you could look at.

Just to summarize. Curious as to whether that memory is correct, where an analysis was done and it was found to not have a lot of efficacies, as far as getting reductions or protecting that cohort, and if so then my contingency comment would be shrinking the slot limit would be an area to focus.

DR. DREW: The TC didn't actually look at shifting it, we only looked at constant measures and compared the slot and some different minimum sizes.

Essentially what we found is, if you keep everything static, we rebuilt in about the same amount of time, like you protected different components of those cohorts under the different situations for sure.

But keeping everything the same the question was basically, did you take a chunk out of that SSB early or late, and it didn't really have an effect on the rebuilding trajectory. But we did not actually look

at could you move that slot or that size limit along with those cohorts, and get a different answer, which was I think the key to the original success of rebuilding striped bass was that minimum size moved up and up with that cohort.

I don't think we'll have time to redo that analysis for this exercise, but we could definitely look at, you know we could do a version where we shrink the slot, we could do a version where we move the slot up, and see which one gives us the reduction that we need. If they are the same, then the Board can discuss which one of those they prefer.

CHAIR GARY: Go to Joe Cimino next, and then followed by Jim.

MR. CIMINO: Thank you, and I'll start by answering Justin's question. I agree, I think it's just too early to pivot away from a slot limit, so I'm comfortable removing an option for a minimum size. Seasonal closures, I think especially if there hasn't been an analysis on what regional possibilities are for seasonal closures. I think just in the timeframe we have, and trying to take this out to the public on our own and come back in December. I don't really think we have the time to do that justice. Then last on the sector separation. In general, I like the idea of states being able to address where these issues are within their fisheries.

But I have two problems with it here. One, I think it would fall under CE. I'm under that same confusion of how it would work as Megan is, and we're under the assumption that CE isn't going to be allowed. I don't see it working here. Second, when you have fisheries like this, you know the possibility of a state needing to cut their quota by say 20,000 pounds, or shift that into the recreational fishery, where it's an additional day or two of a closure.

I don't really think the stock benefits from that type of protection, because I think that effort could easily be shifted in the recreational fishery. I don't think we're seeing that protection by saying on paper we're closing the recreational fishery an extra two days to cover for the commercial fishery. I think we do, unfortunately, need to do equal reductions here, and I would just leave it at that.

CHAIR GARY: Thank you, Joe. We're going to go to Jim, then Robert T. Brown, and then Nichola. Jim.

MR. GILMORE: Just, I agree on looking at adjusting the slot limit. I think that's something we should consider, because we're going to have new data, and it's something we should hang around a bit. On the sector reduction, on the sector split. I'm going to be more simple on this. It's like I want to see the data.

I mean we're prejudging this right now, essentially saying should it be 50/50, should it be 80, you know whatever, 20, 15. I want to see the data, because if we determine today or make a decision that we're just going to leave it 50/50, and then we get into some difficulty in November. We have another option to look at, maybe some other ways of managing this thing.

At this point, I think it's important that we leave as Mike suggested, leave in the 50/50, but do the reduction based upon how the fishery is being prosecuted. I think that is the smart thing at this point. We can fight about it later on. I'm not going to say whether I like one or the other, but in November or a special December meeting, yes, we can really roll up our sleeves and get into it at that point. But right now, I want the data, so I think we should leave it in.

CHAIR GARY: Robert T. Brown.

MR. ROBERT T. BROWN: Yes, I'm going to agree with Jim over there. Also, the maximum size limit is what we need to protect our spawning stock, because that is our future. When it comes to these sector splits, we need a split. Our commercial fishery is really hurting in Maryland. If we get more of a cut, I think cut as many as we've had, it's hard for us to stay in business, and we are a food producer. We need to have the state have the authority to make adjustments as necessary. Thank you.

CHAIR GARY: Thank you, Robert T. Go to Nichola.

MS. MESERVE: I do agree with the equal percent reductions, particularly when it comes to the coastal fisheries. I still may be open to this idea of the Bay as a region deciding upon something different, so that this idea of a state-by-state CE approach to different percentages seems out of line to me with Amendment 7. But I do think we need to make some decisions today that help the TC on that. I do like sticking with the slot on the ocean recreational fishery.

When it comes to the Chesapeake Bay recreational fishery, one point that I wanted to make about seasonal closures, which I know there is support for reducing you know predator harvest closures during the heat of the summer, reducing the release mortality. I just want to make sure that the closures that were implemented as part of a CE proposal for Addendum VI would not count as credit towards a seasonal closure that would be this additional reduction point here.

MS. FRANKE: Yes, that is correct. We wouldn't back calculate, add any reduction from previous measures that were implemented.

CHAIR GARY: We're going to take three more, and then I'm going to turn to staff who have been feverishly summarizing everybody's comments to see how we can pare this down. We'll go, all right, John, we'll give you four. It's going to be Mike, Dave Sikorski, Tom Fote and John Clark, and then we'll stop there. Mike.

MR. LUISI: A couple of people have raised the question about the comments that I made regarding the sector split being like a CE. The way that I look at it, and I'm kind of on the same lines where Jim Gilmore was going, was that once we have an opportunity to see what is analyzed and what is in front of us.

If the entire Board decides to use one option over the other, not trying to predetermine what the Board is going to decide on. But after you see the results of the analysis, if everybody goes in one direction that is not conservation equivalency that is an option for all of the states to fold into their fishery management for 2023.

I'm not suggesting that every state get to choose between one or the other. But let's at least have an opportunity to see what it looks like, and to gauge the severity of the potential reduction, to determine whether or not those states that have a commercial fishery are willing to reduce it by a number that could be enormous. We just don't know yet. I wanted to, Mr. Chairman, just address Megan and Joe's questions on CE.

CHAIR GARY: Go to Dave Sikorski, Tom Fote and John Clark, you will have the last word before we go to staff.

MR. SIKORSKI: I've said enough about what I think. I just want to offer some clarifications. One, when I referenced a max size limit it's across all fisheries, so just for the record I would like to make sure that is noted, commercial as well. I'm perfectly fine with that being Chesapeake Bay focused, so the Bay fishery all fisheries would have a max size limit, and I would propose that a 36 would be a good starting point for calculation.

MS. FRANKE: Just to address that point. As far as reduction. For the commercial fishery we were assuming we would just move forward with quota reductions as the reduction mechanism, and not changing the size limit. I'll turn to Katie if she can say if that is possible, in terms of commercial side.

DR. DREW: I think it is possible, I'm not sure. It would be a different type of calculation than we normally do for these reductions, and it would be a little more complicated. If there is strong interest in pursuing that I think we can look into that.

But, generally speaking, the big change on the commercial side is going to come from adjusting the quota. But if there is interest from the Board about having uniform size limits across all sectors, within a region or across regions, we can look into that as a TC.

MR. SIKORSKI: Thank you. Equal percent reduction for both commercial and recreational takes into

account the proportion of removals which occur in the commercial and recreational fisheries. Different percent reduction would further weight those reductions based on the proportion of removals. I would like to see it considered as a weighted reduction. I think that helps clarify the kind of general use of the term proportion we've been using today, because it is easy to get confused.

CHAIR GARY: Tom.

MR. FOTE: We talk about season closures. I brought this up the last time we started talking about season closures. It makes no real sense to basically do a season closure like Wave 3, 4, when the water temperature in the ocean is something like 49 to 53 or cold, and the hook and release mortality is basically about 3 percent or 4 percent.

We should do the season closures when it has the greatest good, is basically when the hook and release mortality is up to 25 or 30 percent, and that is during the heat. That is when the water warms up and the air temperature warms up. Let's do it, and common sense actually would do that.

Now the other thing, I know Katie was going to try and answer my question about the big fish about the hook and release, and, Marty, you kind of didn't let her. I know she was moving to answer my question, and we do have a study on the bigger fish on the hook and release mortality.

DR. DREW: The data is very limited. I think we do have a little bit of work in the Bay that says that older fish or larger fish have a higher release mortality. But I think the numbers are very limited, and I think it would be very hard to kind of extrapolate, you know 35 versus 36 or 28 to 32, type of a situation. The data do suggest that but it's very limited and would be hard to incorporate into a TC analysis.

MR. FOTE: Marty, if I can follow up on that. I think it's important we answer that question, so we know what the results are we're getting. You think you're protecting the bigger fish by hook and release, yet you may be causing more damage, because people are targeting them. The second thing I've always talked about is, when you look at the thing, is it the big fish or the small fish which produce the greatest young of the year? I mean 95 percent of the females are sexually mature by the time they reach 34 inches. I mean that was the old standard, that is why you raised the size limit back in the eighties, basically to protect that '82-year class until it reached 34 inches, so 95 percent of the females. Do we know if those females, because I know when we did the data back then it was mostly young females showing up on the spawning grounds in Maryland, because we had to fight with the ones where we could basically test them, and actually a lot of them were hatchery raised fish, both male and female.

It is one of the questions we should answer, whether the viability of the eggs depend on the size of the fish. Older fish, because they have been able to produce more eggs, are they more viable, or the older fish eggs are not as viable as the young fish? We know that the older fish don't go up as often to spawn as the younger fish. Maybe we should clarify that at one time too.

CHAIR GARY: John.

MR. CLARK: Real briefly, I just want to support the idea of the slot and to reiterate what Jim and Mike said about making sure we keep both the equal, and take a look at what Dave has now reworded as the weighted reduction. But I would like to see that too. I want to see them both kept, thanks.

CHAIR GARY: Okay thanks, John, thanks Board. We're going to turn to staff now. I know I have my notes, and they've been taking them, so Emilie, can you bring us up to speed. Certainly, some things we've really coalesced around. A few others might need a little work.

MS. FRANKE: As far as the question of sector split, and what types of options for the TC to look at. It sounds like there is support for looking at options that would be an equal percent reduction for both the commercial and recreational sectors, and there is also support for looking at some options that

would be a different percent reduction for each sector that would weigh the reductions.

For example, based on proportion of removals, which would mean the recreational sector would take a higher reduction. I think the TC can look at options under both categories. Does that accurately capture what was said? Did we miss anything? We'll take both of those sector splits to the TC. I'm seeing some head nods.

DR. DAVIS: Just really quickly. If I remember right, in Draft Addendum VI we had something like this, right? There were two different categories of options. Is the idea we would use the same approach we used for Draft Addendum VI, just perhaps update the weights for the recreational versus commercial with the most up to date data?

DR. DREW: Yes, I think that would be, unless the Board has different specific guidance that they would like to say now, yes, we would use that approach for these two options.

MS. FRANKE: All right, so moving on to the commercial fishery. As I mentioned, typically the reduction has been achieved through quota reductions. We had a suggestion to also explore commercial size limit changes, that I think from the staff side is still a question. If there is more specific guidance on size limits for the commercial fishery, again, I'll turn to Katie. That's a new approach.

DR. DREW: Yes, I think part of the issue is that we don't have separate commercial selectivity curves, and we don't have a separate recreational curve. I think it's unclear to me how informative, or how much of an impact adjusting the commercial size limits would be, in terms of again, it wouldn't help us achieve.

It wouldn't change the reduction that we would need, but I think we could loop back and see if it would impact the rebuilding timeline in any way. But I'm not sure we would see a significant difference with looking at a commercial size limit. I guess we would definitely turn to the Board and see if this is something the Board is interested in pursuing. It would be more complicated, but we could try.

CHAIR GARY: Go with Jason and Roy.

DR. McNAMEE: On this topic. I think what you would need to do is like an SPR type of analysis. While your short term, you know the sort of currency we're using of reductions wouldn't, I think it would be difficult to factor in there. You could look at the rebuilding. I think it could be done.

I'm going to recommend against it, because you're introducing again a much more indirect type of analysis, and one of the things we're talking about with striped bass is this kind of loss of productivity potentially, which plays into that type of analysis where you sort of make assumptions about productivity.

While I know it can be done, I would not recommend that, in particular for, it's something we could look at for some subsequent step here. But in this idea of trying to get something in place in a short term, to be protective of the stock, I don't think this would be the right approach.

CHAIR GARY: Roy.

MR. ROY W. MILLER: With regard to commercial reductions. I'm not a fan of commercial size limit changes in this particular case for a couple of reasons. I think it might create the need for use of different mesh size gear. That would be an unanticipated expense for the commercial fishery. There might be market consequences. I think a straight quota reduction is pretty straightforward. I think that can be easily accommodated. I think the commercial size limit change would have a more unpredictable effect on the commercial industry.

CHAIR GARY: Ritchie White.

MR. WHITE: I agree with Jay and Roy.

CHAIR GARY: All right, I would like to go back to Emilie. Do we have a little bit better resolution after that feedback? Do we still have some gray areas that we think we need to clear up?

MS. FRANKE: I guess I would turn back to Mr. Sikorski, as far as, Katie mentioned they could do some exploratory analysis to sort of get a read on how this would impact rebuilding the stock, if that would address your suggestion.

MR. SIKORSKI: Yes, I think that would be helpful, and that would be in lieu of a specific percent reduction, is that correct? That's my expectation.

DR. DREW: Well, I mean I guess that would be the question about how would it be. Are you proposing a commercial size limit change in addition to a quota reduction, or instead of a quota reduction?

MR. SIKORSKI: I would say separate from, so not one or the other. In general, I think this is a good concept for this Board to bounce around, protecting fish above a certain level. If it means you can provide some more information about it in this current context that would be great. But I've heard the opposition as well, and I think this will definitely take more time.

But, my thought process on this goes all the way back to the working group which led to Amendment 7, and how protection of striped bass and then spawning closure protections have not been taken up in a substantive way by this Board yet. I think those two pieces of the puzzle should be, so I'm just taking this opportunity to continue to bring that up. I would look to your best judgment on this. I understand it's not a priority for affecting removals at this time.

DR. DREW: Yes, so we can look into that. If time and the TCs workload permits we can report back on what that would potentially look like. If not, maybe we can bring it back at a future Board meeting down the road.

CHAIR GARY: Emerson.

MR. HASBROUCK: I was just going to suggest relative to this size increase, or change of size, rather on the commercial fishery. It was just mentioned that that would be in addition to a quota reduction. I think the TC is going to have an awful lot to do, once the assessment is finalized.

If this is kind of an exercise to look at what the impact might be, to change the size limit in the commercial fishery. If we're going to get a reduction, and either of the two bullets there under the first item, then I don't know why at this time we're going to explore size change, what the impact is going to be there. It seems to me we've got enough to do.

CHAIR GARY: Robert T. Brown.

MR. BROWN: This is unnecessary changing the size limit on us, as we've got different sized markets for different sized fish. You know some restaurants want pan size fish, a smaller fish, some want a large fish for baking and stuff. It's not a good idea to adjust this at this time. I think we've got enough on our plate.

CHAIR GARY: Any other comments before I turn back to staff and we take another look at what we've got up on the screen? Anything we missed, any comments you would like to add? Mike Luisi, I was wondering, could you clarify? I'm just curious. I know trying to hear you. The bottom of the screen, what we put up there. I'm not sure we completely captured it, but can you further expand on what we have up there, and what exactly you had in mind, to make sure we have it either stays or it goes.

MR. LUISI: You're referring to the Chesapeake Bay recreational? Yes, I think it was Dave who recommended some exploration with a slot limit, which I think is something I certainly would support. I also, so where we are in Chesapeake Bay is that unlike the coast, Virginia, Maryland and Potomac River have very different rules and regulations that have evolved over time with the use of conservation equivalency.

As was stated earlier, you know one of the goals here is to potentially find some likeness amongst the jurisdictions within the Bay. But given where we are, I don't see us coming together in any way,

shape or form in one step, in one hop. What I would like to see. I mean if you're asking me what I would prefer to see in November, I would like to be able to look at recreational measures by jurisdiction in Chesapeake Bay, if reductions are necessary, where the states can add to their already frozen rules that we have now.

If we have summer closures in place, we could extend those summer closures. But because Maryland and Virginia have such different closure periods for striped bass, where Virginia is closed, I think from the middle of June through September, and fourth of October. Maryland has a two-week closure in July.

Trying to find something that we can both agree on is not going to happen overnight. But if we could add to that as a way of reducing our mortality, I would like to see it by state. Maybe that is what you're getting at, Mr. Chairman. There is not going to be one rule that all the jurisdictions in Chesapeake Bay are going to be able to say, oh that works for us.

But it would be nice to have the TC kind of stack those three states to the side, and give us some options to pursue, whether it's slot limits or additional seasonal closures on top of what we currently have, so that we can implement those, with the mindset that we're trying to find something that is more alike between the jurisdictions. It would be incredibly difficult to do it in one step.

CHAIR GARY: It was the season closures, I just needed some expansion on what that meant, so I appreciate that. Bill Hyatt.

MR. HYATT: Just a quick question for clarification. I'm looking at what's on the screen, and seasonal closures are only listed under Chesapeake Bay recreational. I just want to make certain that that is where we're going with that. It's limited to that geographic area for the purposes we're planning. I think I'll preface that with, that's what I'm hoping is the case.

Given that we've heard many, many, times the problems with enforcement associated with seasonal closures, the problems with uncertainty around angler behavior. As a result, I have very little confidence that they could be used and applied broadly, and modeled effectively. Just asking for that clarification based on what I see on the screen.

MS. FRANKE: Yes, for the ocean recreational measure it sounded like there was pretty much consensus to focus on just adjusting the slot limit. Sticking to that either shrinking the slot or shifting it, and then what I just heard as far as Chesapeake Bay. We heard before, looking at seasonal closures, potentially looking at a slot with some sort of maximum size limit. Then I just heard a suggestion, I guess in addition to one default measure looking at state-specific options in the Chesapeake Bay.

CHAIR GARY: Yes, I think I heard the same thing, Bill. Megan Ware actually started that point about the closures. You mentioned that before, Megan, I think. Did you want to pick up on that? Did you want to respond to Bill's point about that? Is that what you're thinking?

MS. WARE: I was going to respond to Mike's comments, but I'm happy to just get in the queue.

CHAIR GARY: Okay, that will be fine. Let's go with Justin, and then Megan, back to you.

DR. DAVIS: I don't want to move away from what Mike brought up, because I think it's important, but quickly. I didn't think we had much discussion about season closures in the ocean recreational fishery, and from my standpoint, I don't like the idea of season closures, but I feel like I'm uneasy about taking them off the table at this point. I view them as kind of an, in case of emergency break glass, kind of thing.

If we end up needing a really large reduction, such that a slot is going to become just too narrow and unworkable. It seems to me as season closures might be the relief valve there. I'll preface that by saying, I think it should be harvest closures, not no targeting closures, because as Bill was alluding to, I

don't think not targeting closures are workable from a regulatory standpoint.

But I would be in favor of leaving no harvest season closures in the tool box for ocean recreational fishery, with the idea that it's a non-preferred option that we would only look to if we were looking at a pretty substantial harvest reduction, and accordingly a very narrow slot without season closure.

MS. FRANKE: Just to respond to that. I think that is a reasonable guidance to the TC that could be to consider season closures if the slot limit is unworkable.

DR. DREW: Would you be looking for a single season closure along the coast, or would you allow states to have some flexibility in adjusting that seasonal closure?

CHAIR GARY: Go ahead and answer, Justin.

DR. DAVIS: My preference would be to allow states flexibility to adjust the seasonal closure state by state, because I just don't think one blanket closure for the entire coast makes sense, given how the fish move up and down the coast.

CHAIR GARY: We'll go to Megan, then Jason McNamee, then Emerson.

MS. WARE: Mike, I think this is a question for you, but in the bullet about state-specific measures, are you thinking about that specific to additional seasonal closures, or also about bag limits and size limits? I guess I'm thinking back to Amendment 7, where there were options for two-week closures based on different wave criteria, I'll say. Is that kind of what you're thinking about, or are you thinking about that outside of season closures?

MR. LUISI: I'm sorry, Megan. I'm having a hard time just understanding the question. Can you restate it?

MS. WARE: That's okay, I'll try again. Are the state-specific measures you're thinking about just state-specific seasonal closures, or is it state-specific bag limits and size limits, different from what you have in current CEs?

MR. LUISI: In the current CE plans that we have, both Maryland, Potomac River and Virginia all have different minimum size limits. We also all have different seasonal closure periods of time, and in Maryland we have a private angler 1-fish bag limit, and a charter boat 2-fish bag limit at the 19 inches.

Based on the previous discussions, where we have kind of, I guess the Board has selected the conservation equivalency measures as being the starting point for change. My vision would be that Maryland, Virginia, Potomac River have those CE measures kind of frozen in time. Then when reductions are necessary, if it's 15 percent that's needed, each state would see under itself certain things.

You could take an additional closure with the flexibility. A Maryland closure is going to be different than a Virginia closures, as far as when it's taken and how much credit you get for it, just based on when the catch happens. I kind of envisioned each state kind of being given by the TC a reasonable measure to implement based on that frozen measure to start with.

That could be something we move forward with, rather than one measure across the board that everybody just puts in place. That would be how I would prefer to see it. Now, if the Technical Committee can also come up with that one, you want to call it the default measure that all of us could agree to, then I would be happy to entertain that. It's just I'm not sure that's going to be as easy to accomplish as some might think.

MS. WARE: Okay, that is helpful. I'm really not trying to be a stick in the mud, but what it sounds like is that each state would have a percent reduction, and then different suites of measures would be crafted, I'll say, for each state to achieve that percent reduction. In my opinion, that is CE. What I would be comfortable with, because I recognize that you guys are all starting in very

different places, and that there is going to need to be some flexibility there.

But I think you know something, I would be okay considering, at least in these measures is, you know we just had a comment about seasonal closures on the ocean side. Let's say we had to take a 10 percent reduction with the seasonal closure, and each state would determine that. I think to be fair; we would have to offer that same opportunity to the Chesapeake Bay states, but that is very specific to the seasonal closure that is in maybe a specific wave that is you know 25 percent of your catch, or whatever it was in Amendment 7. What I'm not comfortable with is each state saying, you have a 10 percent reduction and you come up with the suite of measures that achieve that, because I think that is CE.

CHAIR GARY: Thank you, Megan and Mike, it was informative. I think we're close. We have two more folks that would like to comment, and maybe a little bit of time more, but I would like to wrap this up if we could. We still have one more issue on the agenda to go through. Jason McNamee, and then Emerson.

DR. McNAMEE: I won't weigh in on the discussion that just occurred, and in fact I'll be super brief and just say. You know the discussion on the ocean recreational fishery, and seeing that seasonal closures wasn't there was something that is making me a little itchy as well, simply because it's a tool. Just to reemphasize what Justin said. Having it as a potential option, but a lower priority option if it's needed. I'm in support of that. If we cannot use it that's great.

CHAIR GARY: Emerson, we're going to go to you, and then hopefully can come back to Emilie, summarize it, and I'm keeping my fingers crossed we have a suite of items that we can achieve consensus on. Go ahead, Emerson, bring us home.

MR. HASBROUCK: Yes, I want to agree with Justin and Jason. In the ocean fishery we need to have that option to consider seasonal closures. You know if the slot doesn't work for us, and that those seasonal closures should be flexible.

CHAIR GARY: Emilie, are you able to go ahead and summarize what you've got on the screen, and see if we can't get Board consent?

MS. FRANKE: Sure, so I will, I think we covered the sector split and the commercial reductions already. Again, I'll review the recreational measures. I'm still a little bit unclear on moving forward with the state-specific options that Mike brought up, but I will start with the ocean recreational.

Again, it sounded like there was consensus to first look at adjusting the slot, either shrinking it or shifting it. Then considering seasonal closures if adjusting that slot limit is unworkable. Sort of a lower priority than the slot limit, but if needed consider seasonal closures that would be flexible among the states.

On the Chesapeake Bay side, we heard adjusting seasonal closures, considering a slot limit, or implementing some sort of maximum size. Then also, in addition to one Chesapeake Bay default measure, looking at state-specific measures, and I'm still unclear as to whether the TC would only be doing that state-specific closures or if we're looking at other types of state-specific measures as well. We might need a little bit more guidance on that.
CHAIR GARY: Dave.

MR. SIKORSKI: Yes, that is exactly where I was confused as well, and I think in the conversation that unfolded it opened up as a seasonal closure's clarification, and that is where Mike provided it. I would offer that that third bullet point actually fall under seasonal closures, as a further refinement for the Chesapeake Bay states, state by state. The only thing that we're looking at is a seasonal closure, because of the reasons Mike provided, and they are how far apart the jurisdictions are with their seasons, based on availability of stock to the fishery.

I think that change you've just made is consistent with the discussion we've had as well as the point Megan raised earlier, regarding the clear focus on consistent measures in the regions in the

Amendment 7. If a reduction is necessary, we're operating under Amendment 7, with only bits and pieces left of CE. I think what's on the board there is what we'll be able to use moving forward, if that reduction is necessary. Let me just say consistent measures in the regions.

CHAIR GARY: Mike.

MR. LUISI: Thanks, Dave, you know I was even confused as I was talking, and that's never good, a few minutes ago. I guess the last point here is just to be clear. The first point is that I don't have any intention of trying to pull one over on the Board and try to get some kind of conservation equivalency plan put forth, you know with help from the Technical Committee. There is no intent there. I'm just looking to make sure that what is produced is something that we'll have an ability to work with.

If we're starting with our baseline measures, and we're folding in possible seasonal closures at a state-specific level in addition to a consideration for a slot size, starting without starting point, which is all of our states have different minimum sizes and bag limits and things, and we move that through. I can live with that. I just want to make sure I'm clear with what I'm hoping for at the end of this process in November, so we have something to take to the public.

CHAIR GARY: Okay, Emilie, are you all comfortable with what you have?

MS. FRANKE: Just to respond. Again, as we've just discussed, we can look at state specific seasonal closures. But although we're starting with a baseline of what was in place in 2021, you know unless the Board says otherwise, you know we're looking for some sort of one default Bay size limit. Right now, we're potentially looking at some sort of slot that would be the same across all states. That is the typical approach unless the Board says otherwise.

MR. LUISI: I'll call on myself, since I had the microphone last. I think yes, a consideration of a Bay-wide slot limit is certainly something for consideration. The bag limits, I think to leave them alone at this point would be what I would prefer, to see the bag limits maintain static throughout the analysis.

CHAIR GARY: All right, thank you, Mike, thank you Emilie and Katie. We have what we have, right? One more hand, oh three more hands, okay. All right, please be brief though. We're going to go, Nichola, Justin and Tom, but please be as brief as you can.

MS. MESERVE: I just wanted to draw a distinction for the Chesapeake Bay measures here, between adopting a maximum size, which would be a new FMP standard, which CE cannot be changed. A state can't use CE versus adopting a new slot that would be 18 to 36, for example, because that would be changing the FMP standard that exists of an 18-inch minimum size, and it would throw that whole CE question back into play for me. If the states want to keep your 18 or 19, a minimum size that they already have as part of their currency plan, I think the additional measure just needs to be a maximum size. I think there is a distinction to be drawn there, because I am a little bit uncomfortable with the proximity to CE right now, with some of this stuff. I think that some distinctions like that are important to be made.

CHAIR GARY: We'll go to Justin.

DR. DAVIS: I just wanted to offer one clarification under ocean recreational, and I'm hoping folks agree that we should consider season harvest closures, but not no-targeting closures, because again, I think no targeting closures are unworkable from a regulatory standpoint. Also, I don't think we would be able to calculate what savings we would get from a no-targeting closure, so they wouldn't really be helpful in this instance at least, doing the math.

I also wanted to offer the comment. I understand the tension here between wanting to honor the spirit of Amendment 7, and not allowing CE when the stock is overfished, and accordingly wanting to

see uniformity in the Bay, where the process we're engaged in here is new, not something we've done before.

It is not going to allow for the typical amount of deliberation and public comment. I think we should avoid trying to make really large changes to any jurisdictions regulations as part of this process, because of the sort of unorthodox nature of it. I think that's two things to keep in mind going forward.

CHAIR GARY: Okay, Tom, make it brief.

MR. FOTE: Real brief. Let's take a five-minute break before we start the next topic, because we've been sitting here for two hours and 50 minutes, and we need to walk around and get our minds clear.

CHAIR GARY: You read my mind. That is going to happen, but it will be a hard five minutes. Okay, Emilie, do we need any more description? We're good with what is on the screen? I'm just going to ask a simple question. Any objection to what is on the screen? Seeing none that is what we have, and Katie, just one question. Just to be fair in asking the question, is this management for the TC? That is one of the things we wanted to do, right?
DR. DREW: Yes, I think this is manageable.

CHAIR GARY: All right, Tom, Emilie is going to put five minutes on the clock, it's hard five minutes. Everybody be seated and ready to go for our last item, thank you.

(Whereupon a recess was taken.)

CONSIDER NEXT STEPS FOR DRAFT ADDENDUM I ON QUOTA TRANSFERS (FORMERLY DRAFT ADDENDUM VII)

CHAIR GARY: All right, up next is Number 6 on our agenda. Consider next steps for Draft Addendum I on Quota Transfers (formerly Draft Addendum VII) Possible Action. Motion was from October, 2021, the motion was: *Move to defer until May 2022, consideration by the Atlantic Striped Bass Board of Draft Addendum VII to Amendment 6 to allow further development and review of the transfer options.* I will turn at this time to Emilie to provide background and an update to everyone, and we'll go from there.

MS. FRANKE: I'll provide a brief overview of the Draft Addendum and the Plan Development Team's comments and the potential next steps. Starting with the background on this action. In February, 2021, the Public Information Document for Draft Amendment 7 included the issue of commercial quota allocations. But that issue of commercial quota allocation did not move forward to become part of Draft Amendment 7.

Later that year, last year in August, the Board initiated a separate management action, which was then Draft Addendum VII, which is now Draft Addendum I, to consider allowing voluntary commercial quota transfers between states with commercial quota. This action only applies to quota in the ocean region. The Chesapeake Bay jurisdictions have a separate commercial quota, so this Addendum only applies to ocean commercial quota, and does not consider transferring the quota between the ocean and Chesapeake Bay or vice versa, just ocean only.

Back when the Board initiated this Addendum last year, Board members recognized that this Addendum could be a management option to provide some immediate relief to states, sort of separate from a full reallocation discussion. Based on where we are now, here is the draft timeline for the Draft Addendum. After the Board initiated the Draft Addendum in August, 2021, the Plan Development Team developed the draft document.

In October of 2021, the Board deferred consideration of this Addendum until May 2022. Then it was again postponed until discussion today in August. Today the Board is considering next steps, and if the draft addendum is approved for public comment today, then the public comment period would take place over the next few months, and the Board could consider selecting final measures at the annual meeting in November of this year. Marty just read the motion from October.

The original motion to defer consideration, and again since Amendment 7 is now in place this is now Draft Addendum I to Amendment 7. The Board action for consideration today is the next steps for Draft Addendum I. If the Board wants to move forward, the potential next steps would be to either approve the draft addendum for public comment today, or to provide some additional guidance to the Plan Development Team, and consider a revised draft at a future Board meeting.

The Addendum document includes an introduction, statement of the problem, background, the proposed management options and the compliance schedule. If the draft addendum moves forward, then the background section would of course be updated with 2021 data, since this document was developed last year, and also a summary of what was approved under Amendment 7.

Today I'll just review the proposed management options and the discussion from the PDT memo, which were included in the meeting materials. Option A is the status quo, in which no commercial quota transfers are permitted. Option B is the alternative that would allow voluntary transfers of ocean commercial quota. Under this option transfers between states may occur at any time during the fishing season up to 45 days after the last day of the calendar year. All transfers require a donor state and a receiving state, and the Administrative Commissioner of the two state agencies involved must submit a signed letter to the Commission, identifying the amount of quota to be transferred.

There is no limit on the amount of quota that can be transferred, and the transfer becomes effective upon receipt of a letter from the Commission staff back to the donor and the receiving state. This does not require the approval of the Board. All transfers are final upon receipt of those letters. These transfers do not permanently affect the state-specific shares of the quota.

Once the quota has been transferred, the receiving state becomes responsible for any overages of the transferred quota. As outlined in the memo from the PDT, there were some concerns with adding commercial transfers to the striped bass FMP. If the Board does approve the draft addendum for public comment, the PDT recommends adding their concerns into the draft addendum document.

The PDT notes that similar concerns were raised by the Technical Committee back in 2014 when transfers were considered as part of Draft Addendum IV. The first concern from the PDT is that transfers could potentially undermine the goals and objectives of the Addendum VI reduction. The PDT Noted that the commercial fishery consistently underutilizes their quota, again due to some states not allowing commercial fisheries, and also due to factors like fish availability.

You know, we assume with reduction calculations that the commercial fishery would perform similarly to how it has in the past, assuming some percent quota utilization. This assumption of a constant quota utilization would be violated if transfers are permitted. That was the first concern of the PDT.

The second PDT concern is that a pound of commercial quota is not equal across all states. Through CE, states have been able to adjust their commercial size limits, and this has resulted in changes over time to state's quotas. For example, for Addendum VI, Massachusetts and New York changed their size limits, which resulted in changes to their commercial quota. Again, these types of changes have been occurring since before Addendum VI.

Given additional time, the PDT noted they might be able to address this issue and consider some analysis of all the different size limit changes that have been made affecting commercial quotas over time. Again, just to wrap up, the Board action for consideration today is the next step. The potential next steps could be approving for public comment or providing some additional guidance. I'm happy to take questions.

CHAIR GARY: Thank you, Emilie. Before we take questions, I'll just remind the Board we have a hard stop at 5:45, so we have 40 minutes and I would like

hopefully not for it to be 40 minutes on the nose to finish our business. Let's have a thoughtful but expedient deliberation and discussion. Questions for Emilie. John.

MR. CLARK: Not so much a question at this point, but just to speed things along. About the PDT concerns. I would just like to point out that yes, there is underutilized commercial quota, but that quota is still there, it's latent quota. Good example would be North Carolina. If the striped bass come back to North Carolina, I communicated with our colleague in North Carolina, Mr. Batsavage, and he confirmed that yes, their fishery could easily catch the striped bass again.

I just want to make clear that, I mean we shouldn't be moving ahead under the assumption that that quota should never be touched. I mean if we want to take quota away there is a better way to do it than just leaving it latent there. I just wanted to make that clear, and also just point out that the scale of things we're talking about of a quota that probably would be transferrable, once again referring to North Carolina.

Sorry, Chris, but as the saying went about why banks get robbed is because that is where the money is, that's where the quota is right now, the unused quota. Anyhow, just wanted to point out that even if that entire quota was taken, based on average removals from the past three years, we're talking about 1 percent of removals. Anyhow, without going further on. Everybody has seen the motion, so you'll know that I'm thinking there are ways the Board could control how much gets transferred anyhow.

But I just wanted to point out, we're not looking at a lot of fish here, and I understand the second concern of the PDT about a pound of quota being different in certain states is valid, but it does not seem insurmountable, and once again we're not talking about a lot of removals here, even if the entire North Carolina quota had been caught, which once again they could do it, but just wanted to point those things out.

CHAIR GARY: Additional questions? All right, so we'll open it up to Board discussion on the issue. Jason.

DR. McNAMEE: We're in discussion, I just want to support what John just said. I mean I think just to restate what John said. We have these quotas, they are there. I understand the notion of the assumption, and don't dispute that. However, we shouldn't be setting quotas that we aren't comfortable that they might be harvested.

If there is a problem with the current state of the quotas, we should address that directly. I'm in agreement with John there. I thought the second concern was a little more compelling to me, which I think was getting to the point of different selectivity's, potentially, in the different areas, which I'm in agreement with.

That part, I think the concern is a fair one. However, then I was kind of looking at the magnitude of what might be getting transferred, and I can't imagine we would ever actually be able to detect that within the tools that we have available to us. I guess I'll suggest that I would be supportive of, I think part of the process we're in is putting this out for public comment.

Because I think it's something that happens in other fisheries. I know the striped bass fishery is not in good shape, so maybe the timing is not great here. But, maybe that could be addressed during the process, maybe some contingency that it can't be activated until stock status improves, or something like that. But the general concept I don't have a problem with. I don't foresee there being a lot of this trading going on. It looked like in the table we saw earlier; most people's quotas are being maximized most years. If there is a little flexibility that we can put in here that might be helpful to a state or two. I would be supportive of that.

CHAIR GARY: We'll go to Jim Gilmore and Joe Cimino.

MR. GILMORE: Yes, and I agree with most of what Jason had said. John, I think we're talking about

small numbers, and I think you hit the nail on the head. The one thing, you know in going to what the PDT said about some of those concerns. You know I think you addressed them pretty well.

The one issue, and Jay just mentioned it, was timing. We go back to this morning. If you go back a few years ago, I think a lot of states, including New York, were not even coming close to harvesting the commercial quota. We'd be creeping up on it, I think that last graphic we saw this morning was most of the states were at 98 percent of their commercial harvest, so we're close to it now. We don't have any buffer left.

Now we're kind of like, I think on the schedule we would be voting on this at the November meeting. But at the November meeting we're also now adding on another meeting in December, because whatever. I think to Jay's point. If we had to do the final approval at the November meeting that might be a little soon.

Unless we did have a deferment as when we would implement it, because it seems to make more sense that we would be approving this at the same time when we're seeing what the assessment comes out to look like. Generally, I agree with all of this. I think the concept makes sense, it's consistent with what we do. It's just that that little mismatch of timing in November and December may be a perception issue we may want to consider, and maybe delay this to that following month when we're doing that big meeting on striped bass.

CHAIR GARY: Joe.

MR. CIMINO: I just agree with everything that Jay and Jim just said. I would be interested in maybe visiting some way to have a deferral of when this would kick in explored, if that is possible. You know it really does bug me, the notion that we walk away from the table thinking we set a safe harvest level, but that is only under an assumption that it's 100 percent underutilized. There needs to be another way to handle that, if that is really what that concern is saying.

CHAIR GARY: I'm going to go to Ritchie White and then Nichola.

MR. WHITE: I'm certainly in favor of sending it out to the public. I always want to hear what the public has to say. I agree that I think the timing is very difficult, and I think the concept from a public standpoint of increasing mortality, even though it's extremely small, at the same time we're going to possibly reduce mortality substantially. The public, I think it's pretty obvious where the public is going to weigh in on this. I would suggest that it get delayed, but certainly support it going to the public now, if that is what everybody wants.

CHAIR GARY: Nichola.

MS MESERVE: I feel similar that this get the light of day at some point. I'm not comfortable with approving it for public comment today. John has e-mailed us some suggestion options to add, which I think the PDT should see, so they could potentially add to provide support. I think the PDT in their memo suggested that they might have some additional options to add to it as well. It was developed pretty quickly, at the same time as all the priority was put on Amendment 7. I think there is additional development that is needed before letting this go.

CHAIR GARY: Tom Fote, and then Roy Miller and Dennis Abbott.

MR. FOTE: While you get a letter of attendance at meetings. I was going through a box of mine where I have 300 hats in there that I keep throwing hats when I come back, and I found five rollover hats. Remember when we basically tried to do the rollover, carry over quota for the next year. We wound up with, I guess 150 people in the audience wearing no rollover hats.

If you want to get people in attendance at Striped Bass Board meetings, or try to increase the commercial fishery, and you'll see them out in full force. It would nice to see them at meetings for a change and getting involved again in the fishery. But this will do it. It's up to you if you want to do it.

I mean go out to public hearings.

It will be interesting. We've done that before, and it really just gets everybody mobilized. They are so bad about letting people take home fish to eat, and they show up in force to make sure it's a catch and release fishery. Wait until you try to open up a larger commercial fishery, and see the response.

They will especially look at the numbers that have been increasing in the commercial fishery. Maryland now is what, 50 percent of the overall commercial quota, or last year they caught 50 percent of the overall commercial quota both in the ocean and Bay combined. I think it would be a lot of interesting things going on there. But it's up to you guys.

CHAIR GARY: Roy Miller.

MR. MILLER: Just to start off I would like to say, this is not a proposal to increase the commercial quota. It's just a shifting of where that quota allocation would come from. Secondly, I think I support the suggestion that there be no further action on this particular request until after our December meeting, and we see what reductions are necessary.

I think it would perhaps send the wrong message to approve it now, prior to getting the word from the TC and the Plan Development Team about what we need to do in December. But I have no problem with advancing the concept now, so that it will be ready for action once we have the results of the December meeting.

CHAIR GARY: We have Dennis Abbott, John Clark and Cheri Patterson.

MR. ABBOTT: Though I understand, you know we're not talking about a quota increase. We are talking about the resulting dead fish increase that we would have. I also think it is bad timing right now to consider this. I would be in favor of tabling this to a later date. Even if we went ahead with this and enacted it, it would be somewhat like we do with menhaden, it requires two parties. John talked about going where the money is in the bank, that's why they rob them.

You can't rob a bank unless someone else opens the door in this case, so whatever. I do think that we should set this aside, because I don't think it makes us look too good in the public eye on one hand to be going in one direction with reductions, and on the other hand increasing dead fish. I mean that's the bottom line. This would produce dead fish if there were quota transfers.

CHAIR GARY: John Clark.

MR. CLARK: To that end, I mean obviously it hasn't been good timing to bring this up, pretty much at any of these meetings. But particularly over the last couple of years. That is the reason I sent out that motion. I don't know if we want to get to that yet, Mr. Chair, but what I wanted to do, in order to move this along was to put the mechanism in the actual addendum that would allow the Board to decide, you know no matter when the Addendum passes, it would still be up to the Board to decide whether to allow transfers. Just whenever you're ready for that motion, you can come back to me.

CHAIR GARY: We're going to do three more comments and cut it right there. Cheri, you're next and then Megan and Dennis, you have a last comment you want to make, right? Go ahead, that's fine.

MR. ABBOTT: Yes, just quickly. I did want to comment that this whole concept, I was sympathetic in particular to one of our fellow commissioners, Craig Pugh, who I was hoping would be here to advance his case, because he and I had some good conversations about it, and I would like to say I am sympathetic to Delaware's issue.

CHAIR GARY: Go ahead, Cheri.

MS. CHERI PATTERSON: I'm just concerned about confusing the public, going after them with a couple of these issues back-to-back. As I've heard, you know one is positive, one could be a negative. I just think it should wait until we have some clarity

before we move forward with this one.

CHAIR GARY: We'll go to Megan for the last comment, and then I believe John, you have a motion to tee up.

MS. WARE: Actually, I had a question for either Emilie or Katie on the issue of quota, where I think the example given was Massachusetts is a different minimum size than New York, and kind of the lack of the equality, I'll say, in the quota between those two states. Do you foresee the PDT, given time, being able to come up with a solution or a mechanism to equate quota from one state to another?

DR. DREW: Yes, absolutely. I mean we essentially already do that for several of the commercial CE plans. Our removals that we calculate from the assessment model are all in terms of numbers of fish, so I think it would just be a matter of saying, you know X pounds of quota in Massachusetts equals this many fish.

We're going to move it over to Delaware, you can have this many fish, which based on your fishery would account to this amount of weight. I think we would have to do some calculations behind the scenes, but the key would be that we are harvesting the same number of fish, and not necessarily the same weight. But I think that would address the PDTs concerns.

MS. WARE: Okay, I mean I would be in favor or seeing that from the PDT, kind of knowing what John's motion is, and I think that addresses some of the PDT's concerns. If that could be done to address the other concern, I think that would make it a stronger document.

CHAIR GARY: All right, John, do you have a motion to put up?

MR. CLARK: Yes, thank you, Mr. Chair. I sent it in, do you have that, Emilie?

MS. FRANKE: We do, yes. Thank you, Maya. MR. CLARK: Would you like me to read that? MS. FRANKE: Yes, please.

MR. CLARK: Move to add the following provisions to Draft Addendum I to Amendment 7 under Option B Commercial quota transfer provision of the coastal commercial quota: The Board will decide by their final meeting of the year, based on the information the Board has available on the status of the striped bass stock and performance of the commercial fishery, whether to allow commercial quota transfers in the next year.

If the Board approves commercial quota transfers, the Board may decide to limit the transferable amount of quota to a set poundage or a set percentage of the total commercial quota. The Board may also choose to specify the following criteria: The eligibility of a state to receive a transfer based on percentage of that state's quota landed (e.g., state may not request quota until it has landed 90% of its annual quota) The allocation of allowed transferable quota among seasonal fisheries (e.g., 50% reserved for states that have spring fisheries, 50% reserved for states with summer or fall fisheries).

CHAIR GARY: We have a motion by John Clark, is there a second to this motion? Eric Reid. Before we go with discussion on the motion, I would like to take just a couple of minutes for public comment on this. Is there anybody in the room or virtually, could you raise your hand? We're going to make this really brief. Is there anybody in the room here in Arlington, Virginia that would like to make comment? Is there anyone online that has an interest in making comment? We have one person, and they are.

MS. KERNS: Patrick Paquette.

CHAIR GARY: All right, one person online that would be Patrick Paquette. Go ahead, Patrick.

MR. PAQUETTE: Thank you, Mr. Chairman, Patrick Paquette. I would like the Board to consider adding into this document an option that stated that, and it

addresses a couple of concerns. But I would like to see an option where the tool is allowed, but only when the stock is not overfished, or only when the stock is at the SSB goal.

Like some status of hey, we can move quota up and down the coast. Because right now the stock, we have availability issues up and down the coast, and that is based obviously on a stock that is borderline, you know flirting with recruitment failure. We're trying to shepherd single year's classes.

I think that in a healthy stock this tool, and I have no problem with this tool, so I'm thinking that the public would be interested in commenting on when the tool is available in a stock that is having problems. I think that it would be beneficial, instead of just having angry comments from the public, give the comment to give the public the option to comment on stock status and when this tool is appropriate. Thank you.

CHAIR GARY: Thank you, Patrick. All right, we'll open it up to Board discussion. Steve Train, Pat Geer and Nichola and Eric.

MR. TRAIN: Sympathetic to what Patrick said. I think that makes sense. But I think the fact that it comes back to the Board before it's decided kind of gives us a chance to make that judgment, so I don't know if it has to be in there. Secondly, I think what we need to remember is this fishery, this species, this is a public resource.

Most of the public's access to this fishery is through the commercial fishery, when they sit down at the dinner table and eat it. It's not going out on the water. That is a very limited number of people that actually has that access that way. I think that if we have allowed a quota that we think is sustainably harvestable, and one state chooses not to go after that quota and has it available to a state that has already caught its quota, because there is such abundance. Then something like this should certainly be available.

CHAIR GARY: Pat Geer.

MR. PAT GEER: I have more of a question. If we approve this today, does that mean it will go out for public comment in the upcoming months, or could that be tabled until after our annual meeting, and we have our discussion about, you know we know what the results of the stock assessment are in October, because I agree, I think the timing on this is not great. As Jay said, I agree on the concept of this, I just think the timing is bad. Can we approve this and put off public comment until a later date, maybe after the annual meeting?

MS. FRANKE: I'm going to turn to Toni.

MS. KERNS: Yes, you can do that. I guess the question is, is the Board comfortable not seeing the document fully fleshed out? Because these are new options that we're adding, it's not all of the exact language that would be in the document. Typically, if we're not rushing something then you would task the PDT to go back, add these options.

Then bring it back to the Board, and consider it for approval for public comment. If we want to do something different, then we would need the Board to spell out what that timeline would be, and how we would bring the fleshed-out document back to the Board. Are you waiving that option?

CHAIR GARY: Did that answer the question, Pat?

MR. GEER: Yes, I believe so.

CHAIR GARY: I think if I have this right, I think we had Nichola and then Eric Reid.

MS. MESERVE: My comment is not as much to the motion, it's more about the timeline. Do you want me to go ahead with that? I definitely support the approach that Toni was suggesting there, that the result of this discussion is so approve this motion, but also allow the PDT some additional time to respond to the concerns that are already raised in the memo, that the size limit issue that Megan raised, the options that Mr. Paquette raised, I think may have been on some of the minds of the PDT members, speaking as one of them.

I think the timeline that I am kind of thinking about was that the PDT get to return with a revised draft document in February might provide enough time to put some focus on the responding to the stock assessment, and then to address this issue, but give us a certain timeline to continue its development, and hopefully approve it then.

CHAIR GARY: Eric.

MR. REID: It wasn't that long ago nobody had any problem taking quota away from the commercial sector for three or four different species. Of course, that's a different action, perhaps those stocks are in better shape. Maybe they're not. Nobody is really sure at this point, because they were all under assessment.

But if you read the motion, the first bullet says the Board will decide if transfers are allowed the next year. The second bullet, if the Board approves. The third bullet, the Board may also choose. It's dumbfounding to me that we're having this conversation about not adding quota, but actually allowing the commercial sector to effectively harvest quota that has been issued to them. I'm fully in support of this motion, and that's it for me. But I find it very hard to swallow if this weren't to move ahead.

CHAIR GARY: I've got Tom Fote and then John Clark, and we're on a pretty short fuse, folks, and I would like to go ahead and call the question after that if we could. Go ahead, Tom.

MR. FOTE: I'm just addressing to Eric's comment. Those were fisheries that when they allocated the quotas were set up unfairly, it penalized the recreational sector, so Eric, you weren't around when those quotas were set up, I was. They weren't fairly treated back then, and we proved it with documentation.

CHAIR GARY: All right, thank you, Tom. To you, John, to finish, and we'll call the question.

MR. CLARK: I just wanted to make sure that by having the Board decide on everything here, I was fully cognizant of the fact that this Board, if the stock was still overfished and overfishing was occurring, obviously the Board would not approve transfers, you know given that those options in there.

Both Steve and Eric hit on the fact that these fisheries are supplying fish to people that really enjoy eating striped bass, they are important, as has been made clear time and time again in Delaware. I mean we don't want to re-litigate how we ended up with the small quota we did, but I think this is a very practical method to allow for some extra quota to states that can responsibly harvest it.

I just understand the timing issue, and I don't have any problem with this, if this is approved, putting off the actual addendum until everything can be rewritten by the PDT. You know again, I just think it's something that we need to be cognizant of that, and move this along, because there will be a time when it would be really helpful to allow the commercial fishery to get the quota that is allocated to it. Thank you.

CHAIR GARY: We're going to go ahead and call the question. I'm assuming there is going to be a need to caucus, so I'll give you all three minutes and then we'll bring it back. Let's make that two minutes. Okay, let's bring it back for the vote, and before we do so, I would like to turn this back over to Toni for clarification on timelines.

MS. KERNS: Just for clarity on what you're voting on here is that if this motion passes, then these bullets would be tasked to the PDT to add to the draft document. In addition to that we've already had a request from Board members to also address the issues raised in their memo, specifically Megan did bring up the size limit, which was already in the memo.

Then Nichola brought up the issue that Mr. Paquette brought up, which is the overfished status of the stock, which I believe was actually in the original memo as well. The PDT can try to address all of these issues and bring this back to the Board in November, but if there is a workload issue,

because we did just task the TC with a bunch of items, and we may or may not need a little bit of help from the TC for those things, then they would come back to the Board in November for review for approval for public comment.

CHAIR GARY: Okay, thank you, Toni. We'll go ahead and call the question. All those in favor of this motion, please raise your hand.

MS. KERNS: We have Rhode Island, Massachusetts, Connecticut, New York, New Jersey, NOAA Fisheries, North Carolina, Virginia, D.C., Maryland, Delaware, Maine, New Hampshire and Potomac River Fisheries Commission. Sorry, Pennsylvania.

CHIAR GARY: All those opposed. Abstentions. MS.

KERNS: U.S. Fish and Wildlife Service.

CHAIR GARY: Null votes. Okay, the motion.

MS. FRANKE: We have 15 in favor with 1 abstention.

CHAIR GARY: Emilie is going to provide a clarification on the timeline.

MS. FRANKE: Again, as Toni just stated, the PDT will work to add these options to the document, and address the other concerns raised by the PDT, and we'll aim to bring it back to the Board as soon as possible. Depending on workload that could be in February.

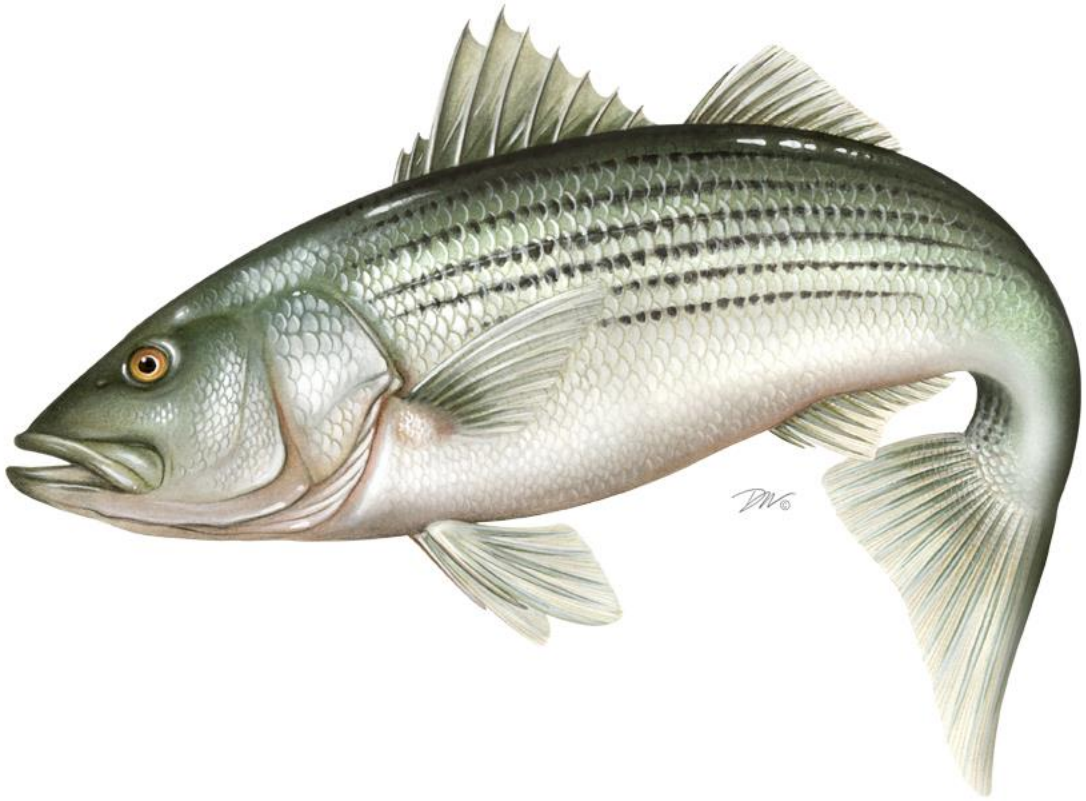
ADJOURNMENT

CHAIR GARY: Is there any other business to bring before this Board? Seeing none, I would seek a motion to adjourn. Motion by Dave Sikorski, second by John Clark, thank you. This Board is adjourned.

(Whereupon the meeting adjourned at 5:30 p.m. on Tuesday, August 2, 2022)

Atlantic States Marine Fisheries Commission

2022 Striped Bass Stock Assessment Update Report



Draft for Board Review
October 2022

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

Draft for Board Review

Atlantic States Marine Fisheries Commission

Striped Bass Stock Assessment Update

Prepared by the
ASMFC Striped Bass Stock Assessment Sub-Committee
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Margaret Conroy, Delaware Division of Fish and Wildlife
Hank Liao, Virginia Marine Resources Commission
Gary Nelson, Massachusetts Division of Marine Fisheries
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EXECUTIVE SUMMARY

The time series of striped bass removals and indices from the 2018 benchmark assessment was updated to include data from 2018-2021. Total removals from 2018-2021 averaged 5.37 million fish annually, a 24% decrease from 2017, the terminal year of the last assessment when the stock was experiencing overfishing. From 2018-2021, recreational release mortality made up 50% of total removals, with recreational harvest making up 37%, commercial harvest making up 11%, and commercial discards making up 2% of the total.

COVID-19 affected fishery-dependent and fishery-independent sampling for state surveys and the MRIP dockside intercept program, although the level of impact varied from state to state. The assessment model was able to accommodate the missing index data, but overall, COVID-19 increased uncertainty in the 2020 and 2021 data.

The single-stock statistical catch-at-age (SCA) model was updated through 2021. The model parameterization was the same as in the benchmark assessment, with the exception of a new selectivity block from 2020-2021 in the Bay and Ocean fleets, to account for the regulation changes from Addendum VI. Sensitivity runs were conducted to look at the effect of only including a new selectivity block in the Ocean fleet and the effect of not including any new selectivity blocks.

Because the recruitment trigger in Amendment 7 was tripped in 2021 for the Maryland juvenile abundance index, the biological reference points were updated using the low recruitment regime assumption. This resulted in a lower *F* target and *F* threshold compared to the benchmark assessment.

In 2021, the Atlantic striped bass stock was overfished but was not experiencing overfishing. Female spawning stock biomass 2021 was estimated at 64,805 metric tons (143 million pounds) which is below the updated SSB threshold of 85,457 metric tons (188 million pounds), and below the updated SSB target of 106,820 metric tons (235 million pounds). Total fishing mortality in 2021 was estimated at 0.14 which is below the updated *F* threshold of 0.20 per year, and below the updated *F* target of 0.17 per year.

The sensitivity run with the new selectivity block for the Ocean fleet only produced very similar results to the base run, while the sensitivity run with no new selectivity blocks produced higher estimates of *F* and lower estimates of SSB in 2020-2021. However, stock status was the same for all three runs.

The retrospective pattern remained moderate to low in magnitude for the assessment update, but reversed direction compared to the benchmark; the model underestimated *F* and overestimated SSB in the most recent peels. The retrospective-adjusted estimates of *F* and SSB were within the 90% confidence intervals of the unadjusted estimates, so correcting for retrospective pattern was not necessary for status determination or projections.

Projections were run to determine the probability of SSB being at or above the SSB target by 2029, the rebuilding deadline. Under the current *F*, there is a 78.6% chance the stock will be rebuilt by 2029, indicating a reduction in catch is not necessary at this time.

The sensitivity run with a new selectivity block in the Ocean fleet only produced very similar results to the base model, but the run with no new selectivity blocks was more pessimistic about rebuilding, requiring an 8.6% reduction in removals to have a 50% chance of being at or above the SSB target in 2029. However, there was a greater than 50% chance of being above the SSB threshold by 2029 for all three runs.

	Target	Threshold	2021 Value	Status
Fishing Mortality	0.17	0.20	0.14	Not overfishing
Female SSB	106,820 mt (235 million lbs)	85,457 mt (188 million lbs)	64,805 mt (143 million lbs)	Overfished

TABLE OF CONTENTS

TOR 1. Update fishery-dependent data (landings, discards, catch-at-age, etc.) that were used in the previous peer-reviewed and accepted benchmark stock assessment.

The time series of striped bass recreational and commercial removals from the 2018 benchmark assessment (NEFSC 2019) was updated to include data from 2018-2021. This included recreational harvest, recreational release mortalities, commercial harvest, and commercial discards.

Total removals from 2018-2021 averaged 5.37 million fish annually, a 24% decrease from 2017, the terminal year of the last assessment when the stock was experiencing overfishing (Table 1, Figure 2). Approximately 62% of the removals came from the ocean fleet over that time period, while 38% came from the Chesapeake Bay fleet, consistent with the overall percentages for the whole time series (Table 1, Figure 1).

From 2018-2021, recreational release mortality made up 50% of total removals, with recreational harvest making up 37% and commercial harvest making of 11% of the total (Figure 2). Commercial dead discards made up approximately 2% of the total removals.

COVID-19 had an impact on fishery-dependent data collection during 2020. Biological sampling levels for the recreational and commercial fisheries were reduced, which increased uncertainty somewhat in the catch-at-age for both fisheries. The MRIP effort survey continued uninterrupted, but the Access Point Angler Intercept Survey (APAIS) was suspended for part of 2020. Data from 2018 and 2019 were used to impute total recreational catch rates for 2020 where necessary. Overall, 29% of recreational harvest rate information and 15% of released alive rate information was attributed to imputed catch data for 2020 (Table 2). The percentage of imputed information in 2020 recreational catch rates varied from state to state, depending on the length of time that APAIS was suspended. Although COVID likely affected the overall harvest from the commercial fishery, it did not significantly impact reporting the catch.

The MRIP CPUE index of abundance was updated with data through 2021. The index was developed using the same species associations identified in the previous benchmark. Imputed records were excluded from the intercept data pull for 2020. The index declined somewhat from 2018-2021.

TOR 2. Update fishery-independent data (abundance indices, age-length data, etc.) that were used in the previous peer-reviewed and accepted benchmark stock assessment.

Where possible, the fishery independent age-1+ and recruitment indices used in the most recent benchmark assessment (Table 3) were updated through 2021. Several surveys were impacted by COVID and other issues in the most recent years (Table 4 and Table 5).

The assessment used seven fishery independent indices of age-1+ abundance: the Chesapeake Bay Multispecies Monitoring and Assessment Program (ChesMMAP), the Maryland Spawning Stock Survey (MDSSN), the Delaware Spawning Stock Electrofishing Survey (DESSN), the Delaware 30’ Bottom Trawl Survey (DE30), the New York Ocean Haul Seine (NYOHS), the New Jersey Bottom Trawl Survey (NJTRL), and the Connecticut Long Island Sound Trawl Survey (CT

LISTS). The NJ Trawl did not operate from 2019-2021 due to COVID and vessel issues. ChesMMAP changed vessels in 2018 and the calibration process has not been finished, so calibrated estimates were not available for 2019-2021 in time for this update. The DE SSN and CT LIST surveys did not operate in 2020 due to COVID. The MD SSN was interrupted for two weeks in 2021 due to COVID. Age-1+ surveys with data through 2021 showed mixed trends, with some surveys increasing since 2017 and some decreasing (Figure 3).

The assessment uses four age-0 juvenile abundance indices (JAI) and two age-1 indices as recruitment indices: the MD, VA, NJ, and NY JAIs and the MD and NY age-1 indices. The MD and VA JAIs were combined into a single composite JAI for Chesapeake Bay using the Conn (2010) method. The NJ JAI was the only survey that did not occur in 2020 due to COVID, although the start of the NY Age-1 survey was delayed. 2018 values indicated a strong year class in most indices, but 2021 was generally low (Figure 4 and Figure 5). The MD JAI tripped the recruitment trigger in 2021, with three consecutive years below the Amendment 7 recruitment threshold.

TOR 3. Tabulate or list the life history information used in the assessment and/or model parameterization (M, age plus group, start year, maturity, sex ratio, etc.) and note any differences (e.g., new selectivity block, revised M value) from benchmark.

Model equations are shown in Appendix 1 Table 1. The model parameterization was the same as used in the benchmark assessment (NEFSC 2019), with the exception of a new selectivity block from 2020-2021 in the Bay and Ocean fleets, to account for the regulation changes from Addendum VI (Table 6). In initial runs, the exponential-logistic and double-logistic selectivity equations were used to explore if the selectivity during 2020-2021 changed to dome-shaped due to changes in size-limits, particularly in the Ocean. Initial results showed that the 2020-2021 selectivity pattern in the Bay remained dome-shaped, and the 2020-2021 selectivity pattern in the Ocean remained flat-topped. Therefore, the exponential-logistic and Gompertz functions were used to model selectivity for 2020-2021.

Re-weighting of survey indices was required with the addition of four years of removal data and missing index data for several surveys. Survey CVs were adjusted to bring the RMSE close to one and effective sample sizes were adjusted once by using the Francis multipliers (Francis 2011). The RMSEs, CV weights and effective samples from the 2018 benchmark and 2022 assessment models are given in Table 2 in Appendix 1. The largest change in CV weight occurred for the NJ Trawl survey, where the correct CV time series was substituted for the incorrect values input in the benchmark.

No changes were made to the life history information used in the assessment (Table 7).

TOR 4. Update accepted model(s) or trend analyses and estimate uncertainty. Include sensitivity runs and retrospective analysis if possible and compare with the benchmark assessment results. Include bridge runs to sequentially document each change from the previously accepted model to the updated model.

Model Fit

The model fit the observed total catches and catch age compositions of all fleets well (Appendix 2). The model fit the MDYOY (1970-1981) and MD & VA composite indices very well and the MD Age1, NYOHS, and MDSSN poorly. It fit the other indices reasonably well (Appendix 2).
The predicted trends matched the observed trends in age composition of survey indices reasonably well for NYOHS, MDSSN, MRIP, CTLIST, and ChesMMAP. The model fit the age composition of NJTrawl, DESSN, and DE30FT survey adequately. Resulting contributions to total likelihood are listed in Table 3 of Appendix 1. Estimates of fully-recruited fishing mortality for each fleet and total fishing mortality, recruitment, parameters of the selectivity functions for the selectivity periods, catchability coefficients for all surveys, and parameters of the survey selectivity functions are given in Table 4 of Appendix 1.

Estimates of the catch selectivity patterns for each fleet showed that, although the patterns varied over time with changes in regulation, selectivity was dome-shaped for Chesapeake Bay and primarily flat-topped for the Ocean over time (Figure 6). There was a steep shift in the descending limb of the selectivity pattern in 2020-2021 for Chesapeake Bay compared to the previous selectivity block, and a shift in the selectivity in 2020-2021 for the Ocean to lower ages (Figure 6).

Fishing Mortality

Fully-recruited annual fishing mortality in 2021 for the Bay and Ocean was 0.05 and 0.10 (Figure 7), and peaked at ages 6 and 10-15, respectively. Total fully-recruited *F* in 2021 was 0.14 (Table 8, Figure 7) and peaked at age 6. Coefficients of variation indicated region-specific and total fishing mortality estimates were precise (CVs mostly less than 0.20) (Table 4 of Appendix 1).

Recruitment

Recruit numbers increased steadily through 1993 (Figure 8). Large recruitment events occurred in 1994, 1997, 2002, and 2004 as the large Chesapeake Bay 1993, 1996, 2001 and 2003 year-classes became age-1. Average to below-average year-classes were produced during 2004-2010, which resulted in a decline of age-1 numbers. Subsequently, strong year-classes were produced in 2011 and 2015. After 2016, recruit abundance fluctuated slightly and has averaged 123.5 million fish (Table 8, Figure 8). Four of the last five year-classes since 2015 have been below average, although not as low as the levels seen from 2004-2010; the 2018 year-class was above average (Table 8, Figure 8). The below-average 2020 and 2021 recruits will start contributing to SSB in 2027 and 2028 as those fish approach full maturity.

Population Abundance (January 1)

Striped bass abundance (1+) increased steadily from 1982 through 1997 when it peaked around 422.4 million fish (Table 8, Figure 9). Total abundance fluctuated without trend through 2004. From 2005-2009, age 1+ abundance declined to about 181.2 million fish. Thereafter, total abundance peaked in 2012 and 2016 as a result of two large year-classes (2011 and 2015) entering the age-1+ population (Table 8, Figure 9). From 2017-2019, total abundance averaged 243.3 million fish. Abundance declined slightly through 2021 to 218.9 million fish (Figure 9).

Abundance of striped bass age 8+ increased steadily through 2004 to 16.6 million fish, but then declined to 11.4 million fish through 2010 (Table 8, Figure 9). A small increase in 8+ abundance occurred in 2011 as the 2003 year-class became age 8 (Table 8, Figure 9). Abundance of age 8+ fish declined steadily through 2018 but has increased recently to an average of 6.7 million fish as the 2011 aged recruited to the age-8+ group (Table 8, Figure 9).

Spawning Stock Biomass and Total Biomass

Female SSB grew steadily from 1982 through 2003 when it peaked at about 113,000 metric tons (Table 8, Figure 10). Female SSB declined steadily from 104,749 metric tons in 2010 to 55,120 metric tons in 2018, but in recent years, has steadily increased (Table 8, Figure 10). Estimates of female spawning stock biomass were very precise (CVs less than 0.14; Table 10 of Appendix 1).

Exploitable biomass (January 1) increased from 36,985 metric tons in 1982 to its peak at 333,000 metric tons in 1999 but declined steadily through 2015 (Figure 10). Since 2016, exploitable biomass steadily increased albeit at a slow pace.

Retrospective Analysis

Moderate retrospective patterning (<15%) was evident in the more recent estimates of fully-recruited total *F* and female SSB (Figure 11). The retrospective pattern suggested that fishing mortality is likely slightly under-estimated (<12%) and female spawning biomass is over-estimated by 5-17%. Recruitment appeared to be over-estimated in most years, although underestimation did occur in a few years (Figure 11). The Mohn's rho values for fishing mortality, female SSB and recruitment were estimated to be -0.087, 0.103 and 0.156, respectively.

The current retrospective trends are different from what was observed in the 2018 benchmark and earlier assessments (NEFSC 2019). The past retrospective patterns showed that female SSB was typically under-estimated and fishing mortality was over-estimated. Exploratory analyses indicated that the change was due, in part, to the addition of new data and changes in index weighting. When the index CV weightings from the 2018 benchmark assessment was used in the current assessment, the past retrospective pattern was reproduced through the 2016 peel and then changed to what is observed currently, albeit at a lower level of percent difference (Appendix 1).

Sensitivity Runs

The NY Age-1 seine survey and MD SSN survey were completed in all years, but the timing of each was affected by the COVID pandemic: the NY Age-1 survey started later than usual in 2020 and the MD SSN survey was suspended for two weeks in 2021. To determine if these potentially biased values influenced the results of the assessment, a run was made in which those index values were coded as missing. Comparison of results (Figure 12) showed that the missing values had little influence on the time series of *F* and SSB estimates.

Two additional runs were made to explore the influence of using the new selectivity blocks in 2020-2021. One run was made in which a new 2020-2021 selectivity block was created only for the Ocean region and a second was made in which no new selectivity periods were created. Full results and diagnostics for these sensitivity runs are presented in Appendix 3 and 4.

Comparison of residual plots, particularly for the fleet age composition, showed that the base run produced the smallest residuals in 2020-2021 (Appendices 2-4). Based on Mohn's rho, the base model had the lowest retrospective pattern (*F*=-0.087; SSB=0.103) compared to the Ocean only run (*F*=-0.094; SSB=0.121) and the no new selectivity blocks run (*F*=-0.107; SSB=0.177).

The run with the new selectivity for the Ocean fleet only produced very similar results to the base run, but the run with no new selectivity blocks produced higher estimates of *F* and lower estimates of SSB in 2020-2021 (Figure 13).

Comparison of Results from the 2018 Benchmark Assessment with 2022 Update Assessment

Fully-recruited fishing mortality and female spawning stock biomass estimates from the update and benchmarks assessments are shown in Figure 14. The updated assessment produced higher estimates of fishing mortality in 2012-2017 and lower estimates of female spawning stock biomass from 1992-2001 and 2012-2017.

TOR 5. Update the biological reference points or trend-based indicators/metrics for the stock. Determine stock status.

The fishing mortality and spawning stock biomass reference points were updated using the same methods as the benchmark assessment (NEFSC 2019). The spawning stock biomass threshold is the 1995 estimate of SSB from the current assessment and the SSB target is 125% of the threshold. Using a stochastic projection drawing recruitment from empirical estimates and a distribution of starting population abundance at age, fishing mortalities associated with the SSB target and threshold were determined. Empirical estimates of recruitment, selectivity, and the starting population came from the SCA model results. The selectivity pattern used in the projections was calculated as the geometric mean of the 2020-2021 total *F*-at-age, scaled to the highest *F*-at-age (Figure 15). Estimates of recruitment were restricted to 2008-2021 to represent the "low" recruitment regime. The population was projected for 100 years and fully-recruited F was adjusted until the median of the projected SSB reached the SSB target or threshold.

The updated SSB reference points and associated fishing mortalities are:

$SSB_{threshold}$ = 85,457 metric tons	**$F_{threshold}$ = 0.20**
SSB_{target} = 106,820 metric tons	**F_{target} = 0.17**

Status of the Stock

Before stock status can proceed, analyses must be done to determine if the estimates of F and SSB in 2021 should be corrected for the apparent pattern observed in the retrospective analyses. Here we used the National Marine Fisheries Service standard procedure in which the estimates are adjusted for the retrospective pattern using Mohn's rho values (average of proportion differences over seven-year peels) and then compared to the unadjusted estimates and their associated 90% confidence intervals. If either retrospective-adjusted value falls outside an unadjusted value's 90% confidence intervals, then the retrospective-adjusted values are used. If not, the unadjusted values are sufficient for stock determination. Figure 16 shows a bivariate plot of the unadjusted estimates and their associated 90% confidence interval along with the retrospective-adjusted values. Because the retrospective-adjusted values fall within the 90% confidence intervals, retrospective adjustment is not needed.

In 2021, the Atlantic striped bass stock was overfished but was not experiencing overfishing based on the point estimates of fully-recruited fishing mortality and female spawning stock biomass relative to the reference points defined in this assessment. Female spawning stock biomass in 2021 was estimated at 64,805 metric tons (143 million pounds) which is below the SSB threshold of 85,457 metric tons (188 million pounds), and below the SSB target of 106,820 metric tons (235 million pounds) (Table 9, Figure 17). However, because of error associated with these estimates, there is a 0.9% probability that the 2021 female SSB estimate is above or equal to the SSB threshold and a 0% probability that the 2021 estimate is above the target.

Total fishing mortality in 2021 was estimated at 0.14 which is below the *F* threshold of 0.20 and the *F* target of 0.17 (Table 9, Figure 17). There is a 99.6% probability that the 2021 fully-recruited fishing mortality is below the fishing mortality threshold, and a 91% probability that the value is below the F target.

Although the estimate of *F* in 2021 was higher for the sensitivity run with no new selectivity blocks, stock status was the same for all three sensitivity runs: overfishing was not occurring and the stock was overfished.

TOR 6. Conduct short term projections when appropriate. Discuss assumptions if different from the benchmark and describe alternate runs.

Three scenarios were run to determine when female SSB is expected to reach the SSB target under the "low" recruitment regime. In the first run, the population was projected over ten years assuming the *F* observed in 2021 (0.14) was the same in 2022-2030. In the second and third runs, the population was projected assuming fishing mortality in 2022-2030 was equal to *F* associated with the *F* target and *F* threshold values. Because the retrospective adjusted values of *F* and SSB fell within the 90% confidence intervals of the unadjusted estimates, retrospective-adjustment was not needed.

The projections used the same methods as the benchmark assessment (NEFSC 2019). For each scenario, the model begins in year 2021 with the estimates of January-1 abundance-at-age and associated standard errors from the SCA assessment model. The fully-recruited *F* estimate and associated standard errors in 2021 (F=0.14), selectivity-at-age in 2021, Rivard weights in 2021, natural mortality, female sex proportions-at-age, and female maturity-at-age are used to calculate female SSB as modeled in the SCA model. For 2022, the January-1 abundance-at-age is calculated from the known values of 2021 abundance-at-age, 2021 selectivity and fully-recruited F for 2021. For the remaining years, the January-1 abundance-at-age is projected and is calculated by using the previous year's abundance-at-age, the scenario fully-recruited F, and natural mortality following the standard exponential decay model. Female spawning stock biomass is calculated using the average Rivard weights-at-age from 2017-2021 along with proportion of female by age and maturity-at-age.

For each iteration of the simulation, the abundance and fishing mortality-at-age values in 2021 are randomly drawn from a normal distribution parameterized with the associated standard errors from the SCA assessment model. For the remaining years, abundance of age-1 recruits is randomly drawn from 2008-2021 recruitment estimates. An age-15 plus-group is assumed. For years 2022-2030, selectivity-at-age is assumed equal to the geometric mean selectivity for years 2020-2021. Female spawning stock biomass was calculated by using geometric mean Rivard weight estimates from 2017-2021, sex proportions-at-age, and female maturity-at-age. For each year of the projection, the probability of SSB being above the SSB target and threshold reference points was calculated from 10,000 simulations using function *pgen* in R package *fishmethods*.

Results

Under current fully-recruited fishing mortality (*F*=0.14), female SSB is expected to reach or exceed the SSB threshold by 2023 with a probability of 70.2%, and exceed or reach the SSB target by 2025 with a probability of 56.1% (Table 10, Figure 18). By the rebuilding deadline of 2029, there is a 78.6% chance the stock will be at or above the SSB target and a 96.7% chance the stock will be at or above the SSB threshold. Under *F* target (*F*=0.17), female SSB is expected to reach or exceed the SSB threshold by 2023 with a probability of 61.9%, and exceed or reach the SSB target by 2028 with a probability of 52.0% (Table 10, Figure 18). Under *F* threshold (*F*=0.20), female SSB is expected to reach or exceed the SSB threshold by 2023 with a probability of 53.2%, but has a less than 50% probability of reaching the SSB target in any year (Table 10, Figure 18).

The sensitivity run with a new selectivity block in the Ocean fleet only produced very similar results to the base model, but the run with no new selectivity blocks was more pessimistic about rebuilding, with the stock having a less than 20% chance of rebuilding under current *F* by 2029 (Appendix 4). An 8.6% reduction in removals would be required to have a 50% chance of being at or above the SSB target in 2029 under that model configuration. However, the stock did have a greater than 50% chance of being above the SSB threshold by 2029 in all three runs.

TOR 7. Comment on research recommendations from the benchmark stock assessment and note which have been addressed or initiated. Indicate which improvements should be made before the stock undergoes a benchmark assessment.

The research recommendations identified in the benchmark assessment (NEFSC 2019) remain relevant, particularly the research recommendations on enhanced collection of life history and biological information including paired scale-otolith samples, migration rates, and sex ratio data. Additional work on refining migration rates and stock composition estimates as well as incorporating tagging data into the spatial statistical catch-at-age model will be required before the next benchmark assessment.

Literature Cited

Conn, P.B. 2010. Hierarchical analysis of multiple noisy abundance indices. Canadian Journal of Fisheries and Aquatic Sciences 67(1), 108-120.

Francis, R.I.C.C. 2011. Data weighting in statistical fisheries stock assessment models. Canadian Journal of Fisheries and Aquatic Sciences. 68(6): 1124-1138.

Northeast Fisheries Science Center (NEFSC). 2019. 66th Northeast Regional Stock Assessment Workshop (66th SAW) Assessment Report. US Dept. Commer., Northeast Fish. Sci. Cent. Ref. Doc. 19-08; 1170 p.

List of Appendices

Appendix 1: Model structure and detailed results for the base model run.

Appendix 2. Diagnostic plots for the base model in which new 2020-2021 selectivity blocks were added for the Bay and Ocean regions.

Appendix 3. Diagnostic plots and results for a model run in which a new 2020-2021 selectivity block was added for the Ocean region only.

Appendix 4. Diagnostic plots and results from the SCA model with no new selectivity blocks added to the model.

Tables

Table 1. Total removals by fleet in numbers of fish

Year	Bay Fleet	Ocean Fleet	Total Removals
1982	229,161	677,600	906,761
1983	339,515	709,879	1,049,394
1984	479,009	357,555	836,564
1985	48,686	853,917	902,603
1986	100,649	307,312	407,961
1987	44,939	231,939	276,878
1988	124,365	332,720	457,085
1989	85,092	521,339	606,431
1990	663,884	574,713	1,238,597
1991	790,833	927,478	1,718,311
1992	986,955	1,243,234	2,230,189
1993	941,415	1,088,947	2,030,362
1994	1,326,775	1,585,122	2,911,897
1995	1,978,738	3,049,239	5,027,977
1996	2,514,266	3,749,942	6,264,208
1997	3,166,575	4,214,559	7,381,134
1998	2,949,332	4,961,986	7,911,318
1999	3,195,145	4,867,163	8,062,308
2000	3,432,148	4,955,360	8,387,508
2001	2,586,938	5,184,845	7,771,783
2002	2,673,581	5,513,147	8,186,728
2003	3,333,975	5,528,236	8,862,211
2004	3,327,387	6,195,000	9,522,387
2005	2,971,213	6,137,340	9,108,553
2006	4,083,679	6,983,996	11,067,675
2007	3,162,774	5,132,018	8,294,792
2008	2,630,471	5,592,223	8,222,694
2009	3,151,161	4,880,287	8,031,448
2010	2,936,586	5,433,285	8,369,871
2011	2,520,001	5,037,736	7,557,737
2012	2,671,307	4,411,580	7,082,887
2013	2,752,138	5,754,205	8,506,343
2014	3,231,424	3,839,183	7,070,607
2015	2,788,075	3,315,477	6,103,552
2016	3,589,860	3,601,305	7,191,165
2017	2,495,418	4,553,797	7,049,215
2018	2,367,605	3,420,077	5,787,682
2019	2,114,336	3,344,764	5,459,100
2020	2,006,072	3,080,791	5,086,863
2021	1,633,797	3,510,737	5,144,534

Table 2. Contribution of imputed data to 2020 MRIP catch rate estimates by state. Imputed data were 2018 and 2019 intercepts that were used to supplement 2020 APAIS data in strata that were under-sampled due to COVID-19.

State	Harvest Rate (A+B1)	Released Alive Rate (B2)
Maine	0%	0%
New Hampshire	15%	7%
Massachusetts	3%	3%
Rhode Island	0%	13%
Connecticut	77%	56%
New York	53%	9%
New Jersey	51%	32%
Delaware	49%	13%
Maryland	9%	7%
Virginia	7%	36%
North Carolina (ocean only)	--	72%
Coastwide	29%	15%

Table 3. Summary of indices used in the striped bass stock assessment model.

Index Name	Index Metric	Design	Time of Year	Years	Age
MRIP Total Catch Rate Index	Total catch per unit effort	Stratified random	Mar-Dec	1982-2021	1+
Connecticut Long Island Sound Trawl Survey (CTLISTS)	Mean number per tow	Stratified random	Apr-Jun	1984-2021	1+
New York Ocean Haul Seine (NYOHS)	Geometric mean per haul	Fixed station	Sep-Oct	1987-2006	1+
New York Young-of-the-Year (NYYOY)	Geometric mean per haul	Fixed station	Jul-Nov	1985-2021	YOY
New York Western Long Island Beach Seine Survey (NY Age-1)	Geometric mean per haul	Fixed station	May-Aug	1984-2021	1
New Jersey Bottom Trawl Survey (NJTRL)	Stratified mean per tow	Stratified random	April	1990-2018	1+
New Jersey Young-of-the-Year Survey (NJYOY)	Geometric mean per haul	Fixed station	Aug-Oct	1982-2021	YOY
Delaware Spawning Stock Electrofishing Survey (DESSN)	Geometric mean per tow	Fixed station	Apr-Jun	1996-2021	1+
Delaware 30’ Bottom Trawl Survey (DE30)	Geometric mean per tow	Fixed station	Nov-Dec	1990-2021	1+
Maryland Spawning Stock Survey (MDSSN)	Selectivity-corrected CPUE	Stratified random	Mar-May	1985-2021	1+
Maryland Young-of-the-Year and Yearlings Surveys (MDYOY and MD Age-1)	Geometric mean per haul	Fixed station	Jul-Sep	1954-2021	0-1
Virginia Young-of-the-Year Survey (VAYOY)	Geometric mean per haul	Fixed station	Jul-Sep	1980-2021	YOY
Chesapeake Bay Multispecies Monitoring and Assessment Program (ChesMMAP)	Stratified mean per tow	Stratified random	Mar-Nov	2002-2018	1+

Table 4. Status of age-1+ striped bass surveys from 2018-2021. Empty cells indicate the survey occurred without interruption.

Year	CT LISTS	NJ TRL	DE SSN	DE 30'	MD SSN	ChesMMAP
2018						
2019		Did not occur				Unavailable
2020	Did not occur	Did not occur	Did not occur			Unavailable
2021		Did not occur			Delayed	Unavailable

Table 5. Status of striped bass recruitment surveys from 2018-2021. Empty cells indicate the survey occurred without interruption.

Year	NY JAI	NY Age-1	NJ JAI	MD JAI	MD Age-1	VA JAI
2018						
2019						
2020		Interrupted	Did not occur			
2021						

Table 6. Model structure summary for the 2021 striped bass update.

	Value(s)
Years in Model	1982-2021
Size/Age Plus Group	15+
Fleets	2 (Bay and Ocean)
Selectivity blocks	Bay fleet: 1982-1984, 1985-1989, 1990-1995, 1996-2019, 2020-2021 Ocean fleet: 1982-1984, 1985-1989, 1990-1996, 1997-2019, 2020-2021

Table 7. Striped bass life history information used in the 2021 stock assessment update.

Age	Proportion Mature	Proportion Female	Natural Mortality
1	0	0.53	1.13
2	0	0.56	0.68
3	0	0.56	0.45
4	0.09	0.52	0.33
5	0.32	0.57	0.25
6	0.45	0.65	0.19
7	0.84	0.73	0.15
8	0.89	0.81	0.15
9	1	0.88	0.15
10	1	0.92	0.15
11	1	0.95	0.15
12	1	0.97	0.15
13	1	1	0.15
14	1	1	0.15
15+	1	1	0.15

Table 8. Population estimates from the 2021 striped bass assessment update.

Year	Full *F*	Recruitment (millions of age-1 fish)	Female SSB (mt)	Total Abundance (millions of fish)	Age 8+ Abundance (millions of fish)
1982	0.17	36.2	18,498	54.5	1.7
1983	0.14	70.1	15,614	92.4	1.5
1984	0.07	60.5	15,783	95.8	1.3
1985	0.19	66.8	16,452	106.2	1.5
1986	0.05	64.5	14,838	109.0	1.7
1987	0.03	71.2	18,247	118.9	2.0
1988	0.04	92.5	24,125	145.2	2.5
1989	0.05	104.6	36,060	167.5	3.3
1990	0.07	128.3	42,017	201.1	5.3
1991	0.09	100.6	49,377	186.7	6.5
1992	0.11	106.0	62,663	190.7	7.5
1993	0.09	131.1	70,390	217.9	8.0
1994	0.12	285.6	79,213	382.5	8.6
1995	0.21	184.3	85,457	336.1	9.6
1996	0.27	232.1	95,380	378.2	9.9
1997	0.21	261.2	90,227	422.4	10.2
1998	0.22	147.1	83,863	325.8	9.7
1999	0.21	152.1	83,024	304.0	9.3
2000	0.21	121.4	95,101	263.3	9.7
2001	0.20	192.2	99,421	318.3	13.6
2002	0.22	228.7	111,329	369.2	14.1
2003	0.24	118.3	113,506	276.1	15.3
2004	0.26	323.3	109,337	453.8	16.6
2005	0.26	157.0	108,416	340.1	14.5
2006	0.30	138.7	102,105	293.5	13.1
2007	0.23	81.2	99,830	216.9	10.9
2008	0.24	131.8	106,075	240.7	11.6
2009	0.23	70.6	104,599	181.2	12.8
2010	0.27	92.3	104,749	182.0	11.4
2011	0.28	118.3	97,556	203.0	14.5
2012	0.28	208.6	95,936	297.5	12.8
2013	0.39	63.6	84,750	182.7	11.2
2014	0.31	76.9	73,346	162.6	8.1
2015	0.27	152.4	63,415	228.0	7.5
2016	0.31	238.7	64,227	333.0	6.2
2017	0.35	101.7	57,106	231.5	5.6
2018	0.26	130.7	55,120	234.8	5.4
2019	0.23	159.6	56,634	263.7	7.4
2020	0.14	109.5	59,980	223.1	6.4
2021	0.14	116.0	64,805	218.9	6.6

Table 9. Updated biological reference points and 2021 estimates for *F* and female SSB compared with the estimates from the 2018 benchmark.

Metric	2018 Target	2018 Threshold	2021 Target	2021 Threshold	2021 Value
Fishing Mortality	0.20	0.24	0.17	0.20	0.14
Female SSB	114,295 mt (252 million lbs)	91,436 mt (202 million lbs)	106,820 mt (235 million lbs)	85,457 mt (188 million lbs)	64,805 mt (143 million lbs)

Table 10. Probability of SSB being at or above the SSB threshold or target under different constant *F* scenarios. Shaded row indicates 2029, the rebuilding deadline.

Year	Probability SSB ≥ SSB threshold under current *F*	Probability SSB ≥ SSB target under current *F*	Probability SSB ≥ SSB threshold under *F* target	Probability SSB ≥ SSB target under *F* target	Probability SSB ≥ SSB threshold under *F* threshold	Probability SSB ≥ SSB target under *F* threshold
2021	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2022	34.4%	0.4%	34.5%	0.4%	34.5%	0.4%
2023	70.2%	14.9%	61.9%	13.1%	53.2%	11.6%
2024	86.0%	39.0%	74.1%	29.2%	61.8%	23.2%
2025	91.8%	56.1%	79.3%	40.3%	64.3%	28.6%
2026	94.1%	65.7%	81.4%	45.5%	63.4%	30.3%
2027	95.7%	72.7%	82.8%	49.9%	63.4%	31.9%
2028	96.4%	76.6%	82.8%	52.0%	61.7%	31.6%
2029	96.7%	78.6%	82.4%	52.5%	59.4%	30.5%
2030	97.0%	80.6%	82.8%	53.7%	58.6%	30.5%

Figures

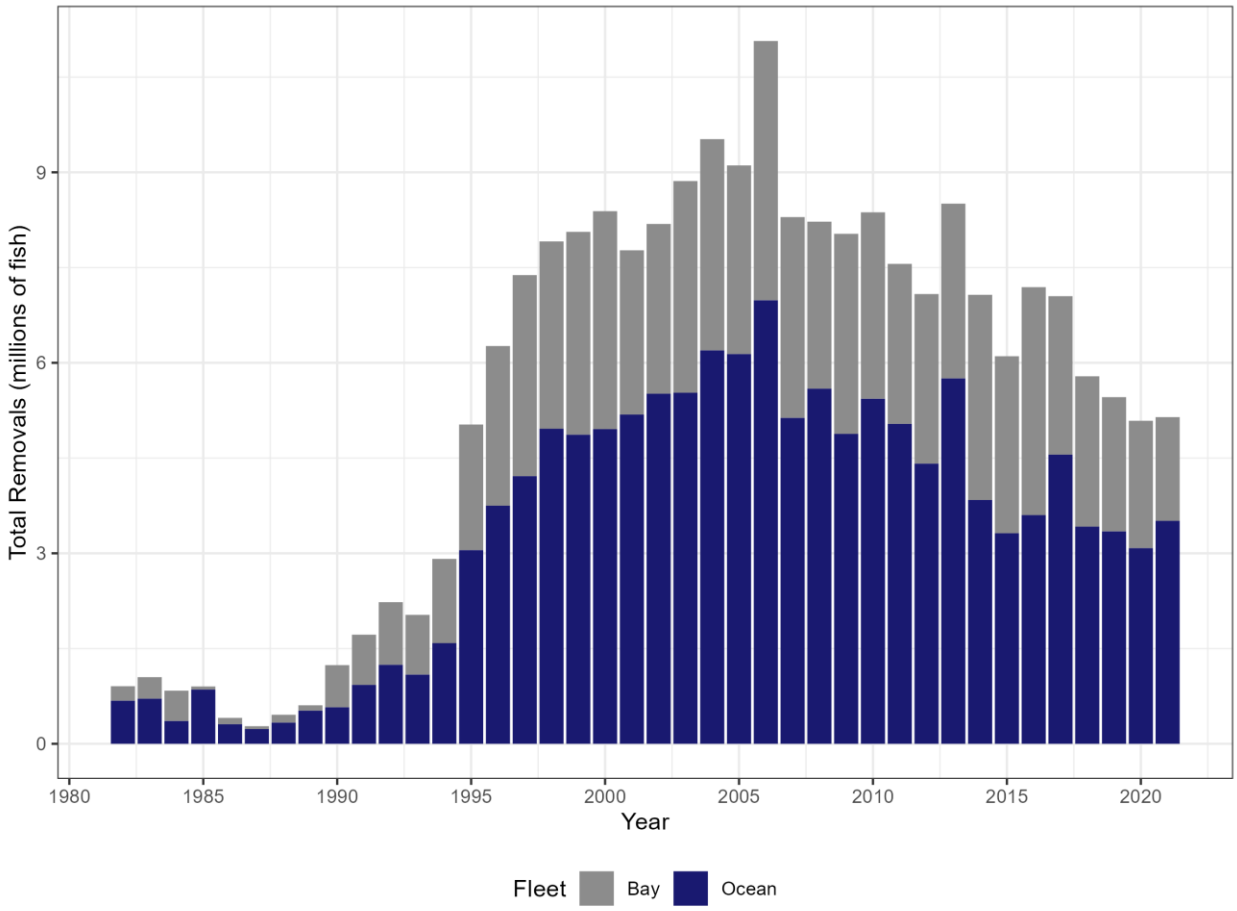


Figure 1. Total striped bass removals by fleet.

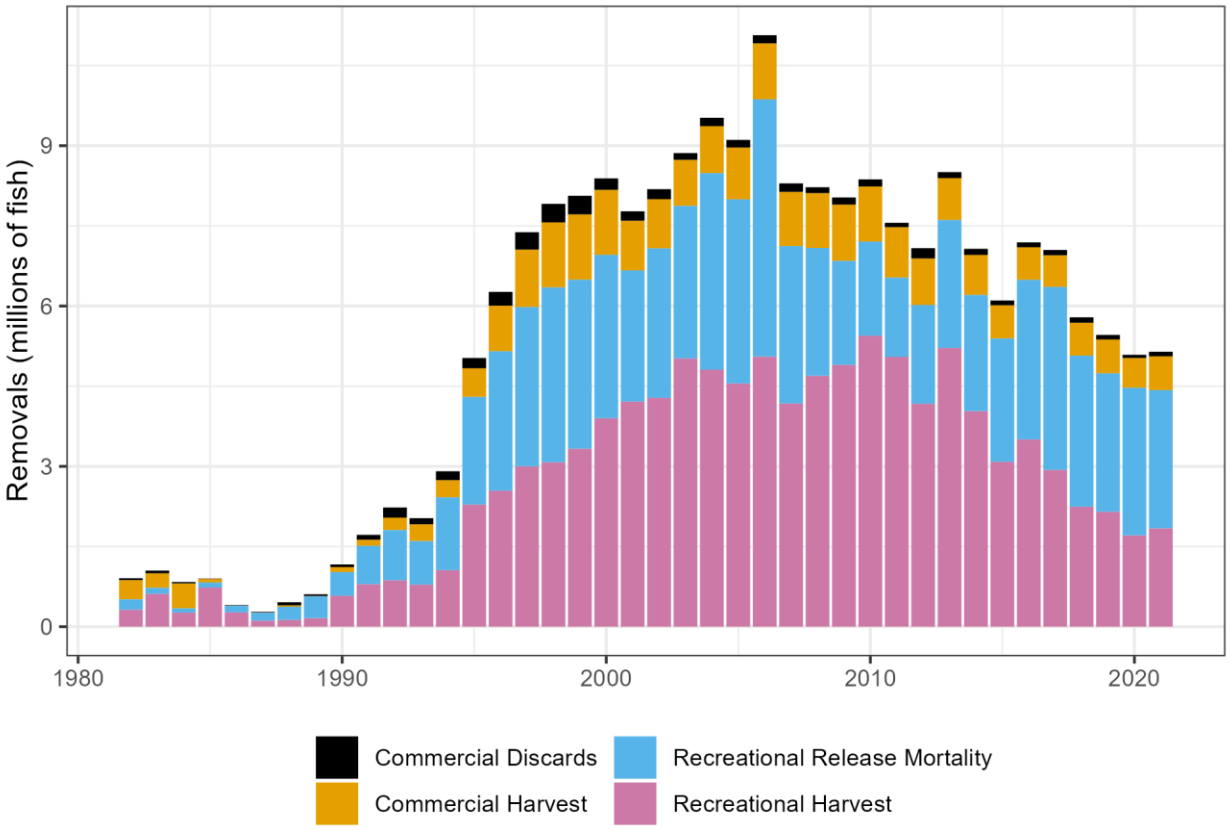


Figure 2. Total striped bass removal by sector.

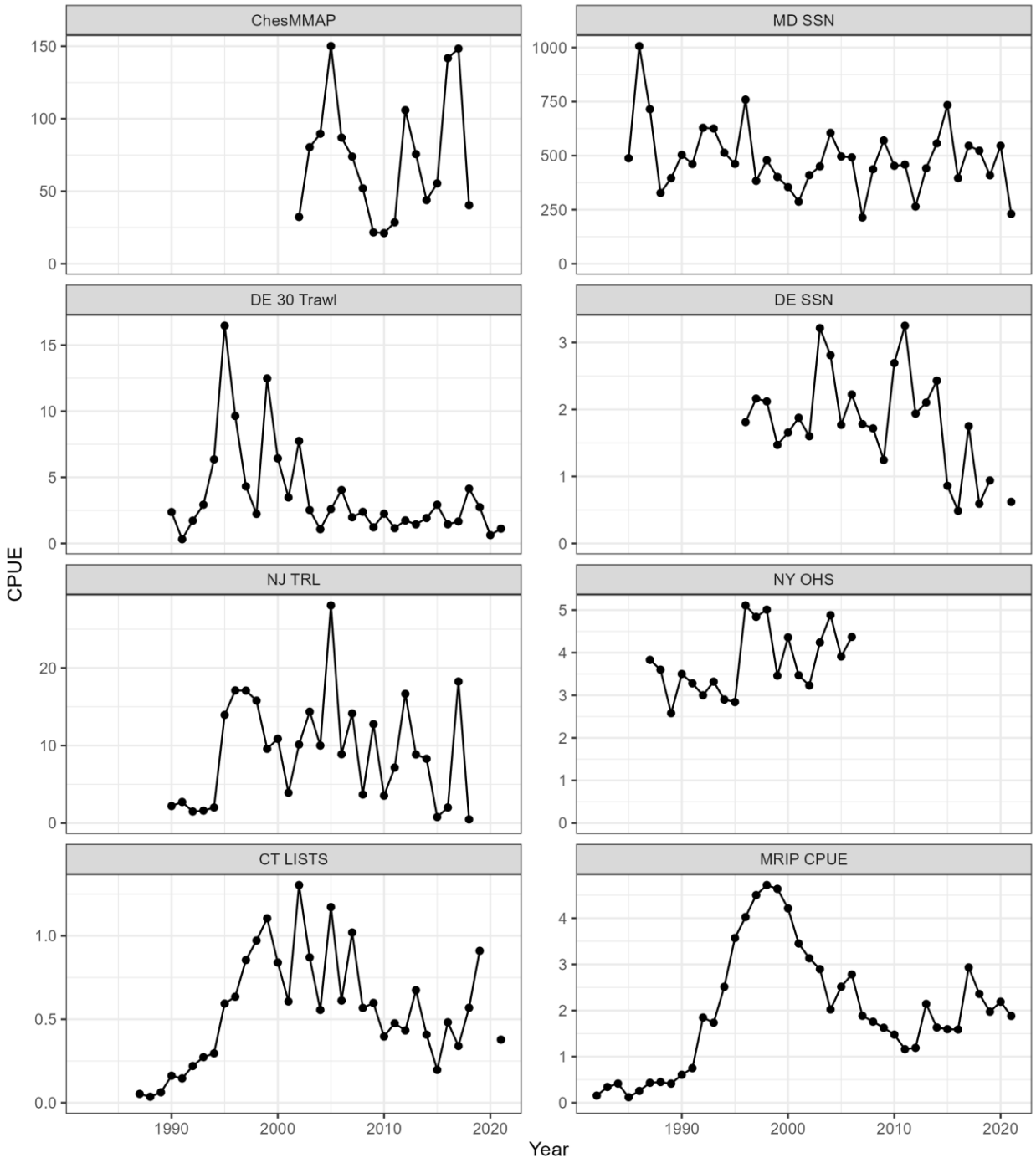


Figure 3. Indices of age-1+ abundance for striped bass, 1982-2021.

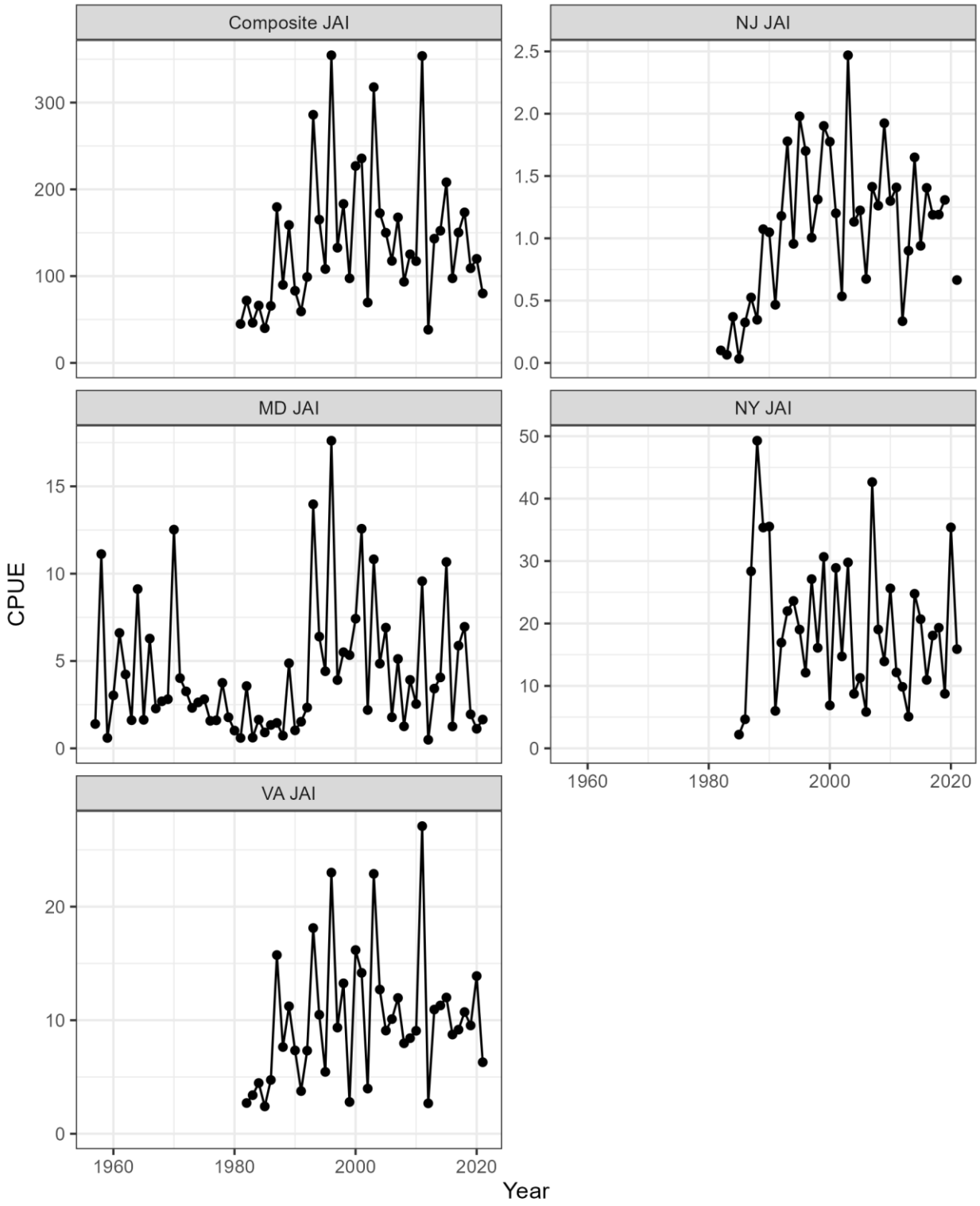


Figure 4. Striped bass juvenile abundance indices, including the composite Chesapeake Bay index (MD-VA), 1954-2021.

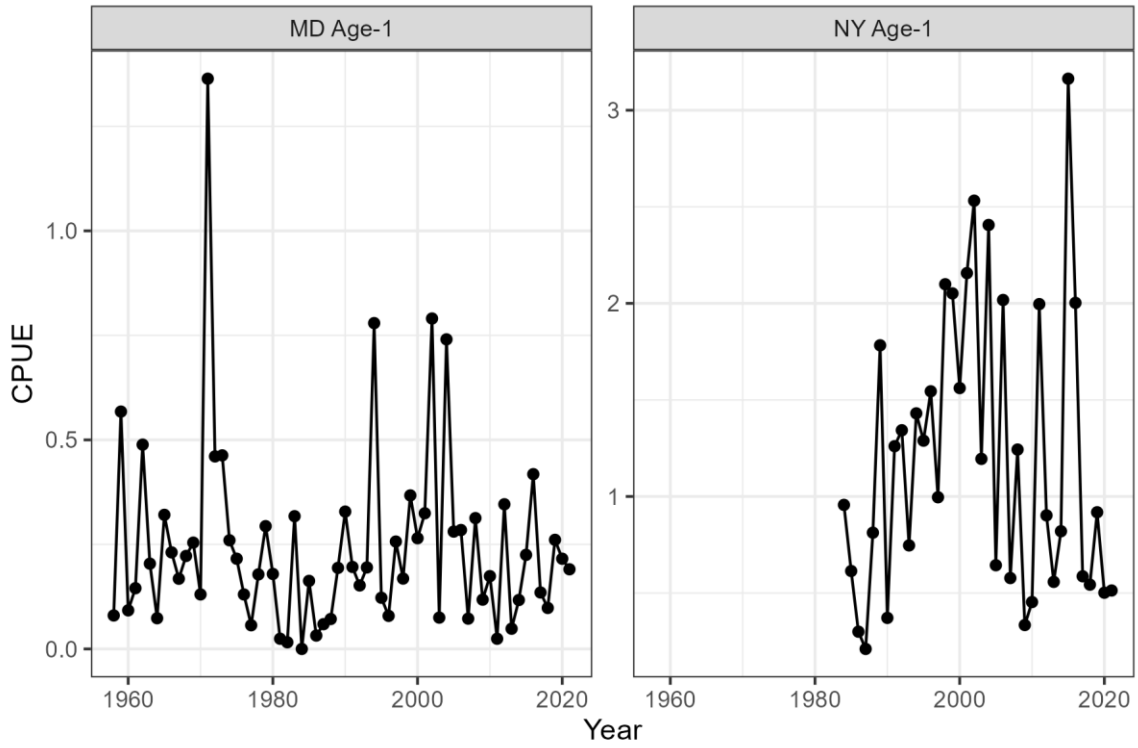


Figure 5. Age-1 recruitment indices for striped bass, 1954-2021.

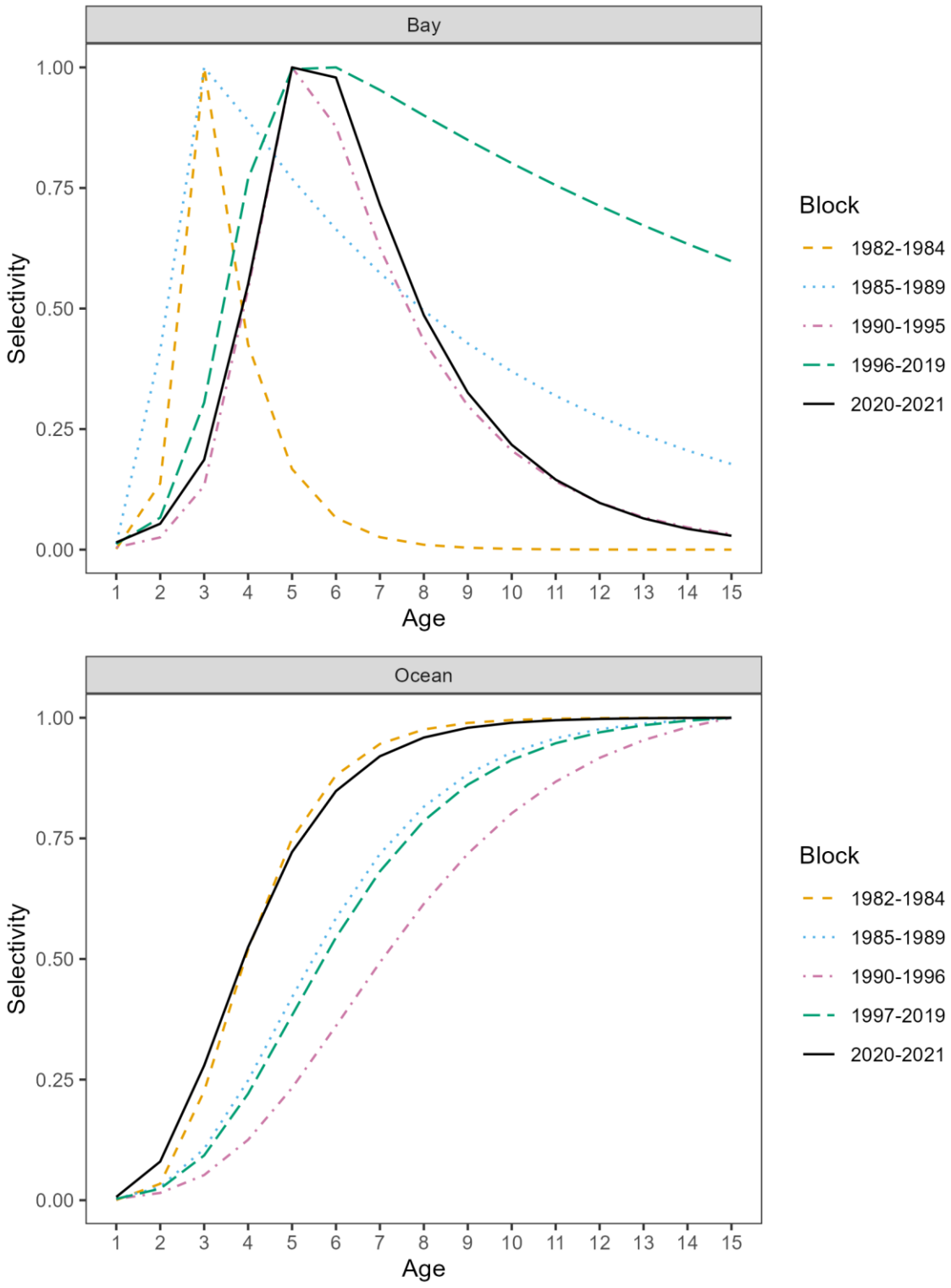


Figure 6. Selectivity patterns for the Bay fleet (top) and the Ocean fleet (bottom).

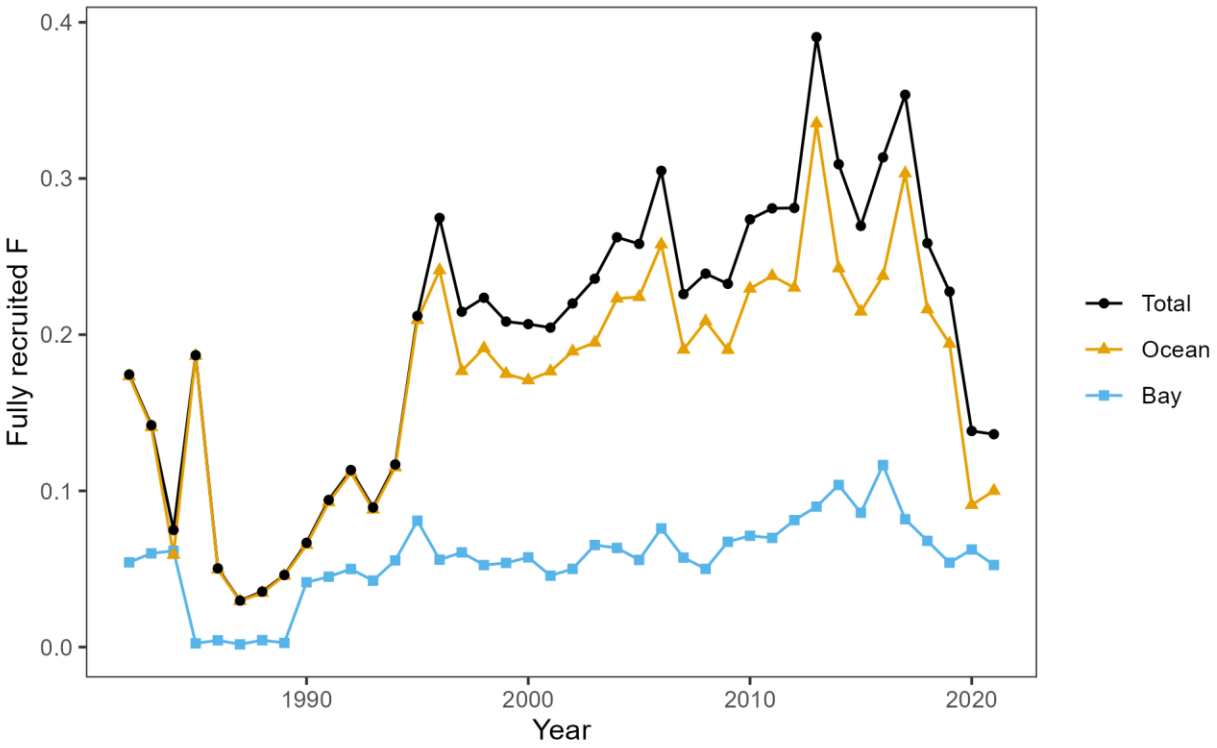


Figure 7. Fully recruited fishing mortality for the Bay and Ocean fleets plotted with the total fully recruited *F*.

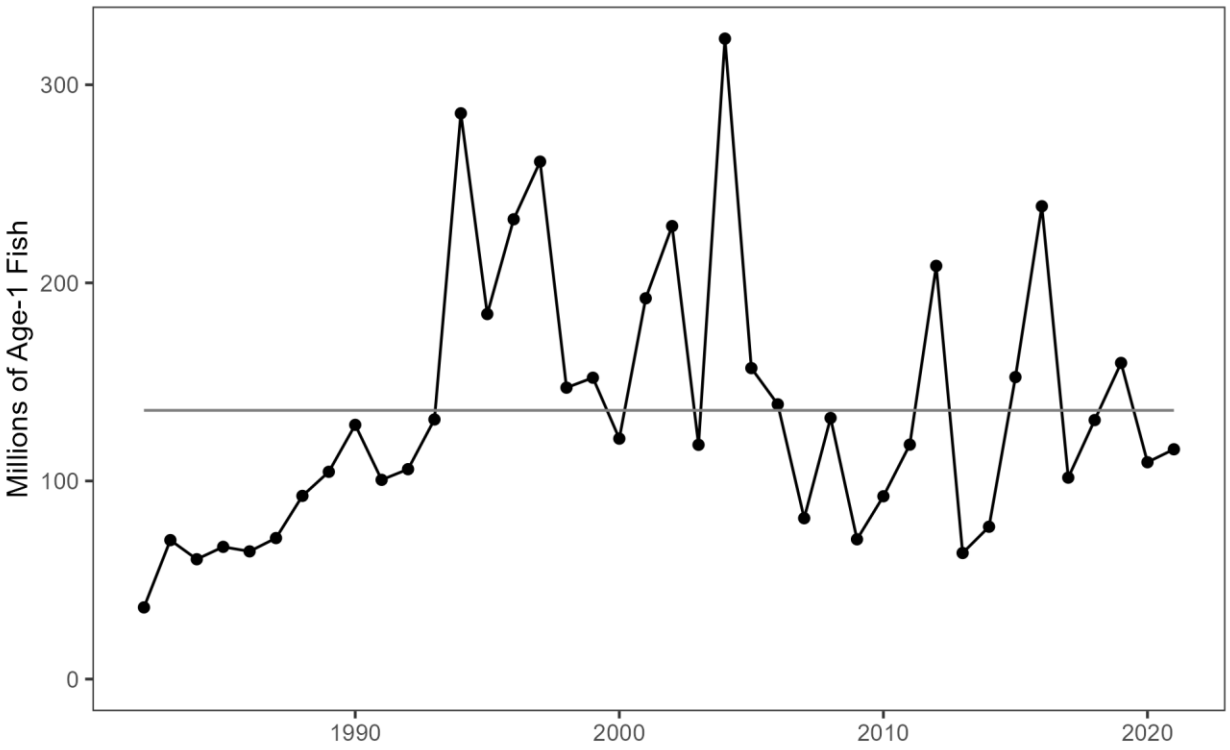


Figure 8. Estimates of striped bass recruitment plotted with the time series mean.

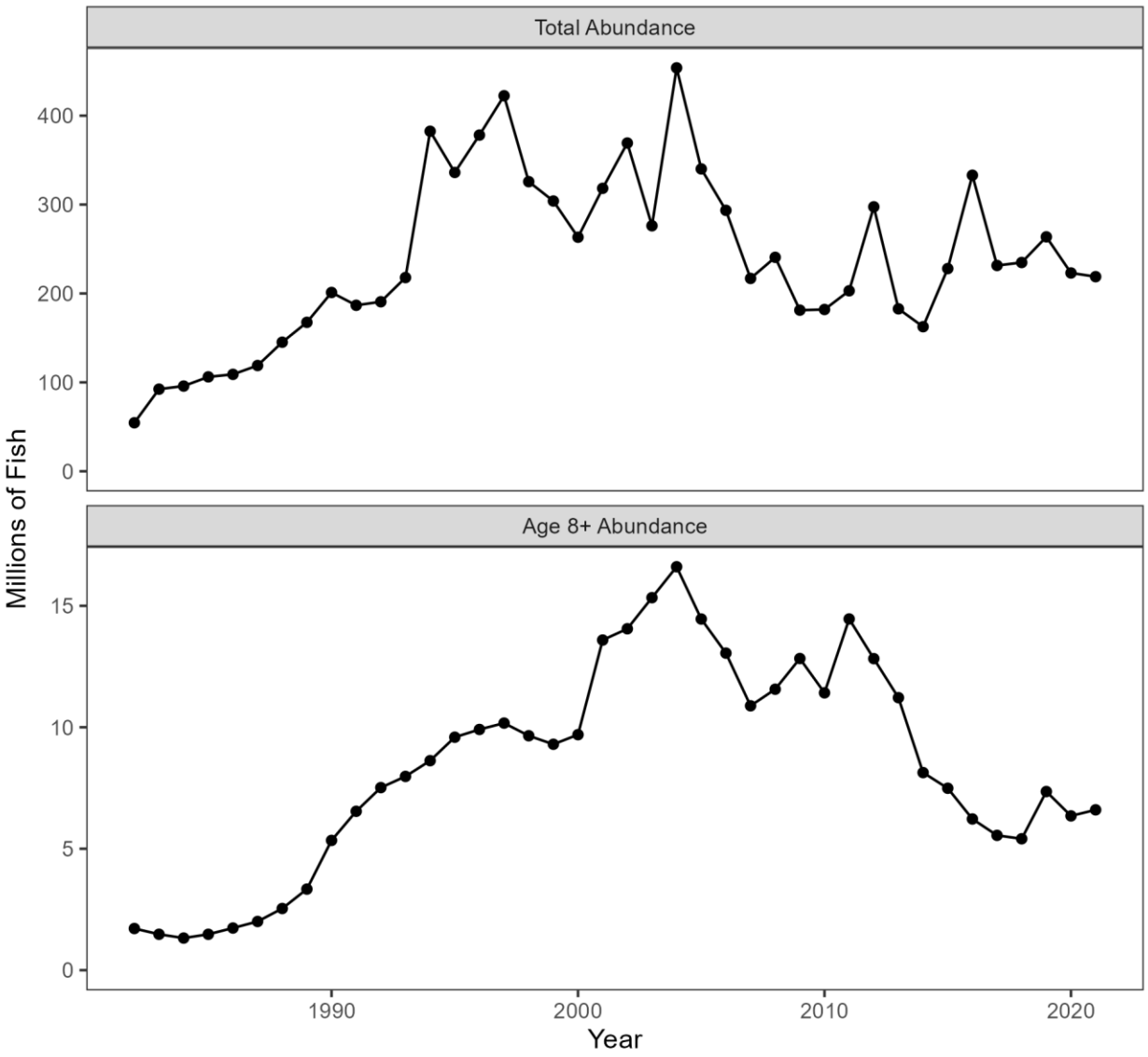


Figure 9. Total abundance (top) and age-8+ abundance of striped bass over time.

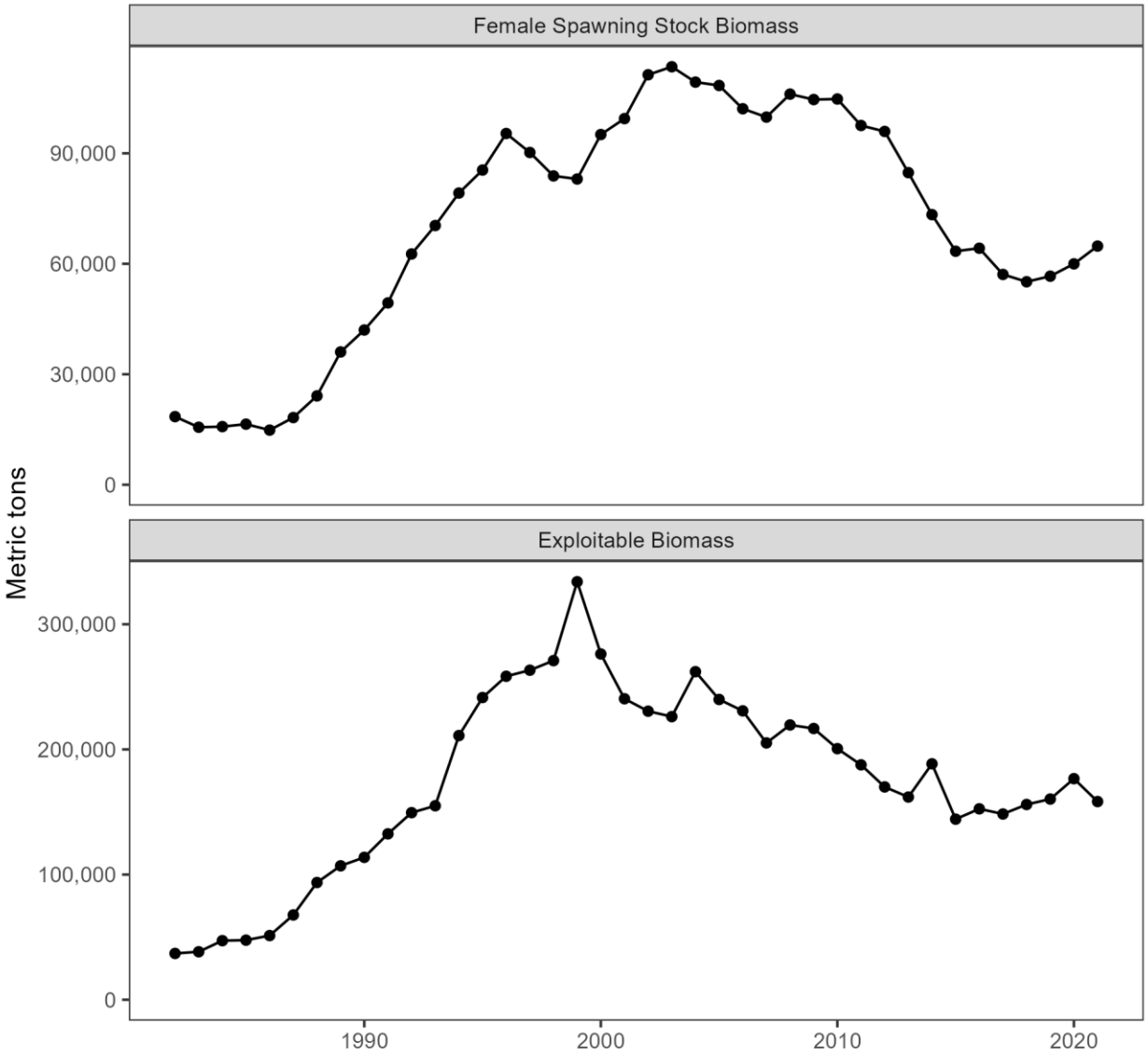


Figure 10. Female spawning stock biomass (top) and exploitable biomass of striped bass over time.

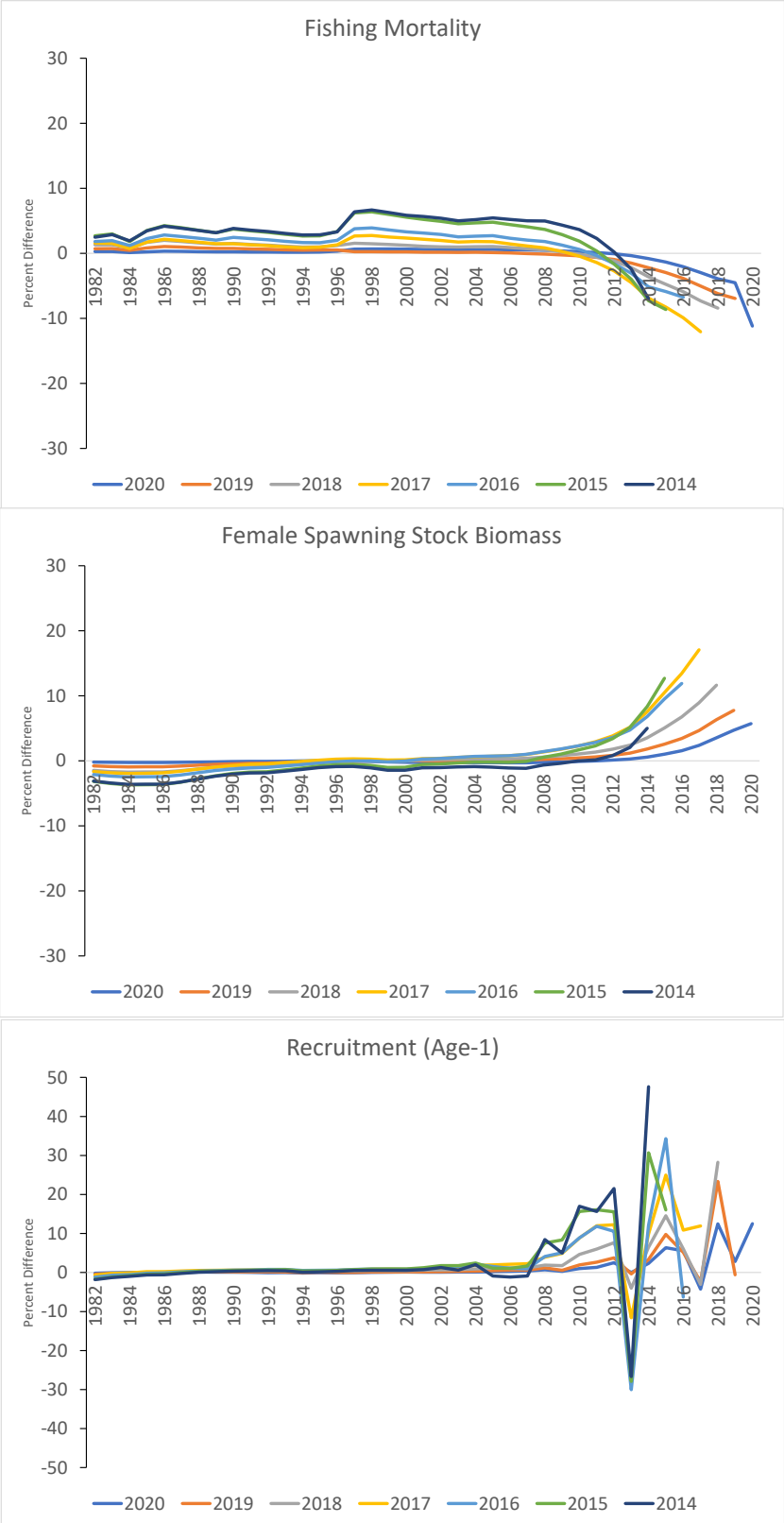


Figure 11. Retrospective plots of seven-year peels for fishing mortality (top), female spawning stock biomass (middle), and recruitment (bottom).

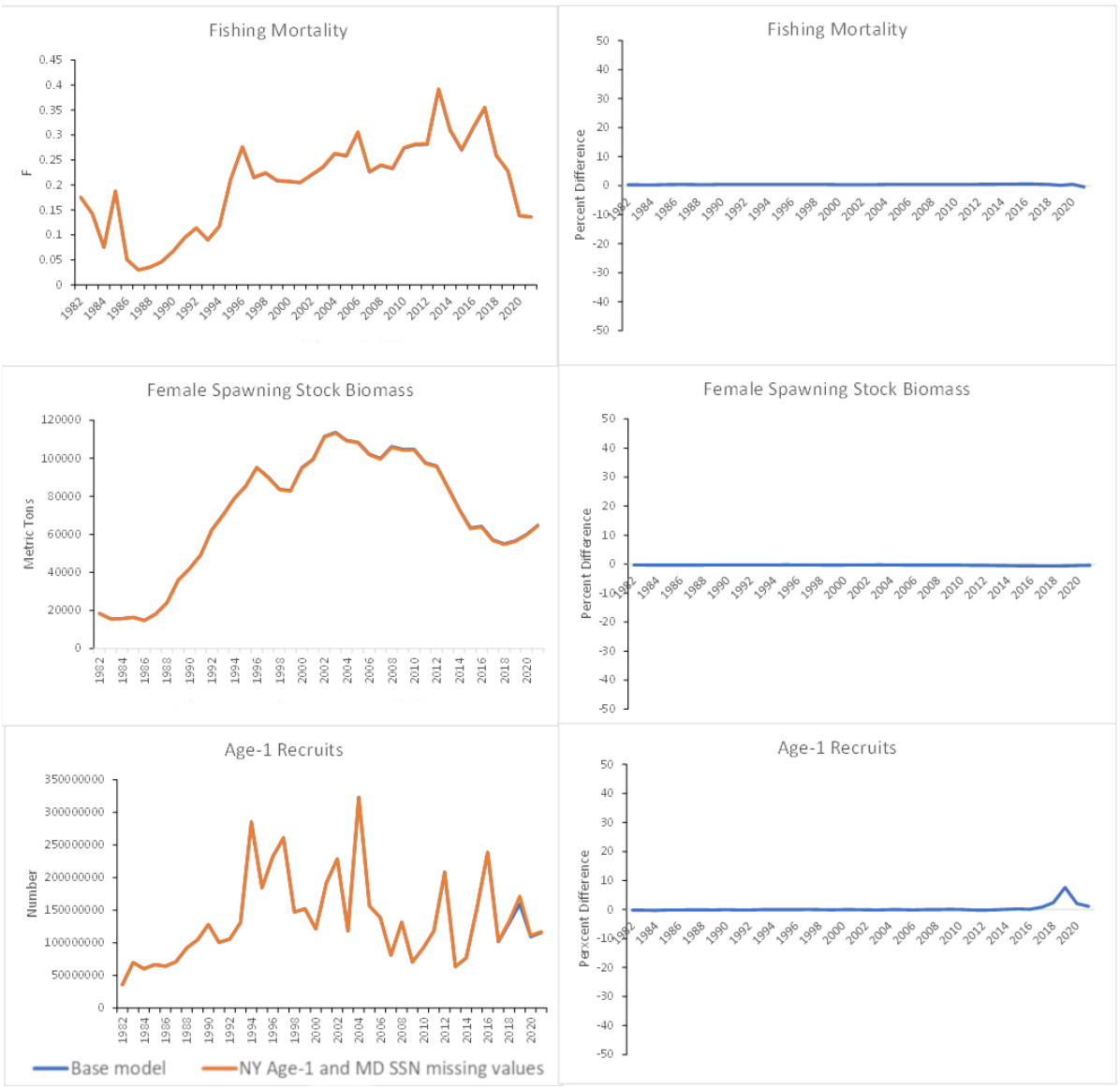


Figure 12. Comparison of fishing mortality (top), female SSB (middle), and recruitment (bottom) estimates from the update assessment and an assessment in which the 2020 NY Age 1 and 2021 MDSSN index values were set as missing. Absolute values are on the left and relative percent difference is on the right.

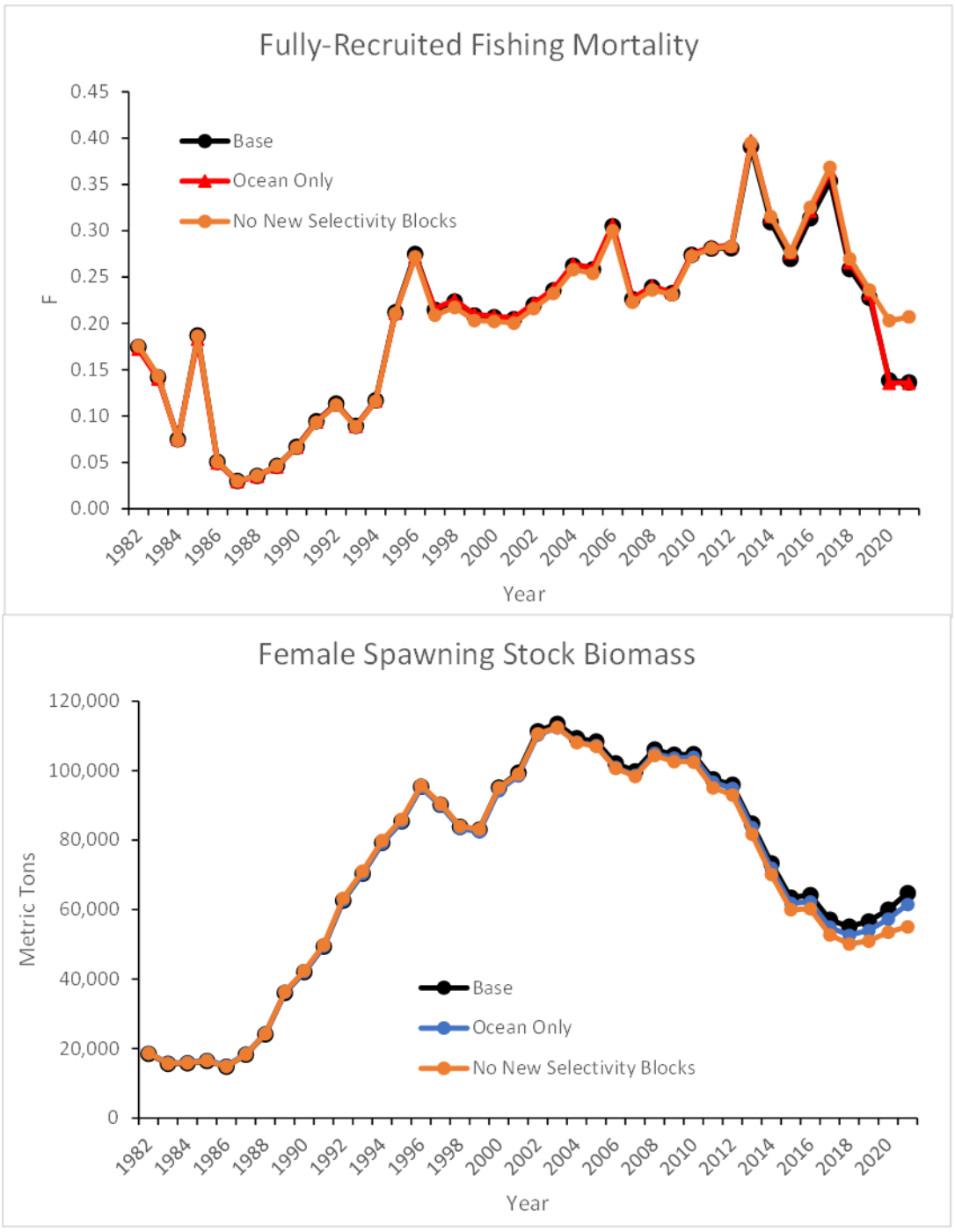


Figure 13. Comparison of fully-recruited fishing mortality (top) and female SSB (bottom) from the update assessment base model and sensitivity runs with a new 2020-2021 selectivity block for the Ocean region only and no new selectivity blocks.

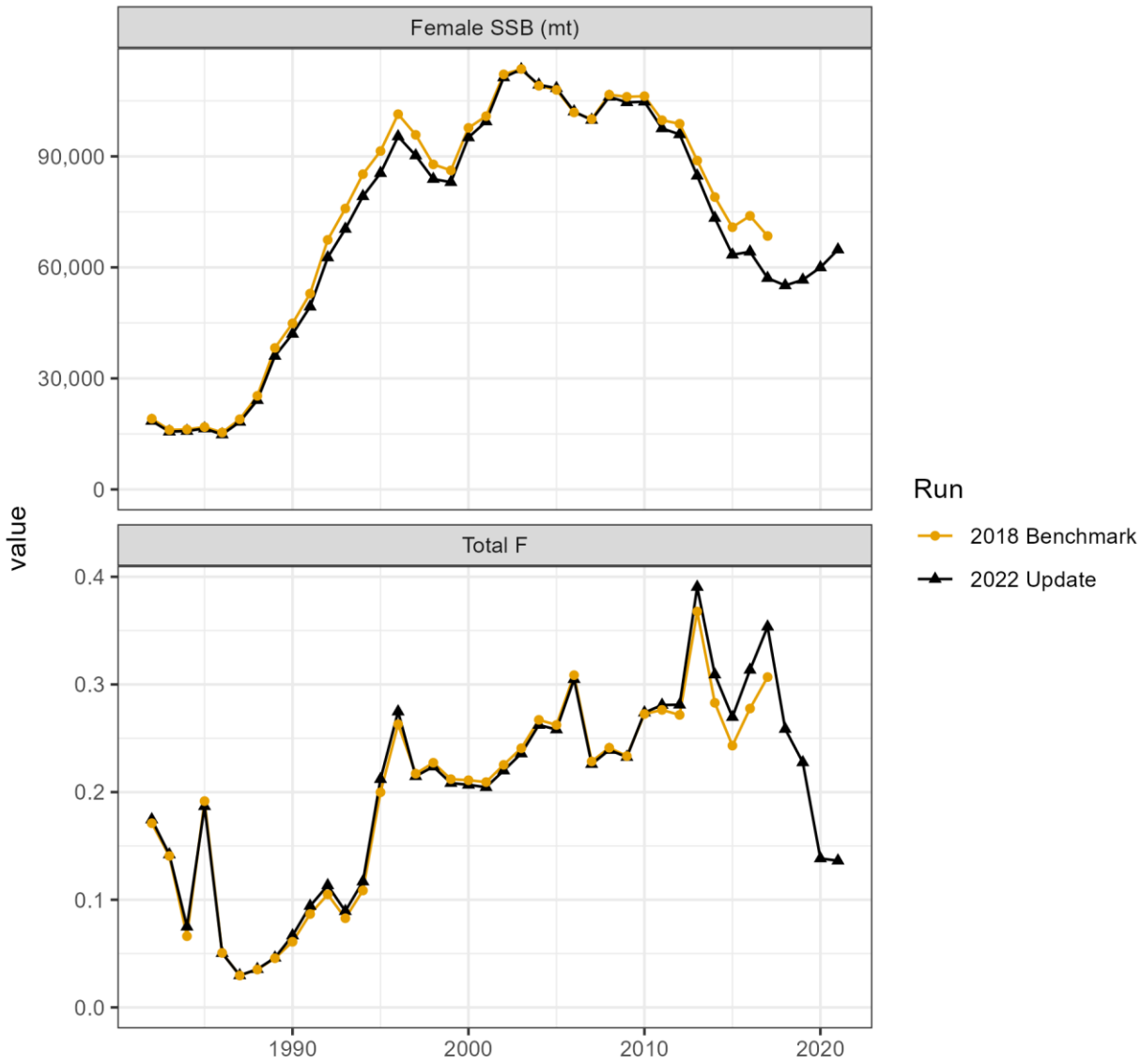


Figure 14. Comparison of estimates of female spawning stock biomass (top) and total fishing mortality (bottom) from the 2018 benchmark assessment and current assessment update.

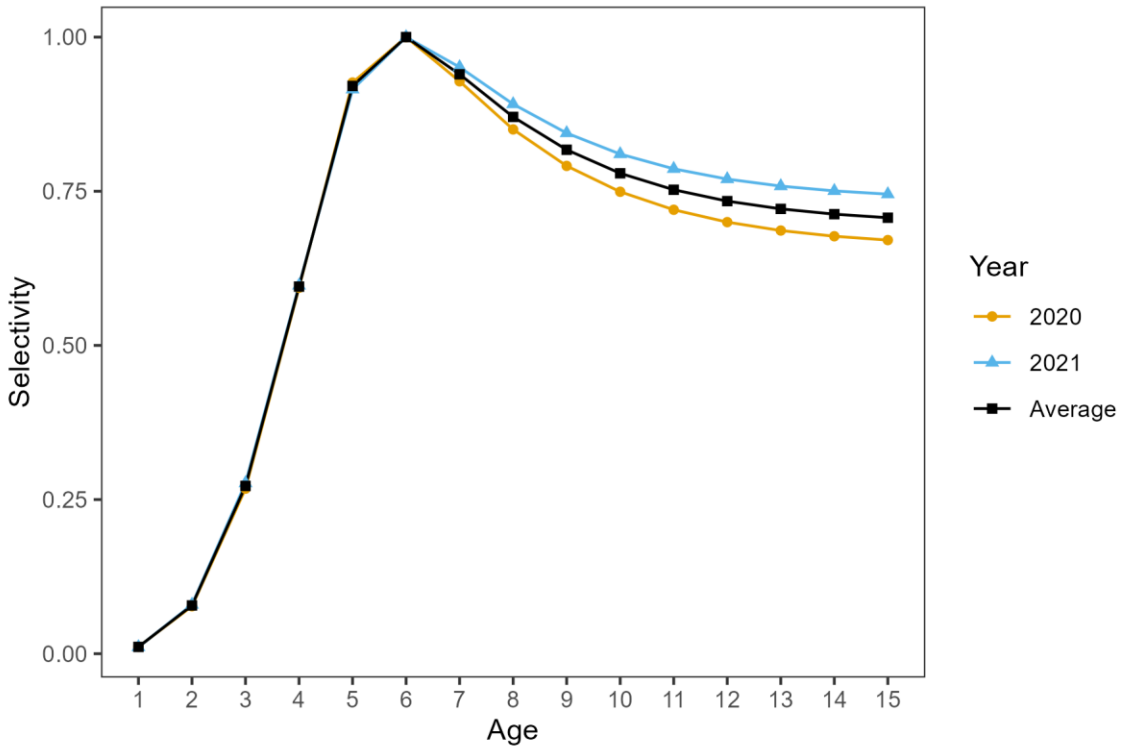


Figure 15. 2020-2021 average selectivity pattern used in the projections to determine fishing mortalities associated with the SSB threshold and targets compared to the overall selectivity in each individual year.

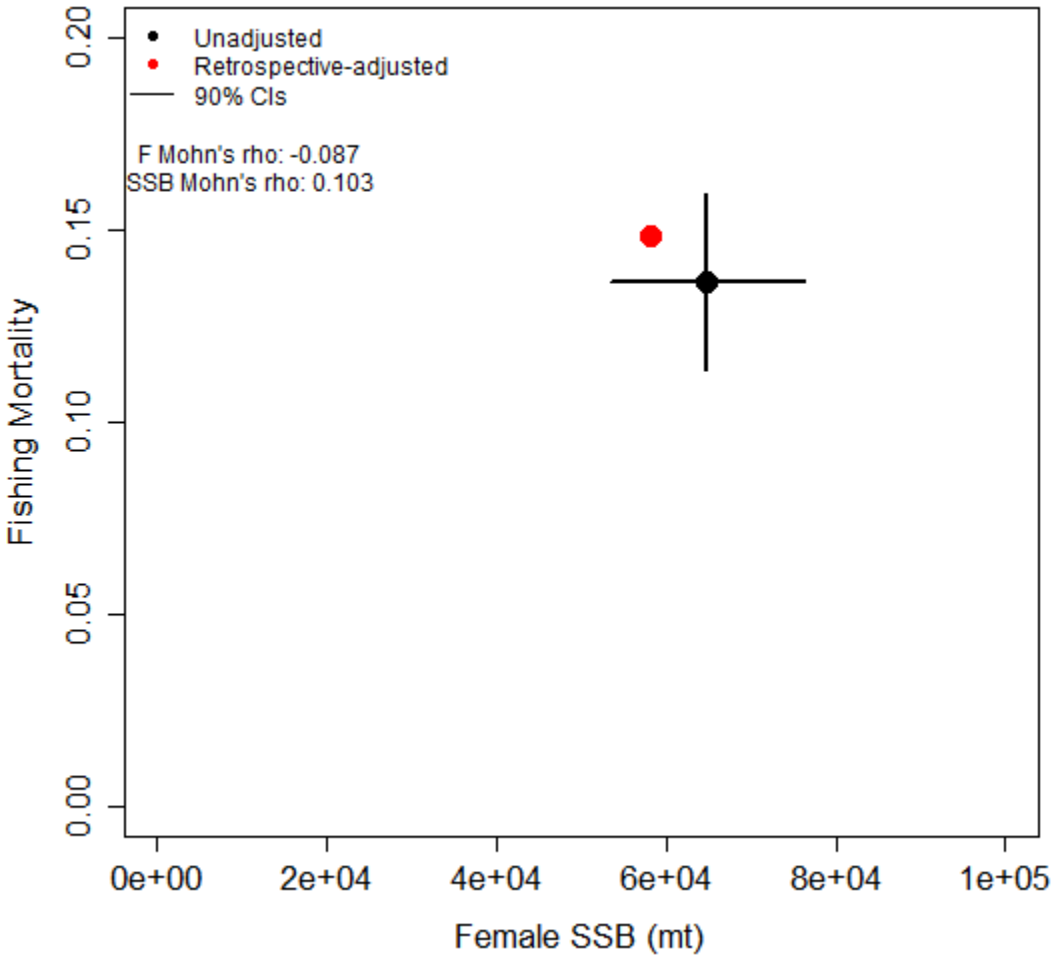


Figure 16. Plot comparing the 2021 retrospective-adjusted *F* and female SSB values with the unadjusted *F* and SSB estimates and their associated 90% confidence intervals.

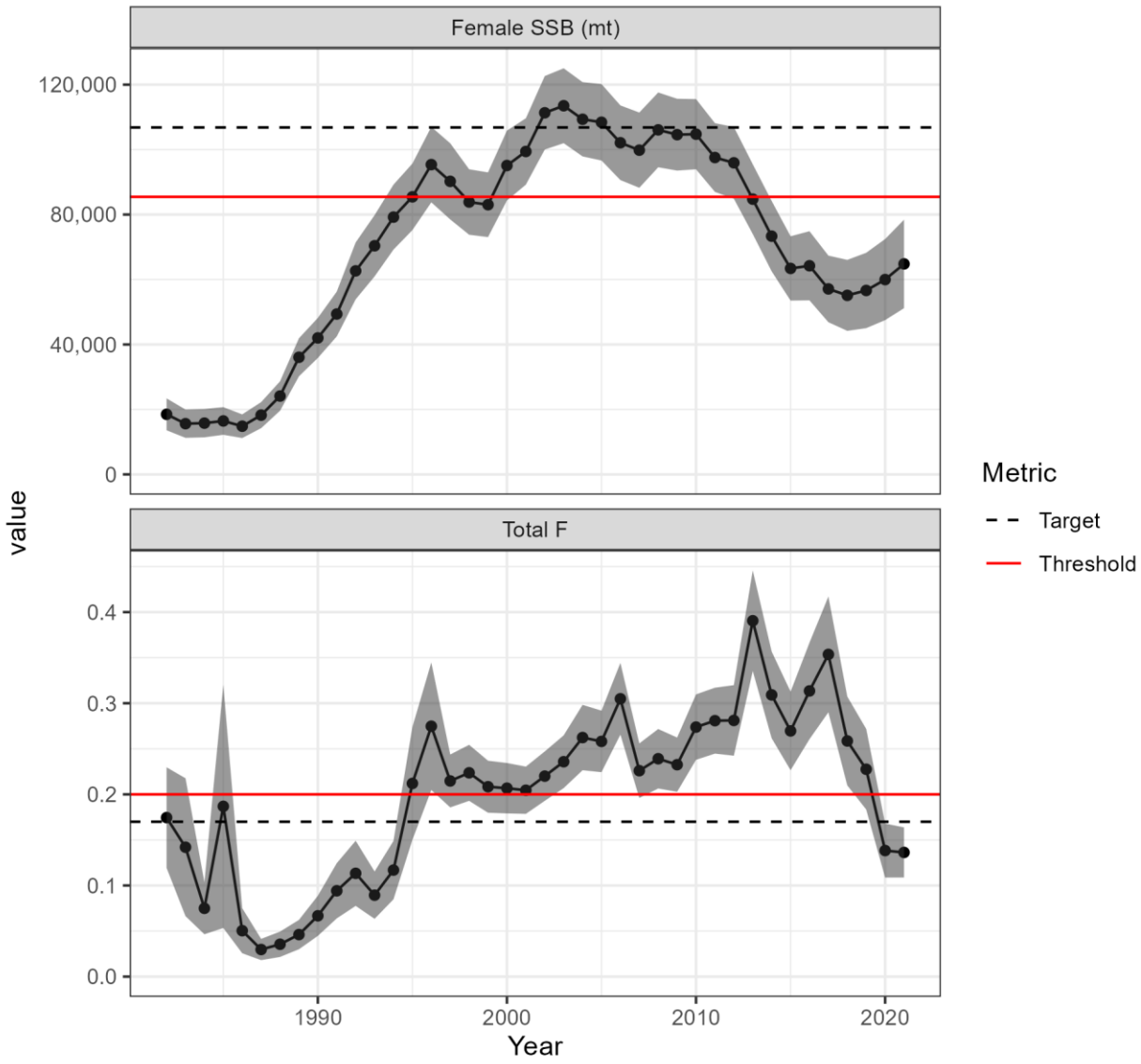


Figure 17. Female SSB (top) and total F estimates (bottom) plotted with their respective targets and thresholds. Shaded area indicates 95% confidence intervals of the estimates.

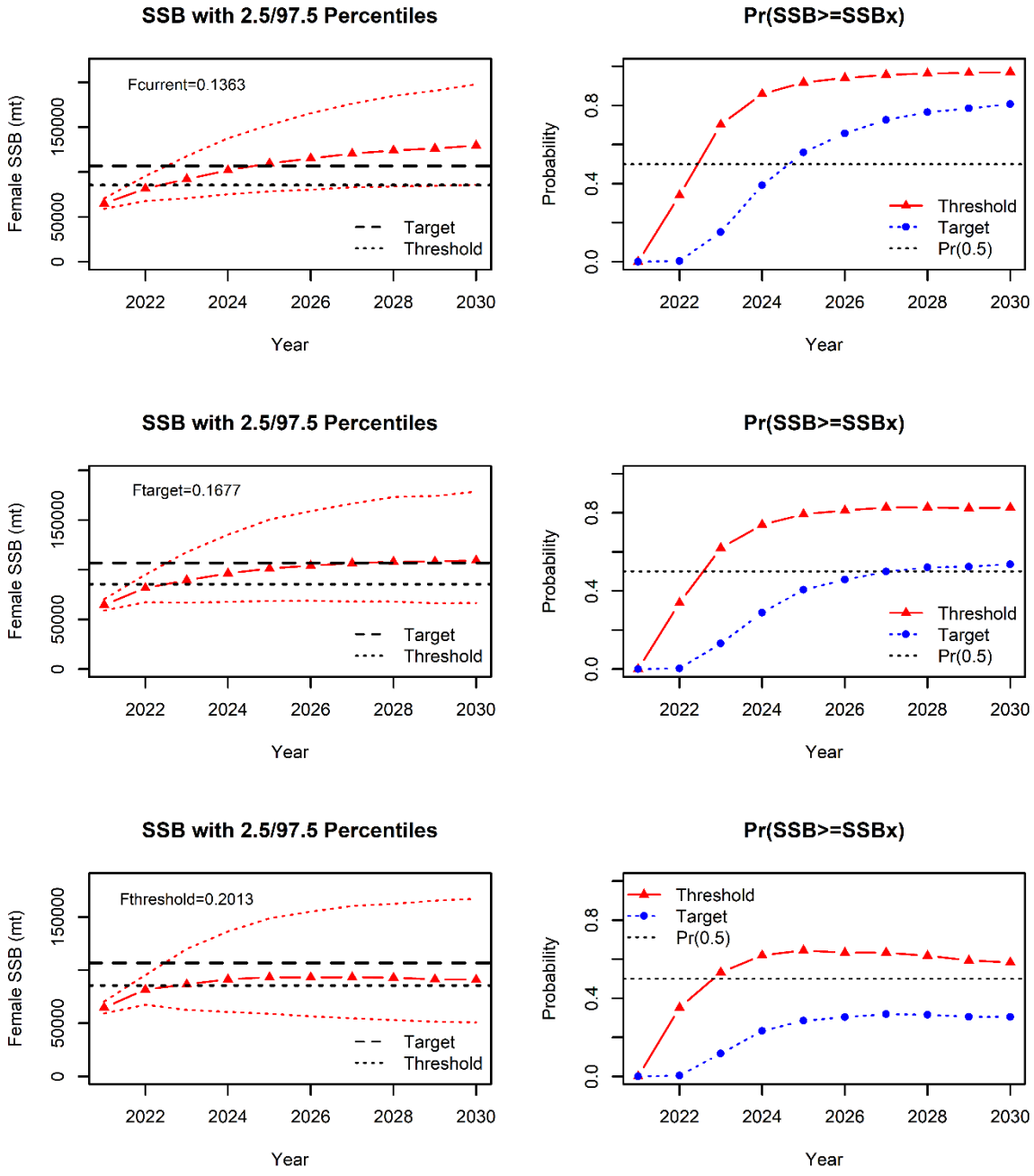


Figure 18. Projections of female spawning stock biomass through 2030 under current *F* (top), target *F* (middle), and threshold *F* (bottom). Absolute values are on the left and the probability of female SSB being above the target and threshold values is on the right.

Appendix 1: Model structure and detailed results for the base model run.

Table 1. Model structure, equation, and data inputs used in this assessment.

General Definitions	Symbol	Description/Definition
Year Index	y	y = {1982,..,2021} for catch. y = {1970,..,2021} for indices.
Age Index	a	a = {1,..,15+}
Fleet Index	f	f = {1: Chesapeake Bay, 2: Coast }
Indices Index:	t	t = {1,..,14}
Input Data	**Symbol**	**Description/Definition**
Observed Fleet Catch	$C_{f,y}$	Reported number of striped bass killed each year (y) by fleet (f)
Coefficient of Variation for Fleets	$CV_{f,y}$	Calculated from MRIP harvest and releases estimates with associated proportional standard errors (commercial harvest from census – no error)
Observed Fleet Age Compositions	$P_{f,y,a}$	Proportion-at-age (a) for each year (y) and fleet (f)
Observed Total Indices of Relative Abundance	$I_{t,y}$	Reported by various states. YOY and Age 1 Indices: 6 Indices with Age Composition: 8 (one fisheries-dependent, 7 fishery-independent)
Coefficient of Variation for Indices	$CV_{t,y}$	Calculated from indices and associated standard errors
Observed Age Compositions of Indices of Relative Abundance	$P_{t,y,a}$	Proportion-at-age (a) for each year (y) and index (t)
Effective Sample Size	$\hat{\tilde{n}}$	<u>Starting Values from 2018 Benchmark</u> Fleets: Bay – 68.4, Ocean – 71 Indices: NYOHS – 21.4, NJ Trawl – 5.2, MDSSN – 16.8, DESSN – 19.7, MRIP – 35.6, CTLIST – 12.4, DE30FT – 7.3, ChesMap – 10.7 The multiplier from equation 1.8 method of Francis (2011) is used to adjust the starting values.

Table 1 (cont.)

Population Model	Symbol	Equation
Age-1 numbers	$\hat{N}_{y,1}$	$\widehat{N}_{y,1} = \overline{N}_1 e^{\hat{\varepsilon}_y - 0.5\sigma_R^2}$ $\hat{\sigma}_R = \sqrt{\frac{\sum_y(\hat{\varepsilon}_y - \hat{\bar{\varepsilon}})^2}{n-1}}$ where ε_y are independent and identically distributed normal random variables with zero mean and constant variance and are constrained to sum to zero over all years
Abundance-at-Age	$\hat{N}_{y,a}$	First year (ages 2-A in 1970): $\hat{N}_{y,a} = \hat{N}_{y,a-1} \exp^{-\hat{F}_{1982,a-1} - M_{1982,a-1}}$ Rest of years (ages 2-15): $\hat{N}_{y,a} = \hat{N}_{y-1,a-1} \exp^{-\hat{F}_{y-1,a-1} - M_{y-1,a-1}}$
Plus-group abundance-at-age	$\hat{N}_{y,A}$	$\hat{N}_{y,A} = \hat{N}_{y-1,A-1} \exp^{-\hat{F}_{y-1,A-1} - M_{y-1,A-1}} + \hat{N}_{y-1,A} \exp^{-\hat{F}_{y-1,A} - M_{y-1,A}}$
Fishing Mortality	$\hat{F}_{f,y,a}$	$\hat{F}_{f,y,a} = \hat{F}_{f,y} \cdot \hat{s}_{f,a}$ where $F_{f,y}$ and $s_{f,a}$ are estimated parameters
Total Mortality	$\hat{Z}_{y,a}$	$Z_{y,a} = F_{y,a} + M_{y,a}$
Fleet Selectivity Time Blocks and Selectivity Equations	$\hat{s}_{f,a}$	Fleet 1 (Chespeake Bay): 1982-1984, 1985-1989, 1990-1995, 1996-2019, 2020-2021 $\hat{s}_a = \frac{1}{1-\hat{\gamma}} \cdot \left(\frac{1-\hat{\gamma}}{\hat{\gamma}}\right)^{\hat{\gamma}} \frac{\exp^{\hat{\alpha}\hat{\gamma}(\hat{\beta}-a)}}{1+\exp^{\hat{\alpha}(\hat{\beta}-a)}}$ Fleet 2 (Ocean): 1982-1984, 1985-1989,1990-1996,1997-2019, 2020-2021 $\hat{s}_a = \exp^{(-\exp^{-\hat{\beta}(a-\hat{\alpha})})}$
Predicted Catch-At-Age	$\hat{C}_{f,y,a}$	$\hat{C}_{f,y,a} = \frac{\hat{F}_{f,y,a}}{\hat{F}_{f,y,a} + M_{y,a}} \cdot (1 - \exp^{-\hat{F}_{y,a} - M_{y,a}}) \cdot \hat{N}_{y,a}$

Table 1 (cont.)

Population Model	Symbol	Equation
Predicted Total Catch	$\hat{C}_{f,y}$	$\hat{C}_{f,y} = \sum_a \hat{C}_{f,y,a}$
Predicted Proportions of Catch-At-Age	$\hat{P}_{f,y,a}$	$\hat{P}_{f,y,a} = \frac{\hat{C}_{f,y,a}}{\sum_a \hat{C}_{f,y,a}}$
Predicted Aggregated Indices of Relative Abundance	$\hat{I}_{t,y,\sum a}$	$\hat{I}_{t,y,\Sigma a} = \hat{q}_t \cdot \sum_a \hat{N}_{y,a} \cdot \exp^{-p_t \cdot Z_{y,a}}$ where q_t is the estimated catchability coefficient of index t and p_t is the fraction of the year when the survey takes place.
Predicted Age-Specific Indices of Relative Abundance	$\hat{I}_{t,y,a}$	$\hat{I}_{t,y,a} = \hat{q}_t \cdot \hat{s}_{t,a} \cdot \hat{N}_{y,a} \cdot exp^{-p_t \hat{Z}_{y,a}}$ where $\hat{s}_{t,a}$ is the selectivity-at-age a for index t
Predicted Total Indices of Relative Abundance with Age Composition Data	$\hat{I}_{t,y}$	$\hat{I}_{t,y} = \hat{q}_t \sum_a \hat{s}_{t,a} \cdot \hat{N}_{y,a} \cdot \exp^{-p_t \cdot \hat{Z}_{y,a}}$
Predicted Age Composition of Survey	$\hat{U}_{t,y,a}$	$\hat{U}_{t,y,a} = \frac{\hat{I}_{t,y,a}}{\sum_a \hat{I}_{t,y,a}}$
Female Spawning Stock Biomass (metric tons)	SSB_y	$SSB_y = \sum_{a=1}^{A} N_{y,a} \cdot sr_a \cdot m_a \cdot w_{y,a}/1000$ where sr_a is the female sex ratio at age a and m_a is female maturity at age a.

Table 1 (cont.)

Likelihood	Symbol	Equation
Concentrated Lognormal Likelihood for Fleet Catch (F) and Indices of Relative Abundance (T)	$-L_F$; $-L_T$	$-L_F = 0.5 * \sum_f n_f * ln\left(\frac{\sum_f RSS_f}{\sum_f n_f}\right)$ $-L_T = 0.5 * \sum_t n_t * ln\left(\frac{\sum_t RSS_t}{\sum_t n_t}\right)$ where $RSS_f = \lambda_f \sum_y \left(\frac{ln(C_{f,y} + 0.00001) - ln(\hat{C}_{f,y} + 0.00001)}{\delta_f \cdot CV_{f,y}}\right)^2$ $RSS_t = \lambda_t \sum_y \left(\frac{ln(I_{t,y} + 0.00001) - ln(\hat{I}_{t,y} + 0.00001)}{\delta_t \cdot CV_{t,y}}\right)^2$ *ln* is the natural log. $CV_{f,y}$ and $CV_{t,y}$ are the annual coefficient of variation for the observed total catch (f) and index (t) in year *y*, δ_f and δ_t is the CV weights for total catch *f* and index *t* , and λ_t and λ_f are relative weights.
Multinomial fleet catch (FC) and index (TC) age compositions	$-L_{FC}$; $-L_{TC}$	$-L_{FC} = \lambda_f \sum_y -n_{f,y} \sum_a P_{f,y,a} \cdot ln(\hat{P}_{f,y,a} + 0.0000001)$ $-L_{TC} = \lambda_t \sum_y -n_{t,y} \sum_a U_{t,y,a} \cdot ln(\hat{U}_{t,y,a} + 0.0000001)$ where λ_f and λ_t are a user-defined weighting factors and n_y are the effective sample sizes.
Constraints Added To Total Likelihood	P_{n1},P_{rdev}, P_{fadd}	$P_{n1} = \lambda_{n1}(\hat{N}_{y,1} - N^e_{y,1})^2$ - forces $N_{1,1}$ to follow S-R curve $P_{rdev} = \lambda_R \sum_y log_e(\hat{\sigma}_R) + \frac{\hat{\varepsilon}_y^2}{2\hat{\sigma}_R^2}$ - for bias correction to constrain deviations $P_{f_{add}} = \begin{cases} \text{phase} < 3, & 10 \cdot \sum_y (F_{f,y} - 0.15)^2 \\ \text{phase} \geq 3, & 0.000001 \cdot \sum_y (F_{f,y} - 0.15)^2 \end{cases}$ - avoid small F values at start

Table 1 (cont.)

Diagnostics	Symbol	Equation
Standardized residuals (lognormal – catch and surveys)	$r_{f,y}$ or $r_{t,y}$	$r_{t,y} = \frac{ln\, I_{t,y} - \widehat{ln\, I_{t,y}}}{\sqrt{ln(\,(\delta_t CV_{t,y})^2 + 1)}}$ $r_{f,y} = \frac{ln\, C_{f,y} - \widehat{ln\, C_{f,y}}}{\sqrt{ln(\,CV_{f,y}^2 + 1)}}$
Standardized residuals (age compositions – catch and surveys)	$ra_{f,y,a}$ or $ra_{t,y,a}$	$ra_{f,y,a} = \frac{P_{f,y,a} - \hat{P}_{f,y,a}}{\sqrt{\frac{\hat{P}_{f,y,a}(1-\hat{P}_{f,y,a})}{\hat{\tilde{n}}_f}}}$ $ra_{t,y,a} = \frac{P_{t,y,a} - \hat{P}_{t,y,a}}{\sqrt{\frac{\hat{P}_{t,y,a}(1-\hat{P}_{t,y,a})}{\hat{\tilde{n}}_t}}}$
Root mean square error	*RMSE*	Total catch $RMSE_f = \sqrt{\frac{\sum_y r_{f,y}^2}{n_f}}$ Index $RMSE_t = \sqrt{\frac{\sum_y r_{t,y}^2}{n_t}}$

Table 2. Comparison of RMSE, CV weights and effective sample sizes from the 2018 benchmark and 2022 update assessments.

2018 Benchmark				
Index	n	RMSE	CV Weight	Effective Sample Size
NYYOY	32	0.99623	3.03	
NJYOY	35	0.989621	1.75	
MDYOY	12	1.04199	2.10	
compos	36	1.01178	0.98	
NYAge1	33	1.01612	3.13	
MDAge1	48	1.03659	3.32	
NYOHS	20	1.0349	2.38	21.48
NJTRAWL	28	1.01072	24.00	5.20
MDSSN	33	1.02561	2.40	16.79
DESSN	21	1.00789	0.95	19.70
MRIP	36	0.98235	0.97	35.58
CTLIST	31	0.987111	1.60	12.41
DE30FT	17	0.994321	0.91	7.33
ChesMP	16	1.00057	2.85	10.76

2022 Update Assessment				
Index	n	RMSE	CV Weight	Effective Sample Size
NYYOY	36	0.990985	2.97	
NJYOY	38	1.00901	1.73	
MDYOY	12	1.00507	2.11	
compos	40	1.00575	0.96	
NYAge1	37	1.00193	1.19	
MDAge1	52	0.998121	3.25	
NYOHS	20	0.996071	2.65	21.80
NJTRAWL	29	1.00117	2.95	5.66
MDSSN	37	0.998646	2.50	14.95
DESSN	24	1.00934	1.17	18.55
MRIP	40	1.00898	2.27	29.64
CTLIST	34	0.996705	3.00	12.93
DE30FT	21	1.00132	0.85	5.81
ChesMP	17	1.00111	2.45	15.10

Table 3. Summary of likelihood component values.

	Likelihood Weight	RSS
Fleet 1 Total Catch:	2	0.198243
Fleet 2 Total Catch:	2	1.63939
Aggregate Abundance Indices		
NYYOY	1	28.0077
NJYOY	1	30.684
MDYOY	1	10.3223
Compos	1	38.5644
NYAge1	1	32.3038
MDAge1	1	24.3656
Age Comp Abundance Indices		
NYOHS	1	18.801
NJTRAWL	1	20.5932
MDSSN	1	31.1497
DESSN	1	22.2464
MRIP	1	36.0733
CTLIST	1	27.1241
DE30FT	1	17.3121
ChesMap	1	14.7808
Total RSS		354.166
No. of Obs		517
Conc. Likel.		-97.7846
Age Composition Data	Likelihood	
Fleet 1 Age Comp:	1	5244.92
Fleet 2 Age Comp:	1	7223.16
NYOHS	1	726.071
NJTRAWL	1	308.944
MDSSN	1	1130.86
DESSN	1	1024.38
MRIP	1	2537.37
CTLIST	1	816.295
DE30FT	1	230.031
ChesMap	1	397.76
Recr Devs :	1	42.5514
Total Likelihood :		19515
AIC :		39412.1

Table 4. Estimates of Bay and Ocean fully-recruited fishing mortality and total fully-recruited fishing mortality with associated standard errors.

	Bay			Ocean			Total		
	Fully-recruited			Fully-recruited			Fully-recruited		
Year	F	SD	CV	F	SD	CV	F	SD	CV
1982	0.054	0.013	0.244	0.173	0.003	0.017	0.175	0.028	0.161
1983	0.060	0.028	0.466	0.141	0.013	0.089	0.142	0.039	0.272
1984	0.062	0.008	0.122	0.059	0.004	0.060	0.075	0.015	0.194
1985	0.002	0.038	16.224	0.186	0.013	0.069	0.187	0.068	0.364
1986	0.004	0.014	3.251	0.050	0.004	0.076	0.050	0.013	0.250
1987	0.002	0.011	6.511	0.029	0.017	0.576	0.030	0.006	0.200
1988	0.004	0.000	0.090	0.035	0.004	0.113	0.036	0.007	0.200
1989	0.003	0.068	25.687	0.046	0.016	0.351	0.046	0.008	0.178
1990	0.041	0.001	0.035	0.065	0.005	0.072	0.067	0.011	0.168
1991	0.045	0.013	0.278	0.093	0.018	0.197	0.094	0.015	0.164
1992	0.050	0.000	0.009	0.112	0.004	0.034	0.113	0.018	0.161
1993	0.043	0.006	0.139	0.088	0.014	0.157	0.089	0.013	0.148
1994	0.055	0.001	0.017	0.115	0.003	0.026	0.117	0.016	0.140
1995	0.081	0.007	0.087	0.209	0.015	0.073	0.212	0.032	0.149
1996	0.056	0.001	0.011	0.241	0.004	0.017	0.275	0.036	0.130
1997	0.061	0.008	0.135	0.177	0.013	0.075	0.215	0.015	0.069
1998	0.052	0.006	0.109	0.191	0.007	0.035	0.224	0.016	0.070
1999	0.054	0.011	0.205	0.175	0.016	0.093	0.208	0.015	0.070
2000	0.057	0.007	0.128	0.171	0.005	0.027	0.207	0.014	0.068
2001	0.046	0.015	0.334	0.177	0.017	0.094	0.205	0.013	0.065
2002	0.050	0.005	0.107	0.189	0.007	0.035	0.220	0.014	0.063
2003	0.065	0.018	0.276	0.195	0.017	0.088	0.236	0.015	0.063
2004	0.063	0.004	0.065	0.223	0.006	0.026	0.262	0.018	0.070
2005	0.056	0.013	0.235	0.224	0.026	0.115	0.258	0.017	0.067
2006	0.076	0.005	0.064	0.258	0.009	0.034	0.305	0.020	0.066
2007	0.057	0.016	0.282	0.190	0.021	0.111	0.226	0.015	0.068
2008	0.050	0.007	0.136	0.209	0.006	0.031	0.239	0.017	0.070
2009	0.067	0.031	0.465	0.190	0.019	0.102	0.233	0.015	0.065
2010	0.071	0.004	0.053	0.230	0.010	0.042	0.274	0.018	0.067
2011	0.070	0.034	0.493	0.238	0.023	0.095	0.281	0.018	0.066
2012	0.081	0.004	0.043	0.230	0.007	0.032	0.281	0.020	0.070
2013	0.090	0.013	0.143	0.335	0.029	0.088	0.391	0.028	0.072
2014	0.104	0.003	0.029	0.243	0.006	0.024	0.309	0.024	0.078
2015	0.086	0.014	0.167	0.215	0.022	0.103	0.270	0.022	0.082
2016	0.117	0.003	0.025	0.238	0.004	0.019	0.314	0.027	0.086
2017	0.082	0.013	0.160	0.303	0.020	0.067	0.354	0.032	0.092
2018	0.068	0.003	0.050	0.216	0.007	0.033	0.259	0.025	0.096
2019	0.054	0.012	0.230	0.194	0.016	0.084	0.228	0.023	0.099
2020	0.062	0.002	0.039	0.091	0.007	0.072	0.138	0.015	0.109
2021	0.053	0.012	0.231	0.100	0.017	0.172	0.136	0.014	0.103

Table 4 cont.

Year	Recruitment	SD	CV
1982	36,189,600	3,415,330	0.094
1983	70,145,300	5,542,010	0.079
1984	60,501,600	4,742,270	0.078
1985	66,752,800	4,951,110	0.074
1986	64,466,700	4,809,840	0.075
1987	71,185,100	5,141,690	0.072
1988	92,479,400	6,290,120	0.068
1989	104,639,000	7,046,020	0.067
1990	128,332,000	8,206,210	0.064
1991	100,577,000	7,316,250	0.073
1992	105,956,000	7,799,400	0.074
1993	131,057,000	8,985,700	0.069
1994	285,603,000	14,309,000	0.050
1995	184,270,000	11,209,300	0.061
1996	232,110,000	12,916,600	0.056
1997	261,208,000	13,616,500	0.052
1998	147,107,000	9,796,390	0.067
1999	152,132,000	9,786,470	0.064
2000	121,379,000	8,726,180	0.072
2001	192,224,000	10,957,900	0.057
2002	228,677,000	11,909,800	0.052
2003	118,255,000	8,247,380	0.070
2004	323,301,000	13,987,900	0.043
2005	156,979,000	9,376,400	0.060
2006	138,701,000	8,611,040	0.062
2007	81,206,600	6,223,450	0.077
2008	131,795,000	8,033,860	0.061
2009	70,564,800	5,605,470	0.079
2010	92,287,300	6,652,580	0.072
2011	118,345,000	7,876,950	0.067
2012	208,585,000	11,831,700	0.057
2013	63,645,900	5,833,940	0.092
2014	76,900,600	6,625,860	0.086
2015	152,439,000	11,679,900	0.077
2016	238,696,000	18,299,700	0.077
2017	101,690,000	10,165,500	0.100
2018	130,745,000	13,613,800	0.104
2019	159,592,000	18,174,900	0.114
2020	109,463,000	15,540,500	0.142
2021	116,007,000	24,287,000	0.209

Catch Selectivity Parameters

Bay	Estimate	SD	CV
1982-1984			
α	-5.448	0.215	0.04
β	2.541	0.046	0.02
ϒ	0.829	0.022	0.03
1985-1989			
α	-4.103	0.442	0.11
β	2.155	0.073	0.03
ϒ	0.964	0.012	0.01
1990-1995			
α	-2.062	0.110	0.05
β	4.456	0.203	0.05
ϒ	0.819	0.035	0.04
1996-2019			
α	-1.820	0.072	0.04
β	3.597	0.094	0.03
ϒ	0.968	0.010	0.01
2020-2021			
α	-1.689	0.159	0.09
β	4.735	0.140	0.03
ϒ	0.761	0.073	0.10

Ocean	Estimate	SD	CV
1982-1984			
α	3.484	0.194	0.06
β	0.820	0.086	0.10
1985-1989			
α	4.713	0.383	0.08
β	0.473	0.051	0.11
1990-1996			
α	6.186	0.508	0.08
β	0.345	0.034	0.10
1997-2019			
α	4.932	0.170	0.03
β	0.450	0.022	0.05
2020-2021			
α	3.358	0.384	0.11
β	0.682	0.127	0.19

Survey Selectivity Parameters			
NYOHS	Estimate	SD	CV
α	-3.03	0.51	0.17
β	2.62	0.15	0.06
ϒ	0.92	0.03	0.03
NJ Trawl			
α	1.63	0.55	0.34
β	0.26	0.12	0.45
MDSSN			
s_2	0.13	0.02	0.16
DE SSN			
α	3.96	0.28	0.07
β	0.59	0.08	0.14
MRIP			
α	2.56	0.07	0.03
β	1.08	0.06	0.06
CTLIST			
α	-2.83	0.29	0.10
β	2.16	0.12	0.05
ϒ	0.96	0.01	0.01
DE30FT			
α	-1.246	0.983	0.79
β	1.290	0.813	0.63
ϒ	0.938	0.102	0.11
ChesMap			
α	-2.56	0.42	0.16
β	1.77	0.20	0.11
ϒ	0.91	0.03	0.03

Catchability Coefficients			
Survey	Estimate	SD	CV
NYYOY	1.24E-07	1.29E-08	0.10
NJYOY	8.37E-09	5.61E-10	0.07
MDYOY	1.35E-07	2.27E-08	0.17
compos	1.05E-06	4.75E-08	0.05
NYAge1	2.55E-08	1.95E-09	0.08
MDAge1	9.00E-09	1.58E-09	0.18
NYOHS	8.97E-08	8.47E-09	0.09
NJTRAWL	1.02E-07	1.68E-08	0.16
MDSSN	7.94E-08	7.16E-09	0.09
DESSN	4.90E-08	6.41E-09	0.13
MRIP	4.31E-08	2.96E-09	0.07
CTLIST	7.98E-09	6.76E-10	0.08
DE30FT	2.76E-08	5.01E-09	0.18
ChesMap	7.69E-07	9.90E-08	0.13

Table 5. Bay Fishing Mortality-At-Age, 1982-2021.

	Age														
Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15+
1982	0.0001	0.0075	0.0542	0.0231	0.0091	0.0036	0.0014	0.0006	0.0002	0.0001	0.0000	0.0000	0.0000	0.0000	0.0011
1983	0.0001	0.0082	0.0600	0.0255	0.0100	0.0040	0.0016	0.0006	0.0002	0.0001	0.0000	0.0000	0.0000	0.0000	0.0012
1984	0.0001	0.0085	0.0616	0.0262	0.0103	0.0041	0.0016	0.0006	0.0003	0.0001	0.0000	0.0000	0.0000	0.0000	0.0013
1985	0.0000	0.0010	0.0024	0.0021	0.0018	0.0016	0.0014	0.0012	0.0010	0.0009	0.0008	0.0007	0.0006	0.0005	0.0004
1986	0.0001	0.0018	0.0043	0.0038	0.0033	0.0029	0.0025	0.0021	0.0019	0.0016	0.0014	0.0012	0.0010	0.0009	0.0008
1987	0.0000	0.0007	0.0017	0.0016	0.0013	0.0012	0.0010	0.0009	0.0007	0.0006	0.0006	0.0005	0.0004	0.0004	0.0003
1988	0.0001	0.0018	0.0044	0.0039	0.0034	0.0029	0.0025	0.0022	0.0019	0.0016	0.0014	0.0012	0.0011	0.0009	0.0008
1989	0.0000	0.0011	0.0027	0.0024	0.0020	0.0018	0.0015	0.0013	0.0011	0.0010	0.0008	0.0007	0.0006	0.0005	0.0005
1990	0.0002	0.0011	0.0055	0.0224	0.0415	0.0364	0.0260	0.0180	0.0124	0.0085	0.0059	0.0040	0.0028	0.0019	0.0013
1991	0.0002	0.0012	0.0060	0.0243	0.0450	0.0395	0.0282	0.0195	0.0134	0.0093	0.0064	0.0044	0.0030	0.0021	0.0014
1992	0.0002	0.0013	0.0066	0.0270	0.0500	0.0438	0.0313	0.0216	0.0149	0.0103	0.0071	0.0049	0.0034	0.0023	0.0016
1993	0.0002	0.0011	0.0056	0.0230	0.0425	0.0373	0.0266	0.0184	0.0127	0.0087	0.0060	0.0042	0.0029	0.0020	0.0014
1994	0.0003	0.0014	0.0073	0.0300	0.0555	0.0487	0.0347	0.0240	0.0166	0.0114	0.0079	0.0054	0.0037	0.0026	0.0018
1995	0.0004	0.0021	0.0107	0.0437	0.0809	0.0710	0.0506	0.0350	0.0242	0.0166	0.0115	0.0079	0.0054	0.0037	0.0026
1996	0.0007	0.0037	0.0170	0.0430	0.0557	0.0560	0.0533	0.0504	0.0475	0.0448	0.0423	0.0399	0.0376	0.0355	0.0335
1997	0.0007	0.0040	0.0185	0.0466	0.0604	0.0606	0.0578	0.0546	0.0515	0.0486	0.0458	0.0432	0.0408	0.0384	0.0363
1998	0.0006	0.0035	0.0160	0.0404	0.0523	0.0525	0.0500	0.0473	0.0446	0.0421	0.0397	0.0374	0.0353	0.0333	0.0314
1999	0.0006	0.0036	0.0164	0.0414	0.0536	0.0539	0.0513	0.0485	0.0457	0.0432	0.0407	0.0384	0.0362	0.0341	0.0322
2000	0.0007	0.0038	0.0175	0.0442	0.0572	0.0575	0.0548	0.0517	0.0488	0.0460	0.0434	0.0410	0.0386	0.0364	0.0344
2001	0.0006	0.0030	0.0139	0.0352	0.0455	0.0457	0.0436	0.0412	0.0388	0.0366	0.0345	0.0326	0.0307	0.0290	0.0273
2002	0.0006	0.0033	0.0153	0.0385	0.0499	0.0501	0.0477	0.0451	0.0425	0.0401	0.0378	0.0357	0.0337	0.0317	0.0299
2003	0.0008	0.0043	0.0199	0.0502	0.0651	0.0653	0.0623	0.0588	0.0555	0.0523	0.0494	0.0466	0.0439	0.0414	0.0391
2004	0.0008	0.0042	0.0193	0.0488	0.0632	0.0635	0.0605	0.0572	0.0539	0.0509	0.0480	0.0453	0.0427	0.0403	0.0380
2005	0.0007	0.0037	0.0170	0.0429	0.0556	0.0558	0.0532	0.0502	0.0474	0.0447	0.0422	0.0398	0.0375	0.0354	0.0334
2006	0.0009	0.0050	0.0231	0.0584	0.0757	0.0760	0.0724	0.0684	0.0645	0.0609	0.0574	0.0541	0.0511	0.0482	0.0454
2007	0.0007	0.0038	0.0175	0.0441	0.0571	0.0573	0.0546	0.0516	0.0487	0.0459	0.0433	0.0408	0.0385	0.0363	0.0343
2008	0.0006	0.0033	0.0153	0.0385	0.0499	0.0501	0.0477	0.0451	0.0425	0.0401	0.0378	0.0357	0.0337	0.0317	0.0299
2009	0.0008	0.0045	0.0205	0.0518	0.0671	0.0674	0.0642	0.0607	0.0572	0.0540	0.0509	0.0480	0.0453	0.0427	0.0403
2010	0.0009	0.0047	0.0217	0.0548	0.0710	0.0713	0.0679	0.0642	0.0605	0.0571	0.0539	0.0508	0.0479	0.0452	0.0426
2011	0.0008	0.0046	0.0213	0.0538	0.0696	0.0699	0.0666	0.0629	0.0594	0.0560	0.0528	0.0498	0.0470	0.0443	0.0418
2012	0.0010	0.0054	0.0248	0.0625	0.0809	0.0813	0.0775	0.0732	0.0690	0.0651	0.0614	0.0579	0.0546	0.0515	0.0486
2013	0.0011	0.0060	0.0274	0.0692	0.0896	0.0899	0.0857	0.0810	0.0764	0.0720	0.0679	0.0641	0.0604	0.0570	0.0538
2014	0.0012	0.0069	0.0316	0.0798	0.1034	0.1038	0.0989	0.0934	0.0882	0.0832	0.0784	0.0740	0.0698	0.0658	0.0621
2015	0.0010	0.0057	0.0262	0.0662	0.0857	0.0860	0.0820	0.0775	0.0731	0.0689	0.0650	0.0613	0.0578	0.0546	0.0515
2016	0.0014	0.0077	0.0355	0.0896	0.1161	0.1165	0.1110	0.1049	0.0990	0.0934	0.0880	0.0830	0.0783	0.0739	0.0697
2017	0.0010	0.0054	0.0249	0.0630	0.0815	0.0818	0.0780	0.0737	0.0695	0.0656	0.0619	0.0583	0.0550	0.0519	0.0489
2018	0.0008	0.0045	0.0207	0.0523	0.0678	0.0680	0.0648	0.0613	0.0578	0.0545	0.0514	0.0485	0.0457	0.0431	0.0407
2019	0.0006	0.0036	0.0165	0.0416	0.0538	0.0540	0.0515	0.0486	0.0459	0.0433	0.0408	0.0385	0.0363	0.0343	0.0323
2020	0.0009	0.0034	0.0116	0.0344	0.0625	0.0612	0.0447	0.0304	0.0203	0.0136	0.0091	0.0061	0.0040	0.0027	0.0018
2021	0.0008	0.0028	0.0098	0.0289	0.0525	0.0514	0.0376	0.0255	0.0171	0.0114	0.0076	0.0051	0.0034	0.0023	0.0015

Table 6. Ocean Fishing Mortality-At-Age, 1982-2021.

	Age														
Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15+
1982	0.0001	0.0059	0.0392	0.0901	0.1300	0.1527	0.1640	0.1692	0.1715	0.1726	0.1730	0.1732	0.1733	0.1734	0.1734
1983	0.0001	0.0048	0.0318	0.0732	0.1055	0.1240	0.1331	0.1374	0.1393	0.1401	0.1405	0.1407	0.1407	0.1408	0.1408
1984	0.0000	0.0020	0.0134	0.0307	0.0443	0.0520	0.0559	0.0577	0.0585	0.0588	0.0590	0.0590	0.0591	0.0591	0.0591
1985	0.0006	0.0051	0.0199	0.0463	0.0785	0.1090	0.1338	0.1521	0.1647	0.1731	0.1785	0.1820	0.1842	0.1856	0.1864
1986	0.0002	0.0014	0.0053	0.0123	0.0209	0.0290	0.0356	0.0405	0.0438	0.0461	0.0475	0.0484	0.0490	0.0494	0.0496
1987	0.0001	0.0008	0.0031	0.0073	0.0124	0.0172	0.0211	0.0240	0.0260	0.0273	0.0282	0.0287	0.0291	0.0293	0.0294
1988	0.0001	0.0010	0.0037	0.0086	0.0146	0.0203	0.0249	0.0283	0.0307	0.0322	0.0332	0.0339	0.0343	0.0346	0.0347
1989	0.0001	0.0013	0.0049	0.0113	0.0192	0.0267	0.0328	0.0372	0.0403	0.0424	0.0437	0.0446	0.0451	0.0455	0.0457
1990	0.0002	0.0010	0.0034	0.0082	0.0152	0.0236	0.0322	0.0402	0.0470	0.0525	0.0567	0.0600	0.0624	0.0641	0.0654
1991	0.0003	0.0014	0.0048	0.0116	0.0216	0.0335	0.0457	0.0570	0.0666	0.0744	0.0805	0.0851	0.0885	0.0910	0.0928
1992	0.0003	0.0017	0.0058	0.0140	0.0260	0.0404	0.0551	0.0687	0.0803	0.0897	0.0970	0.1025	0.1066	0.1096	0.1118
1993	0.0002	0.0013	0.0046	0.0110	0.0205	0.0318	0.0434	0.0541	0.0632	0.0706	0.0764	0.0807	0.0839	0.0863	0.0880
1994	0.0003	0.0018	0.0060	0.0144	0.0268	0.0416	0.0568	0.0707	0.0827	0.0924	0.0999	0.1056	0.1098	0.1129	0.1151
1995	0.0006	0.0032	0.0109	0.0262	0.0488	0.0756	0.1032	0.1287	0.1504	0.1680	0.1817	0.1920	0.1997	0.2053	0.2094
1996	0.0006	0.0037	0.0126	0.0302	0.0562	0.0871	0.1189	0.1483	0.1733	0.1935	0.2093	0.2212	0.2301	0.2366	0.2413
1997	0.0005	0.0042	0.0164	0.0390	0.0677	0.0963	0.1205	0.1390	0.1522	0.1613	0.1674	0.1714	0.1740	0.1757	0.1767
1998	0.0005	0.0046	0.0178	0.0422	0.0733	0.1042	0.1304	0.1505	0.1648	0.1747	0.1812	0.1856	0.1884	0.1902	0.1913
1999	0.0005	0.0042	0.0162	0.0386	0.0670	0.0953	0.1192	0.1375	0.1507	0.1597	0.1657	0.1696	0.1722	0.1739	0.1749
2000	0.0005	0.0041	0.0159	0.0377	0.0655	0.0930	0.1164	0.1343	0.1471	0.1559	0.1618	0.1656	0.1681	0.1698	0.1708
2001	0.0005	0.0042	0.0164	0.0390	0.0677	0.0962	0.1203	0.1388	0.1521	0.1611	0.1672	0.1712	0.1738	0.1755	0.1765
2002	0.0005	0.0045	0.0176	0.0418	0.0725	0.1031	0.1290	0.1489	0.1630	0.1728	0.1793	0.1836	0.1864	0.1882	0.1893
2003	0.0006	0.0047	0.0181	0.0430	0.0747	0.1062	0.1329	0.1533	0.1679	0.1779	0.1847	0.1891	0.1919	0.1938	0.1950
2004	0.0006	0.0053	0.0207	0.0492	0.0855	0.1216	0.1521	0.1755	0.1922	0.2037	0.2114	0.2164	0.2197	0.2218	0.2232
2005	0.0006	0.0054	0.0208	0.0495	0.0859	0.1221	0.1528	0.1762	0.1930	0.2046	0.2123	0.2173	0.2206	0.2227	0.2241
2006	0.0007	0.0062	0.0239	0.0569	0.0988	0.1405	0.1758	0.2028	0.2221	0.2354	0.2442	0.2501	0.2539	0.2563	0.2579
2007	0.0005	0.0045	0.0177	0.0420	0.0730	0.1037	0.1298	0.1497	0.1640	0.1738	0.1804	0.1847	0.1875	0.1893	0.1904
2008	0.0006	0.0050	0.0194	0.0460	0.0800	0.1137	0.1422	0.1641	0.1797	0.1904	0.1976	0.2023	0.2054	0.2074	0.2086
2009	0.0005	0.0045	0.0177	0.0420	0.0729	0.1036	0.1297	0.1496	0.1639	0.1737	0.1802	0.1845	0.1873	0.1891	0.1903
2010	0.0007	0.0055	0.0213	0.0506	0.0879	0.1250	0.1564	0.1805	0.1977	0.2095	0.2174	0.2226	0.2259	0.2281	0.2295
2011	0.0007	0.0057	0.0221	0.0524	0.0911	0.1294	0.1620	0.1868	0.2046	0.2169	0.2251	0.2304	0.2339	0.2362	0.2376
2012	0.0007	0.0055	0.0214	0.0508	0.0882	0.1253	0.1568	0.1809	0.1982	0.2100	0.2179	0.2231	0.2265	0.2287	0.2301
2013	0.0010	0.0080	0.0311	0.0740	0.1285	0.1827	0.2286	0.2637	0.2888	0.3061	0.3176	0.3252	0.3301	0.3333	0.3353
2014	0.0007	0.0058	0.0225	0.0535	0.0929	0.1321	0.1653	0.1907	0.2089	0.2214	0.2297	0.2352	0.2387	0.2410	0.2425
2015	0.0006	0.0051	0.0199	0.0474	0.0823	0.1170	0.1464	0.1689	0.1850	0.1961	0.2035	0.2083	0.2115	0.2135	0.2148
2016	0.0007	0.0057	0.0221	0.0525	0.0911	0.1295	0.1620	0.1869	0.2047	0.2169	0.2251	0.2305	0.2340	0.2362	0.2377
2017	0.0009	0.0072	0.0282	0.0669	0.1162	0.1652	0.2067	0.2385	0.2612	0.2769	0.2873	0.2941	0.2986	0.3015	0.3033
2018	0.0006	0.0052	0.0201	0.0477	0.0829	0.1178	0.1474	0.1700	0.1862	0.1974	0.2048	0.2097	0.2129	0.2149	0.2162
2019	0.0006	0.0046	0.0180	0.0429	0.0745	0.1058	0.1324	0.1528	0.1673	0.1773	0.1840	0.1884	0.1913	0.1931	0.1943
2020	0.0006	0.0073	0.0254	0.0477	0.0657	0.0772	0.0837	0.0873	0.0891	0.0901	0.0905	0.0908	0.0909	0.0910	0.0910
2021	0.0007	0.0080	0.0279	0.0525	0.0722	0.0848	0.0921	0.0959	0.0980	0.0990	0.0995	0.0998	0.0999	0.1000	0.1000

Table 7. Total Fishing Mortality-At-Age, 1982-2021.

	Age														
Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15+
1982	0.0002	0.0134	0.0934	0.1132	0.1390	0.1563	0.1654	0.1697	0.1718	0.1727	0.1731	0.1733	0.1733	0.1734	0.1745
1983	0.0002	0.0130	0.0918	0.0987	0.1156	0.1280	0.1347	0.1380	0.1395	0.1402	0.1405	0.1407	0.1408	0.1408	0.1420
1984	0.0001	0.0105	0.0750	0.0569	0.0546	0.0561	0.0575	0.0583	0.0587	0.0589	0.0590	0.0591	0.0591	0.0591	0.0604
1985	0.0006	0.0061	0.0222	0.0484	0.0803	0.1106	0.1352	0.1532	0.1657	0.1739	0.1793	0.1826	0.1847	0.1861	0.1869
1986	0.0002	0.0031	0.0096	0.0162	0.0242	0.0319	0.0381	0.0426	0.0457	0.0477	0.0489	0.0496	0.0501	0.0503	0.0504
1987	0.0001	0.0015	0.0049	0.0089	0.0137	0.0184	0.0221	0.0249	0.0267	0.0280	0.0287	0.0292	0.0295	0.0297	0.0297
1988	0.0002	0.0028	0.0081	0.0126	0.0180	0.0232	0.0275	0.0305	0.0326	0.0339	0.0347	0.0351	0.0354	0.0355	0.0355
1989	0.0002	0.0023	0.0075	0.0137	0.0213	0.0285	0.0343	0.0386	0.0415	0.0434	0.0446	0.0453	0.0457	0.0460	0.0461
1990	0.0004	0.0021	0.0089	0.0306	0.0567	0.0600	0.0582	0.0582	0.0594	0.0610	0.0626	0.0640	0.0652	0.0661	0.0667
1991	0.0005	0.0026	0.0108	0.0360	0.0666	0.0730	0.0739	0.0765	0.0801	0.0837	0.0868	0.0894	0.0915	0.0930	0.0942
1992	0.0005	0.0030	0.0124	0.0410	0.0760	0.0842	0.0864	0.0903	0.0952	0.0999	0.1040	0.1074	0.1099	0.1119	0.1134
1993	0.0004	0.0024	0.0102	0.0340	0.0630	0.0691	0.0700	0.0725	0.0759	0.0794	0.0824	0.0849	0.0868	0.0883	0.0894
1994	0.0006	0.0032	0.0133	0.0444	0.0823	0.0902	0.0915	0.0948	0.0992	0.1038	0.1077	0.1110	0.1135	0.1155	0.1169
1995	0.0009	0.0052	0.0216	0.0700	0.1297	0.1466	0.1539	0.1637	0.1745	0.1846	0.1931	0.1999	0.2051	0.2091	0.2120
1996	0.0013	0.0074	0.0296	0.0733	0.1119	0.1431	0.1723	0.1986	0.2208	0.2384	0.2516	0.2611	0.2677	0.2721	0.2748
1997	0.0012	0.0082	0.0349	0.0856	0.1281	0.1569	0.1782	0.1935	0.2037	0.2099	0.2132	0.2146	0.2147	0.2141	0.2130
1998	0.0012	0.0081	0.0338	0.0826	0.1256	0.1567	0.1805	0.1977	0.2094	0.2167	0.2209	0.2230	0.2237	0.2235	0.2227
1999	0.0011	0.0078	0.0326	0.0800	0.1207	0.1491	0.1706	0.1860	0.1964	0.2028	0.2064	0.2080	0.2084	0.2080	0.2071
2000	0.0012	0.0079	0.0334	0.0819	0.1227	0.1505	0.1712	0.1860	0.1959	0.2019	0.2052	0.2066	0.2068	0.2062	0.2052
2001	0.0011	0.0073	0.0303	0.0741	0.1132	0.1419	0.1639	0.1800	0.1909	0.1978	0.2018	0.2038	0.2045	0.2044	0.2039
2002	0.0011	0.0078	0.0328	0.0803	0.1224	0.1532	0.1767	0.1939	0.2056	0.2129	0.2171	0.2193	0.2200	0.2199	0.2192
2003	0.0013	0.0090	0.0380	0.0933	0.1398	0.1715	0.1951	0.2121	0.2234	0.2303	0.2340	0.2356	0.2358	0.2352	0.2340
2004	0.0014	0.0095	0.0401	0.0981	0.1488	0.1850	0.2126	0.2326	0.2461	0.2546	0.2593	0.2617	0.2624	0.2620	0.2611
2005	0.0013	0.0091	0.0378	0.0924	0.1415	0.1779	0.2059	0.2265	0.2404	0.2493	0.2544	0.2571	0.2581	0.2581	0.2575
2006	0.0016	0.0112	0.0471	0.1153	0.1745	0.2164	0.2482	0.2712	0.2866	0.2962	0.3016	0.3042	0.3049	0.3045	0.3033
2007	0.0012	0.0084	0.0351	0.0861	0.1301	0.1610	0.1844	0.2013	0.2127	0.2197	0.2237	0.2255	0.2260	0.2256	0.2247
2008	0.0012	0.0083	0.0346	0.0845	0.1298	0.1637	0.1899	0.2091	0.2222	0.2305	0.2354	0.2380	0.2390	0.2391	0.2386
2009	0.0013	0.0090	0.0382	0.0938	0.1400	0.1710	0.1939	0.2103	0.2211	0.2276	0.2311	0.2325	0.2326	0.2318	0.2305
2010	0.0015	0.0102	0.0430	0.1055	0.1589	0.1963	0.2243	0.2446	0.2582	0.2666	0.2712	0.2734	0.2738	0.2733	0.2721
2011	0.0015	0.0103	0.0434	0.1062	0.1607	0.1993	0.2286	0.2498	0.2640	0.2729	0.2779	0.2802	0.2809	0.2805	0.2794
2012	0.0016	0.0109	0.0461	0.1133	0.1691	0.2066	0.2343	0.2541	0.2672	0.2751	0.2794	0.2811	0.2812	0.2802	0.2787
2013	0.0020	0.0140	0.0585	0.1431	0.2180	0.2726	0.3142	0.3446	0.3652	0.3781	0.3855	0.3893	0.3905	0.3903	0.3891
2014	0.0019	0.0127	0.0541	0.1333	0.1963	0.2359	0.2642	0.2841	0.2970	0.3045	0.3081	0.3091	0.3085	0.3068	0.3046
2015	0.0016	0.0108	0.0462	0.1136	0.1680	0.2031	0.2284	0.2464	0.2581	0.2650	0.2685	0.2696	0.2693	0.2681	0.2663
2016	0.0021	0.0134	0.0576	0.1421	0.2071	0.2460	0.2730	0.2918	0.3037	0.3103	0.3132	0.3135	0.3123	0.3101	0.3074
2017	0.0018	0.0127	0.0531	0.1299	0.1978	0.2471	0.2848	0.3122	0.3308	0.3424	0.3491	0.3525	0.3536	0.3534	0.3523
2018	0.0014	0.0097	0.0408	0.1001	0.1506	0.1858	0.2122	0.2313	0.2440	0.2519	0.2562	0.2582	0.2586	0.2581	0.2569
2019	0.0012	0.0082	0.0345	0.0844	0.1283	0.1599	0.1839	0.2014	0.2132	0.2206	0.2248	0.2269	0.2276	0.2273	0.2266
2020	0.0016	0.0107	0.0370	0.0821	0.1282	0.1383	0.1284	0.1176	0.1094	0.1036	0.0996	0.0968	0.0949	0.0937	0.0928
2021	0.0015	0.0108	0.0377	0.0814	0.1247	0.1363	0.1296	0.1215	0.1151	0.1104	0.1072	0.1049	0.1033	0.1023	0.1016

Table 8. Estimates of age-specific population abundance, 1982-2021.

	Age																
Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15+	Total	8+
1982	36,189,600	8,980,640	3,381,790	2,540,120	1,011,400	406,282	323,876	204,485	180,341	276,008	188,655	301,291	156,225	113,064	295,270	54,549,047	1,715,339
1983	70,145,300	11,688,500	4,489,350	1,963,990	1,630,780	685,430	287,364	236,271	148,525	130,725	199,890	136,571	218,071	113,064	295,270	92,369,101	1,478,387
1984	60,501,600	22,655,600	5,844,880	2,611,450	1,279,310	1,131,440	498,741	216,168	177,150	111,189	97,795	149,490	102,121	163,052	305,029	95,845,015	1,321,994
1985	66,752,800	19,541,600	11,358,100	3,457,730	1,773,590	943,389	884,612	405,297	175,524	143,782	90,227	79,351	121,290	82,855	379,454	106,189,601	1,477,780
1986	64,466,700	21,550,300	9,840,040	7,083,080	2,368,390	1,274,720	698,466	665,117	299,279	128,007	103,997	64,915	56,897	86,785	330,142	109,016,835	1,735,139
1987	71,185,100	20,820,600	10,883,500	6,214,350	5,010,570	1,800,400	1,021,060	578,704	548,589	246,090	105,049	85,240	53,168	46,581	341,226	118,940,227	2,004,647
1988	92,479,400	22,992,600	10,532,000	6,905,910	4,428,270	3,849,050	1,461,770	859,604	485,861	459,715	205,970	87,855	71,255	44,432	324,010	145,187,702	2,538,702
1989	104,639,000	29,869,100	11,616,100	6,661,230	4,902,890	3,387,190	3,109,900	1,224,080	717,638	404,789	382,507	171,243	73,009	59,200	306,062	167,523,938	3,338,528
1990	128,332,000	33,795,900	15,096,800	7,351,370	4,723,790	3,738,090	2,722,480	2,586,480	1,013,730	592,589	333,620	314,878	140,862	60,030	300,217	201,102,836	5,342,406
1991	100,577,000	41,440,300	17,086,600	9,540,890	5,125,770	3,476,090	2,911,240	2,210,780	2,100,440	822,243	479,865	269,721	254,210	113,592	290,082	186,698,823	6,540,933
1992	105,956,000	32,474,900	20,940,800	10,777,900	6,616,980	3,734,680	2,672,270	2,327,250	1,762,730	1,668,790	650,916	378,672	212,289	199,673	316,316	190,690,166	7,516,636
1993	131,057,000	34,209,300	16,403,600	13,187,400	7,437,180	4,776,140	2,839,040	2,109,730	1,830,110	1,379,440	1,299,750	504,897	292,750	163,696	396,743	217,886,776	7,977,116
1994	285,603,000	42,317,400	17,289,200	10,353,100	9,163,740	5,438,300	3,686,010	2,278,370	1,688,870	1,460,040	1,096,730	1,030,240	399,213	231,023	441,270	382,476,506	8,625,756
1995	184,270,000	92,207,000	21,371,100	10,878,000	7,119,850	6,572,990	4,109,230	2,895,270	1,783,720	1,316,300	1,132,820	847,560	793,599	306,733	515,063	336,119,235	9,591,065
1996	232,110,000	59,469,700	46,469,700	13,335,300	7,292,030	4,870,560	4,694,430	3,032,470	2,115,680	1,289,380	941,967	803,808	597,325	556,375	572,827	378,151,552	9,909,832
1997	261,208,000	74,881,500	29,907,100	28,765,200	8,909,970	5,077,830	3,490,770	3,401,170	2,139,880	1,460,180	874,407	630,420	532,853	393,370	739,399	422,412,049	10,171,679
1998	147,107,000	84,275,700	37,624,900	18,416,100	18,983,100	6,104,780	3,589,470	2,514,050	2,412,300	1,502,370	1,018,860	608,107	437,817	370,007	787,656	325,752,217	9,651,167
1999	152,132,000	47,465,000	42,353,100	23,194,400	12,190,100	13,038,900	4,316,110	2,579,400	1,775,670	1,684,030	1,041,160	703,131	418,796	301,313	797,271	303,990,381	9,300,771
2000	121,379,000	49,087,900	23,860,900	26,138,200	15,392,700	8,414,510	9,288,820	3,132,430	1,843,250	1,255,810	1,183,390	729,039	491,536	292,653	768,483	263,258,621	9,696,591
2001	192,224,000	39,163,700	24,673,300	14,715,200	17,313,900	10,603,700	5,986,220	6,737,100	2,238,420	1,304,230	883,242	829,603	510,372	344,044	743,712	318,270,743	13,590,723
2002	228,677,000	62,029,900	19,697,700	15,262,600	9,823,400	12,041,200	7,609,030	4,373,520	4,843,600	1,591,840	921,138	621,321	582,407	358,032	763,427	369,196,115	14,055,285
2003	118,255,000	73,786,600	31,180,000	12,154,200	10,126,200	6,769,040	8,543,360	5,488,150	3,100,730	3,394,270	1,107,370	638,088	429,485	402,284	775,057	276,149,834	15,335,434
2004	323,301,000	38,149,600	37,047,000	19,140,000	7,959,900	6,857,590	4,715,460	6,049,750	3,820,880	2,134,520	2,320,550	754,257	433,921	292,001	801,592	453,778,021	16,607,471
2005	156,979,000	104,292,000	19,143,700	22,694,700	12,474,700	5,342,360	4,712,970	3,281,300	4,126,330	2,571,160	1,424,320	1,541,060	499,737	287,294	724,775	340,095,406	14,455,976
2006	138,701,000	50,643,700	52,359,900	11,753,700	14,876,200	8,433,790	3,698,010	3,301,530	2,251,910	2,792,590	1,724,770	950,527	1,025,700	332,272	673,235	293,518,834	13,052,534
2007	81,206,600	44,731,600	25,371,300	31,850,800	7,529,640	9,730,730	5,617,200	2,483,440	2,166,770	1,455,240	1,787,380	1,097,970	603,545	650,813	638,794	216,921,822	10,883,952
2008	131,795,000	26,200,400	22,473,400	15,618,900	21,009,400	5,148,980	6,850,080	4,020,570	1,747,730	1,507,650	1,005,460	1,230,090	754,240	414,402	886,201	240,662,503	11,566,343
2009	70,564,800	42,523,600	13,163,800	13,842,100	10,318,600	14,370,300	3,615,030	4,876,120	2,807,530	1,204,550	1,030,470	683,868	834,507	511,156	881,696	181,228,127	12,829,897
2010	92,287,300	22,764,200	21,349,900	8,079,120	9,060,350	6,986,110	10,015,700	2,563,070	3,401,060	1,937,140	825,694	703,915	466,496	569,216	951,562	181,960,833	11,418,153
2011	118,345,000	29,767,200	11,415,600	13,040,100	5,226,960	6,019,360	4,747,670	6,888,190	1,727,350	2,261,190	1,277,160	541,857	460,959	305,338	996,678	203,020,612	14,458,722
2012	208,585,000	38,172,000	14,925,900	6,970,100	8,430,340	3,466,540	4,078,220	3,251,400	4,618,370	1,141,760	1,481,440	832,577	352,400	299,590	847,266	297,452,903	12,824,803
2013	63,645,900	67,270,700	19,129,200	9,088,220	4,474,310	5,544,020	2,331,610	2,777,010	2,170,560	3,042,960	746,344	964,313	541,024	228,976	746,716	182,701,863	11,217,903
2014	76,900,600	20,518,200	33,607,700	11,504,000	5,662,340	2,801,930	3,490,930	1,465,690	1,693,450	1,296,690	1,794,520	436,879	562,374	315,114	568,950	162,619,367	8,133,667
2015	152,439,000	24,793,700	10,263,900	20,300,100	7,238,160	3,623,860	1,830,230	2,307,050	949,515	1,083,010	823,097	1,134,990	276,032	355,552	560,684	227,978,880	7,489,930
2016	238,696,000	49,162,600	12,425,500	6,249,390	13,027,300	4,765,250	2,446,100	1,253,600	1,552,070	631,344	715,149	541,636	746,012	181,492	603,844	332,997,287	6,225,147
2017	101,690,000	76,947,900	24,574,900	7,479,710	3,897,850	8,247,590	3,081,390	1,602,320	805,921	986,013	398,441	450,037	340,722	469,863	496,770	231,469,427	5,550,087
2018	130,745,000	32,789,000	38,492,300	14,859,400	4,722,360	2,490,960	5,327,360	1,994,980	1,009,300	498,309	602,592	241,876	272,286	205,913	584,657	234,836,293	5,409,913
2019	159,592,000	42,174,900	16,451,500	23,562,500	9,665,710	3,163,480	1,710,600	3,708,470	1,362,530	680,598	333,396	401,421	160,811	180,953	526,121	263,674,990	7,354,300
2020	109,463,000	51,492,000	21,191,600	10,134,300	15,568,200	6,621,540	2,229,610	1,225,000	2,609,650	947,550	469,826	229,178	275,368	110,240	485,102	223,052,164	6,351,914
2021	116,007,000	35,305,300	25,810,300	13,021,100	6,711,400	10,666,200	4,768,280	1,687,760	937,358	2,013,300	735,274	366,046	179,050	215,544	466,930	218,890,842	6,601,262

Table 9. Estimates of female spawning stock biomass, 1982-2021.

	Age															
Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15+	Total
1982	0.0	0.0	0.0	145.8	375.5	411.5	874.9	791.2	861.0	2,012.0	1,828.1	2,987.7	1,925.8	1,557.2	4,727.7	18,498.3
1983	0.0	0.0	0.0	105.6	576.1	566.4	623.0	834.9	730.4	855.1	1,664.3	1,304.2	2,466.3	1,476.8	4,410.6	15,613.7
1984	0.0	0.0	0.0	154.1	482.9	958.1	1,316.9	752.9	940.9	704.6	732.3	1,618.5	1,183.5	2,171.0	4,766.9	15,782.6
1985	0.0	0.0	0.0	240.8	600.2	854.5	2,279.5	1,467.7	935.6	899.6	694.9	724.1	1,375.3	1,034.5	5,345.0	16,451.8
1986	0.0	0.0	0.0	582.1	879.4	996.9	1,566.1	2,278.6	1,358.6	697.5	718.0	543.8	538.8	917.0	3,760.8	14,837.5
1987	0.0	0.0	0.0	484.3	2,079.7	1,374.8	2,069.5	1,793.7	2,473.7	1,334.3	692.4	724.0	507.6	494.2	4,218.9	18,246.9
1988	0.0	0.0	0.0	526.5	2,100.6	3,766.1	3,364.1	2,587.0	2,072.7	2,244.4	1,484.9	781.4	699.5	481.5	4,016.0	24,124.8
1989	0.0	0.0	0.0	521.8	2,255.2	3,829.2	9,034.4	4,772.5	3,395.4	2,700.0	2,740.7	1,484.9	758.9	664.3	3,902.6	36,059.9
1990	0.0	0.0	0.0	553.9	1,829.8	3,696.3	7,601.1	10,244.5	4,918.8	3,087.7	2,317.8	2,612.4	1,281.2	606.9	3,266.7	42,017.0
1991	0.0	0.0	0.0	737.1	2,107.3	2,788.6	7,662.7	8,200.3	11,048.6	4,355.3	3,626.5	1,993.0	2,361.2	1,151.3	3,344.7	49,376.5
1992	0.0	0.0	0.0	786.2	2,905.4	3,432.2	6,794.3	8,746.7	9,656.4	11,124.4	5,086.9	4,017.6	2,387.5	2,596.7	5,128.4	62,662.5
1993	0.0	0.0	0.0	988.8	3,141.4	4,391.0	7,384.7	8,308.7	10,187.1	9,266.7	10,681.2	4,854.3	3,390.3	2,107.4	5,688.2	70,389.6
1994	0.0	0.0	0.0	838.9	3,976.9	4,887.8	9,715.3	9,005.2	9,271.8	9,364.5	9,091.6	9,770.2	4,364.5	2,828.5	6,097.5	79,212.5
1995	0.0	0.0	0.0	927.4	3,090.2	6,105.5	11,410.0	11,391.3	10,256.1	9,382.7	7,594.9	7,462.4	8,059.3	3,441.9	6,334.8	85,456.6
1996	0.0	0.0	0.0	1,125.8	3,545.7	5,275.1	14,959.1	13,525.2	12,756.4	9,561.9	7,636.7	6,793.6	6,255.0	6,430.1	7,515.6	95,380.3
1997	0.0	0.0	0.0	2,589.0	3,957.4	4,851.6	9,030.3	12,295.1	11,981.3	11,028.6	7,545.1	5,695.7	5,808.0	4,871.0	10,574.0	90,227.3
1998	0.0	0.0	0.0	1,147.3	7,244.0	4,811.8	9,056.4	9,043.2	12,528.9	8,951.1	7,290.2	5,428.2	4,348.4	4,183.0	9,830.9	83,863.2
1999	0.0	0.0	0.0	1,328.7	3,707.8	8,619.1	8,053.8	8,585.9	9,219.3	10,950.4	7,599.5	5,859.1	4,368.6	3,553.6	11,177.9	83,023.7
2000	0.0	0.0	0.0	1,475.8	4,634.1	5,779.0	18,578.5	9,678.4	9,870.9	7,713.8	9,643.6	6,696.5	5,442.3	3,758.7	11,829.7	95,101.2
2001	0.0	0.0	0.0	955.3	5,718.9	8,225.6	12,844.4	21,382.1	11,063.9	8,524.7	6,503.9	6,470.0	4,991.8	3,814.9	8,925.5	99,420.8
2002	0.0	0.0	0.0	890.5	3,363.1	9,436.4	17,154.9	15,017.4	22,889.7	9,878.7	7,127.4	5,309.8	5,756.9	4,112.0	10,391.9	111,329.0
2003	0.0	0.0	0.0	660.0	3,358.4	5,314.4	18,798.0	18,161.3	15,081.3	20,003.9	8,073.3	5,363.0	4,243.5	4,534.2	9,915.0	113,506.0
2004	0.0	0.0	0.0	1,023.8	2,788.6	5,274.8	10,457.6	19,784.5	18,232.7	12,480.4	16,197.7	6,033.2	4,123.3	3,144.5	9,795.6	109,337.0
2005	0.0	0.0	0.0	1,309.4	4,086.8	4,337.2	10,459.9	11,489.4	20,421.9	15,165.0	10,217.6	13,186.1	4,951.8	3,238.3	9,552.5	108,416.0
2006	0.0	0.0	0.0	631.1	4,602.7	5,990.7	7,741.9	11,088.6	11,761.6	16,943.4	12,429.6	7,804.7	10,370.5	3,808.1	8,932.1	102,105.0
2007	0.0	0.0	0.0	1,530.8	2,347.3	7,218.8	12,452.7	8,188.5	11,489.8	9,395.9	13,985.6	9,623.4	6,402.9	7,956.4	9,237.5	99,829.6
2008	0.0	0.0	0.0	837.0	6,580.6	4,259.0	17,490.6	13,998.0	9,043.9	10,182.8	7,842.1	10,767.7	7,943.4	4,991.0	12,138.7	106,075.0
2009	0.0	0.0	0.0	752.1	3,048.2	11,466.6	8,710.9	18,210.7	14,952.5	7,686.3	7,892.3	5,797.5	8,493.9	5,943.9	11,643.9	104,599.0
2010	0.0	0.0	0.0	437.4	2,734.5	5,473.2	22,864.5	8,614.0	17,024.1	12,298.7	6,279.2	5,731.0	4,605.2	6,428.1	12,258.8	104,749.0
2011	0.0	0.0	0.0	772.2	1,583.2	4,476.3	10,548.3	22,585.5	8,575.3	13,871.4	9,050.7	4,726.5	4,584.4	3,499.6	13,282.7	97,556.0
2012	0.0	0.0	0.0	429.1	2,901.2	2,685.3	9,420.5	11,685.3	23,258.0	7,574.1	11,261.8	7,328.8	3,764.8	3,620.9	12,005.9	95,935.6
2013	0.0	0.0	0.0	482.6	1,545.8	4,549.9	5,138.5	9,333.4	11,353.0	18,707.6	5,851.7	8,625.3	5,777.6	2,796.8	10,588.0	84,750.1
2014	0.0	0.0	0.0	564.2	1,797.8	2,140.3	8,005.4	4,870.1	8,980.2	8,762.6	13,742.2	4,373.2	6,569.9	4,249.3	9,291.3	73,346.4
2015	0.0	0.0	0.0	1,158.5	2,523.1	3,183.3	4,312.2	8,183.3	5,044.0	6,933.9	6,387.7	10,382.0	3,055.2	4,442.4	7,809.4	63,414.9
2016	0.0	0.0	0.0	299.4	4,302.8	4,021.6	6,219.4	4,708.9	8,435.1	4,494.3	5,881.4	5,141.7	8,693.8	2,410.2	9,618.8	64,227.4
2017	0.0	0.0	0.0	412.4	1,345.3	6,539.0	7,283.8	5,502.5	4,111.2	6,811.4	3,324.9	4,255.1	3,936.4	6,249.7	7,334.6	57,106.2
2018	0.0	0.0	0.0	797.7	1,530.5	2,196.1	11,389.4	6,741.0	5,675.1	3,501.8	5,337.6	2,623.8	3,178.1	2,626.2	9,522.9	55,120.3
2019	0.0	0.0	0.0	1,242.3	3,052.0	2,428.7	3,927.0	13,810.6	7,732.0	4,899.2	2,927.5	4,177.4	2,108.0	2,409.5	7,920.0	56,634.1
2020	0.0	0.0	0.0	620.1	4,863.5	4,698.5	5,194.9	4,773.2	14,328.6	6,921.7	4,249.9	2,446.1	3,366.4	1,441.1	7,076.1	59,980.3
2021	0.0	0.0	0.0	747.6	2,368.8	7,218.7	10,002.4	5,738.2	4,475.4	13,863.5	4,495.5	3,637.8	2,252.2	2,830.6	7,174.6	64,805.3

Table 10. Estimate of total female spawning stock biomass with associated standard errors and coefficients of variation.

Year	Total	SE	CV
1982	18,498.3	2,503.5	0.135
1983	15,613.7	2,222.4	0.142
1984	15,782.6	2,227.6	0.141
1985	16,451.8	2,168.2	0.132
1986	14,837.5	1,853.5	0.125
1987	18,246.9	2,045.6	0.112
1988	24,124.8	2,308.8	0.096
1989	36,059.9	2,987.1	0.083
1990	42,017.0	3,143.0	0.075
1991	49,376.5	3,516.2	0.071
1992	62,662.5	4,466.7	0.071
1993	70,389.6	4,811.8	0.068
1994	79,212.5	5,098.9	0.064
1995	85,456.6	5,224.7	0.061
1996	95,380.3	5,924.5	0.062
1997	90,227.3	5,980.4	0.066
1998	83,863.2	5,138.6	0.061
1999	83,023.7	5,080.4	0.061
2000	95,101.2	5,484.7	0.058
2001	99,420.8	5,210.0	0.052
2002	111,329.0	5,770.6	0.052
2003	113,506.0	5,879.3	0.052
2004	109,337.0	5,831.2	0.053
2005	108,416.0	6,006.0	0.055
2006	102,105.0	5,861.8	0.057
2007	99,829.6	5,908.9	0.059
2008	106,075.0	5,872.6	0.055
2009	104,599.0	5,640.0	0.054
2010	104,749.0	5,512.3	0.053
2011	97,556.0	5,396.3	0.055
2012	95,935.6	5,634.8	0.059
2013	84,750.1	5,475.6	0.065
2014	73,346.4	5,526.5	0.075
2015	63,414.9	5,051.1	0.080
2016	64,227.4	5,429.4	0.085
2017	57,106.2	5,230.7	0.092
2018	55,120.3	5,571.5	0.101
2019	56,634.1	5,917.2	0.104
2020	59,980.3	6,369.9	0.106
2021	64,805.3	6,945.1	0.107

Table 11. Estimates of exploitable biomass, 1982-2021.

	Age															
Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15+	Total
1982	2,287.3	4,742.6	3,288.0	3,153.3	2,099.2	1,519.5	1,485.0	1,162.1	978.2	2,281.6	2,077.3	3,213.5	2,030.9	1,611.7	5,055.0	36,985.1
1983	8,099.7	3,125.5	3,482.1	2,400.0	3,115.5	1,934.1	1,080.5	1,202.2	876.2	926.4	1,821.8	1,446.7	2,564.7	1,552.4	4,700.7	38,328.3
1984	9,107.9	7,848.1	5,635.1	3,222.6	2,446.8	3,207.0	2,036.9	997.7	1,066.3	759.3	807.2	1,644.8	1,184.1	2,197.0	5,039.1	47,199.9
1985	1,299.5	7,477.1	9,100.7	5,791.5	3,340.7	2,920.8	3,609.1	2,132.4	1,085.6	1,020.4	754.0	752.4	1,492.5	1,095.5	5,722.2	47,594.1
1986	3,848.4	3,985.4	8,660.9	11,350.6	4,766.5	3,332.1	2,630.2	3,312.0	1,631.1	821.9	790.2	589.4	581.8	991.3	3,971.6	51,263.3
1987	6,674.4	6,836.0	9,757.0	10,172.8	12,273.3	4,797.5	3,426.8	2,504.1	2,896.4	1,462.2	722.6	742.1	518.4	498.1	4,446.2	67,727.9
1988	17,520.6	9,809.0	9,692.9	11,538.9	11,361.9	12,202.2	5,218.7	3,540.8	2,421.4	2,560.5	1,537.0	789.8	723.8	491.7	4,234.8	93,643.9
1989	7,098.7	15,151.0	12,239.5	10,432.9	12,068.3	12,734.0	14,449.3	6,394.3	3,823.6	2,730.0	2,711.3	1,565.4	786.9	674.6	4,119.6	106,979.4
1990	3,027.5	12,753.2	14,685.1	11,625.9	10,813.8	12,797.0	12,839.7	14,632.5	6,040.9	3,558.4	2,681.0	2,837.0	1,360.7	651.4	3,455.5	113,759.5
1991	11,652.1	11,242.5	18,308.2	15,006.2	11,879.2	9,487.6	12,495.4	11,633.9	13,033.2	4,903.8	3,606.2	2,119.5	2,436.8	1,175.1	3,547.7	132,527.4
1992	3,843.5	12,361.8	22,989.2	17,006.3	16,339.7	11,580.8	10,531.9	12,281.6	11,044.1	12,108.7	5,082.4	4,107.9	2,246.3	2,487.0	5,450.1	149,461.3
1993	2,368.7	9,430.8	15,595.5	21,292.3	17,196.0	15,148.6	11,915.8	11,543.7	11,676.0	10,299.7	11,454.8	5,176.7	3,609.5	2,225.4	6,030.5	154,964.0
1994	40,135.7	11,472.6	19,594.0	17,615.8	21,823.4	16,933.1	15,501.1	12,429.1	10,886.1	10,622.8	9,682.1	10,398.6	4,521.2	2,944.1	6,482.3	211,041.9
1995	26,643.9	37,793.6	25,444.2	20,879.5	17,616.0	21,199.8	17,831.4	15,971.4	11,975.4	10,217.0	8,552.8	8,246.8	8,590.0	3,680.7	6,798.8	241,441.3
1996	15,441.5	32,245.5	47,138.7	23,600.1	19,349.9	17,234.1	22,671.5	18,755.2	14,674.6	10,544.9	8,555.1	7,028.5	6,422.1	6,648.8	8,117.0	258,427.5
1997	13,952.6	22,061.5	33,289.7	54,700.9	22,749.6	17,411.2	15,760.8	19,359.0	14,802.4	12,357.1	8,361.8	6,155.4	5,936.7	5,036.7	11,349.8	263,285.2
1998	37,766.7	26,663.6	32,453.5	25,462.2	44,660.7	17,576.6	14,830.9	12,702.0	14,184.9	10,333.9	8,594.7	6,023.3	4,608.5	4,512.1	10,562.5	270,936.0
1999	100,144.0	28,120.7	39,155.5	30,489.8	21,442.8	30,986.3	13,588.6	12,528.2	10,819.9	12,321.9	8,137.8	6,119.2	4,494.7	3,618.7	11,991.0	333,959.0
2000	44,315.5	28,665.0	23,741.3	33,160.5	25,859.7	19,424.4	29,025.0	12,954.2	11,023.1	8,731.9	10,326.4	7,030.0	5,468.1	3,814.8	12,687.7	276,227.6
2001	22,095.7	14,685.1	19,365.0	20,416.5	30,993.9	26,762.6	20,295.7	29,771.4	12,735.9	9,706.4	7,052.2	7,439.3	5,389.1	4,179.7	9,571.6	240,460.0
2002	12,272.1	13,814.7	12,501.5	19,848.5	19,187.1	31,870.9	28,078.7	20,781.2	26,648.9	11,038.0	7,751.3	5,705.9	5,694.0	4,175.0	11,161.3	230,529.2
2003	6,509.7	19,799.0	17,360.3	14,806.2	18,456.4	17,878.5	30,800.0	25,617.4	17,927.5	22,365.1	8,877.0	5,898.3	4,435.7	4,796.5	10,664.8	226,192.4
2004	50,432.9	6,930.2	26,300.8	22,646.7	14,681.6	17,937.6	17,163.2	27,853.2	21,466.4	14,067.1	17,808.8	6,608.0	4,321.2	3,324.7	10,565.0	262,107.4
2005	11,936.2	35,367.1	11,741.8	26,637.0	21,992.3	14,967.1	16,992.7	15,855.7	23,698.4	17,009.5	11,086.9	13,937.9	5,048.1	3,330.7	10,299.1	239,900.5
2006	15,617.4	11,256.1	33,321.7	14,581.3	26,671.1	21,027.0	13,023.7	15,612.8	13,842.9	19,201.1	13,565.7	8,501.5	10,898.5	3,997.7	9,674.4	230,792.8
2007	3,828.1	12,871.5	15,163.5	32,684.0	12,678.0	23,869.5	19,513.6	11,224.7	13,155.2	10,547.0	14,909.3	10,231.1	6,452.7	8,129.4	9,926.9	205,184.4
2008	16,107.6	5,557.9	15,544.1	18,108.5	35,042.2	13,899.4	26,971.8	19,593.1	10,426.6	11,373.6	8,534.5	11,812.0	8,231.7	5,258.2	13,062.6	219,523.8
2009	11,181.5	15,343.9	8,962.0	16,762.1	17,097.7	38,130.3	14,269.2	26,252.8	17,273.4	8,662.2	8,790.5	6,379.8	8,810.2	6,264.2	12,520.1	216,699.8
2010	8,190.7	9,711.5	17,711.4	9,736.3	15,176.8	17,691.3	37,539.8	12,396.6	20,403.4	14,043.3	6,875.5	6,320.0	4,780.7	6,777.3	13,236.2	200,590.8
2011	15,278.3	8,586.2	9,740.1	17,104.4	8,777.6	14,902.3	17,568.9	32,238.7	9,982.2	15,547.3	10,115.4	5,126.8	4,695.5	3,645.0	14,352.2	187,660.9
2012	6,742.5	11,827.2	10,816.9	9,185.7	15,917.5	8,838.0	15,081.3	15,964.3	26,812.1	8,333.0	12,237.5	7,692.3	3,875.7	3,732.8	12,971.6	170,028.5
2013	7,107.5	13,318.9	12,985.3	10,768.3	8,711.6	15,457.8	8,552.6	13,471.2	13,613.6	21,431.5	6,547.0	9,373.3	6,077.1	2,959.1	11,566.6	161,941.4
2014	48,980.7	6,632.8	22,193.8	12,702.5	9,788.6	7,396.7	13,277.7	6,865.6	10,307.4	9,737.9	14,931.6	4,588.0	6,676.4	4,326.0	10,064.7	188,470.4
2015	13,505.2	9,346.3	7,301.1	24,148.6	12,897.3	10,289.8	6,847.9	11,385.1	5,771.1	7,940.2	7,149.5	11,158.3	3,294.4	4,796.4	8,427.1	144,258.3
2016	24,148.9	12,485.7	5,909.6	6,701.7	24,198.2	13,893.0	10,323.7	6,584.5	9,837.2	4,978.1	6,280.7	5,430.1	8,872.4	2,455.9	10,422.4	152,522.2
2017	12,740.3	21,980.7	16,591.3	8,329.7	6,876.7	22,003.6	11,999.2	8,047.2	5,007.0	7,669.7	3,721.5	4,686.1	4,126.3	6,633.0	7,983.1	148,395.4
2018	20,361.3	11,541.5	26,400.2	17,971.9	8,629.1	7,437.2	19,078.2	9,653.5	6,369.4	3,767.6	5,743.4	2,720.0	3,257.5	2,783.3	10,266.6	155,980.7
2019	19,247.5	15,599.0	13,492.2	27,401.4	16,532.6	8,123.4	6,601.4	18,288.5	8,600.9	5,507.2	3,199.7	4,500.9	2,201.9	2,523.6	8,512.6	160,332.9
2020	28,307.1	17,078.0	16,079.1	13,686.9	26,439.4	16,161.4	8,287.5	6,320.8	16,934.5	7,713.1	4,521.7	2,564.4	3,466.2	1,551.5	7,504.5	176,616.2
2021	4,218.7	13,980.2	18,754.7	16,186.5	12,986.2	25,101.9	15,926.1	8,104.1	5,596.6	15,173.4	5,452.9	3,949.1	2,318.8	2,962.5	7,615.6	158,327.3

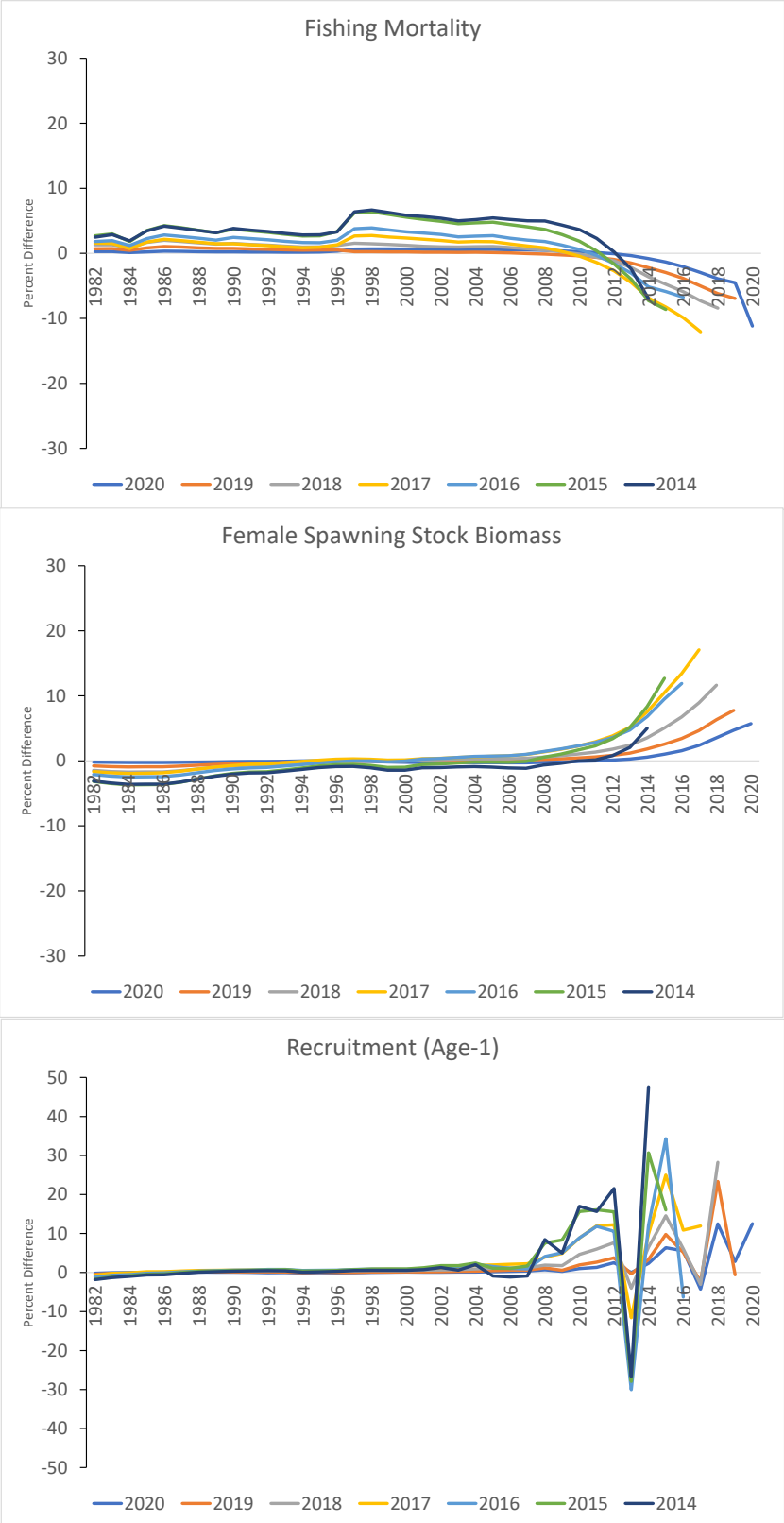
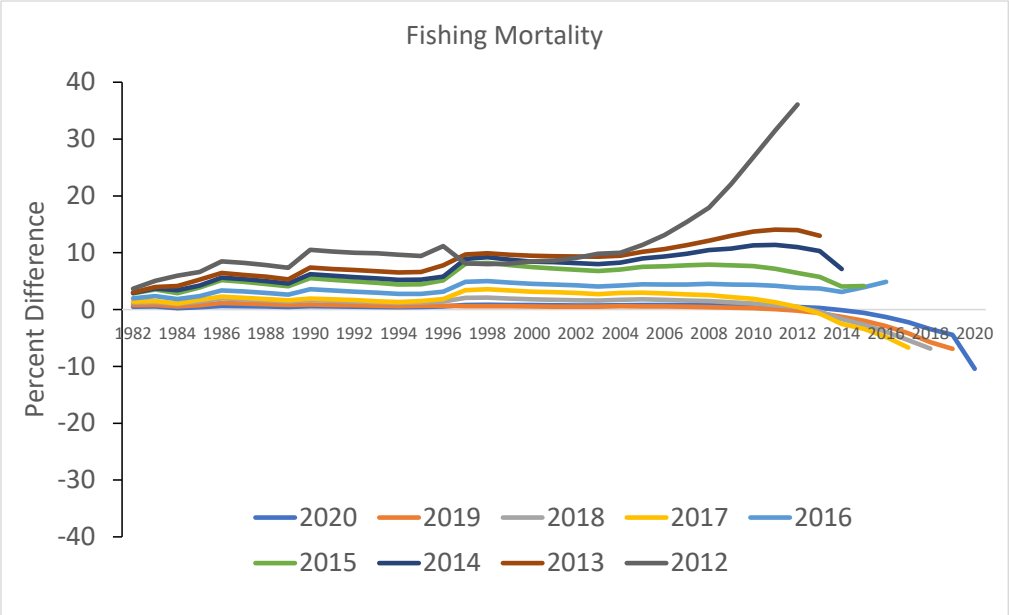


Figure 1. Base model retrospective plots of seven-year peels for fishing mortality, female spawning stock biomass and recruitment.



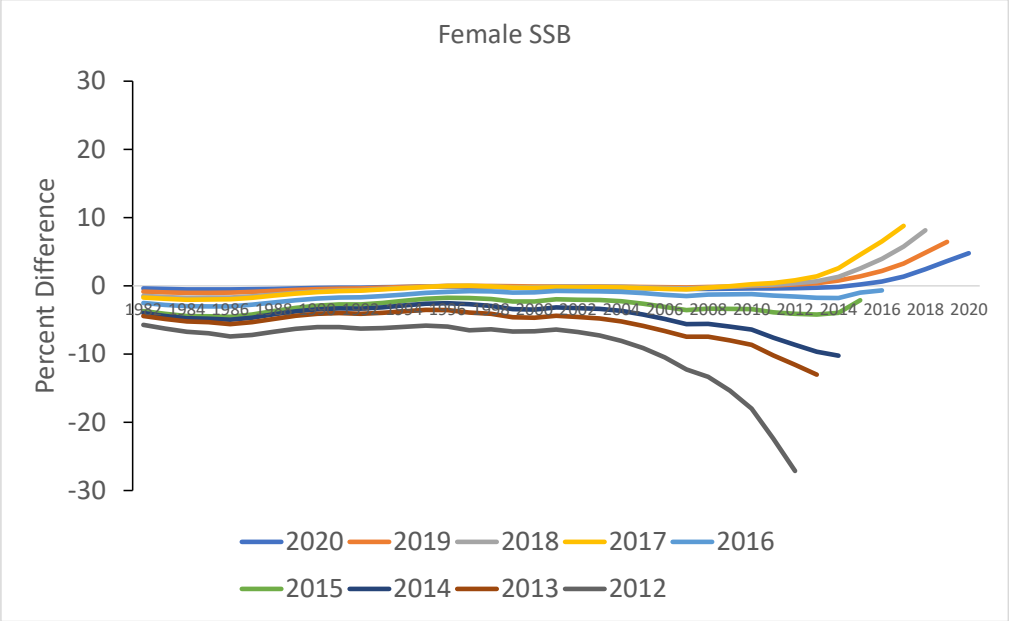
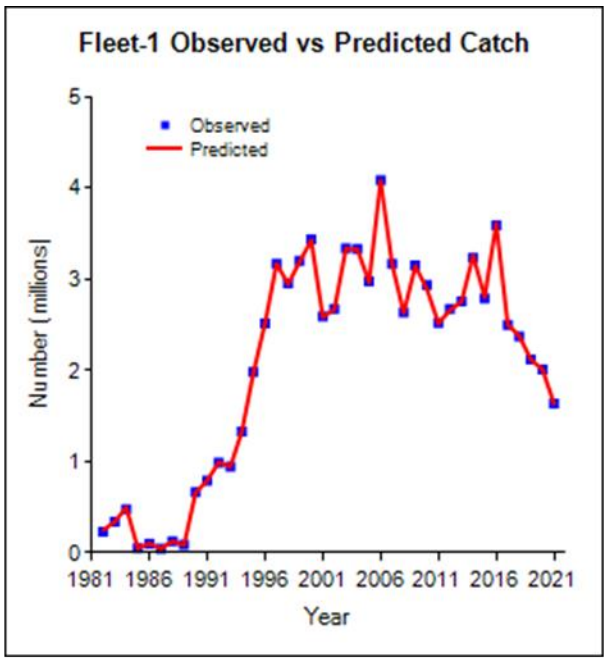
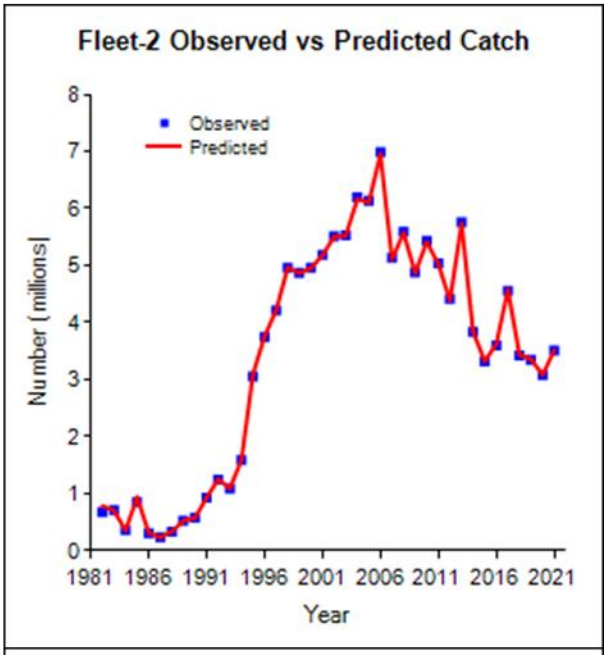
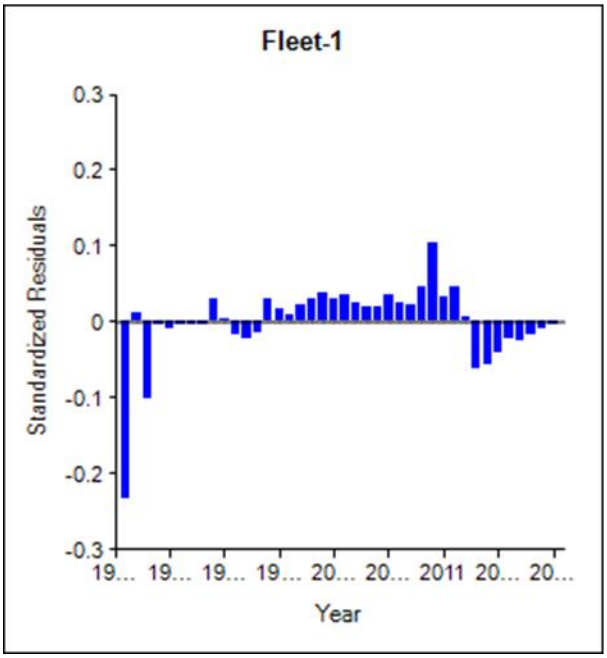


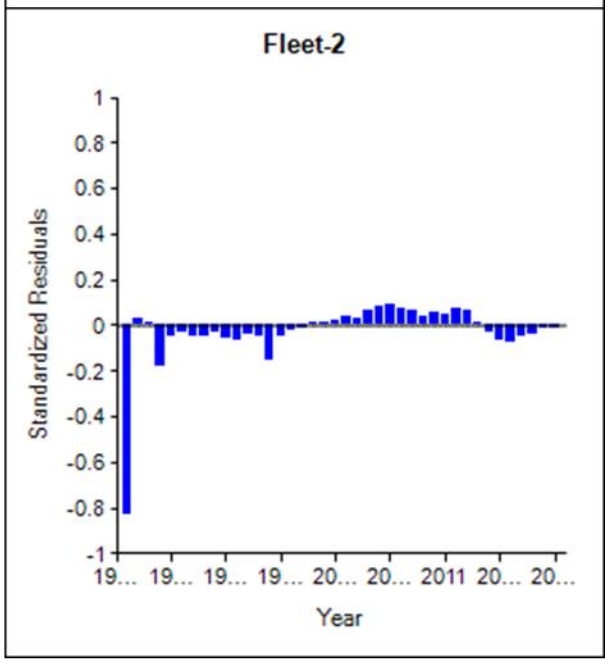
Figure 2. Plots showing changes in the retrospective pattern when the index CV weights from the 2018 benchmark are used in the current assessment.

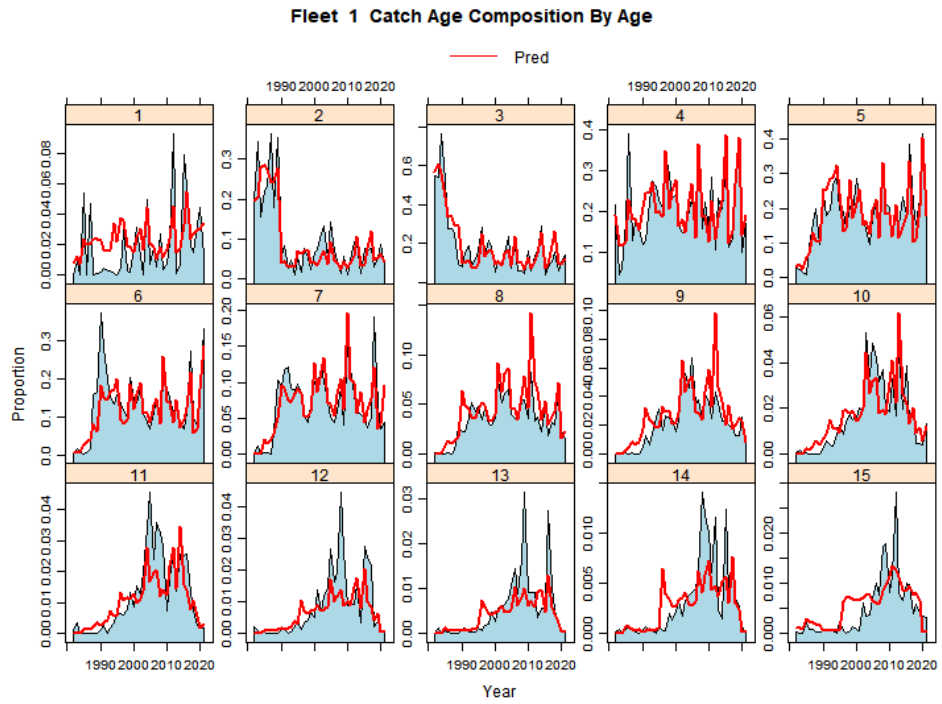
Appendix 2. Diagnostic plots for the base model in which new 2020-2021 selectivity blocks were added for the Bay and Ocean regions.

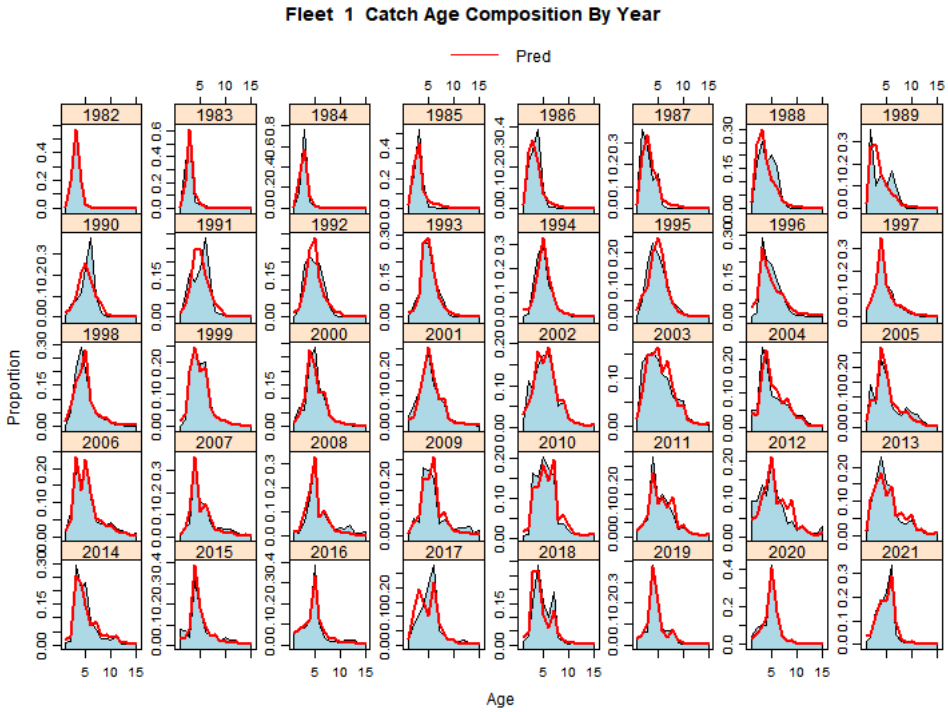

Fleet-1 Observed vs Predicted Catch
Observed
Predicted
Number (millions)
Year
0
1
2
3
4
5
1981 1986 1991 1996 2001 2006 2011 2016 2021

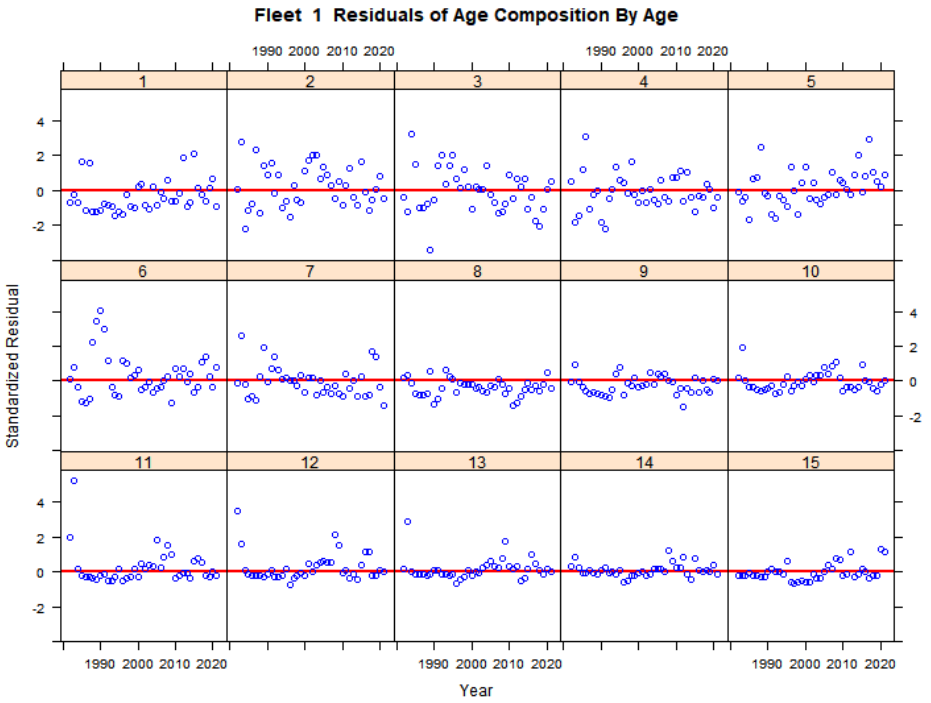

Fleet-2 Observed vs Predicted Catch
Observed
Predicted
Number (millions)
Year
0
1
2
3
4
5
6
7
8
1981 1986 1991 1996 2001 2006 2011 2016 2021

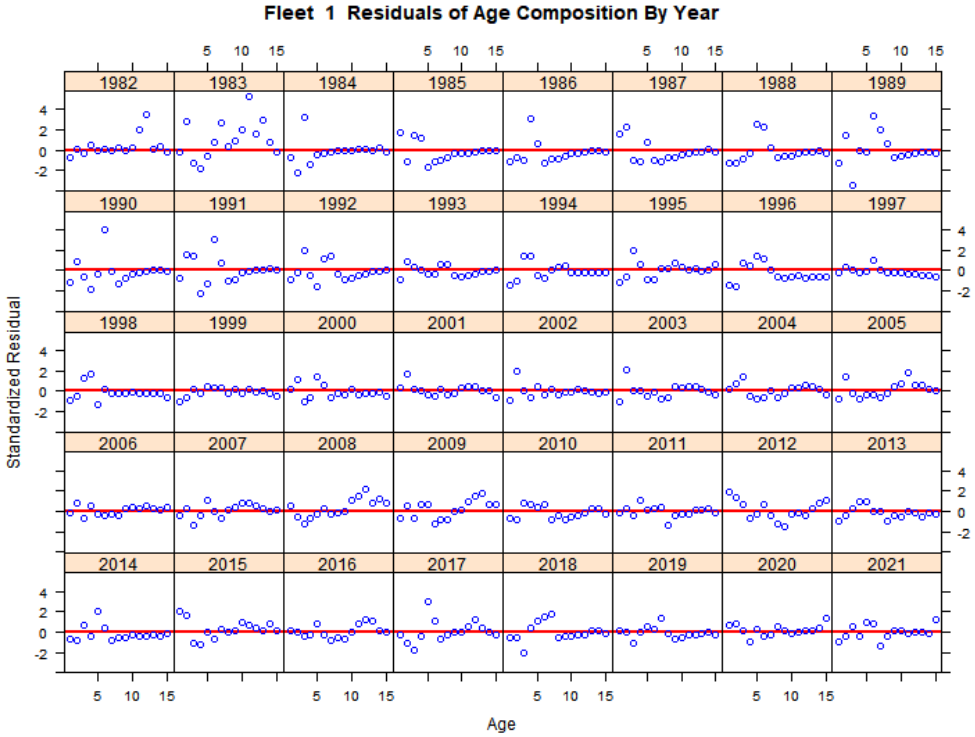

Fleet-1
Standardized Residuals
Year
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
19... 19... 19... 19... 20... 20... 2011 20... 20...

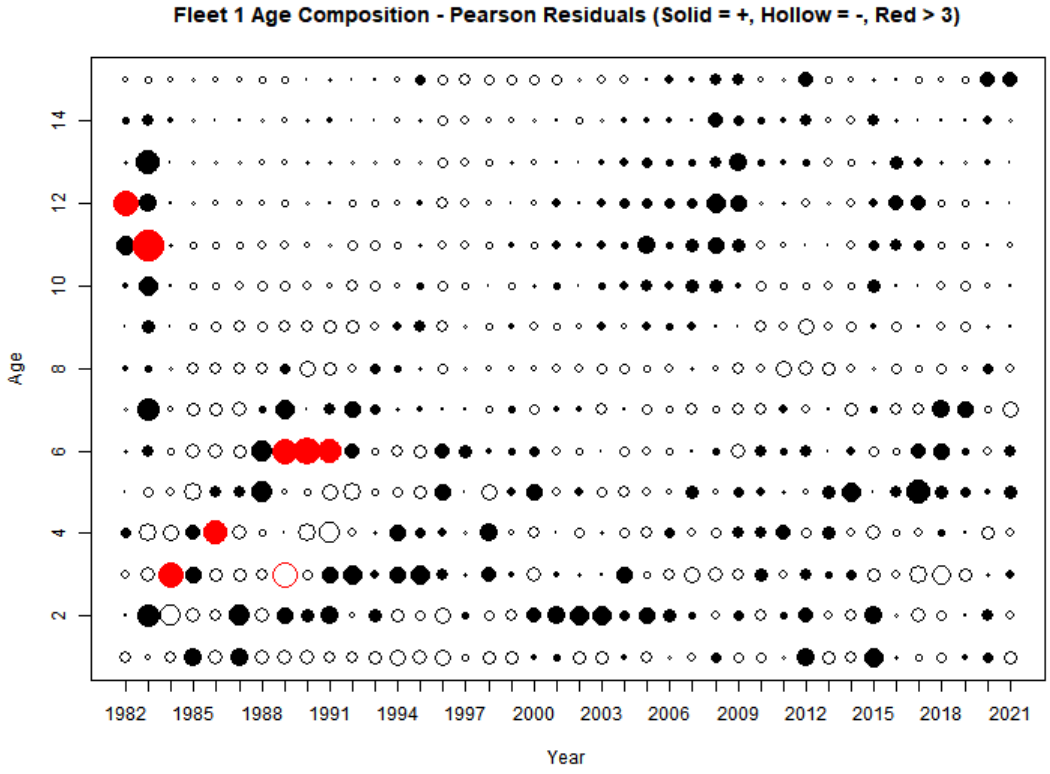

Fleet-2
Standardized Residuals
Year
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
19... 19... 19... 19... 20... 20... 2011 20... 20...


Fleet 1 Catch Age Composition By Age
Pred
Proportion
Year

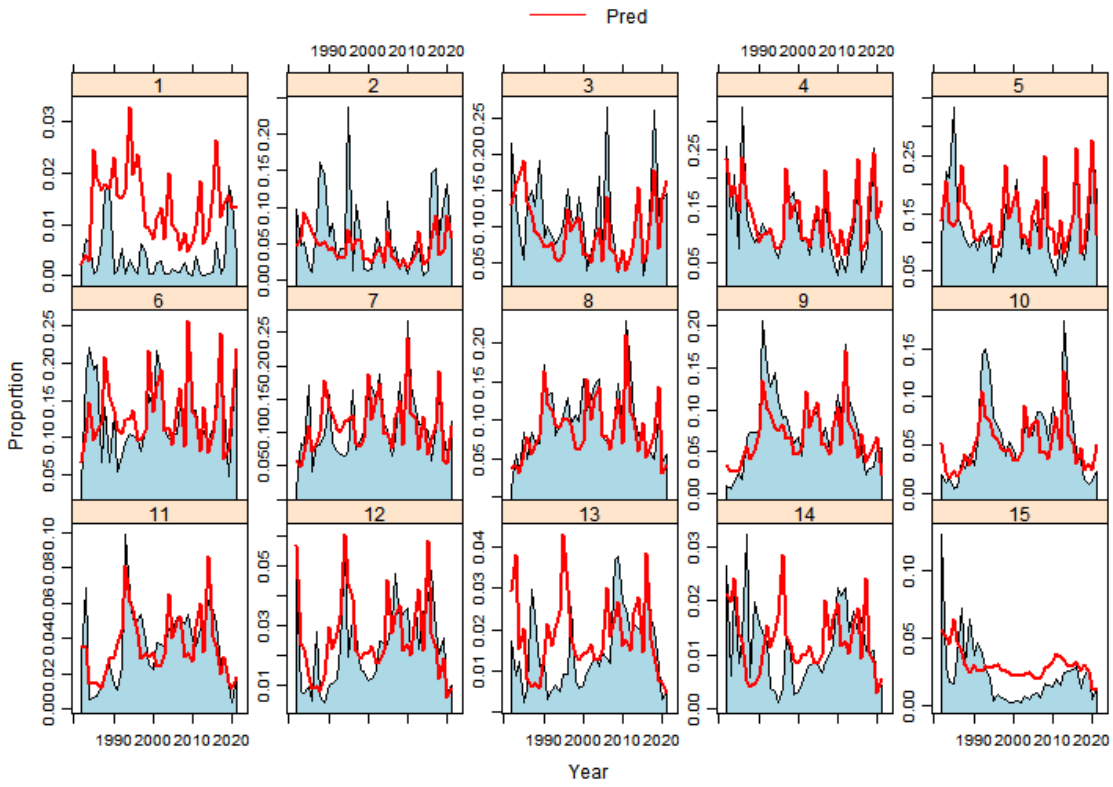

Fleet 1 Catch Age Composition By Year
Pred
Proportion
Age


Fleet 1 Residuals of Age Composition By Age
1 2 3 4 5
6 7 8 9 10
11 12 13 14 15
Standardized Residual
Year

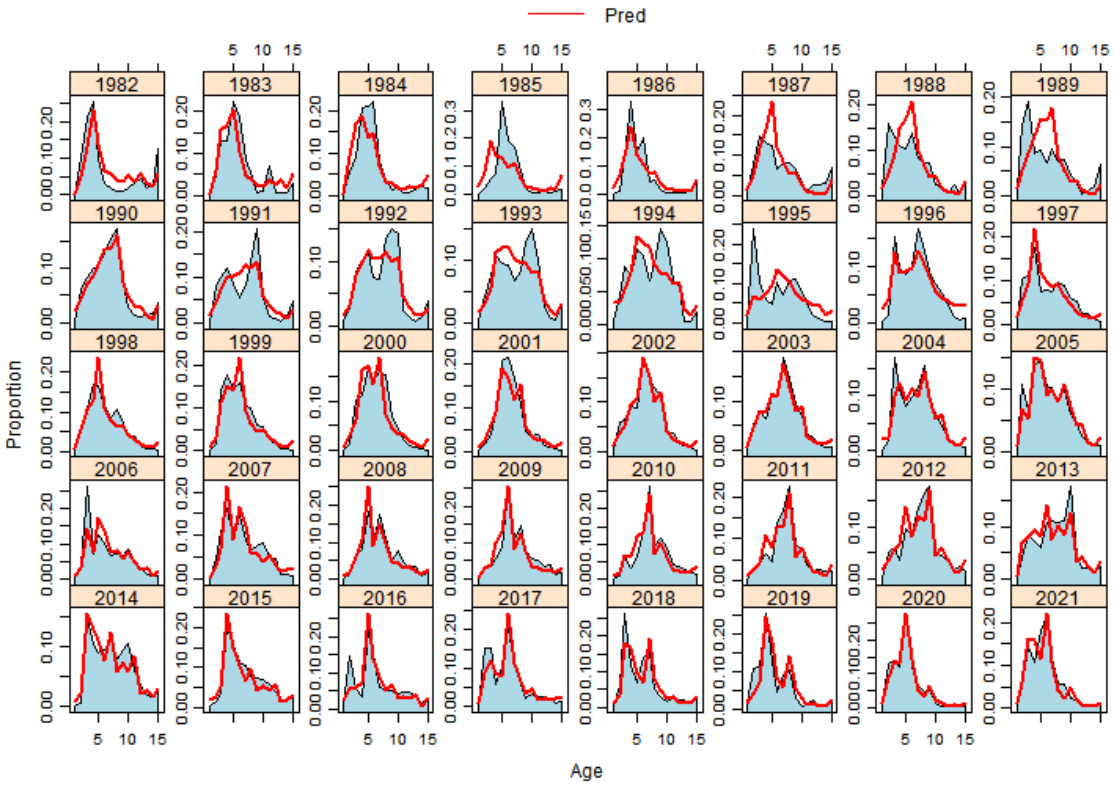

Fleet 1 Residuals of Age Composition By Year
1982 1983 1984 1985 1986 1987 1988 1989
1990 1991 1992 1993 1994 1995 1996 1997
1998 1999 2000 2001 2002 2003 2004 2005
2006 2007 2008 2009 2010 2011 2012 2013
2014 2015 2016 2017 2018 2019 2020 2021
Standardized Residual
Age

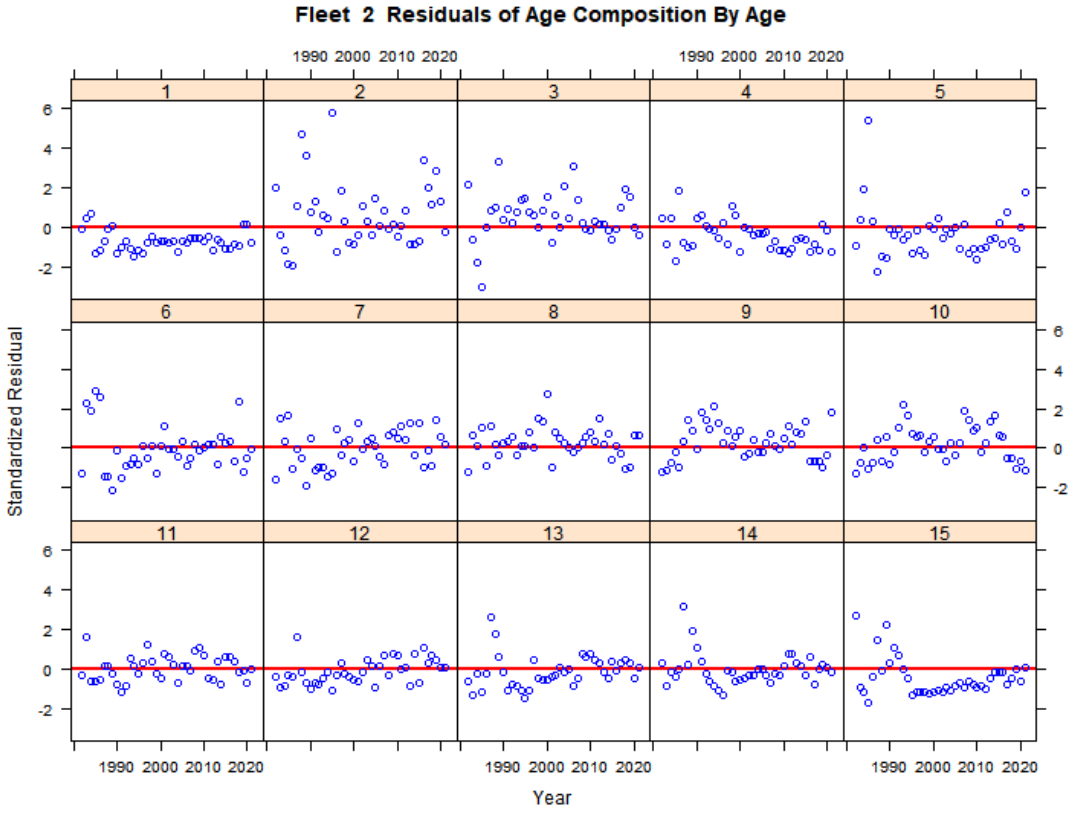

Fleet 1 Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)
Age
2
4
6
8
10
12
14
1982
1985
1988
1991
1994
1997
2000
2003
2006
2009
2012
2015
2018
2021
Year

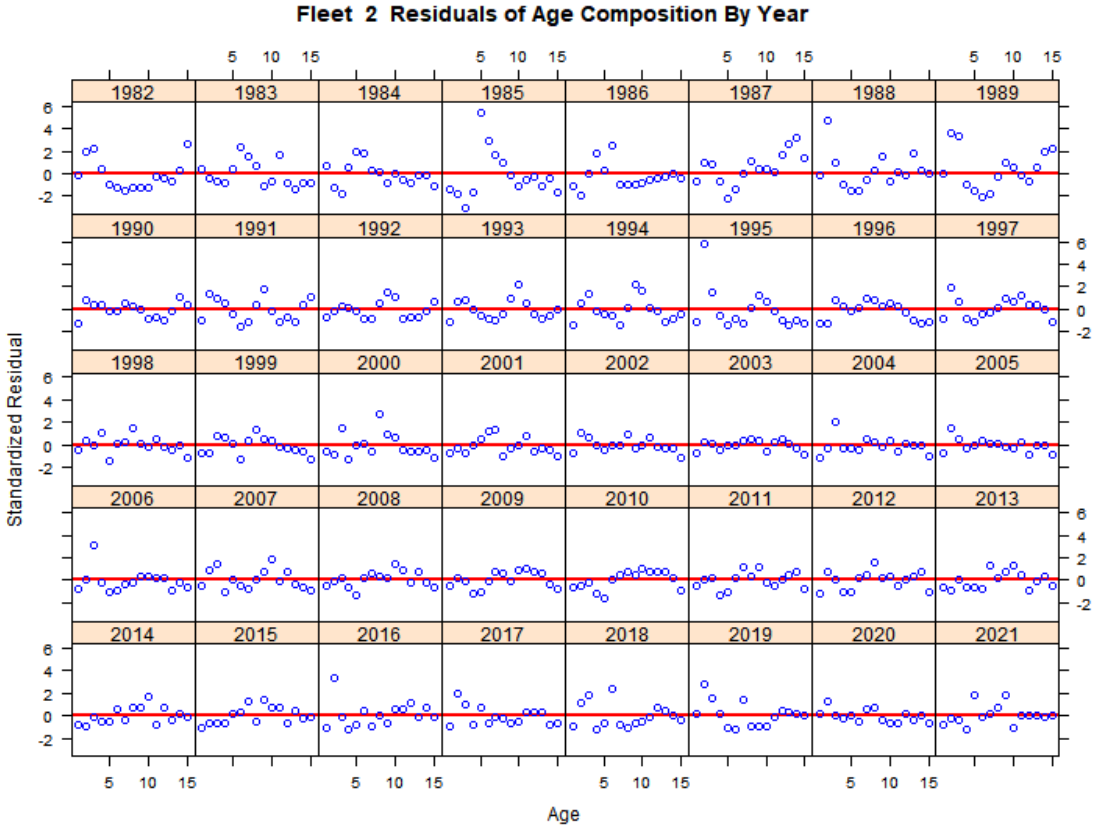
Fleet 2 Catch Age Composition By Age

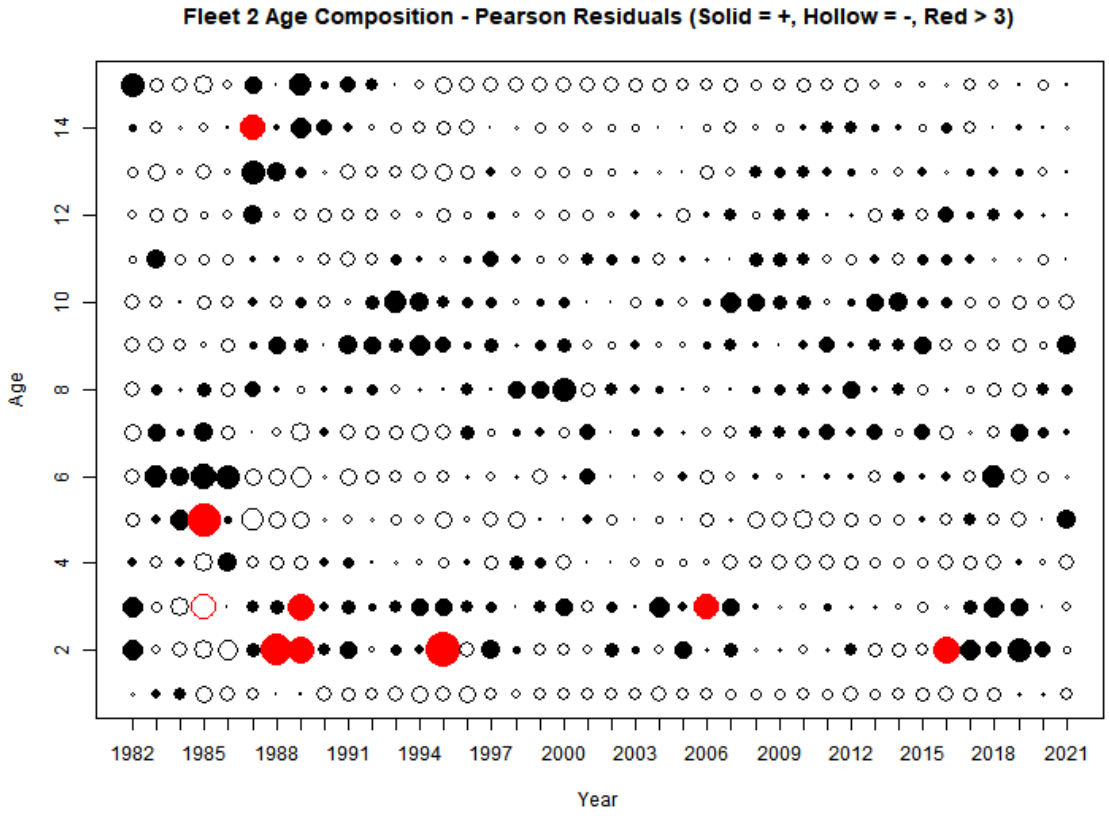


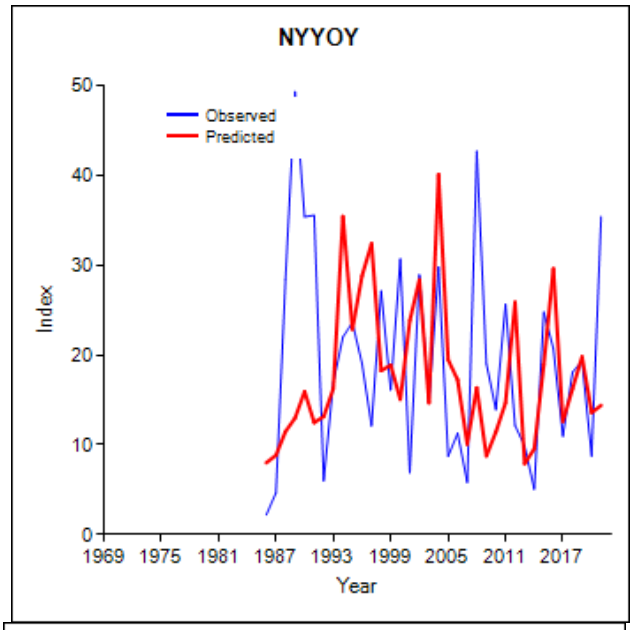
Fleet 2 Catch Age Composition By Year

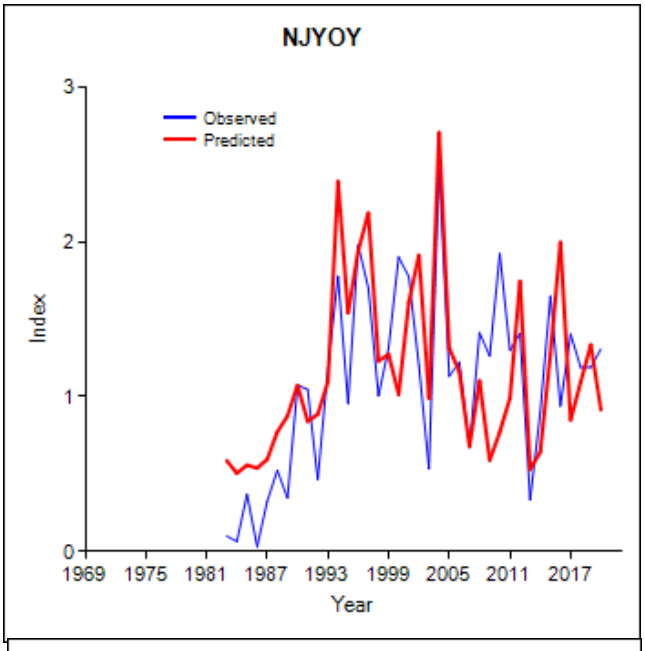


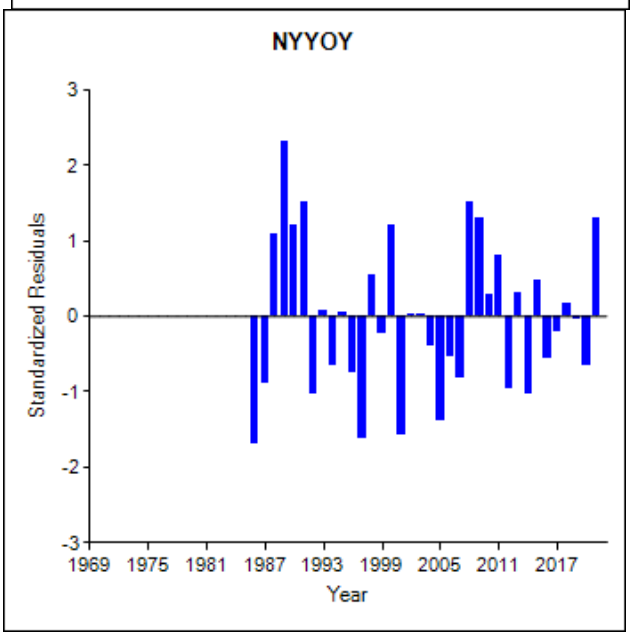

Fleet 2 Residuals of Age Composition By Age
1 2 3 4 5
6 7 8 9 10
11 12 13 14 15
Standardized Residual
Year


Fleet 2 Residuals of Age Composition By Year
1982 1983 1984 1985 1986 1987 1988 1989
1990 1991 1992 1993 1994 1995 1996 1997
1998 1999 2000 2001 2002 2003 2004 2005
2006 2007 2008 2009 2010 2011 2012 2013
2014 2015 2016 2017 2018 2019 2020 2021
Standardized Residual
Age


Fleet 2 Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)
Age
2
4
6
8
10
12
14
1982
1985
1988
1991
1994
1997
2000
2003
2006
2009
2012
2015
2018
2021
Year


NYYOY
Observed
Predicted
Index
Year
0
10
20
30
40
50
1969 1975 1981 1987 1993 1999 2005 2011 2017


NJYOY
Observed
Predicted
Index
Year
0
1
2
3
1969 1975 1981 1987 1993 1999 2005 2011 2017


NYYOY
Standardized Residuals
Year
-3
-2
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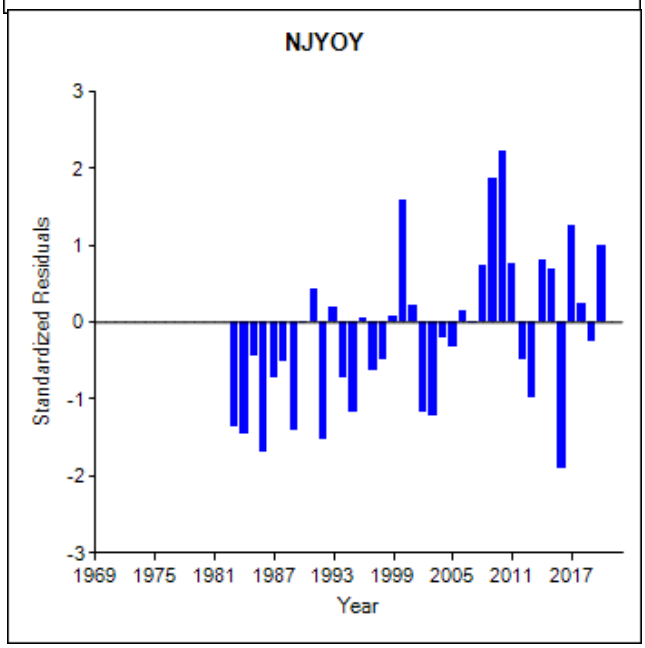
0
1
2
3
1969 1975 1981 1987 1993 1999 2005 2011 2017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Standardized Residuals
Year
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0
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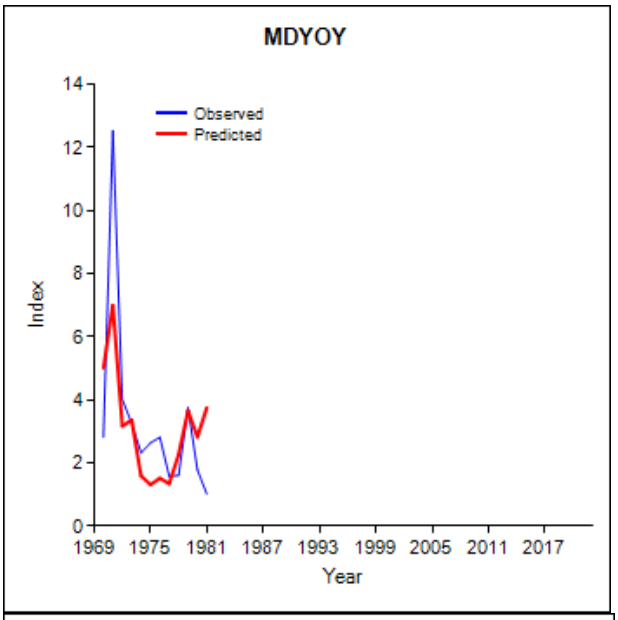
MDYOY
Observed
Predicted
Index
Year
0
2
4
6
8
10
12
14
1969
1975
1981
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1993
1999
2005
2011
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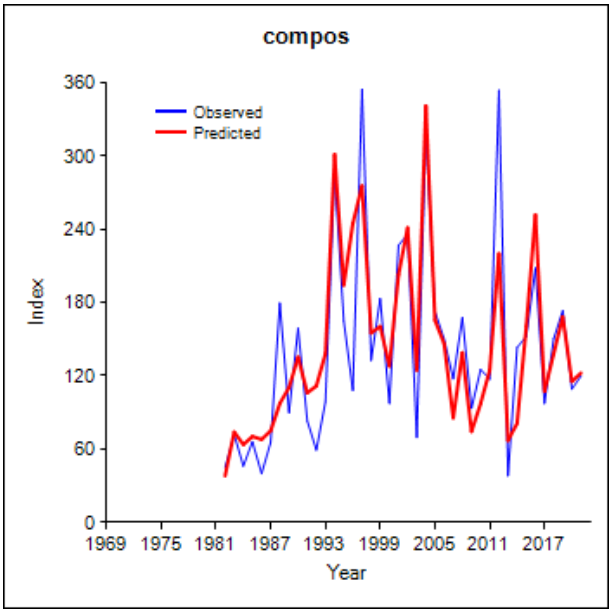
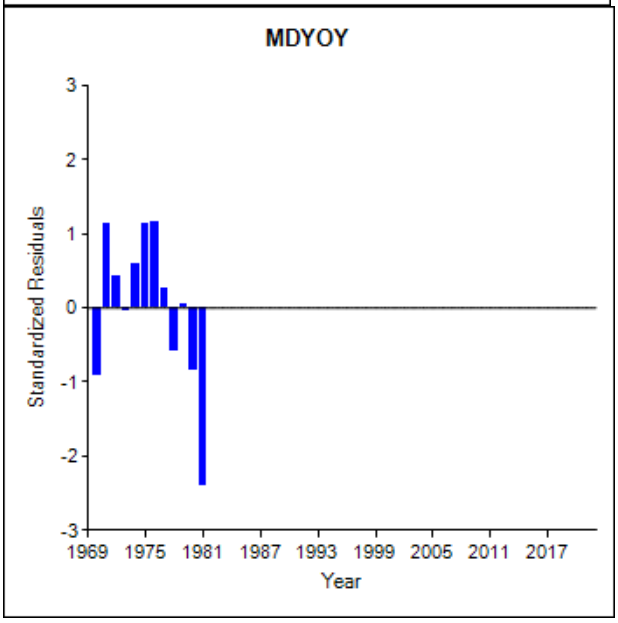
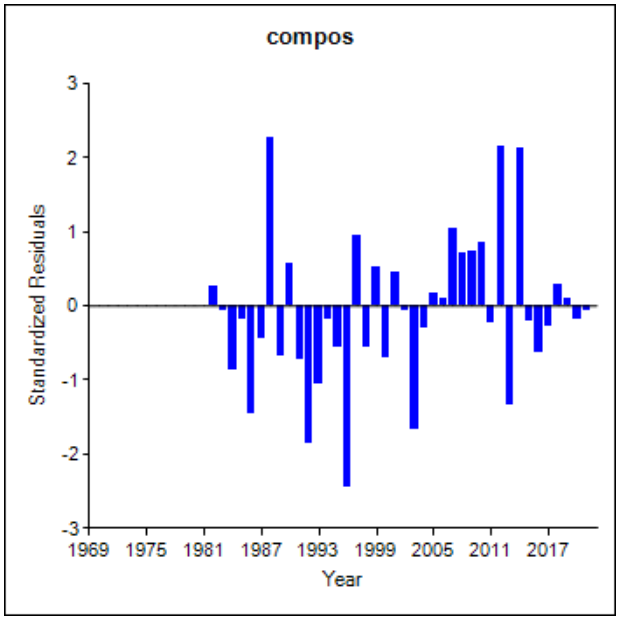

compos
Observed
Predicted
Index
Year
0
60
120
180
240
300
360
1969
1975
1981
1987
1993
1999
2005
2011
2017


MDYOY
Standardized Residuals
Year
-3
-2
-1
0
1
2
3
1969
1975
1981
1987
1993
1999
2005
2011
2017


compos
Standardized Residuals
Year
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-1
0
1
2
3
1969
1975
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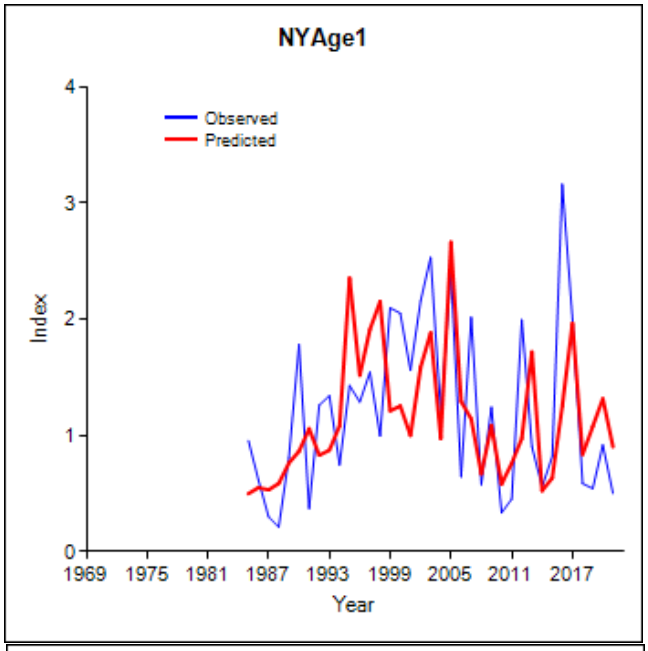
1999
2005
2011
2017


NYAge1
Observed
Predicted
Index
Year
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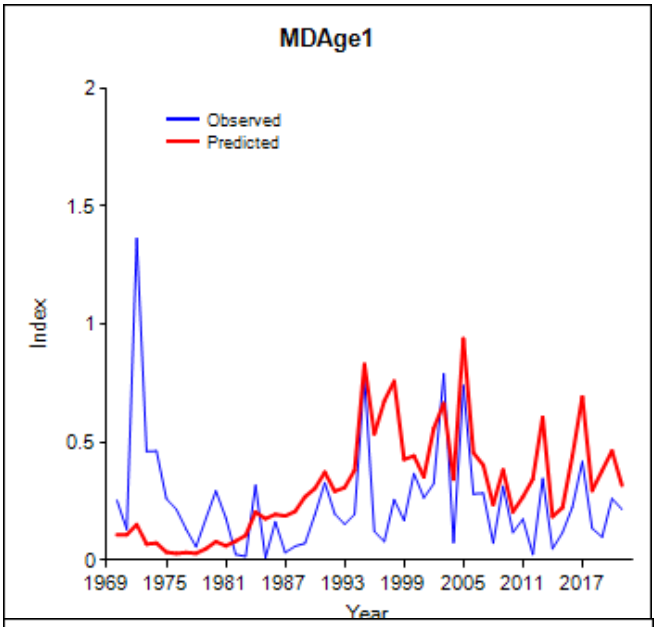
1
2
3
4
1969
1975
1981
1987
1993
1999
2005
2011
2017


MDAge1
Observed
Predicted
Index
Year
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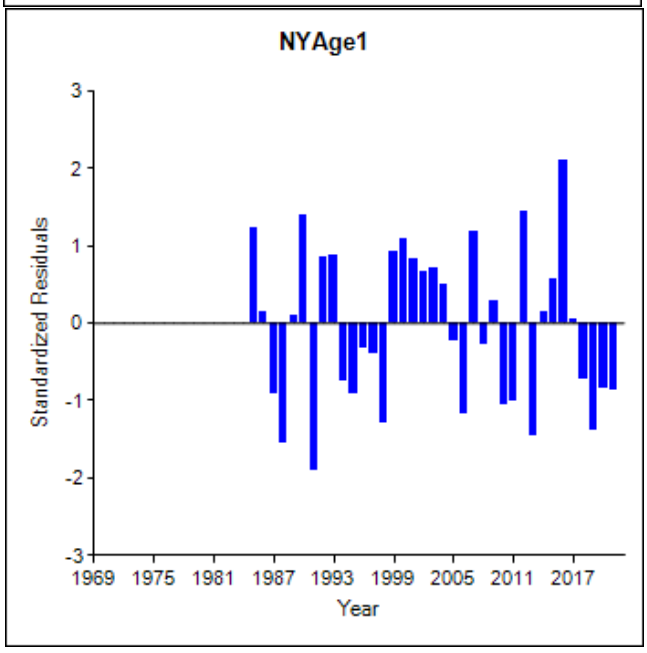
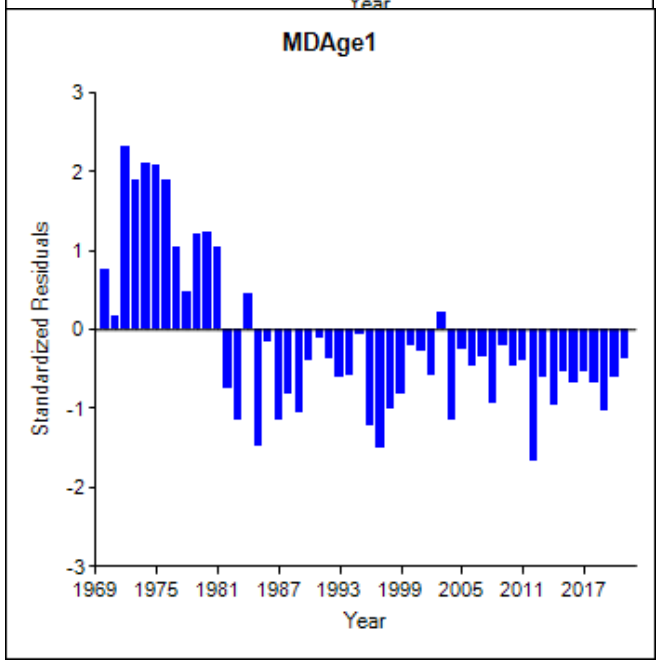
0.5
1
1.5
2
1969
1975
1981
1987
1993
1999
2005
2011
2017


NYAge1
Standardized Residuals
Year
-3
-2
-1
0
1
2
3
1969
1975
1981
1987
1993
1999
2005
2011
2017


MDAge1
Standardized Residuals
Year
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0
1
2
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1969
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1981
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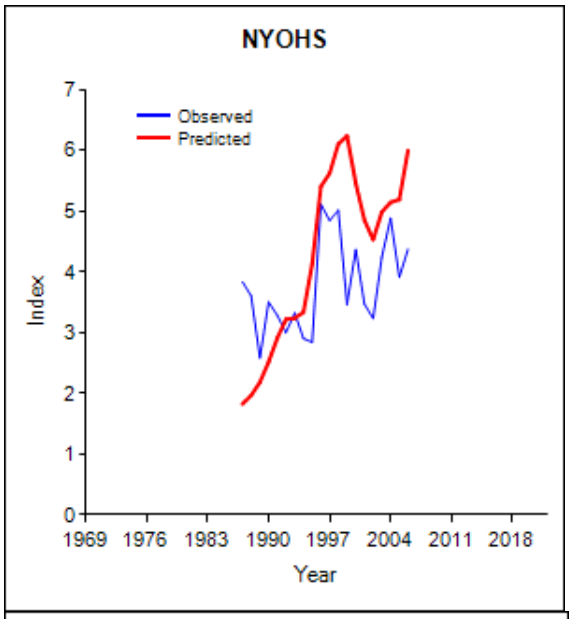
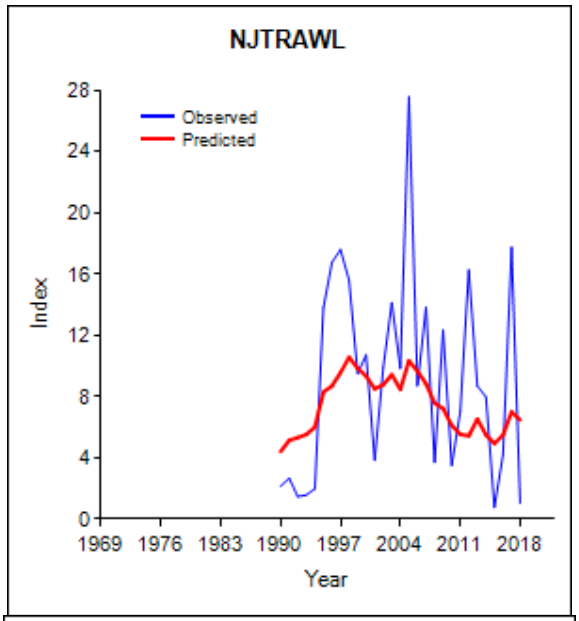
1999
2005
2011
2017


NYOHS
Observed
Predicted
Index
Year
0
1
2
3
4
5
6
7
1969
1976
1983
1990
1997
2004
2011
2018


NJTRAWL
Observed
Predicted
Index
Year
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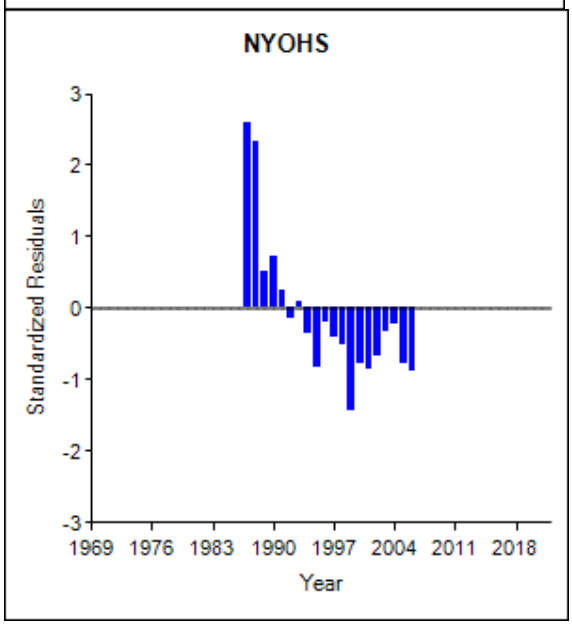
4
8
12
16
20
24
28
1969
1976
1983
1990
1997
2004
2011
2018


NYOHS
Standardized Residuals
Year
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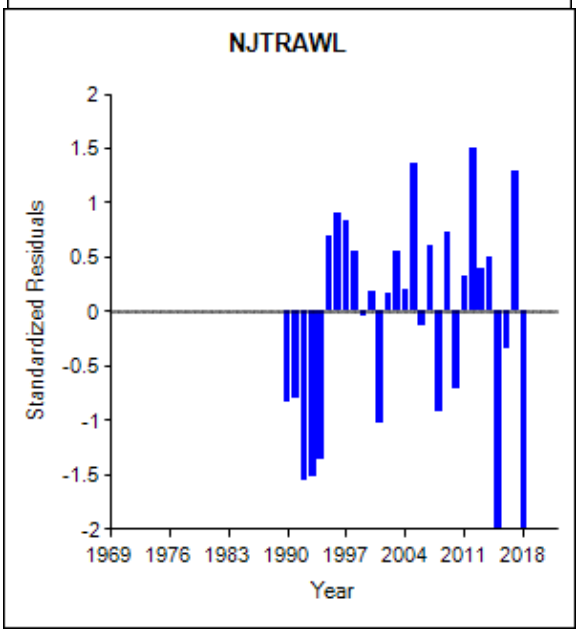
-2
-1
0
1
2
3
1969
1976
1983
1990
1997
2004
2011
2018


NJTRAWL
Standardized Residuals
Year
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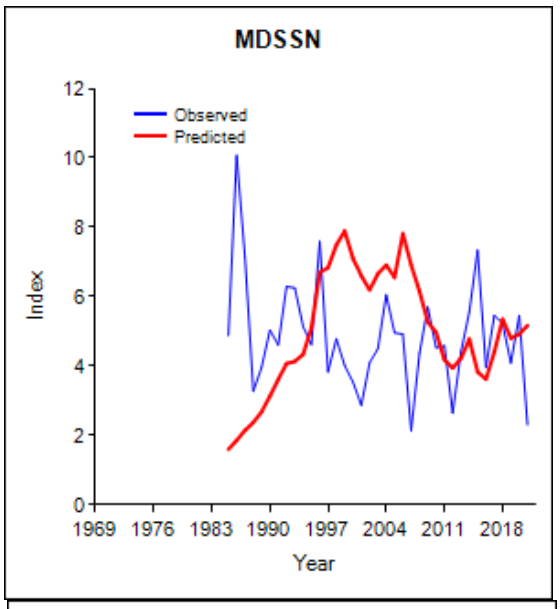
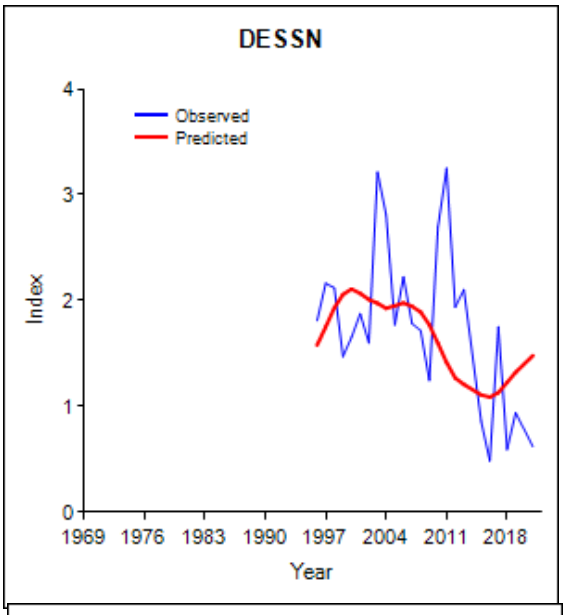
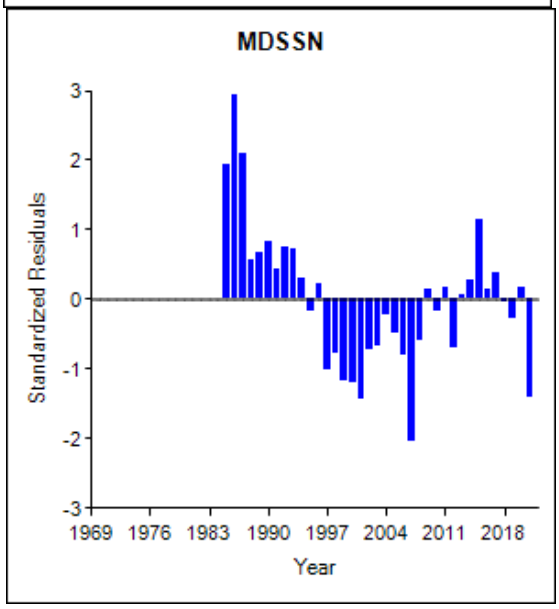
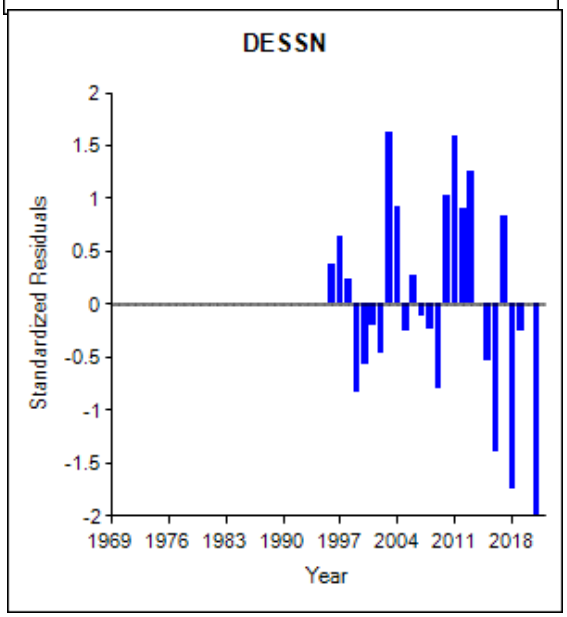
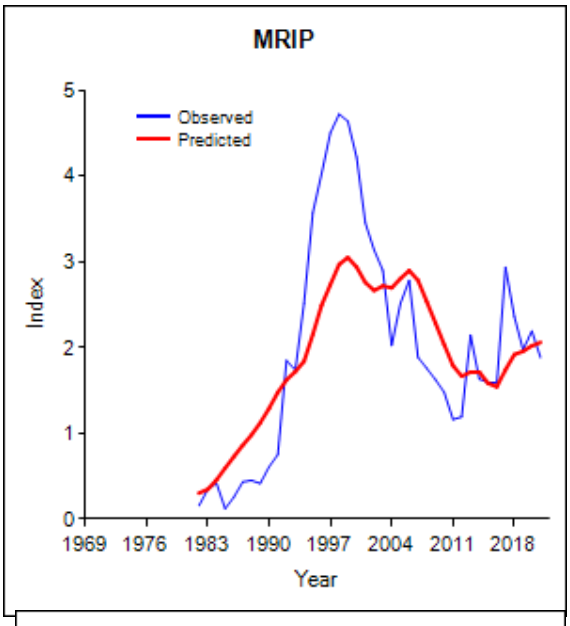
-1.5
-1
-0.5
0
0.5
1
1.5
2
1969
1976
1983
1990
1997
2004
2011
2018

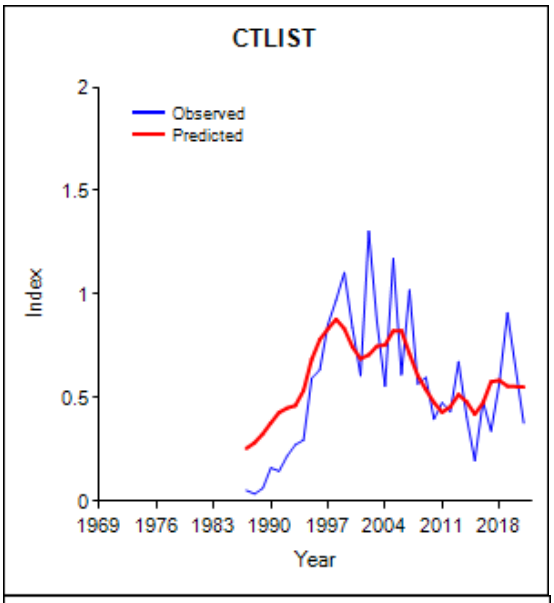

MDSSN
Observed
Predicted
Index
Year
0
2
4
6
8
10
12
1969
1976
1983
1990
1997
2004
2011
2018

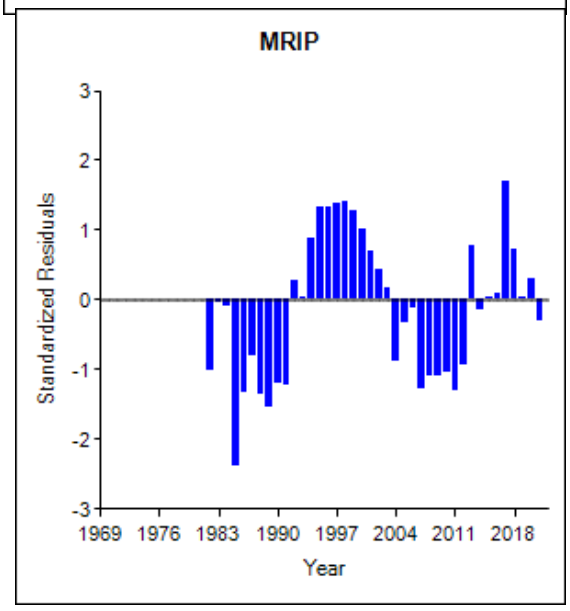

DESSN
Observed
Predicted
Index
Year
0
1
2
3
4
1969
1976
1983
1990
1997
2004
2011
2018

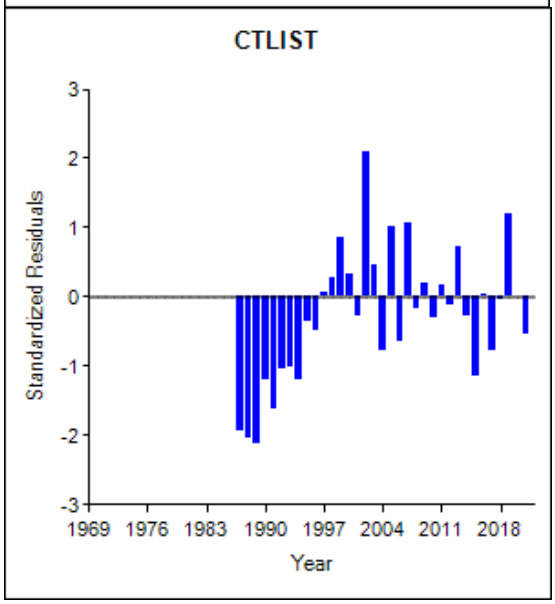

MDSSN
Standardized Residuals
Year
-3
-2
-1
0
1
2
3
1969
1976
1983
1990
1997
2004
2011
2018

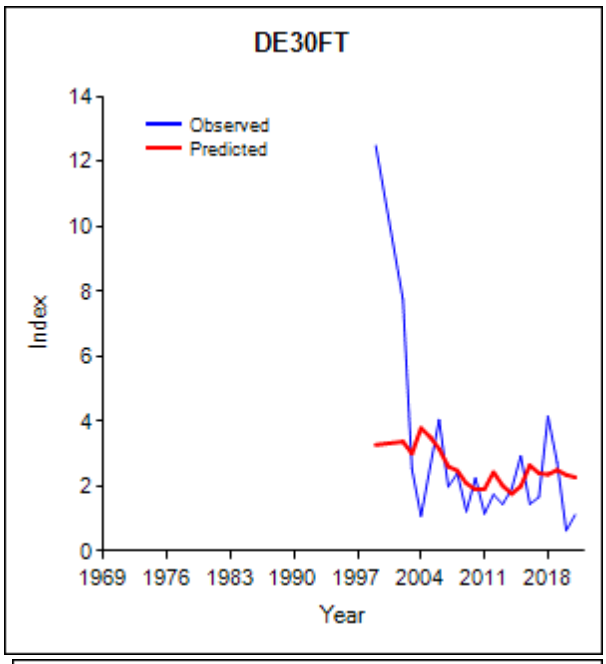

DESSN
Standardized Residuals
Year
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
1969
1976
1983
1990
1997
2004
2011
2018

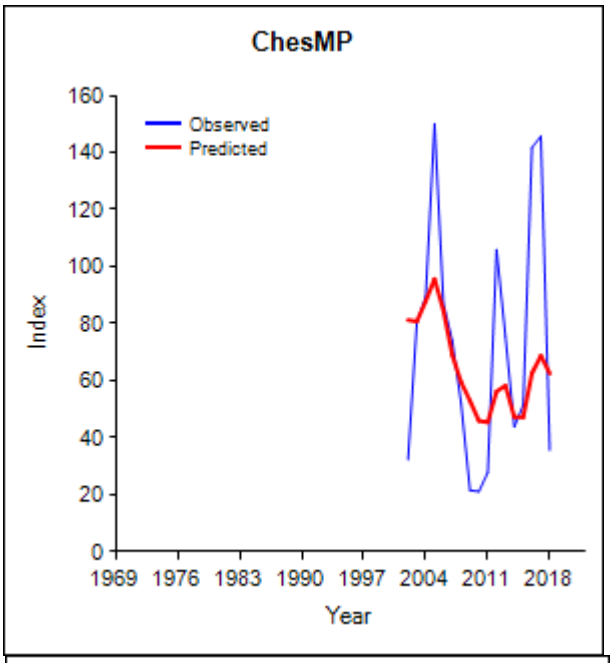

MRIP
Observed
Predicted
Index
Year
0
1
2
3
4
5
1969
1976
1983
1990
1997
2004
2011
2018


CTLIST
Observed
Predicted
Index
Year
0
0.5
1
1.5
2
1969
1976
1983
1990
1997
2004
2011
2018


MRIP
Standardized Residuals
Year
-3
-2
-1
0
1
2
3
1969
1976
1983
1990
1997
2004
2011
2018


CTLIST
Standardized Residuals
Year
-3
-2
-1
0
1
2
3
1969
1976
1983
1990
1997
2004
2011
2018


DE30FT
Observed
Predicted
Index
Year
0
2
4
6
8
10
12
14
1969
1976
1983
1990
1997
2004
2011
2018


ChesMP
Observed
Predicted
Index
Year
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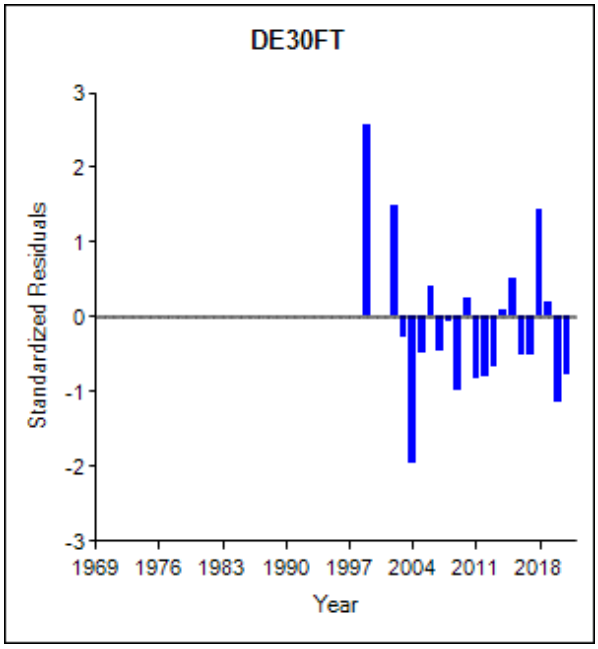
40
60
80
100
120
140
160
1969
1976
1983
1990
1997
2004
2011
2018


DE30FT
Standardized Residuals
Year
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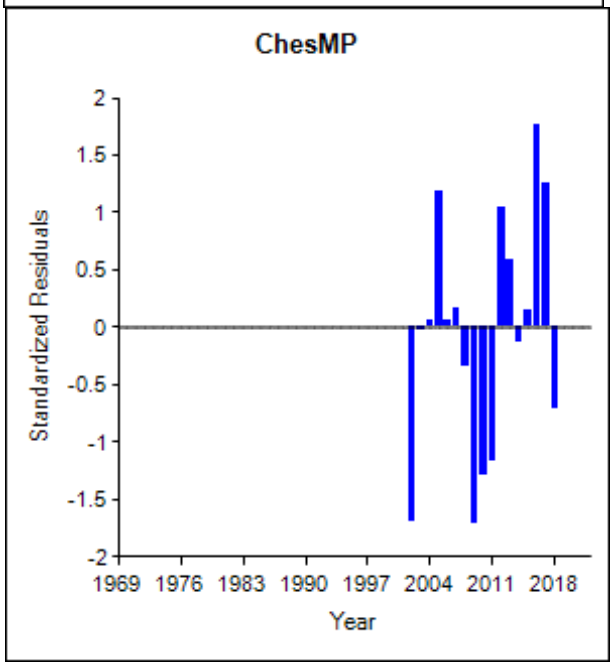
-1
0
1
2
3
1969
1976
1983
1990
1997
2004
2011
2018


ChesMP
Standardized Residuals
Year
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-1
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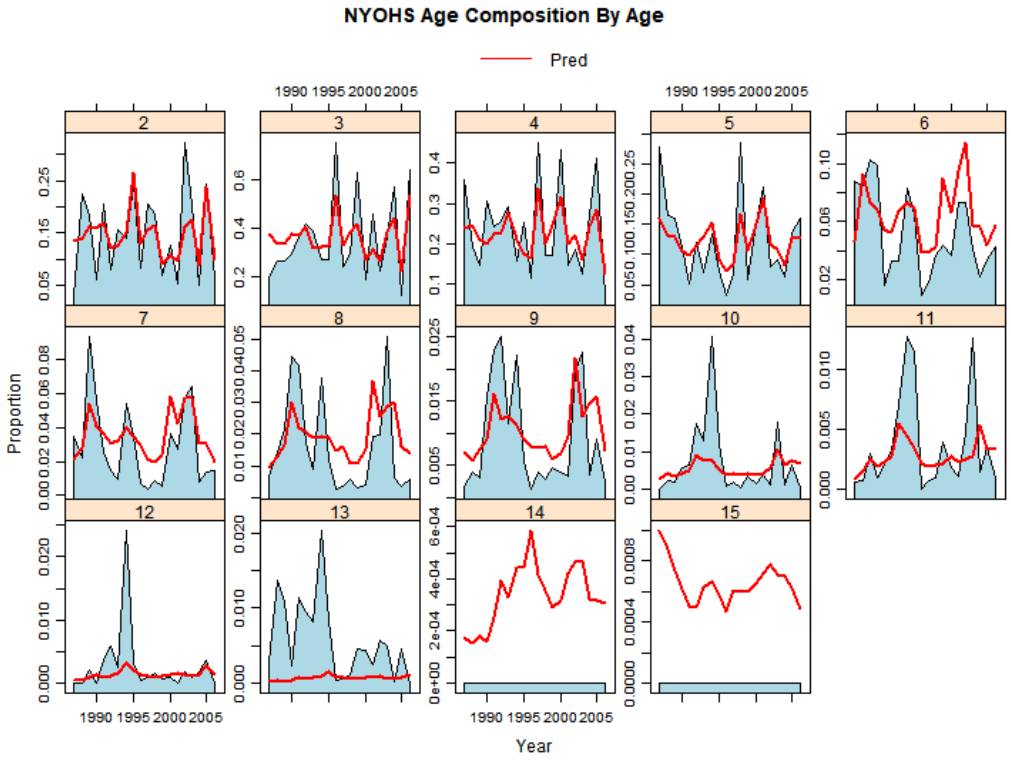
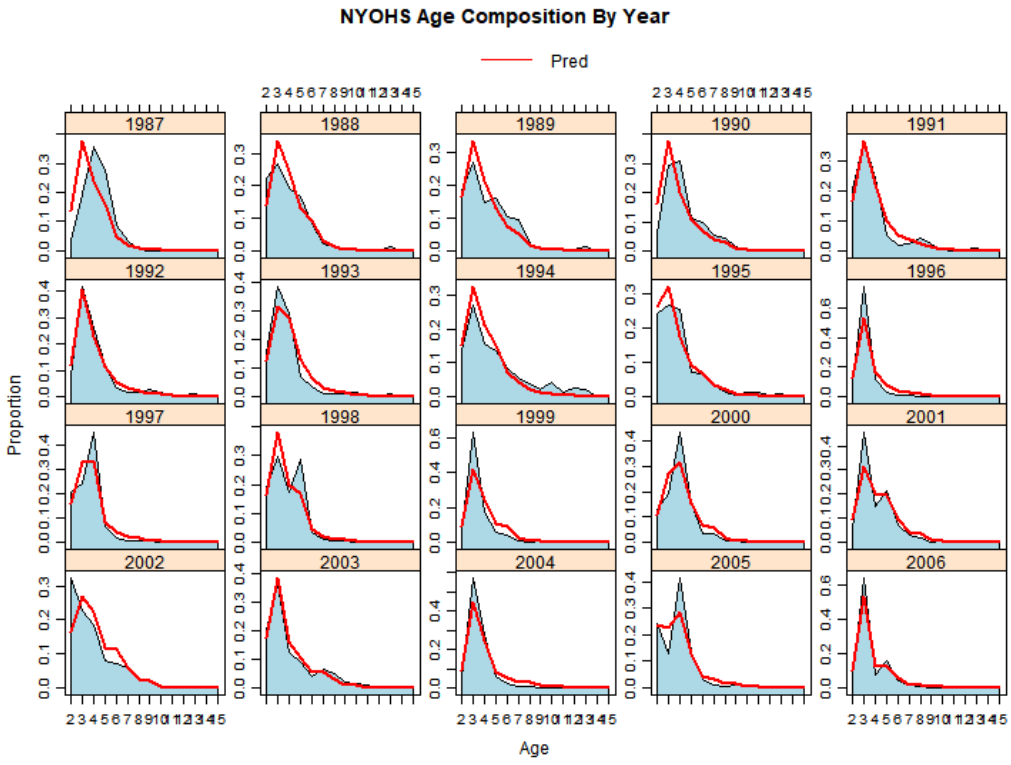
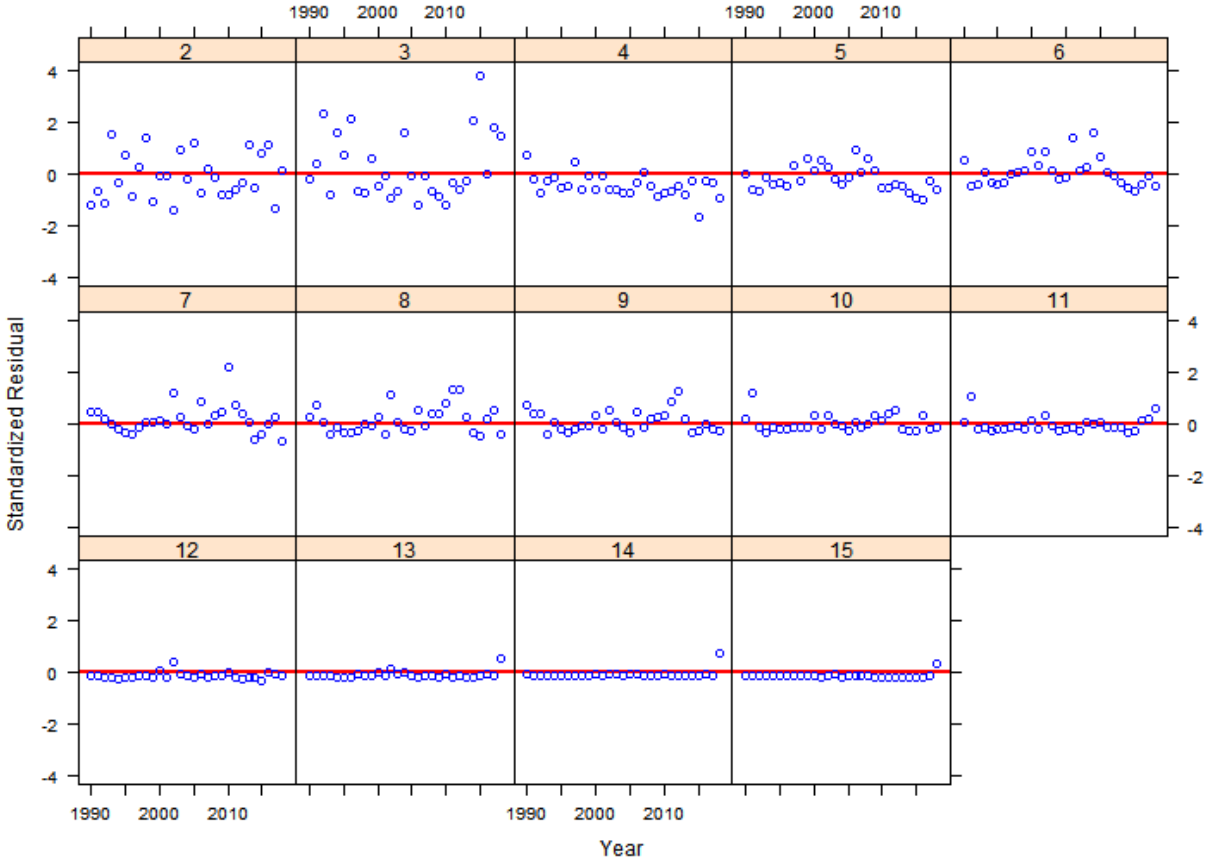
0
0.5
1
1.5
2
1969
1976
1983
1990
1997
2004
2011
2018

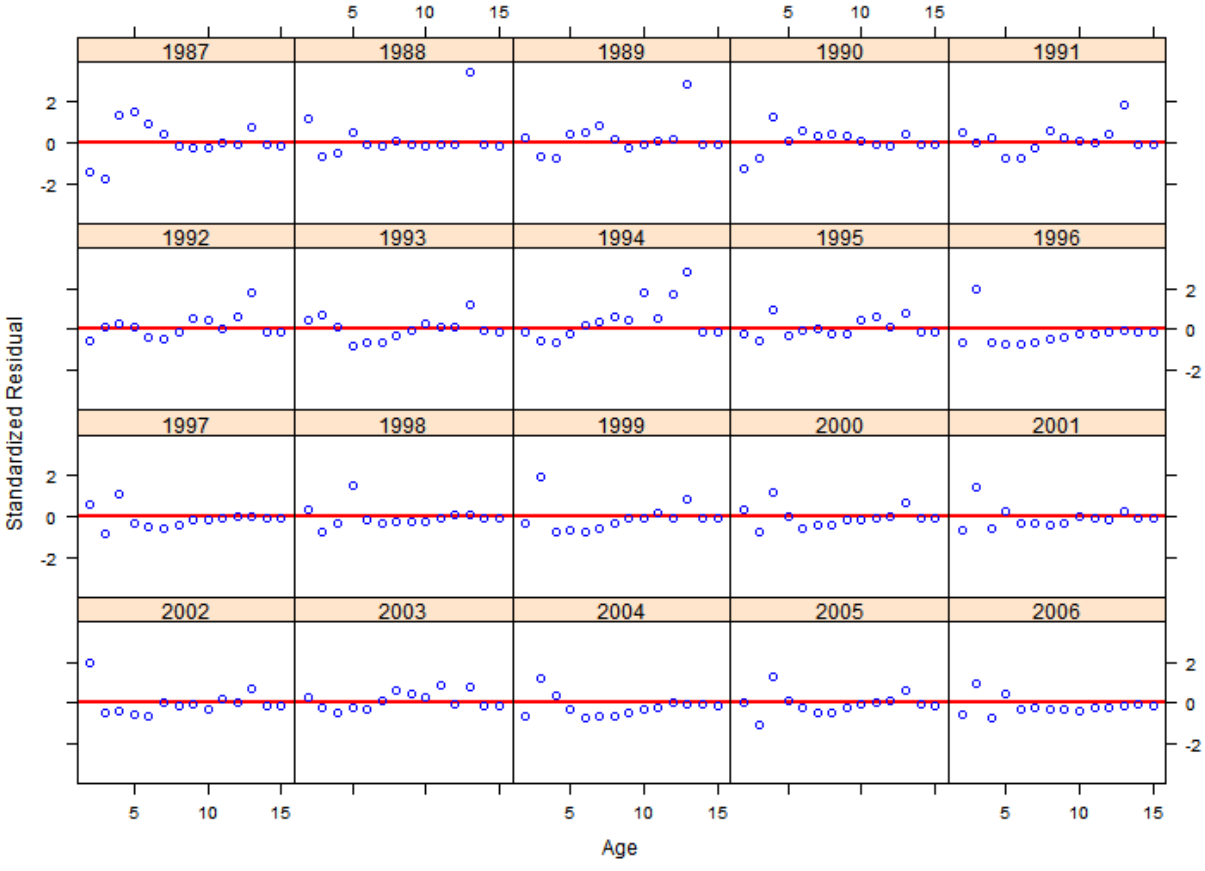

NYOHS Age Composition By Age
Pred
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Proportion
Year

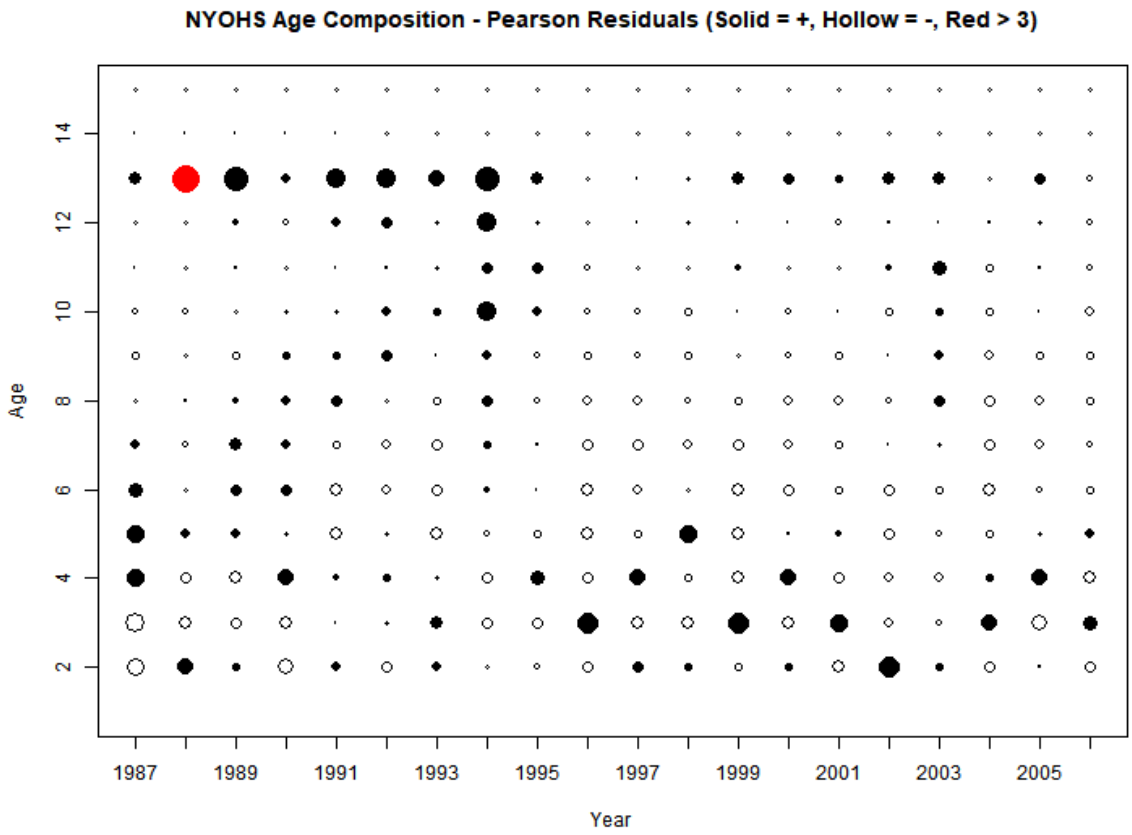

NYOHS Age Composition By Year
Pred
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Proportion
Age

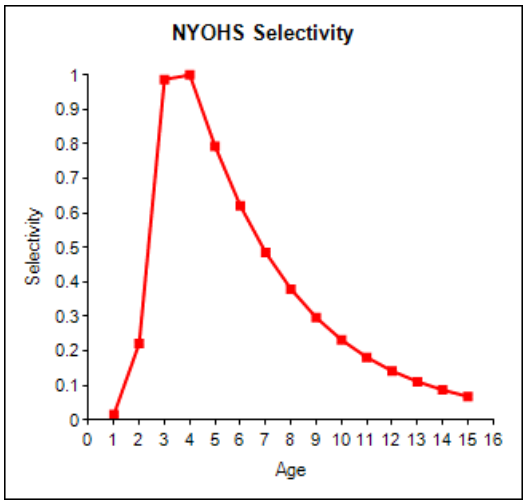
NJTrawl Age Residuals By Age



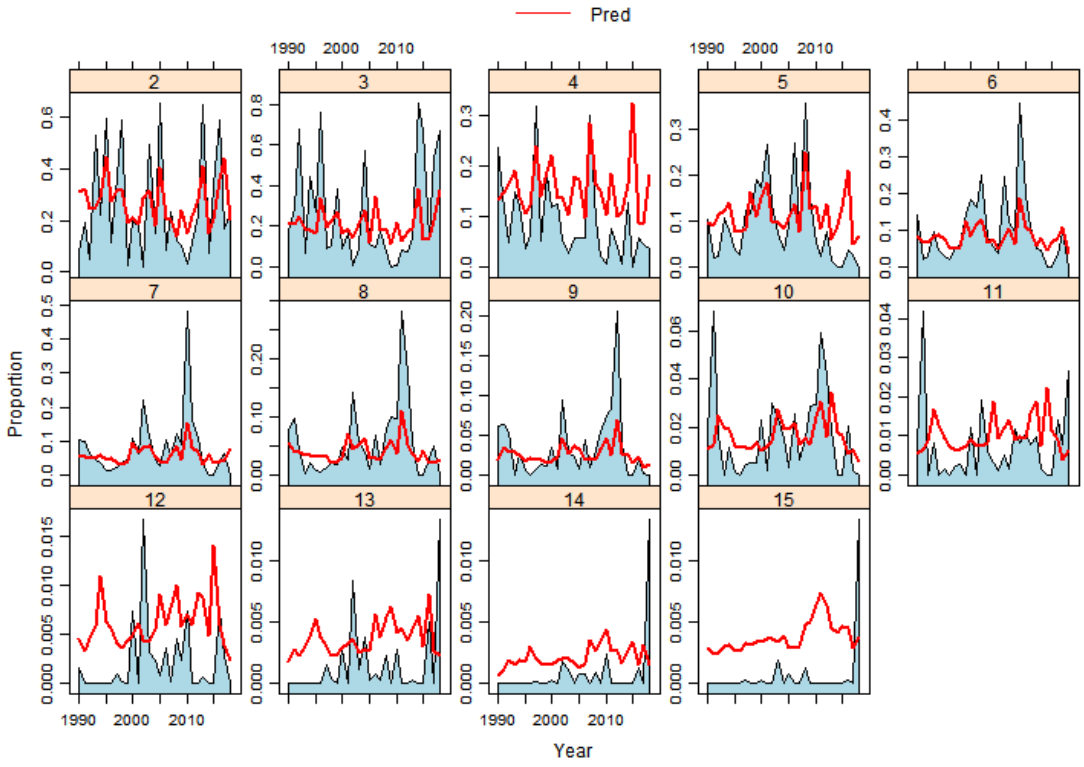
NYOHS Age Residuals By Year



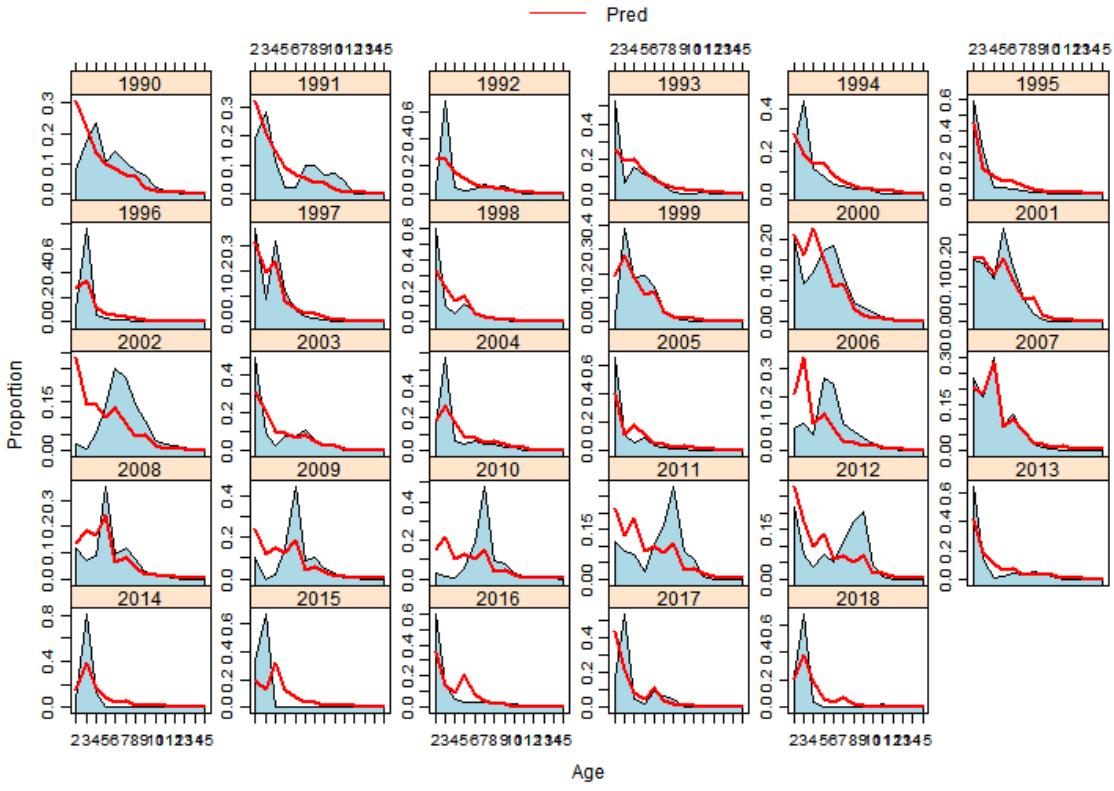

NYOHS Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)
Age
2
4
6
8
10
12
14
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
Year

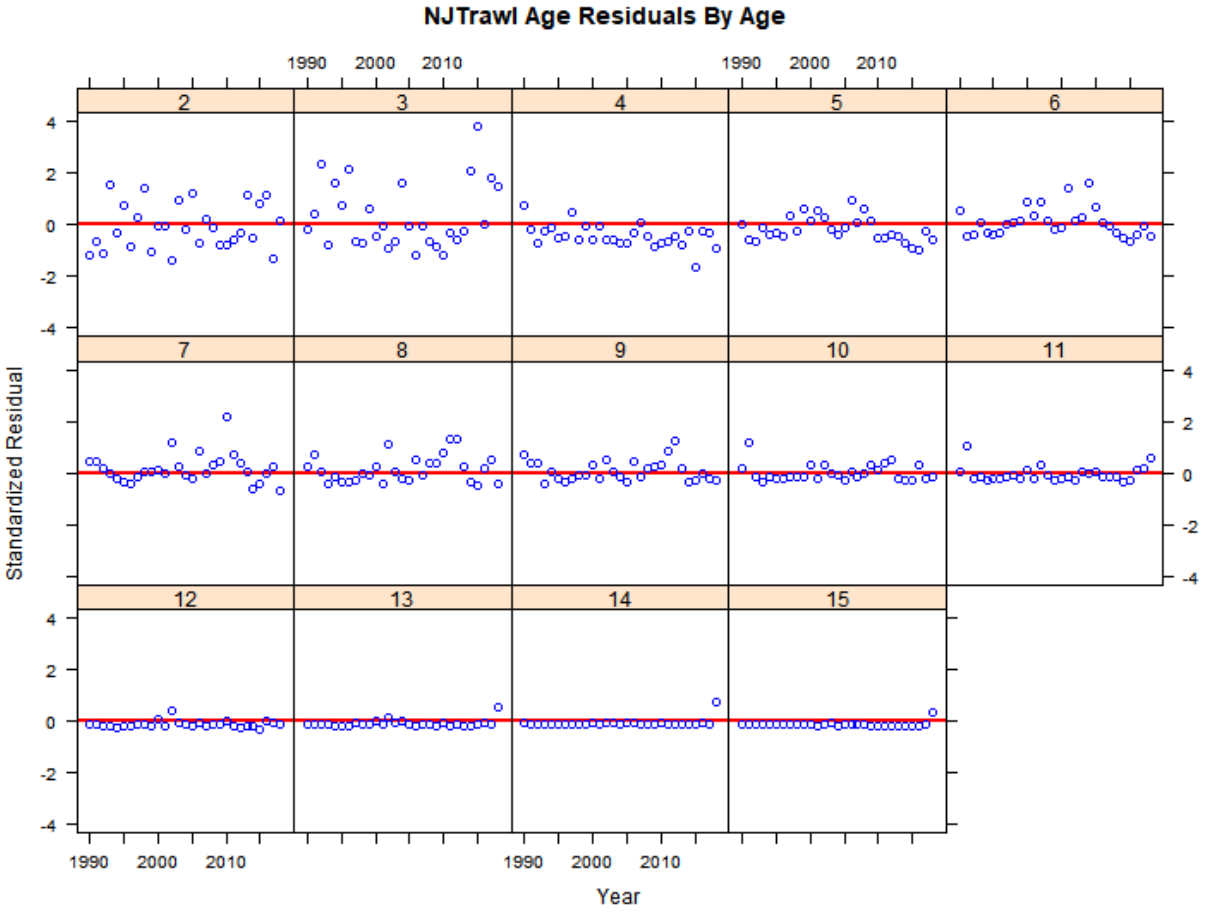

NYOHS Selectivity
Selectivity
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Age

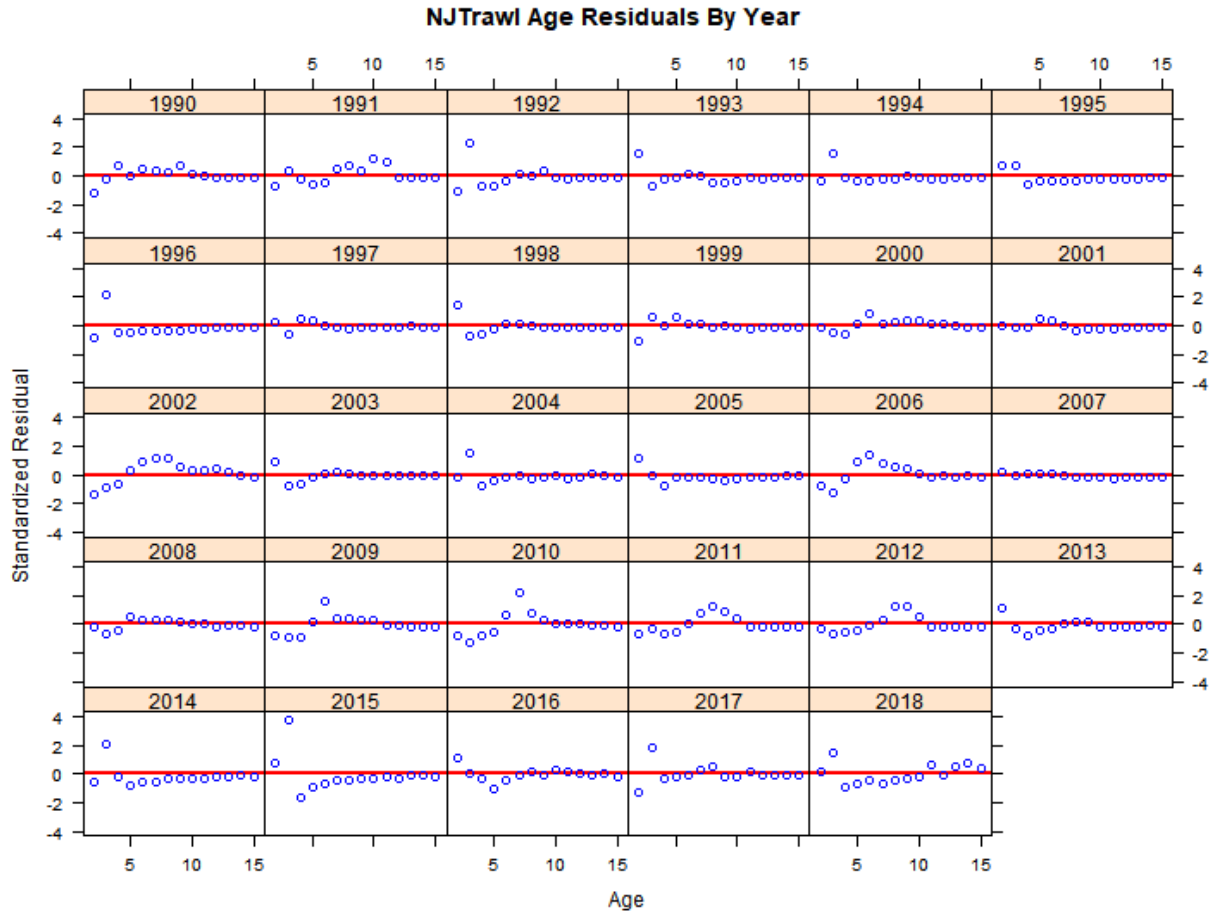
NJTrawl Age Composition By Age

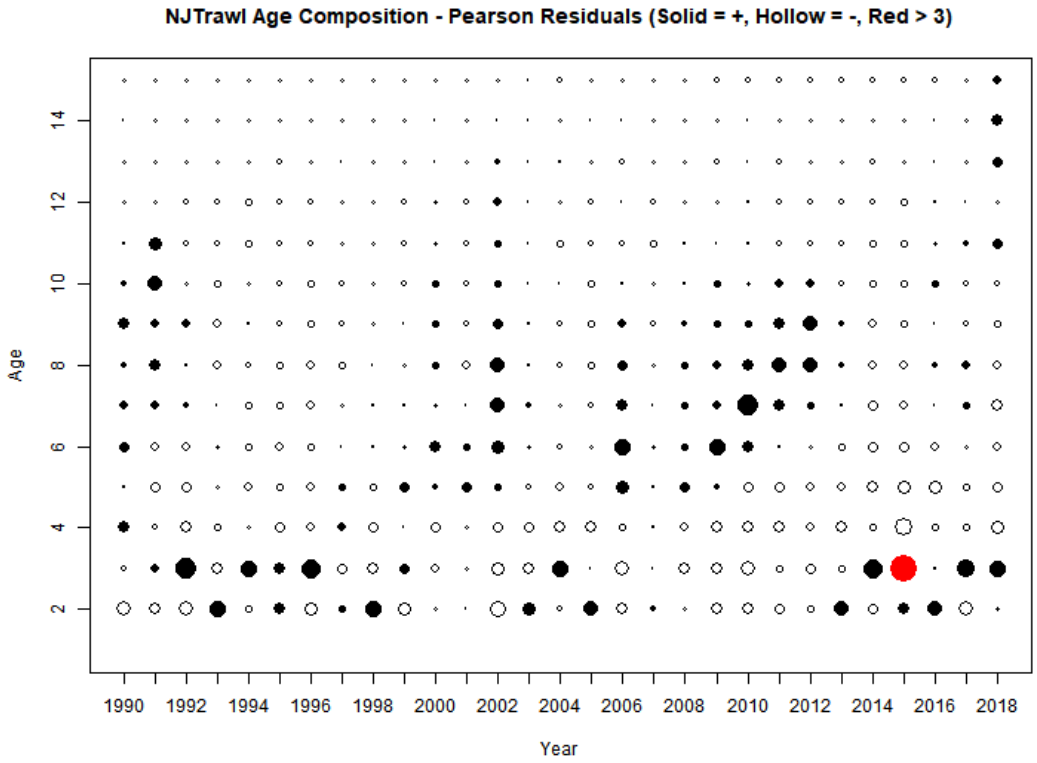


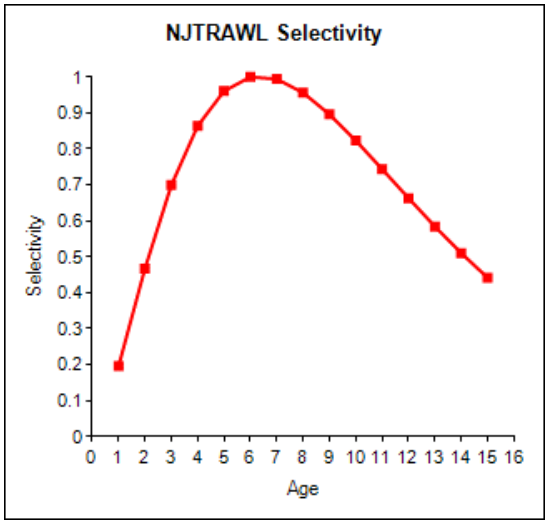
NJTrawl Age Composition By Year

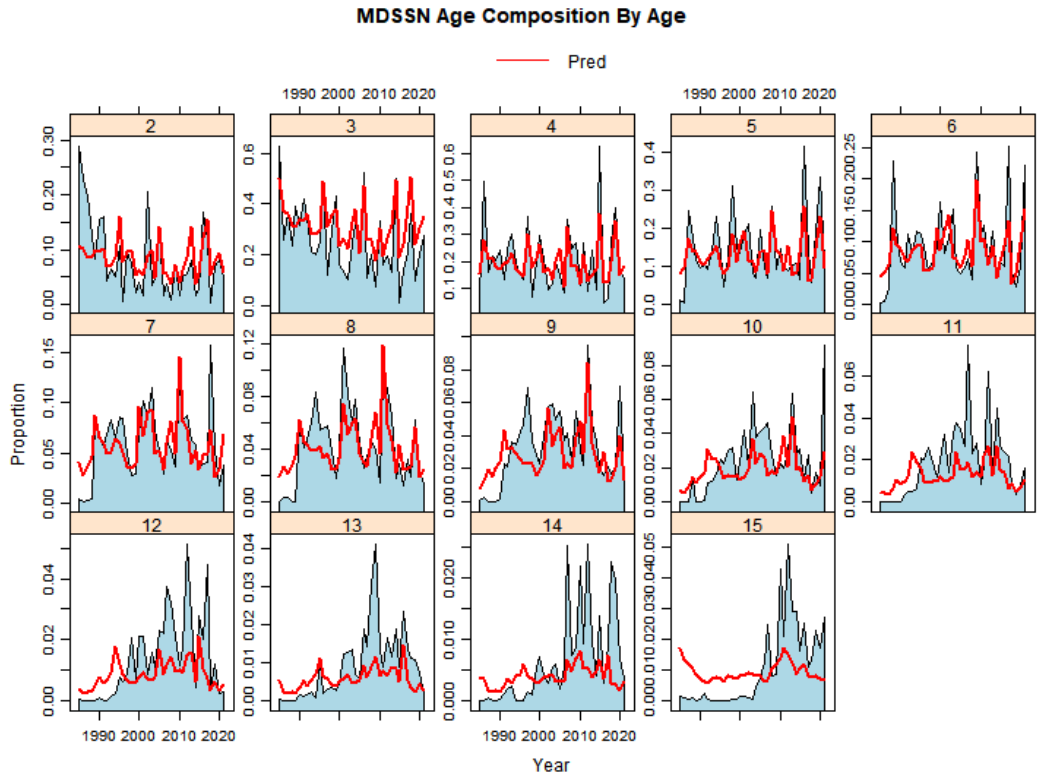


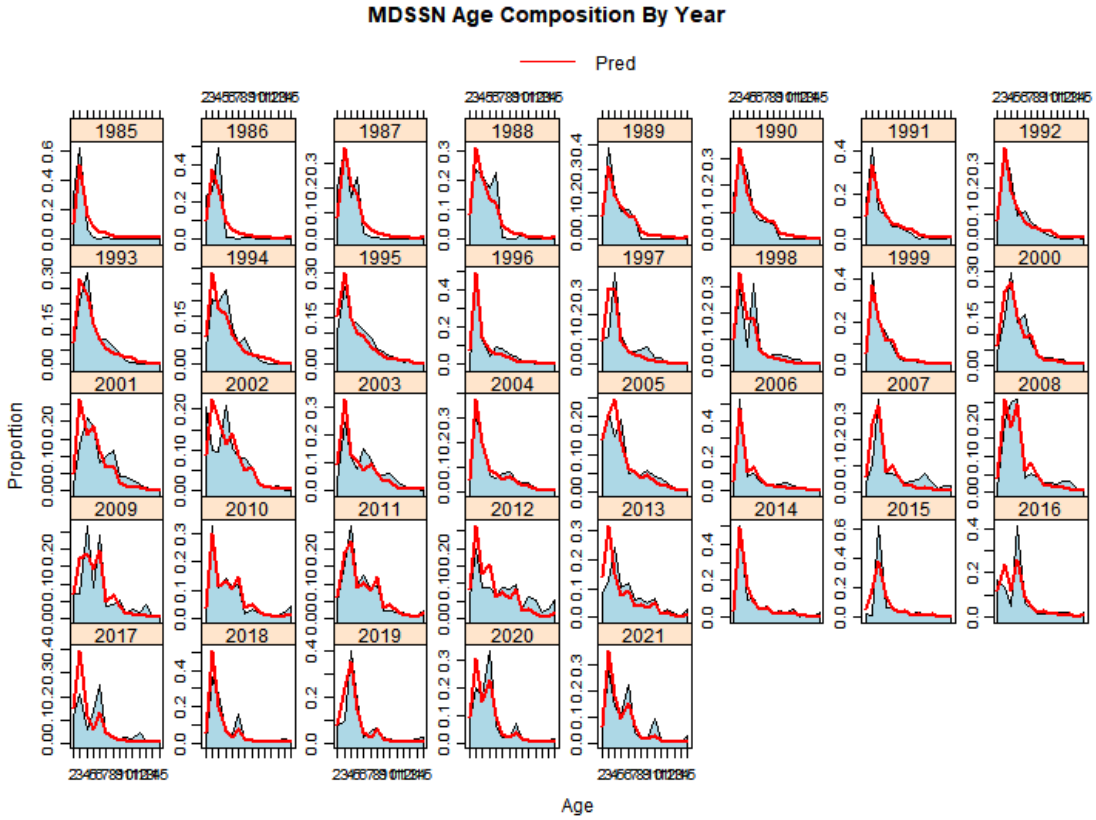

NJTrawl Age Residuals By Age
2
3
4
5
6
7
8
9
10
11
12
13
14
15
1990
2000
2010
Standardized Residual
Year

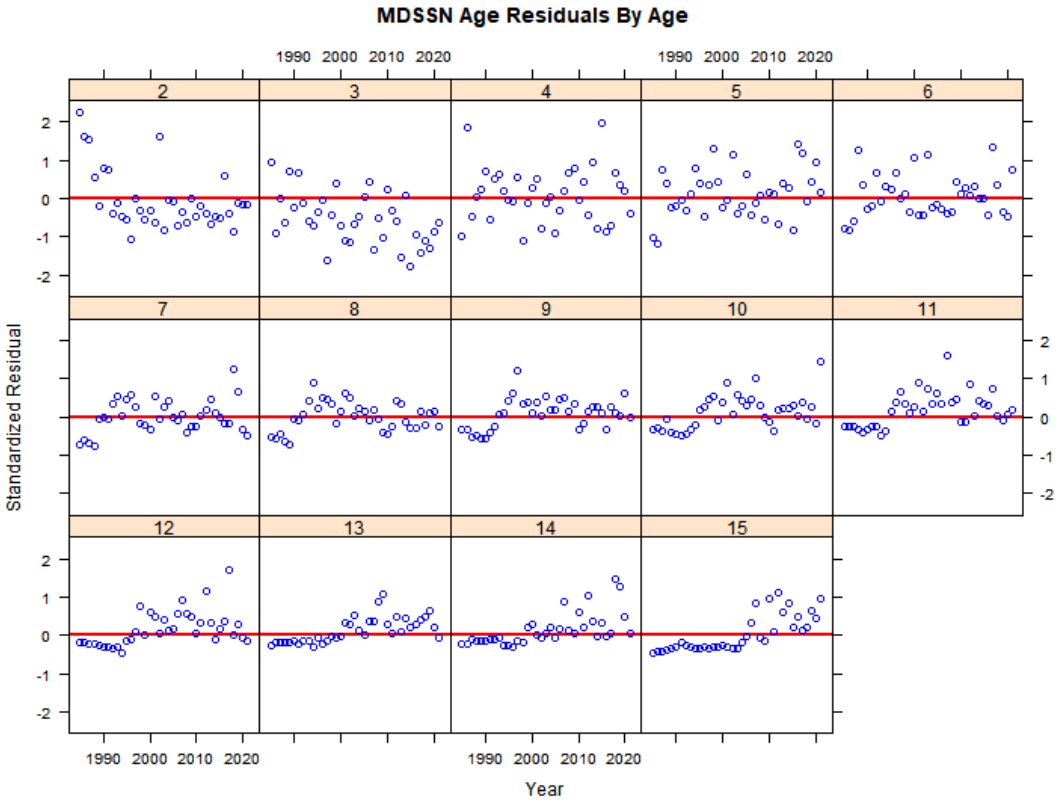

NJTrawl Age Residuals By Year
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
5
10
15
Standardized Residual
Age

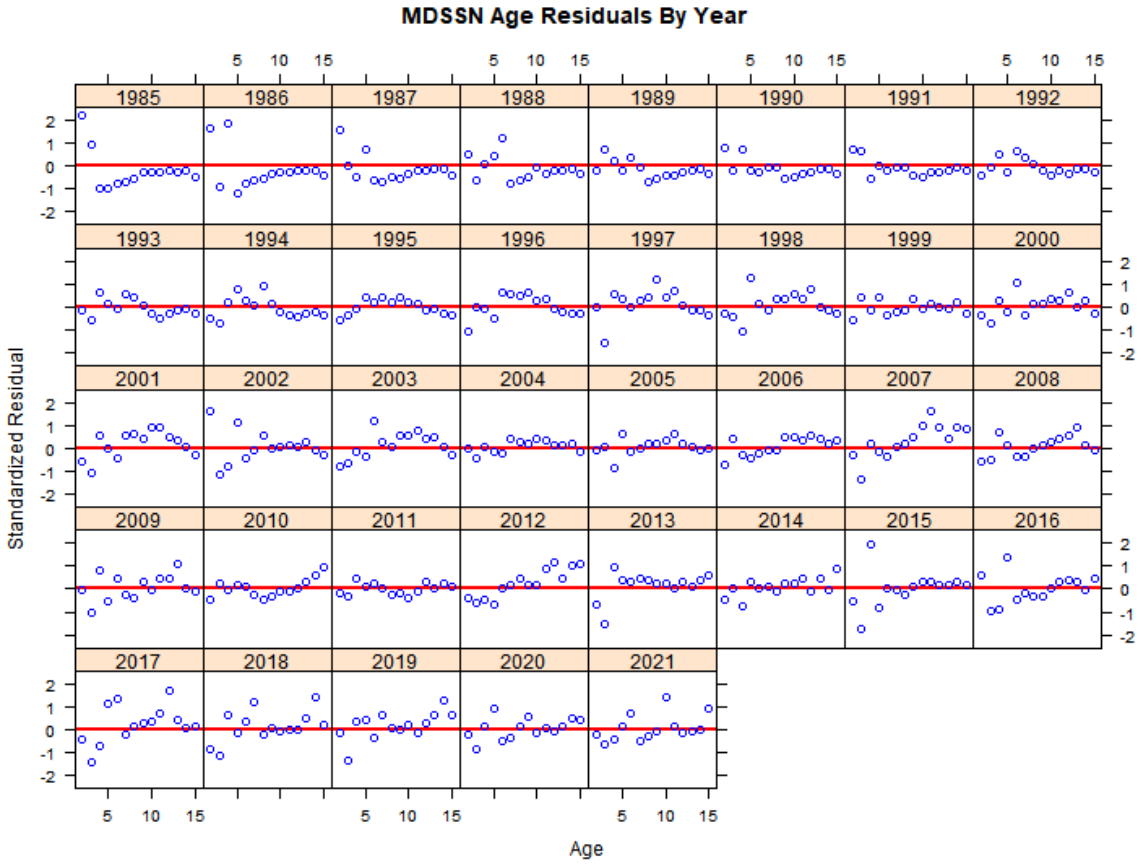

NJTrawl Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)
Age
2
4
6
8
10
12
14
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Year

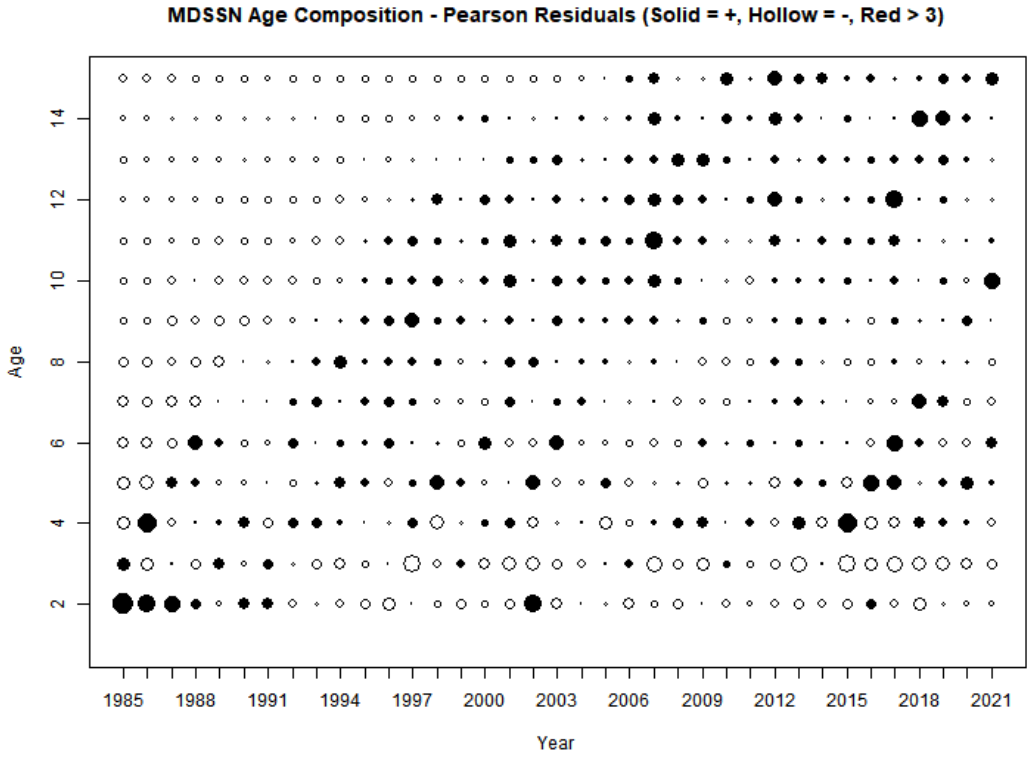

NJTRAWL Selectivity
Selectivity
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Age

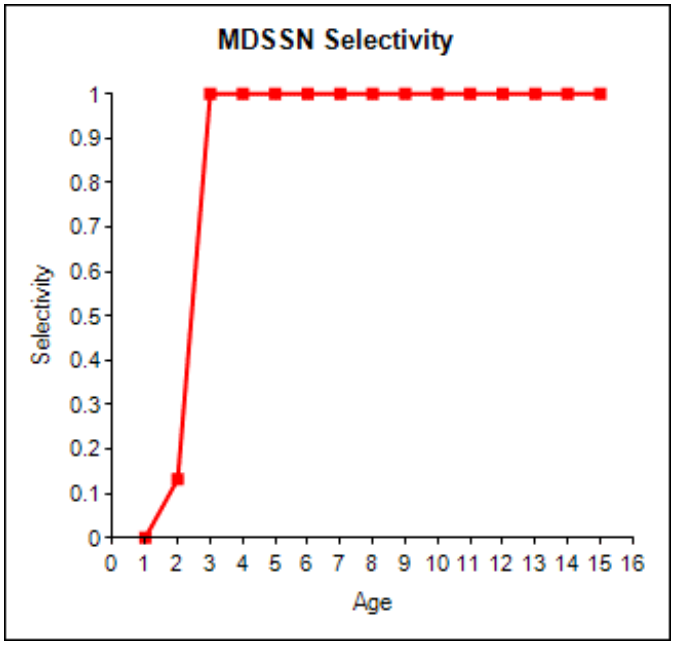

MDSSN Age Composition By Age
Pred
Proportion
Year

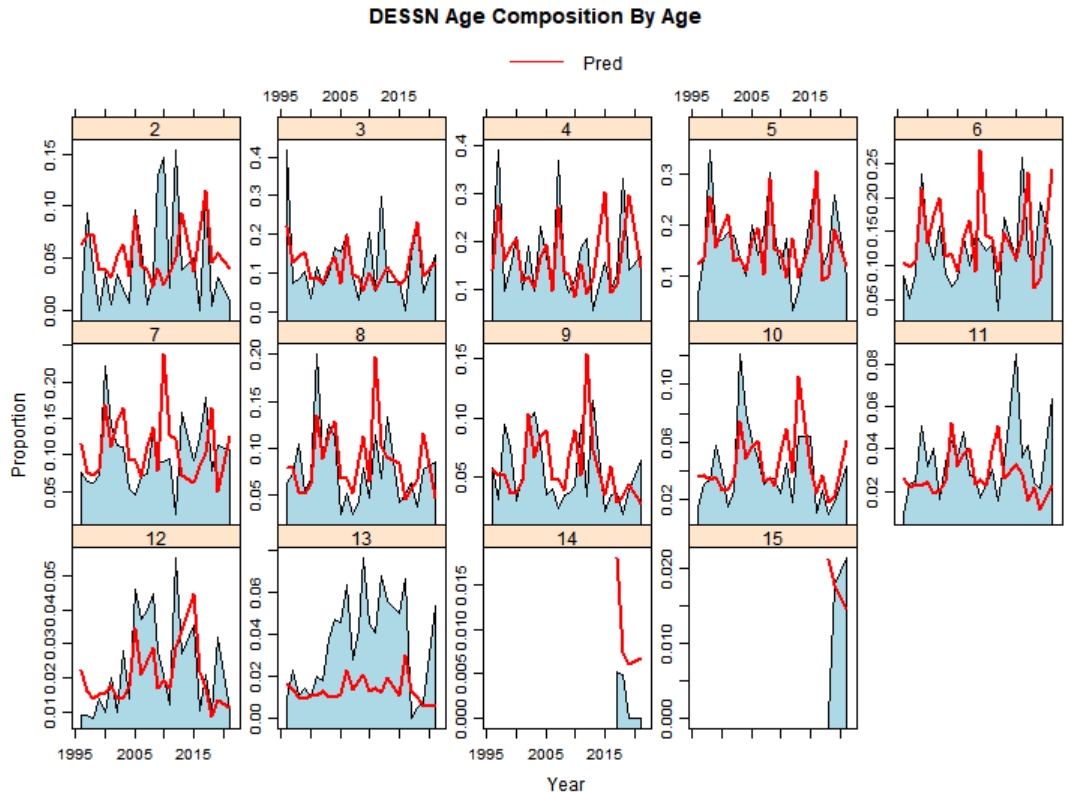

MDSSN Age Composition By Year
Pred
Proportion
Age

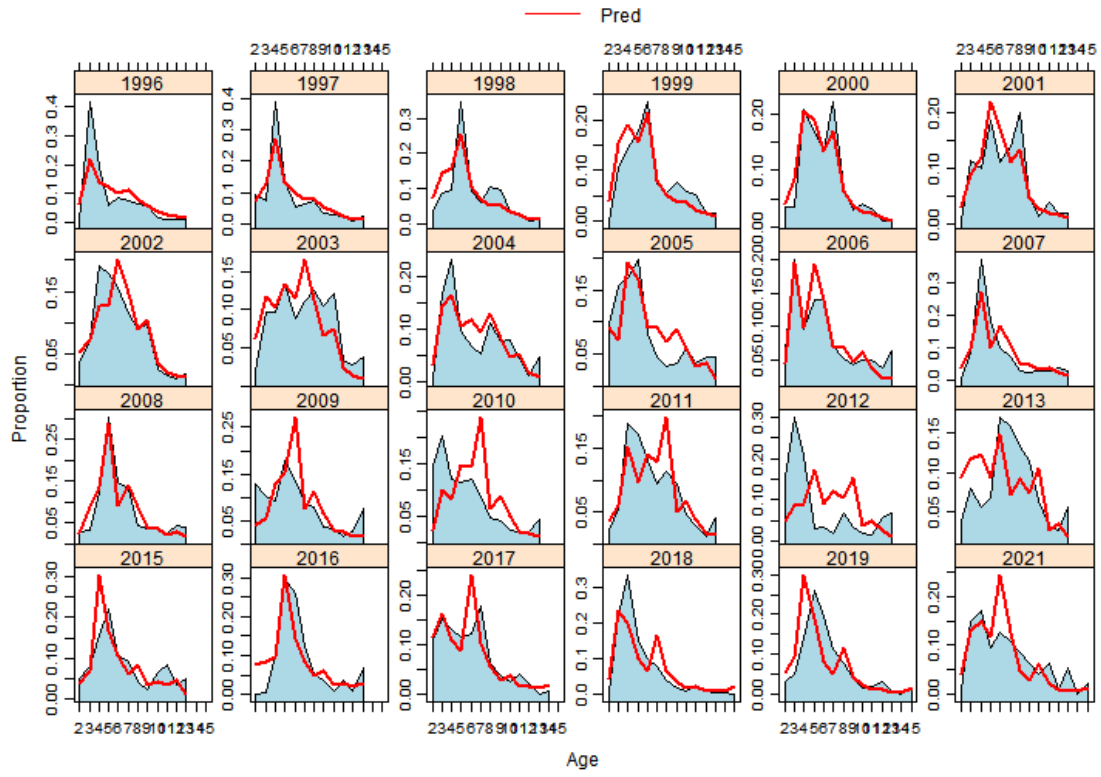

MDSSN Age Residuals By Age
Standardized Residual
Year
2
3
4
5
6
7
8
9
10
11
12
13
14
15

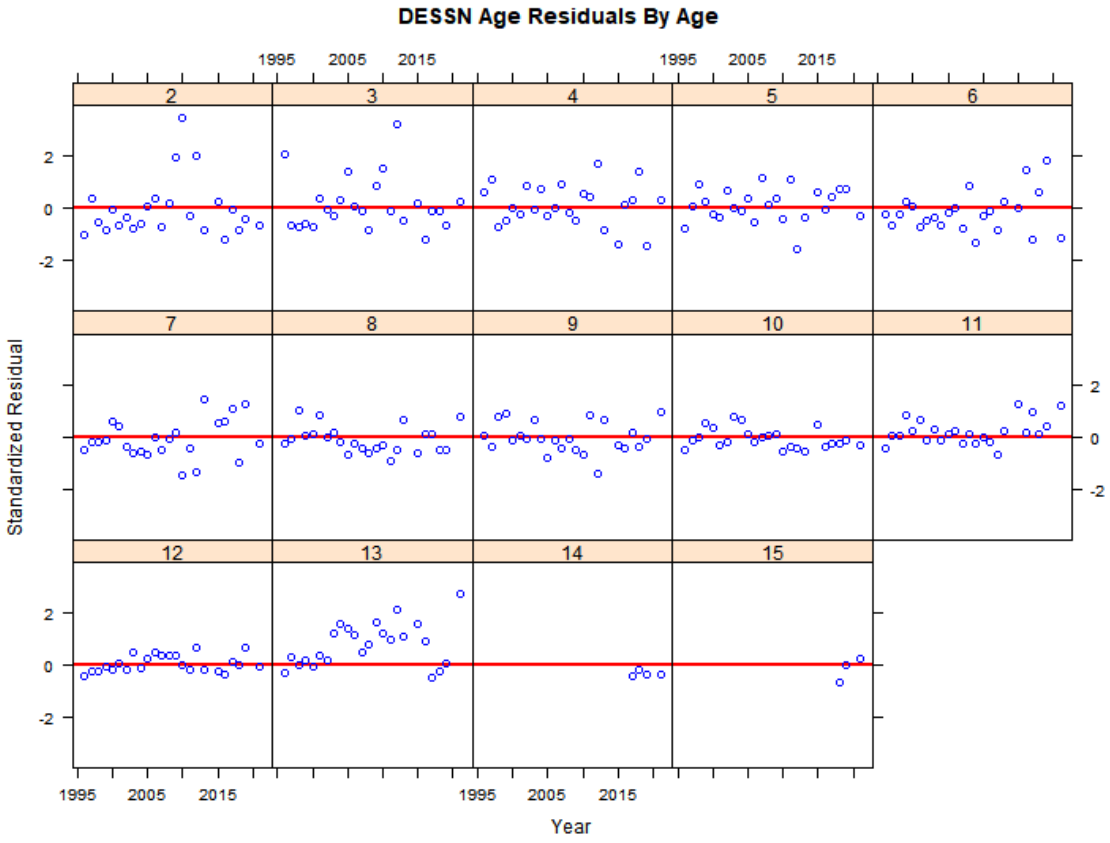

MDSSN Age Residuals By Year
Standardized Residual
Age
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021

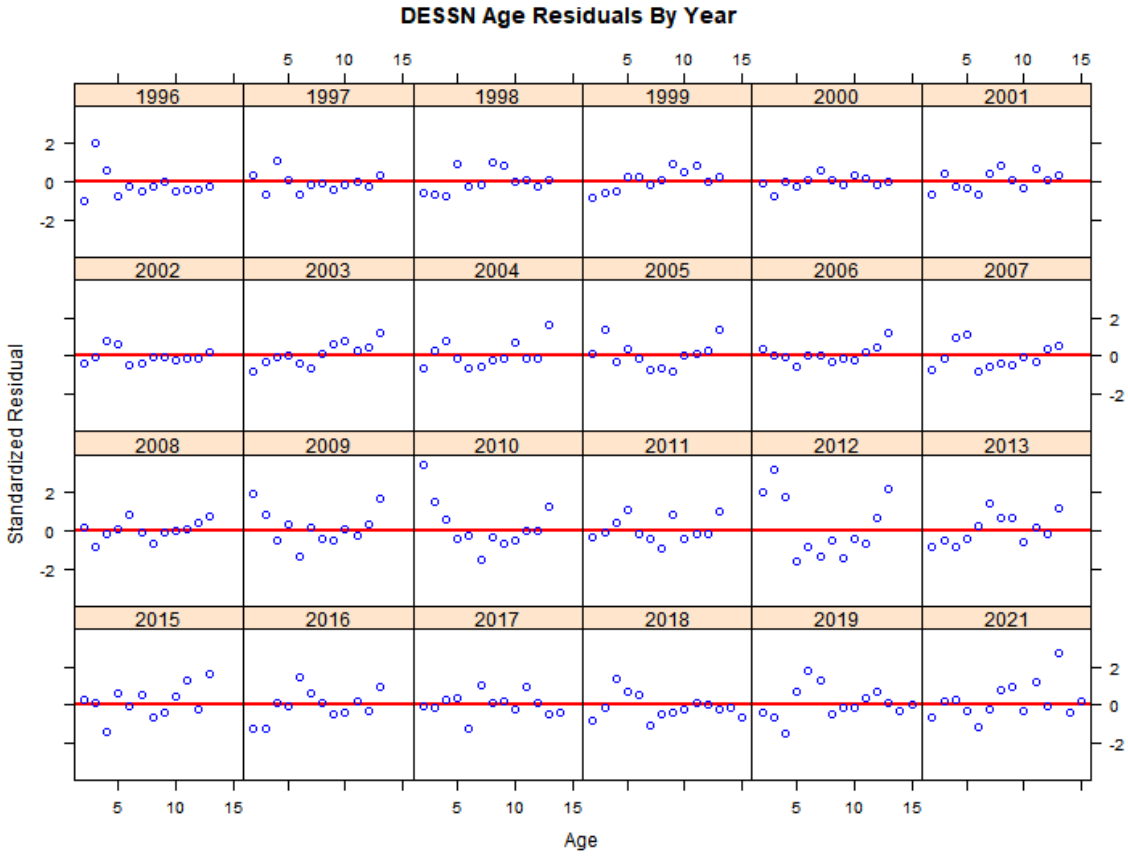

MDSSN Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)
Age
2
4
6
8
10
12
14
1985
1988
1991
1994
1997
2000
2003
2006
2009
2012
2015
2018
2021
Year

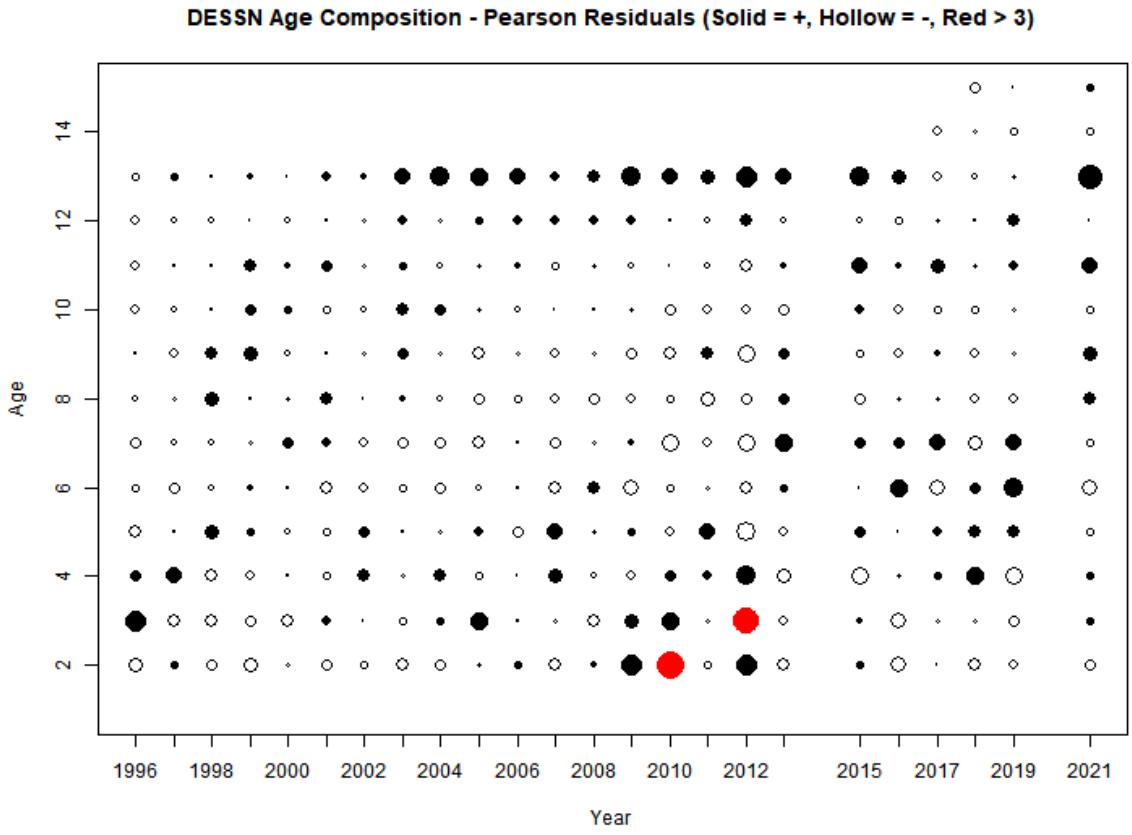

MDSSN Selectivity
Selectivity
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Age

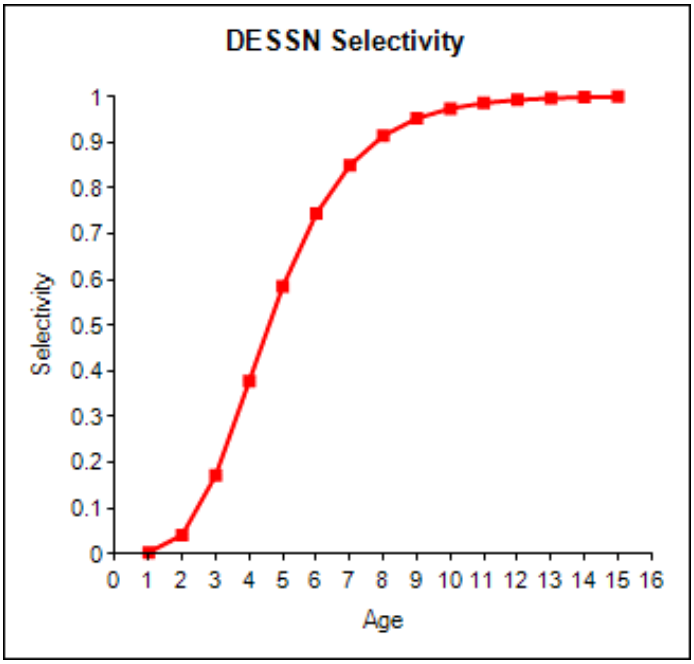

DESSN Age Composition By Age
Pred
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Proportion
Year
1995
2005
2015


DESSN Age Composition By Year
Pred
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2015
2016
2017
2018
2019
2021
Proportion
Age

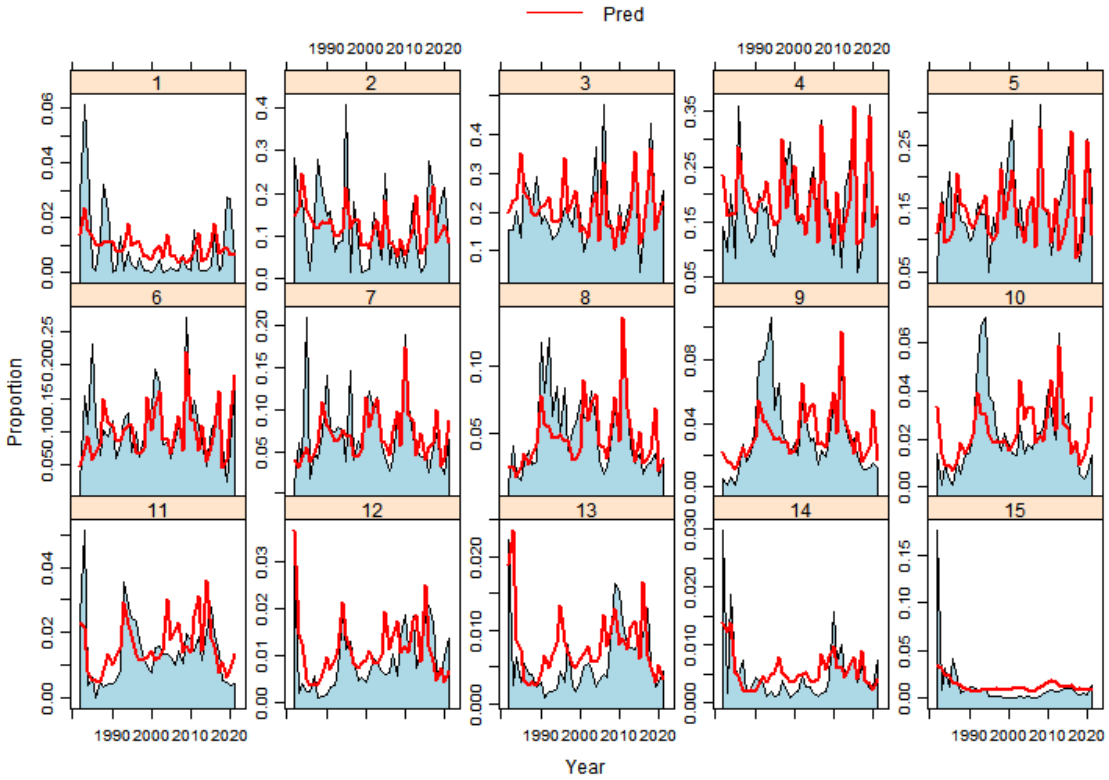

DESSN Age Residuals By Age
2
3
4
5
6
7
8
9
10
11
12
13
14
15
1995
2005
2015
Standardized Residual
Year


DESSN Age Residuals By Year
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2015
2016
2017
2018
2019
2021
5
10
15
Standardized Residual
Age

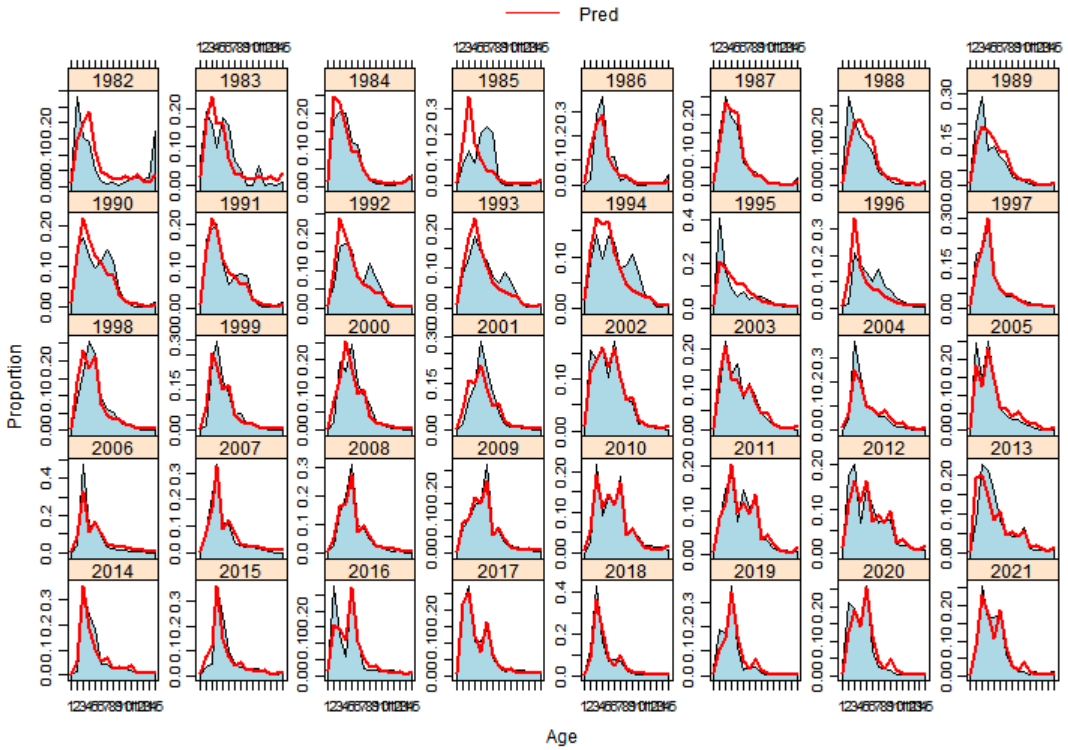

DESSN Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)
Age
2
4
6
8
10
12
14
1996
1998
2000
2002
2004
2006
2008
2010
2012
2015
2017
2019
2021
Year


DESSN Selectivity
Selectivity
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Age

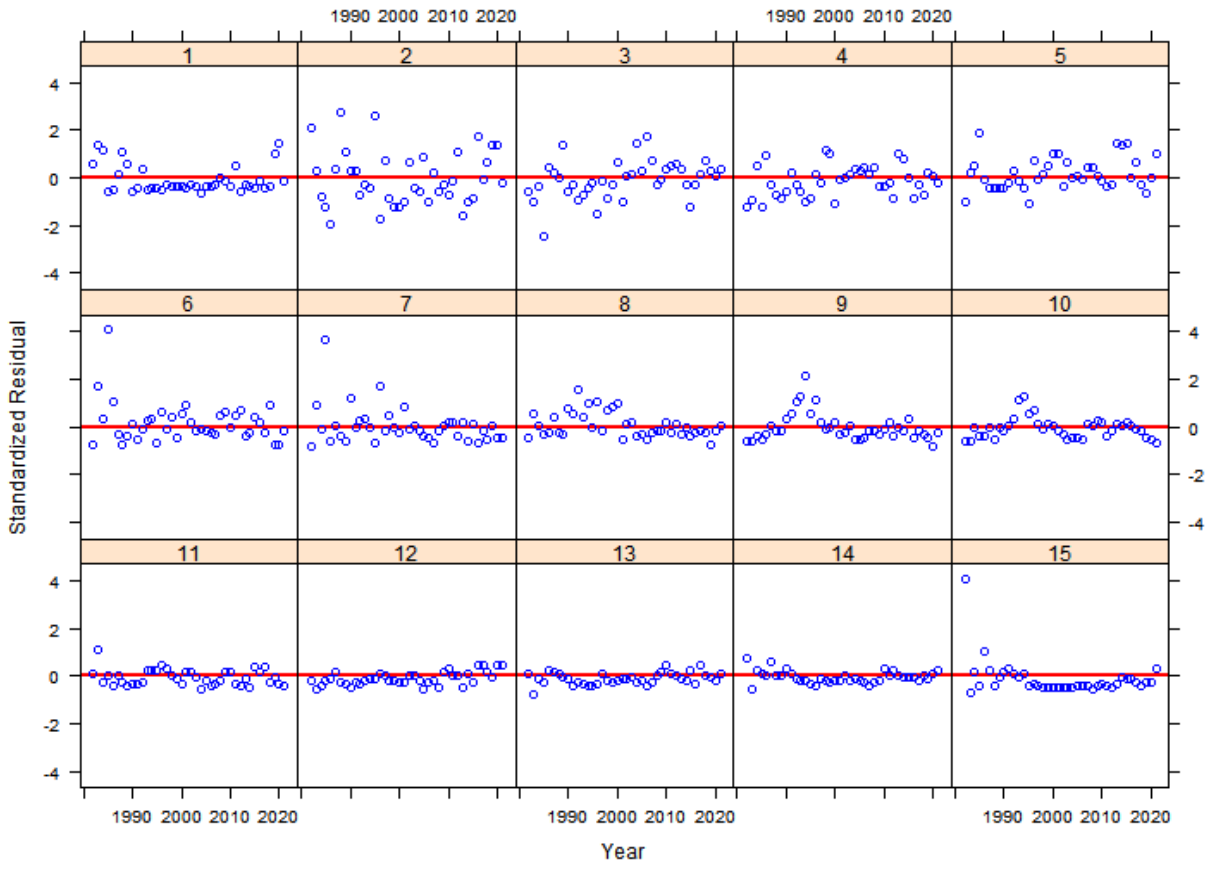
MRIP Age Composition By Age



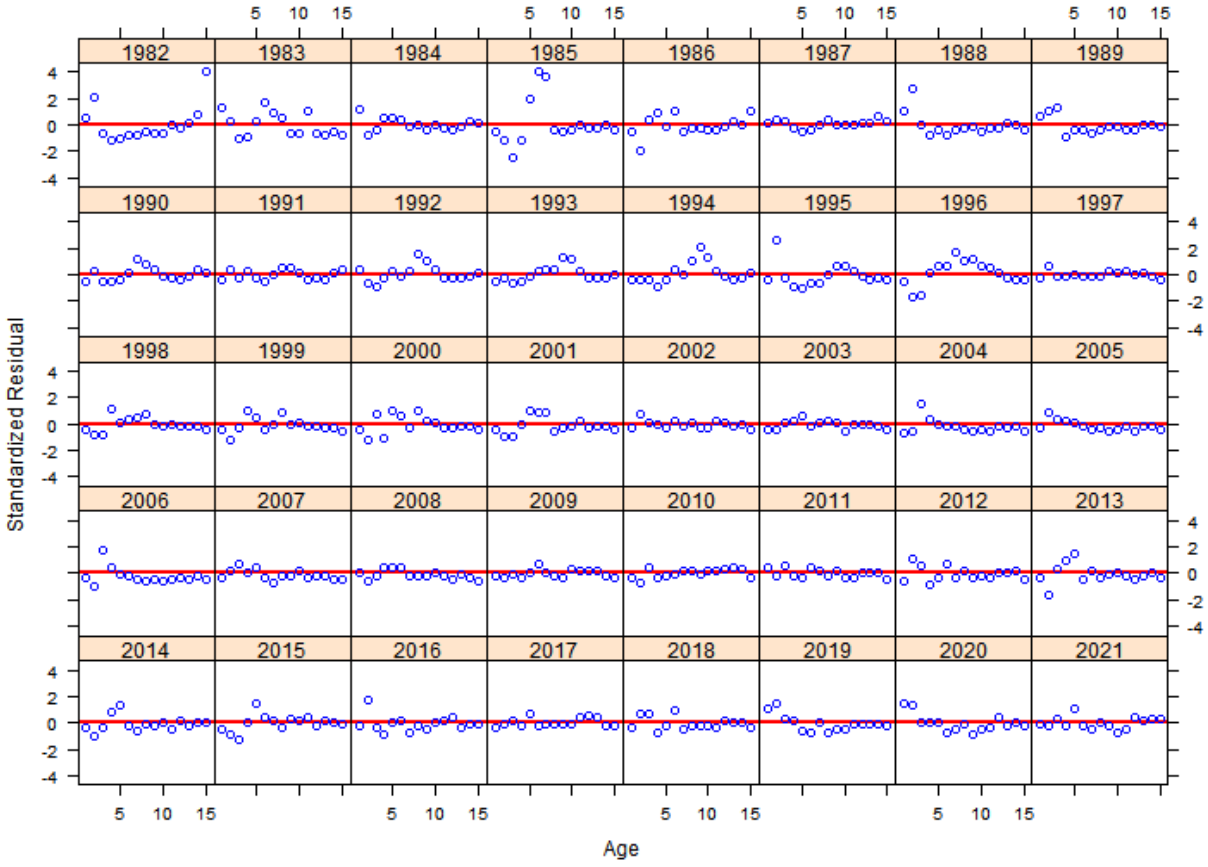
MRIP Age Composition By Year

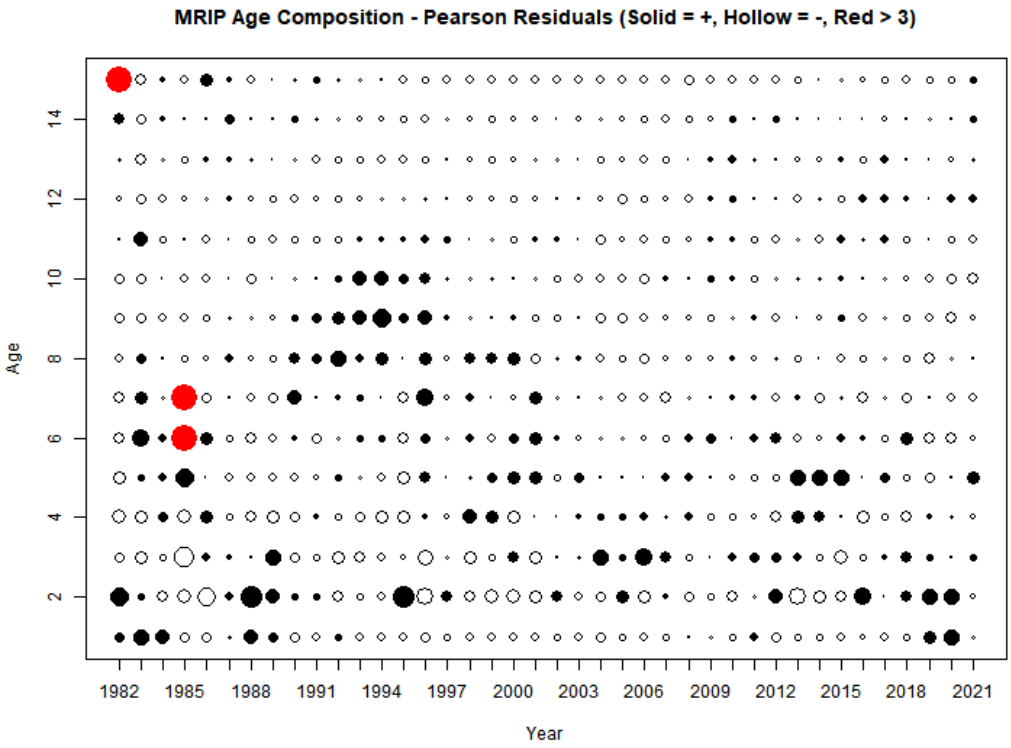


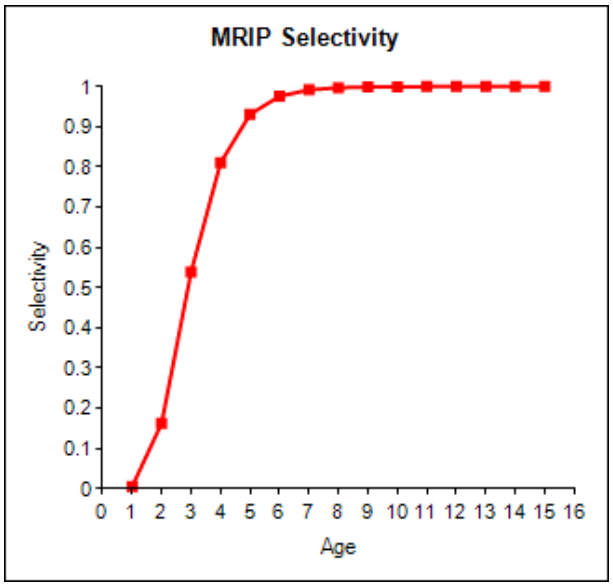
MRIP Age Residuals By Age

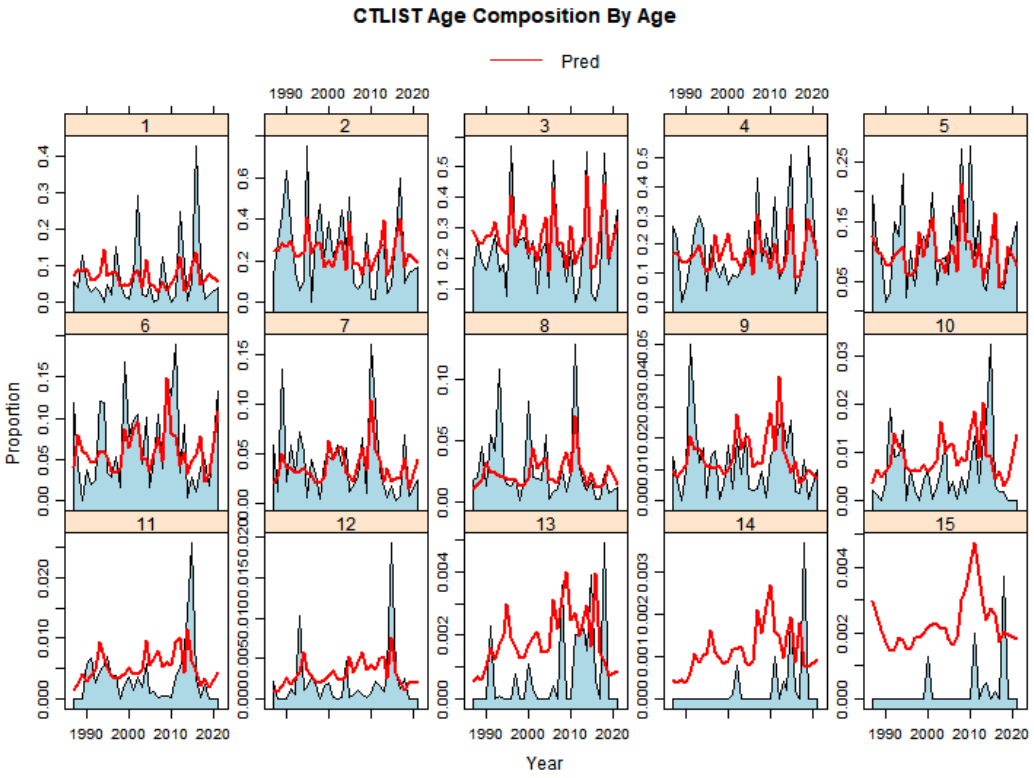


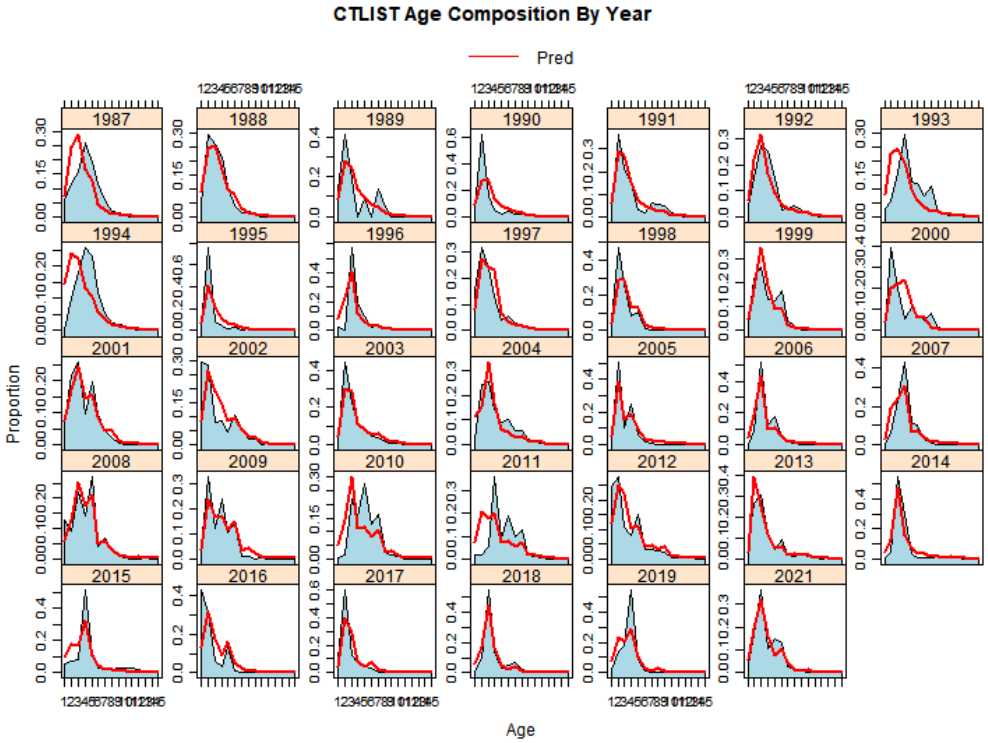
MRIP Age Residuals By Year

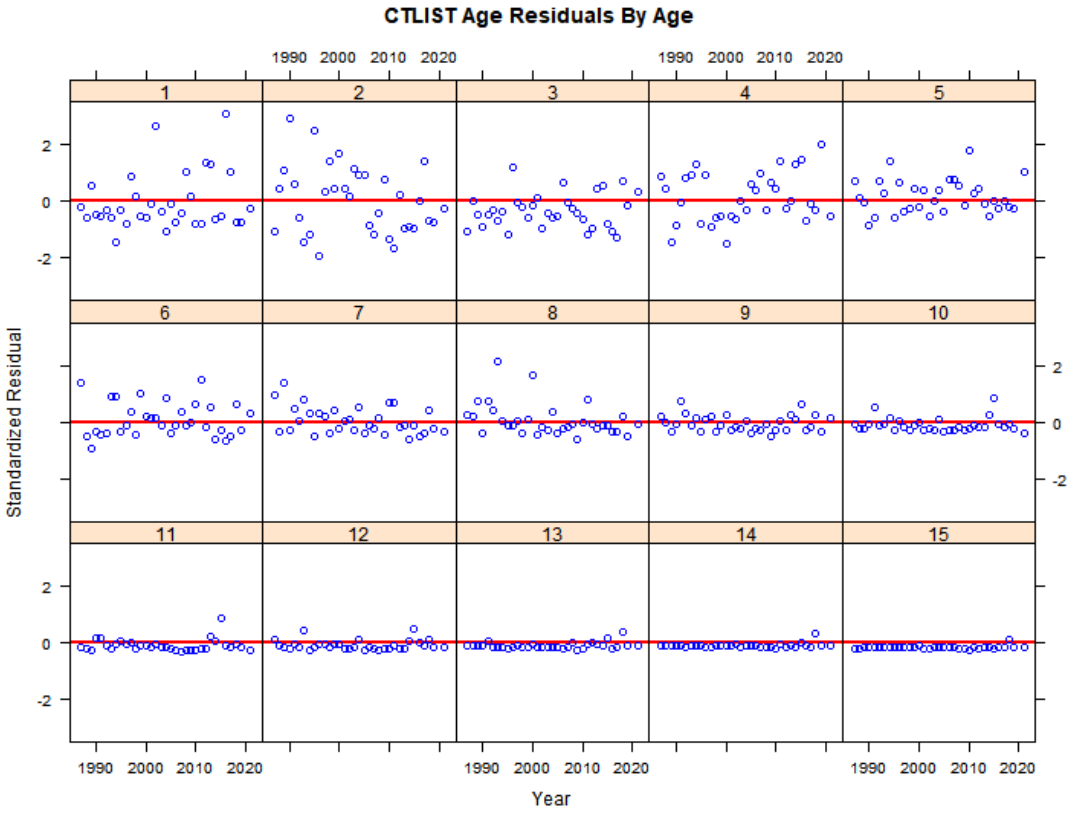


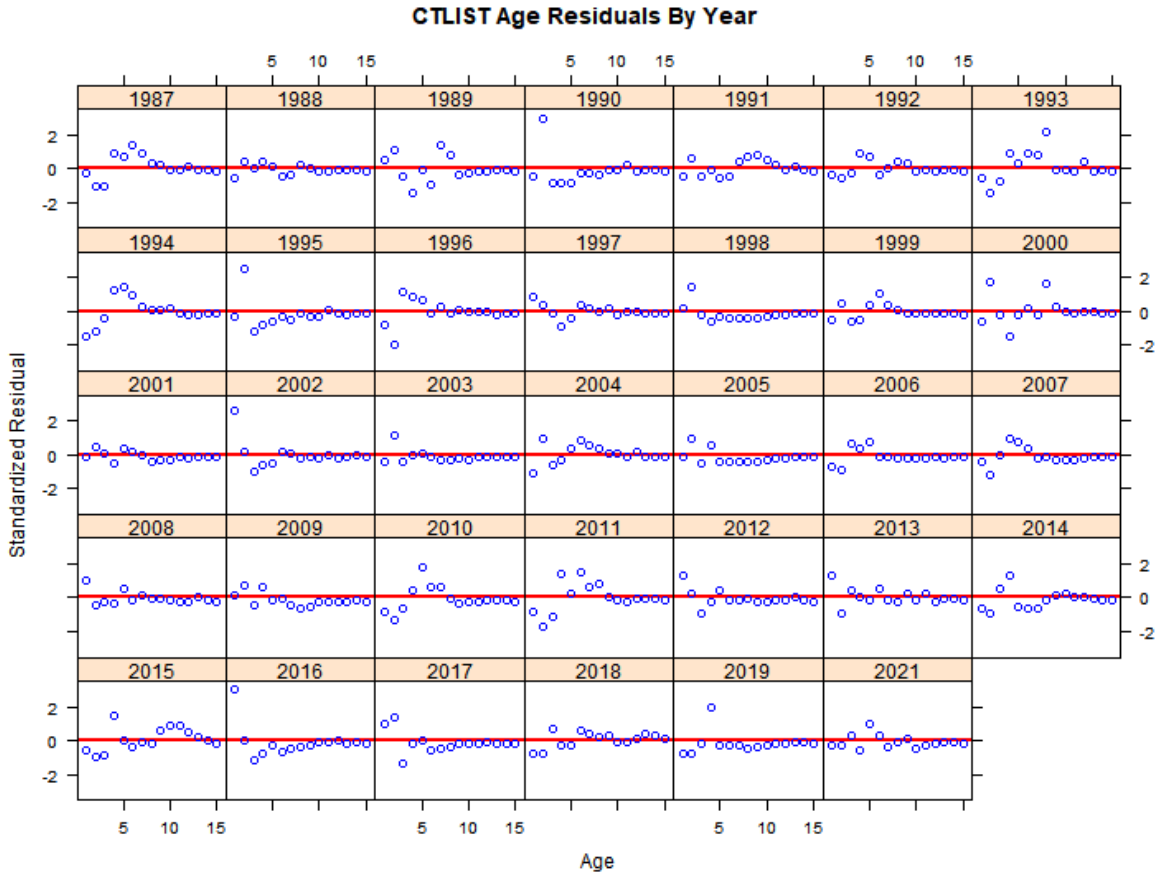

MRIP Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)
Age
2
4
6
8
10
12
14
1982
1985
1988
1991
1994
1997
2000
2003
2006
2009
2012
2015
2018
2021
Year

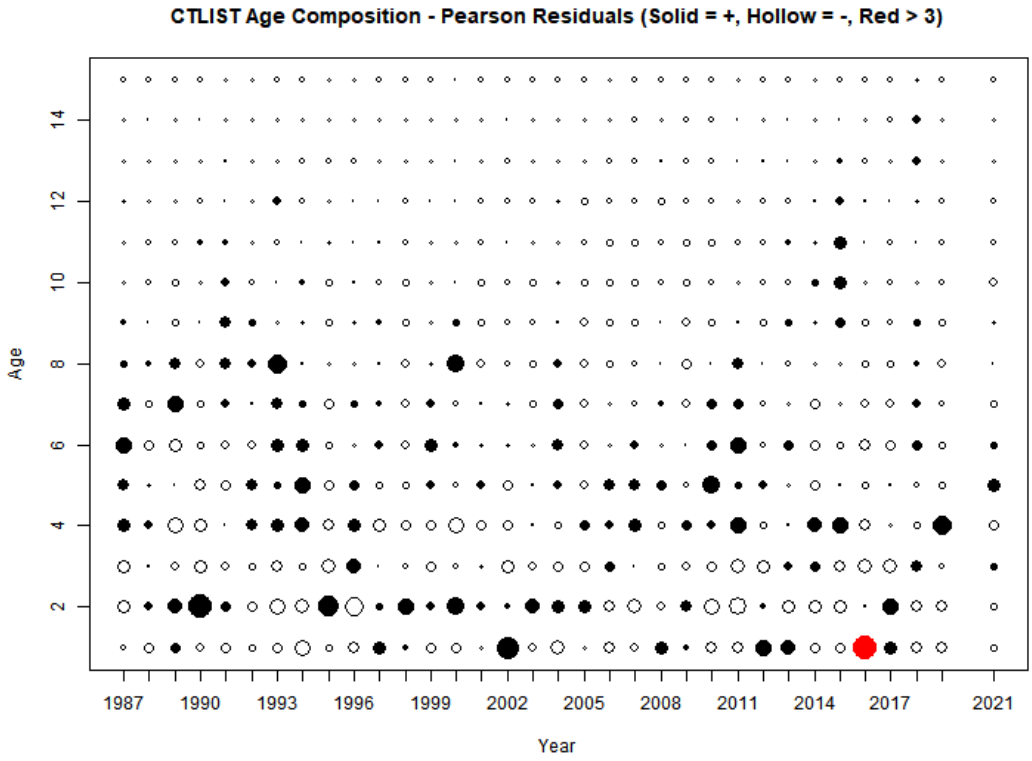

MRIP Selectivity
Selectivity
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Age

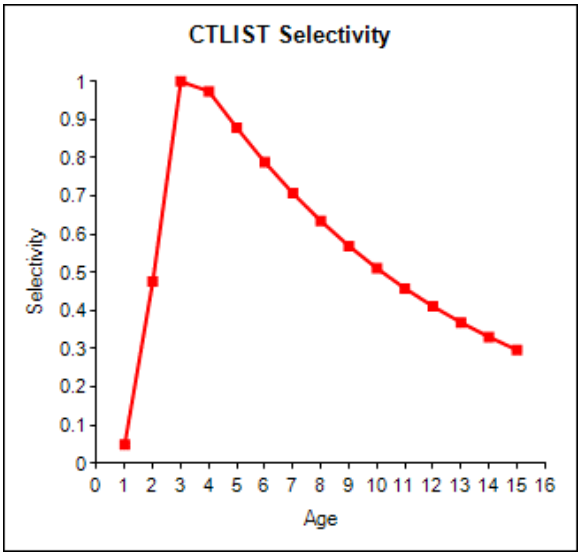

CTLIST Age Composition By Age
Pred
Proportion
Year

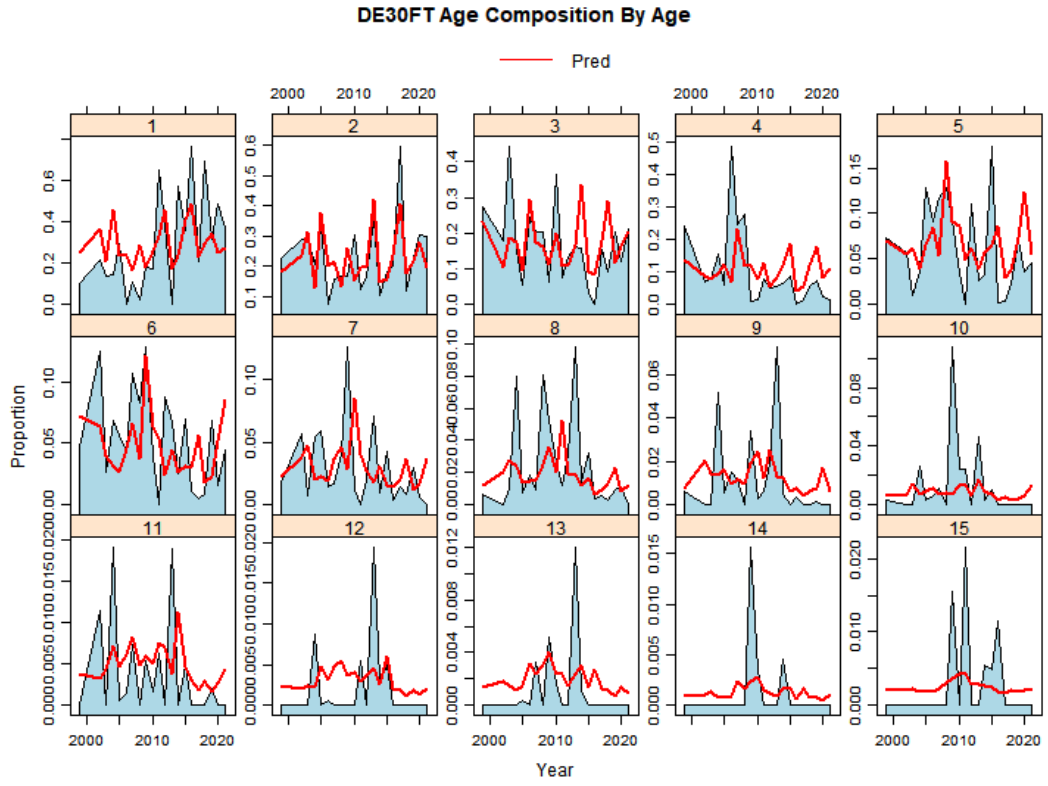

CTLIST Age Composition By Year
Pred
Proportion
Age

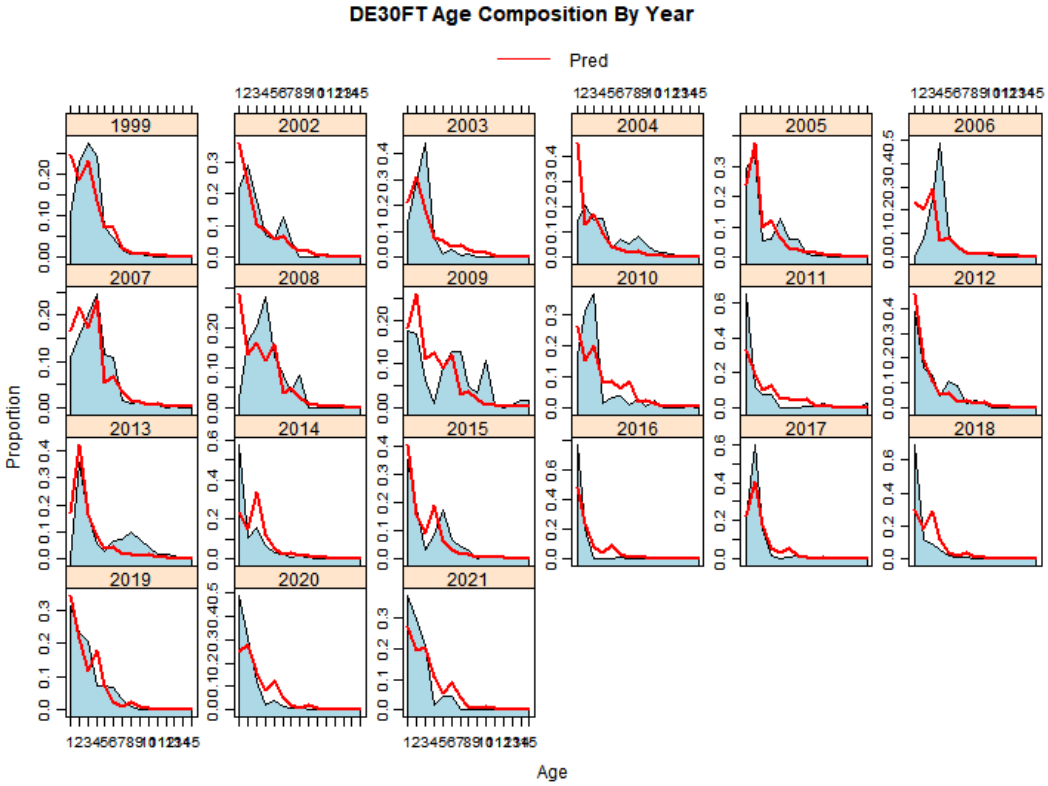

CTLIST Age Residuals By Age
Standardized Residual
Year
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
1990 2000 2010 2020

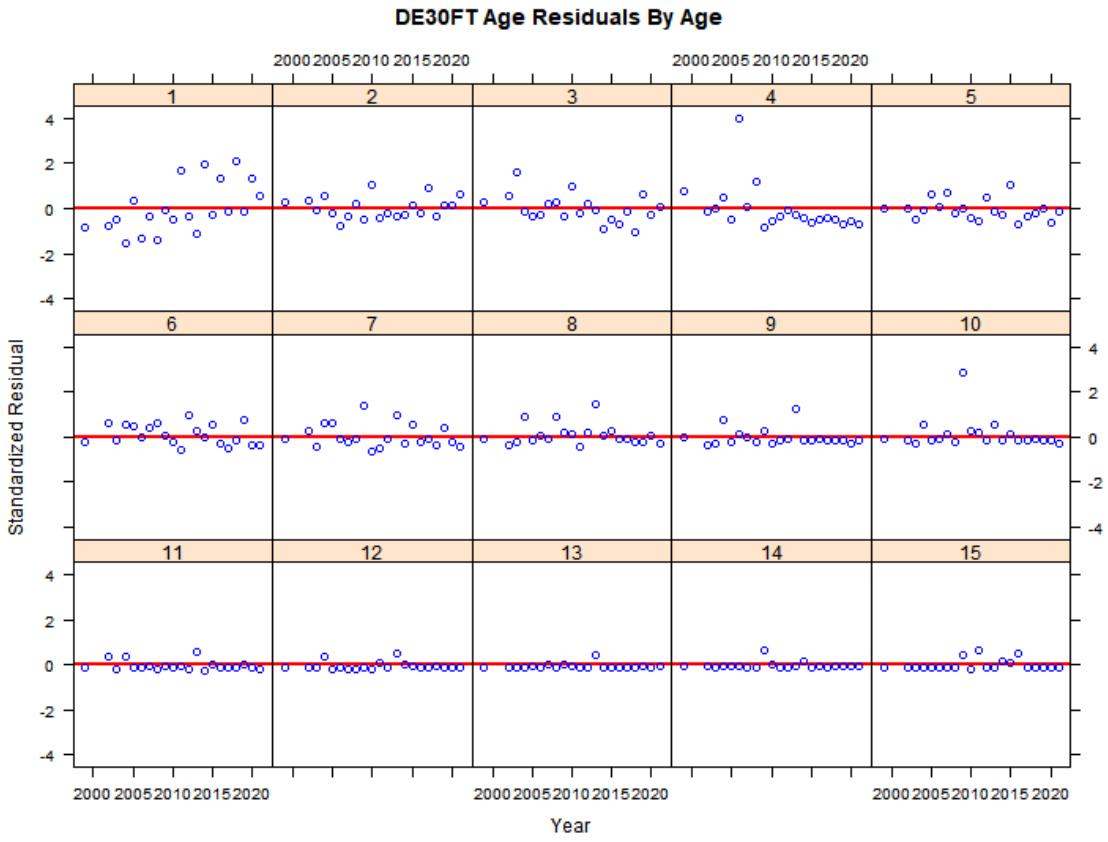

CTLIST Age Residuals By Year
Standardized Residual
Age
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2021
5 10 15

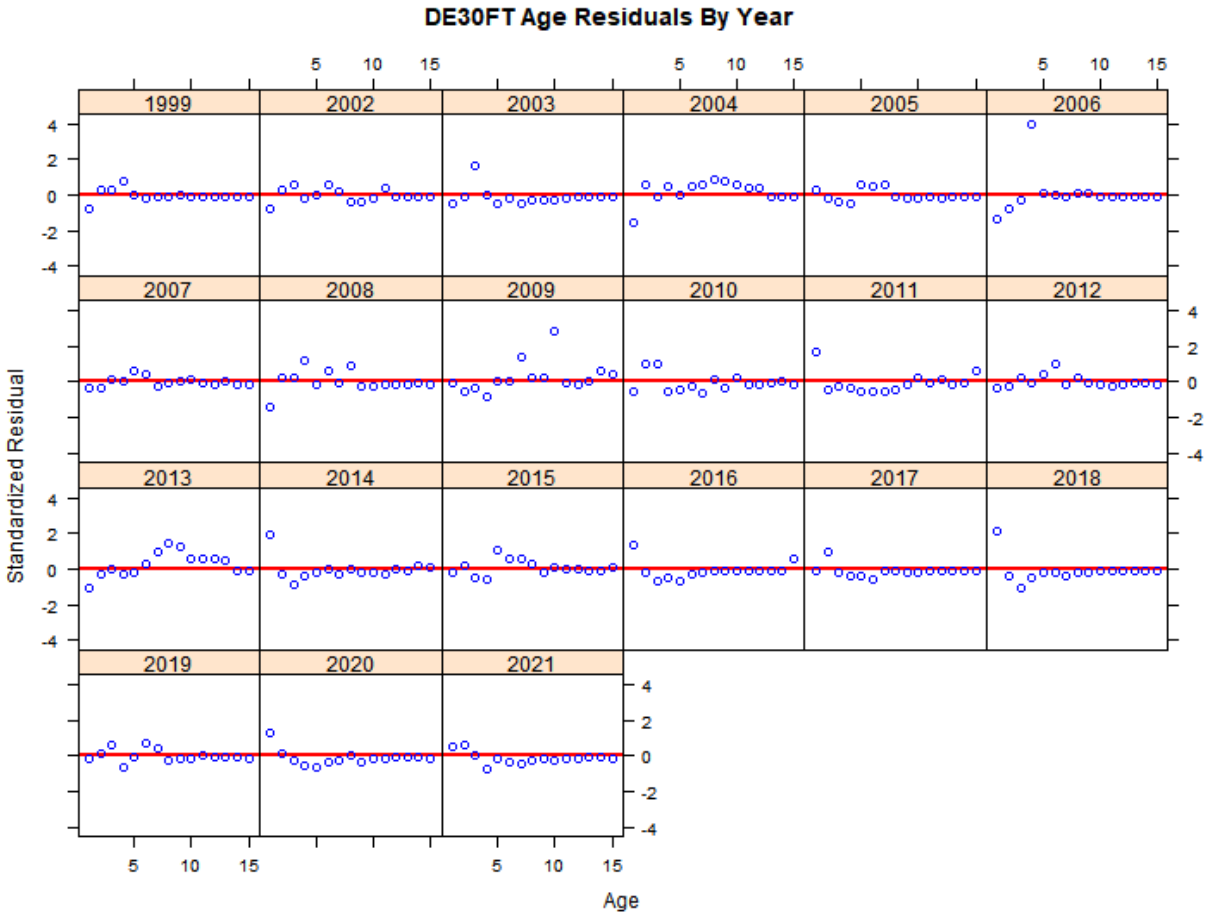

CTLIST Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)
Age
2
4
6
8
10
12
14
1987
1990
1993
1996
1999
2002
2005
2008
2011
2014
2017
2021
Year


CTLIST Selectivity
Selectivity
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Age

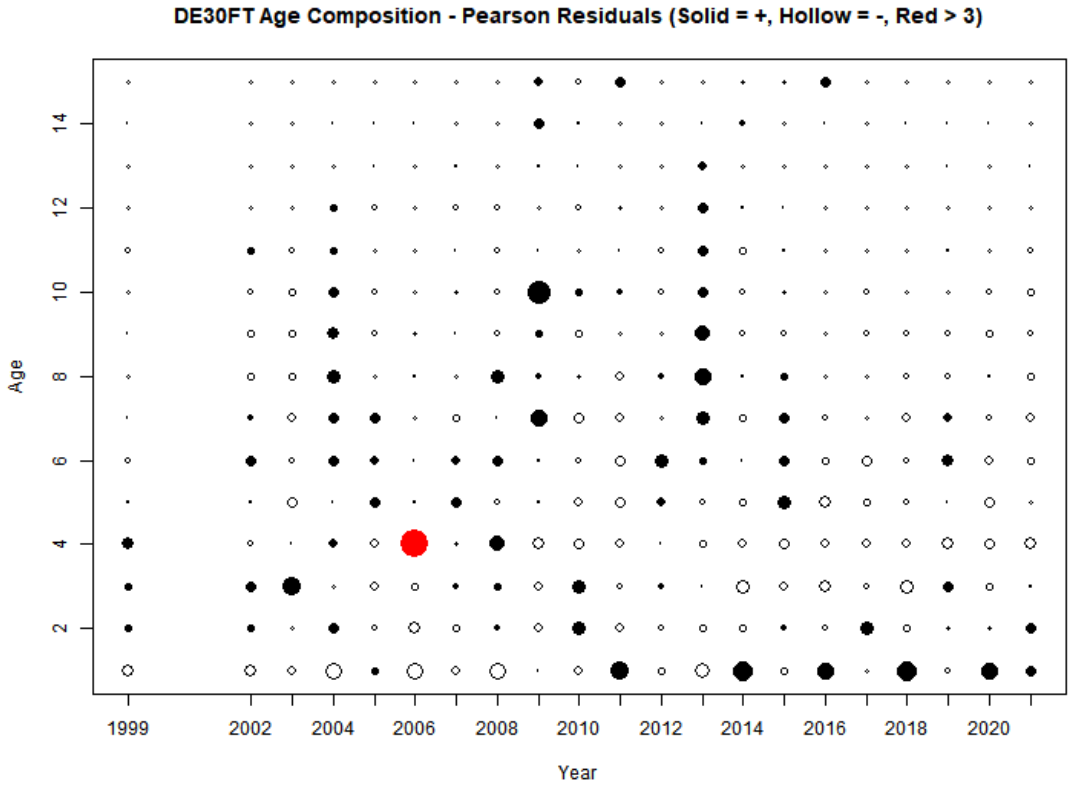

DE30FT Age Composition By Age
Pred
Proportion
Year

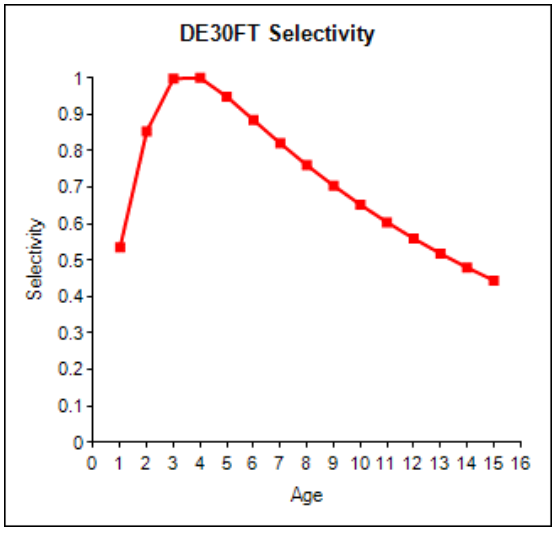

DE30FT Age Composition By Year
Pred
Proportion
Age

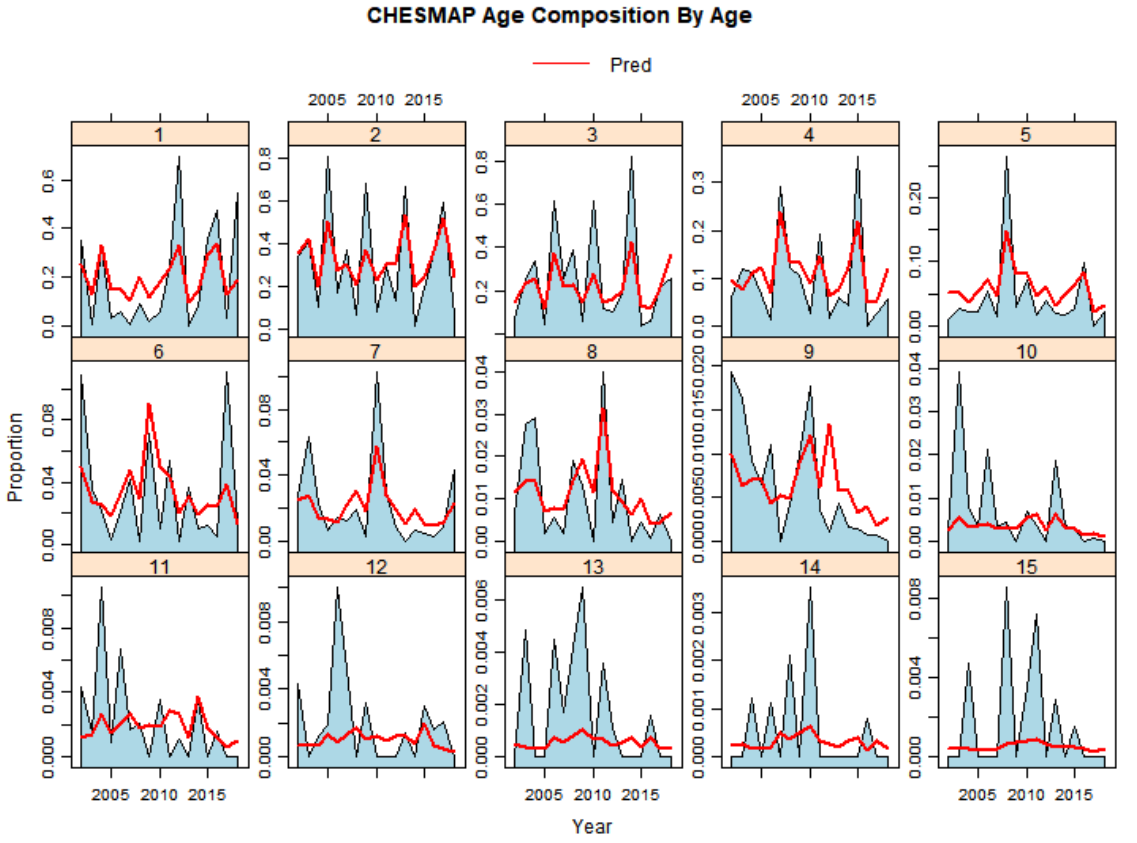


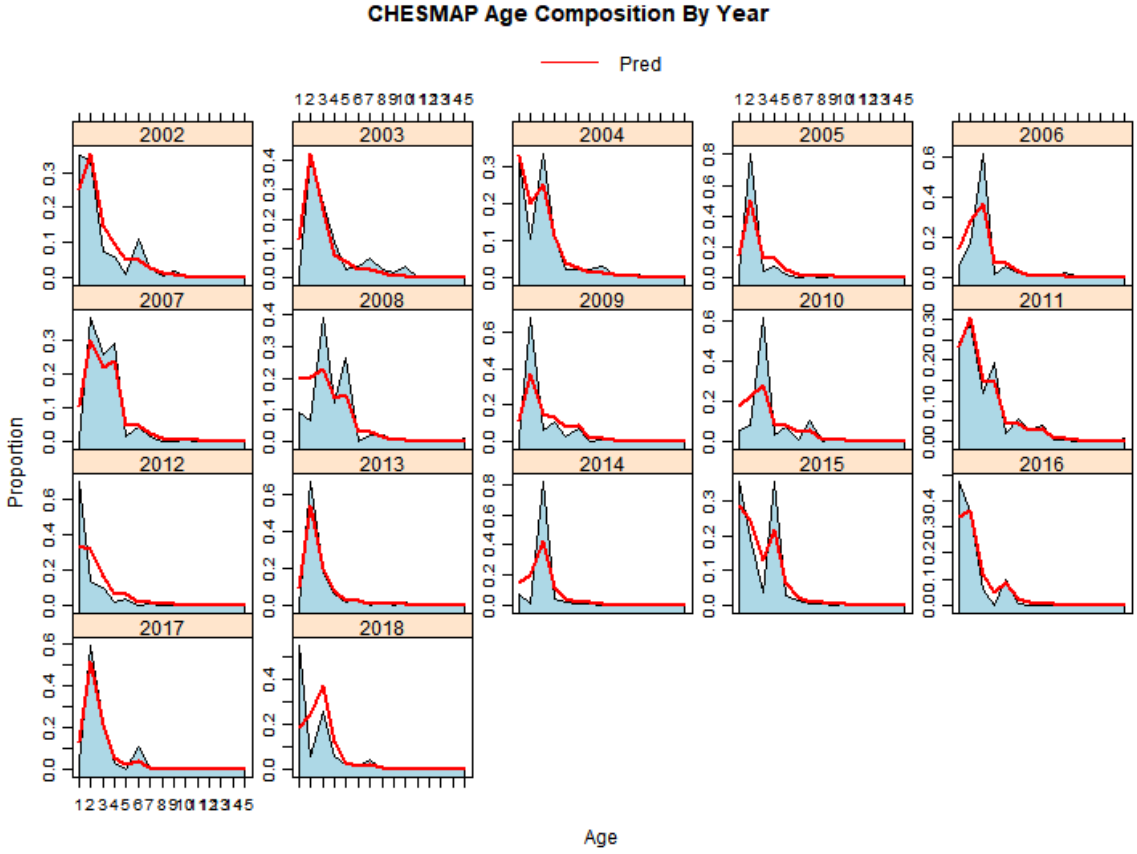


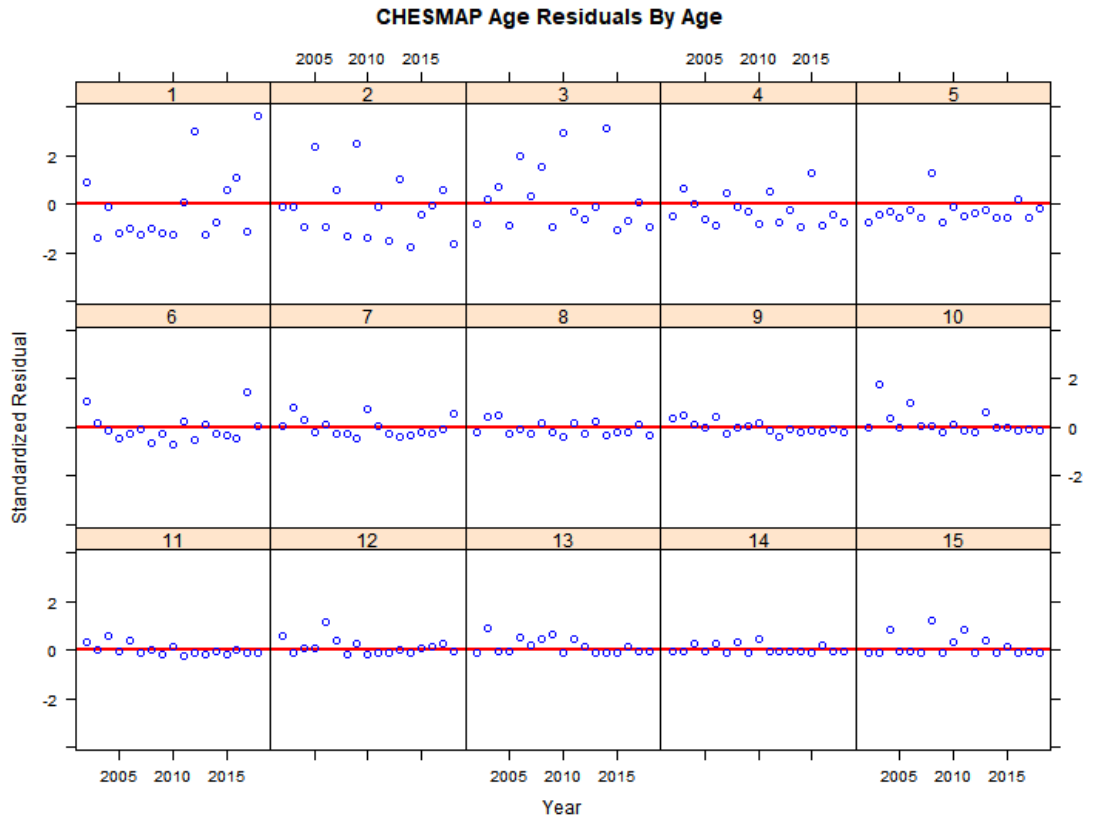
Draft for Board Review

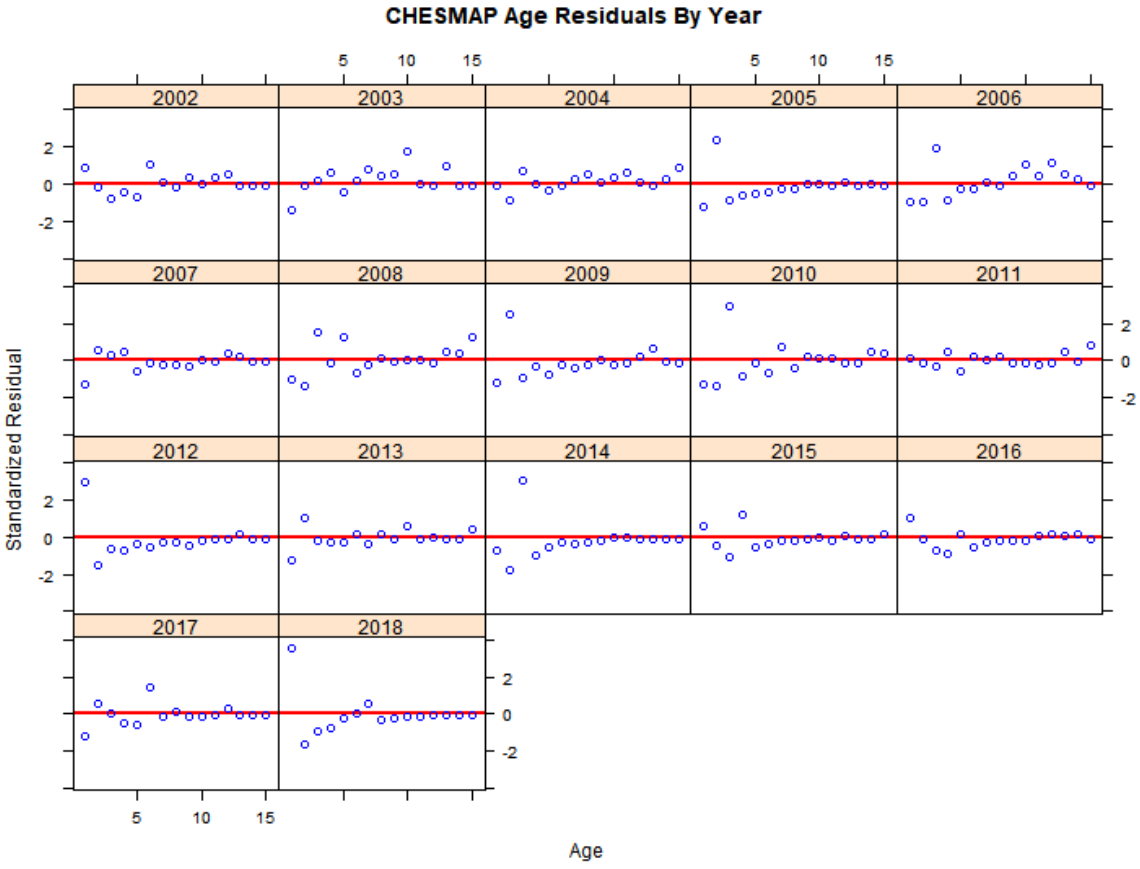

DE30FT Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)
Age
2
4
6
8
10
12
14
1999
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Year

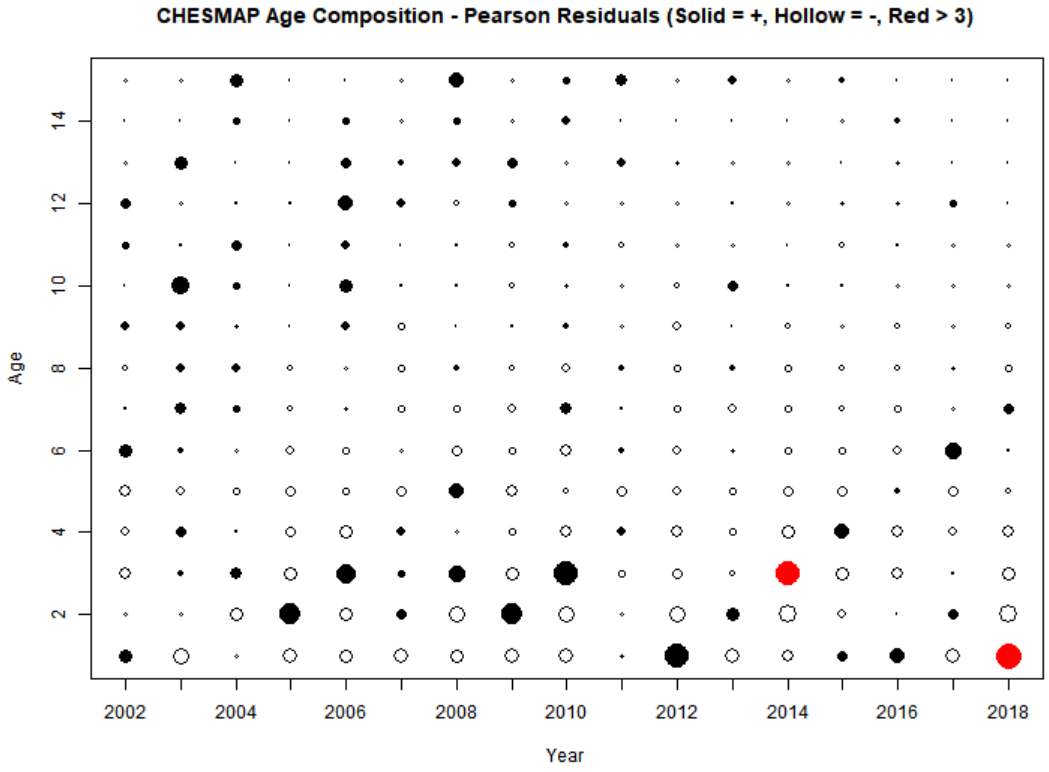

DE30FT Selectivity
Selectivity
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Age

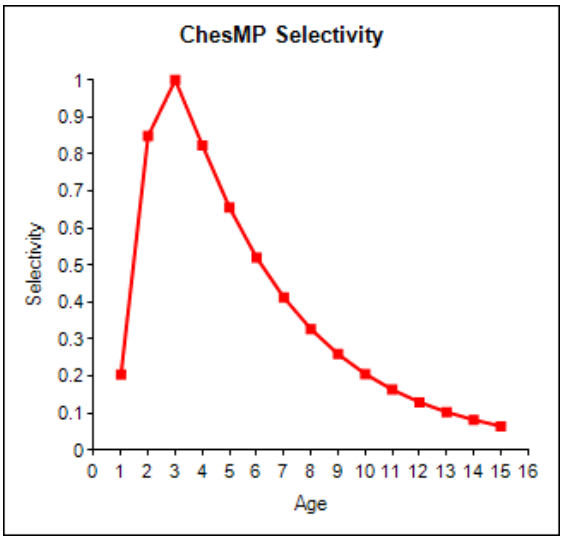

CHESMAP Age Composition By Age
Pred
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Proportion
Year


CHESMAP Age Composition By Year
Pred
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Proportion
Age

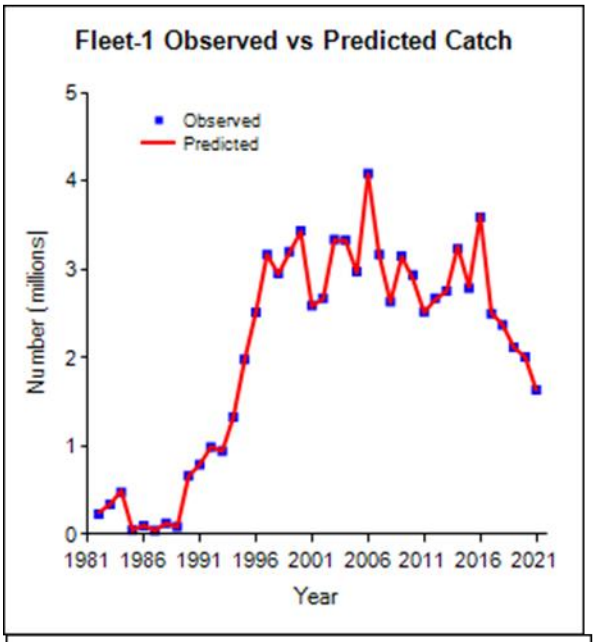

CHESMAP Age Residuals By Age
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Standardized Residual
Year
2005
2010
2015

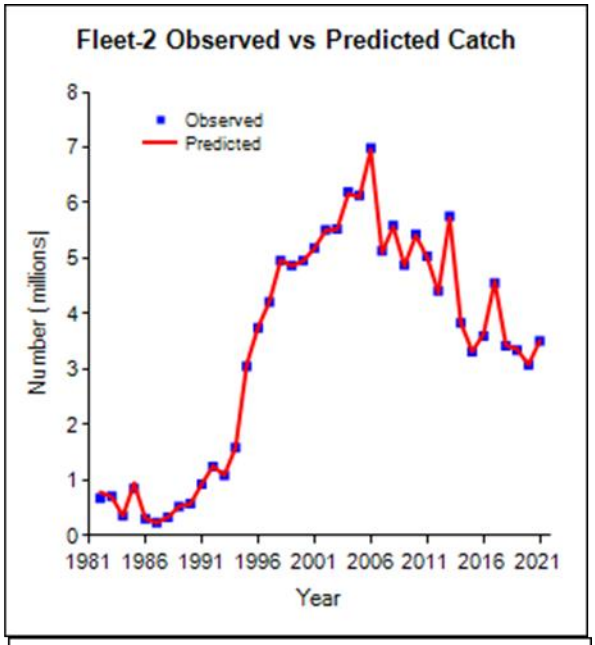

CHESMAP Age Residuals By Year
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Standardized Residual
Age
5
10
15

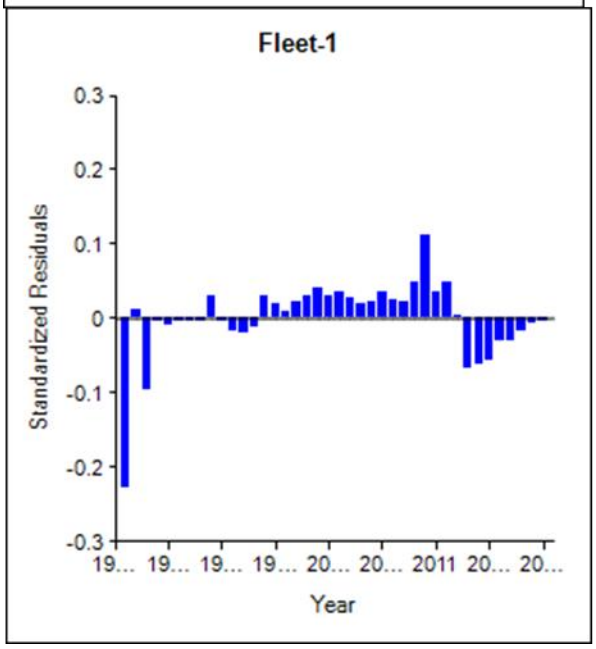

CHESMAP Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)
Age
2
4
6
8
10
12
14
2002
2004
2006
2008
2010
2012
2014
2016
2018
Year

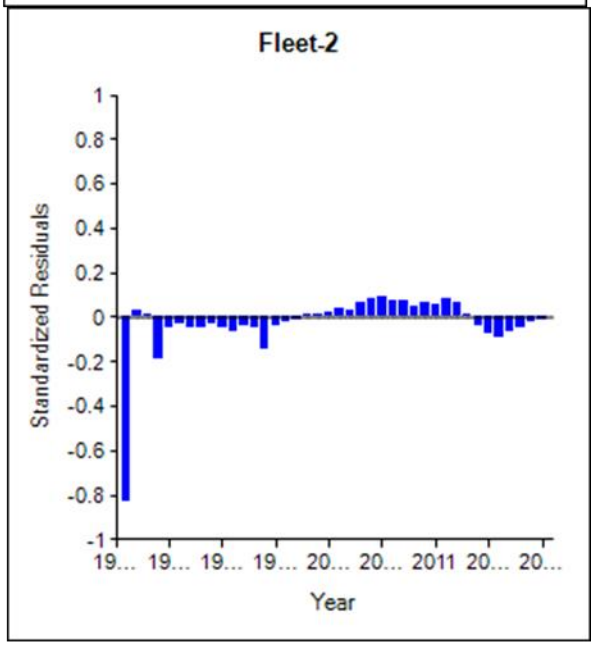

ChesMP Selectivity
Selectivity
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Age

Appendix 3. Diagnostic plots and results for a model run in which a new 2020-2021 selectivity block was added for the Ocean region only.

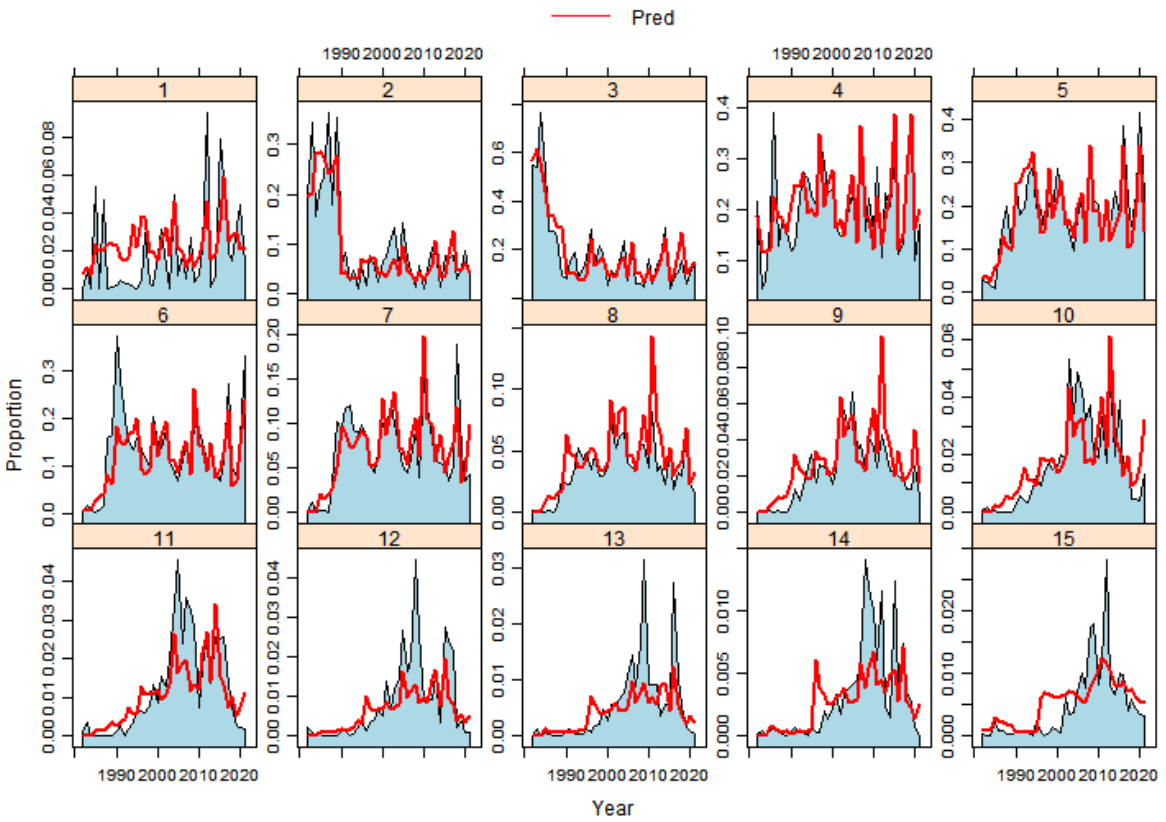

Fleet-1 Observed vs Predicted Catch
Observed
Predicted
Number (millions)
Year
0
1
2
3
4
5
1981 1986 1991 1996 2001 2006 2011 2016 2021


Fleet-2 Observed vs Predicted Catch
Observed
Predicted
Number (millions)
Year
0
1
2
3
4
5
6
7
8
1981 1986 1991 1996 2001 2006 2011 2016 2021

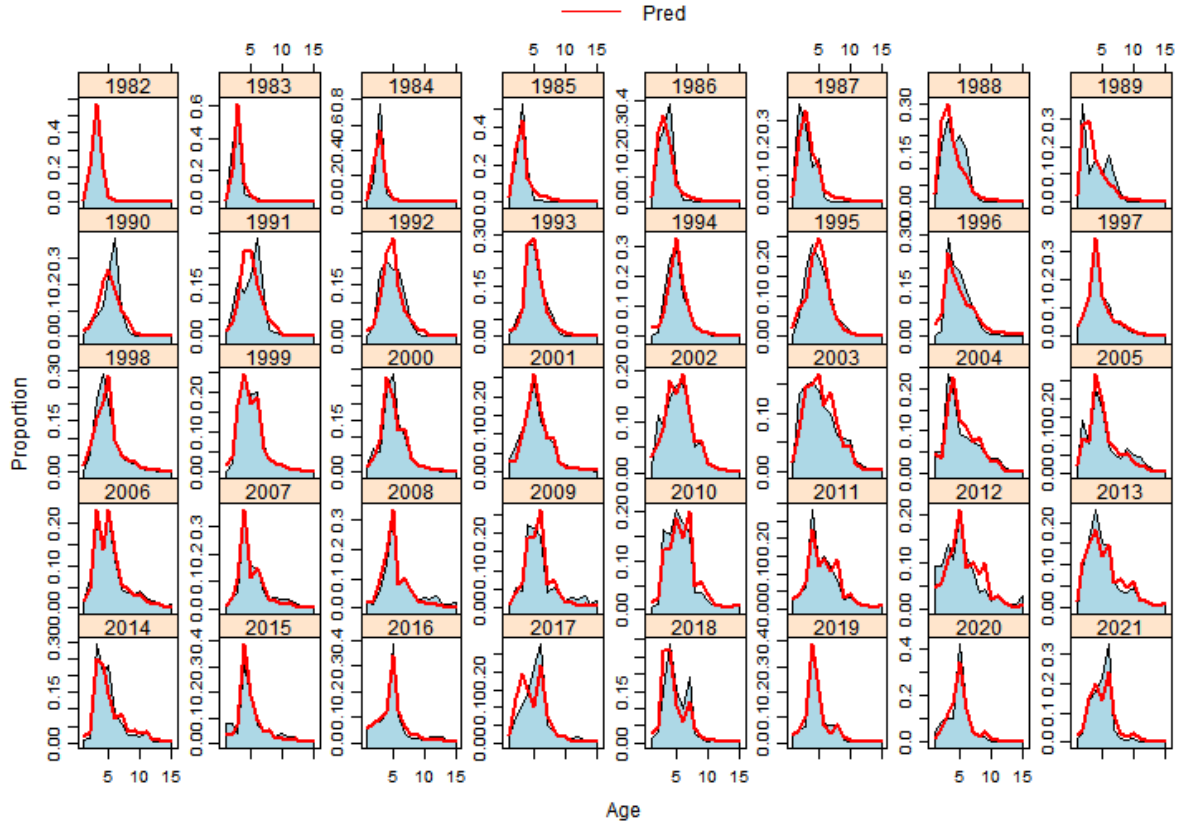

Fleet-1
Standardized Residuals
Year
-0.3
-0.2
-0.1
0
0.1
0.2
0.3
19... 19... 19... 19... 20... 20... 2011 20... 20...

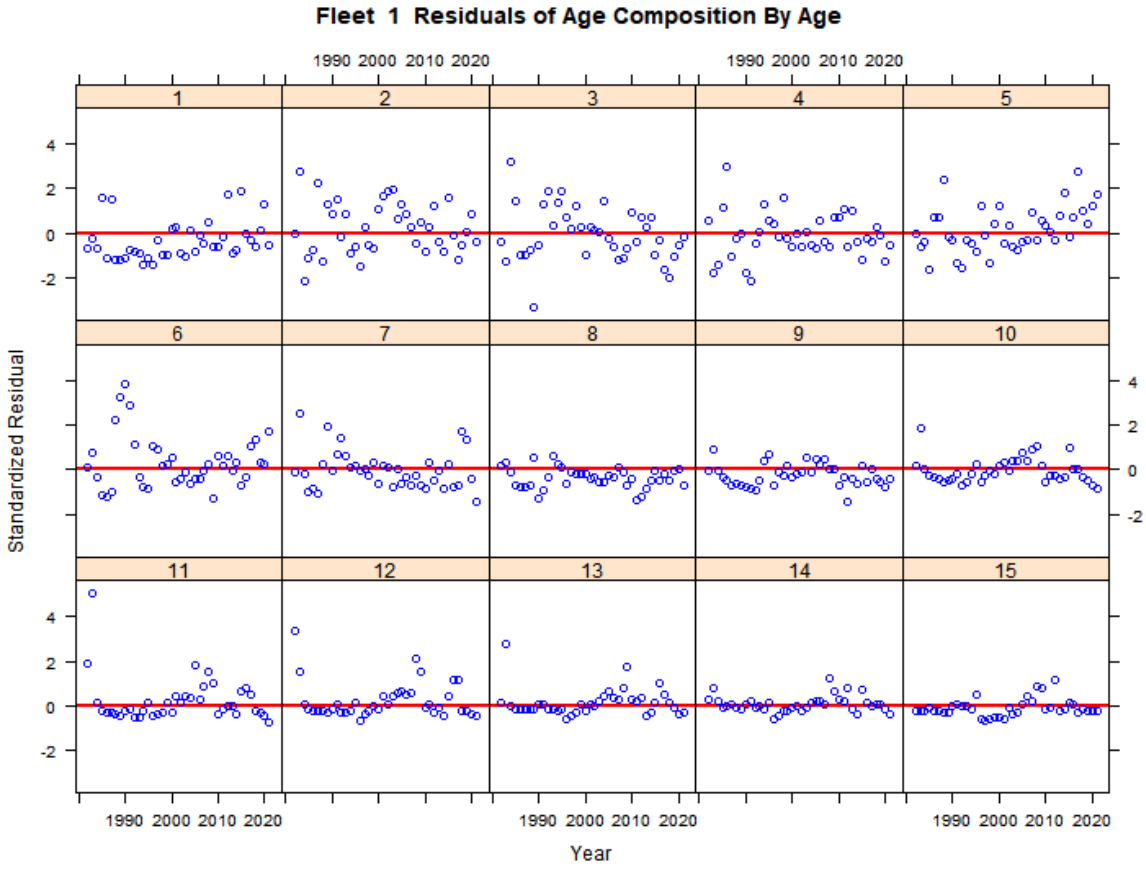

Fleet-2
Standardized Residuals
Year
-1
-0.8
-0.6
-0.4
-0.2
0
0.2
0.4
0.6
0.8
1
19... 19... 19... 19... 20... 20... 2011 20... 20...

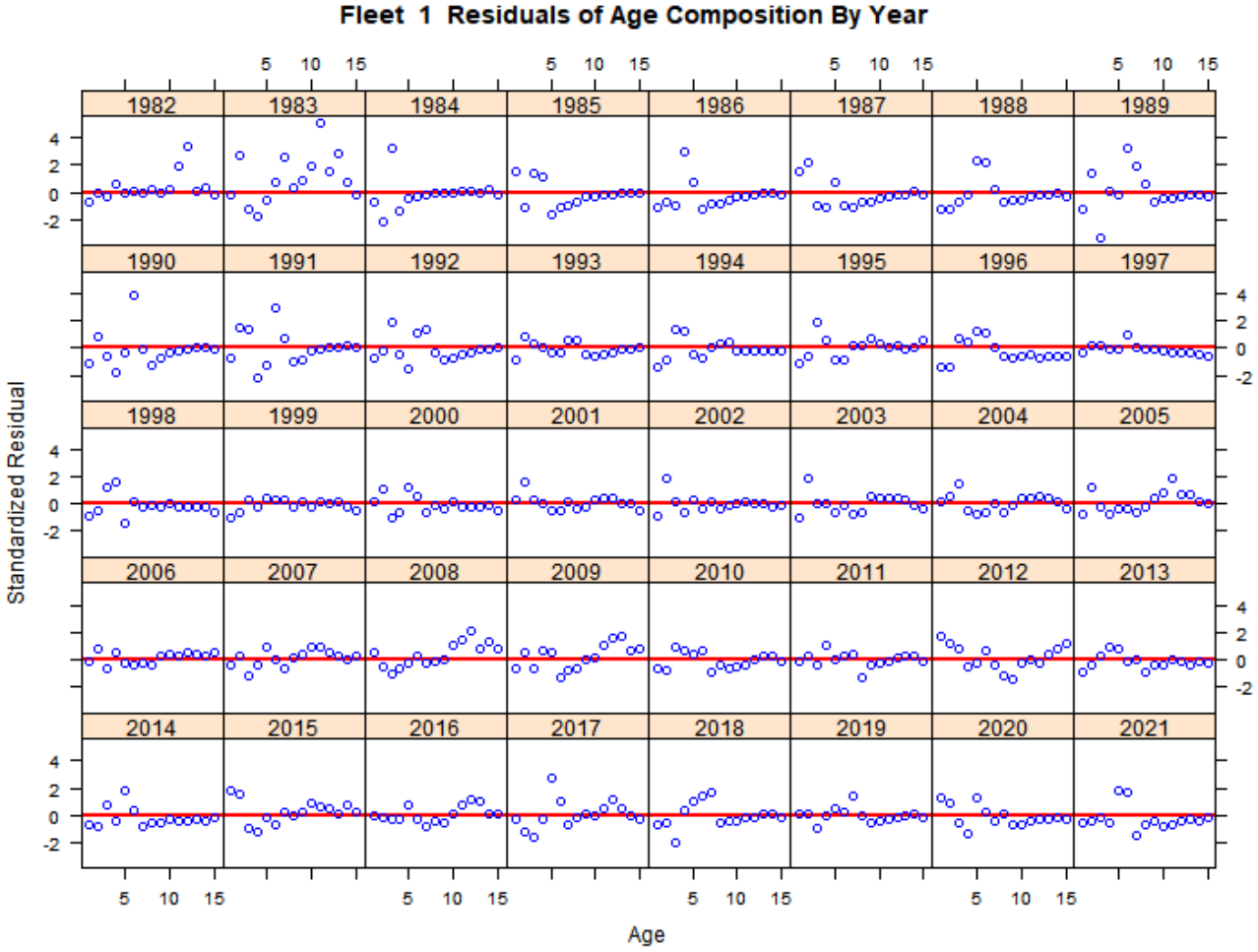
Fleet 1 Catch Age Composition By Age

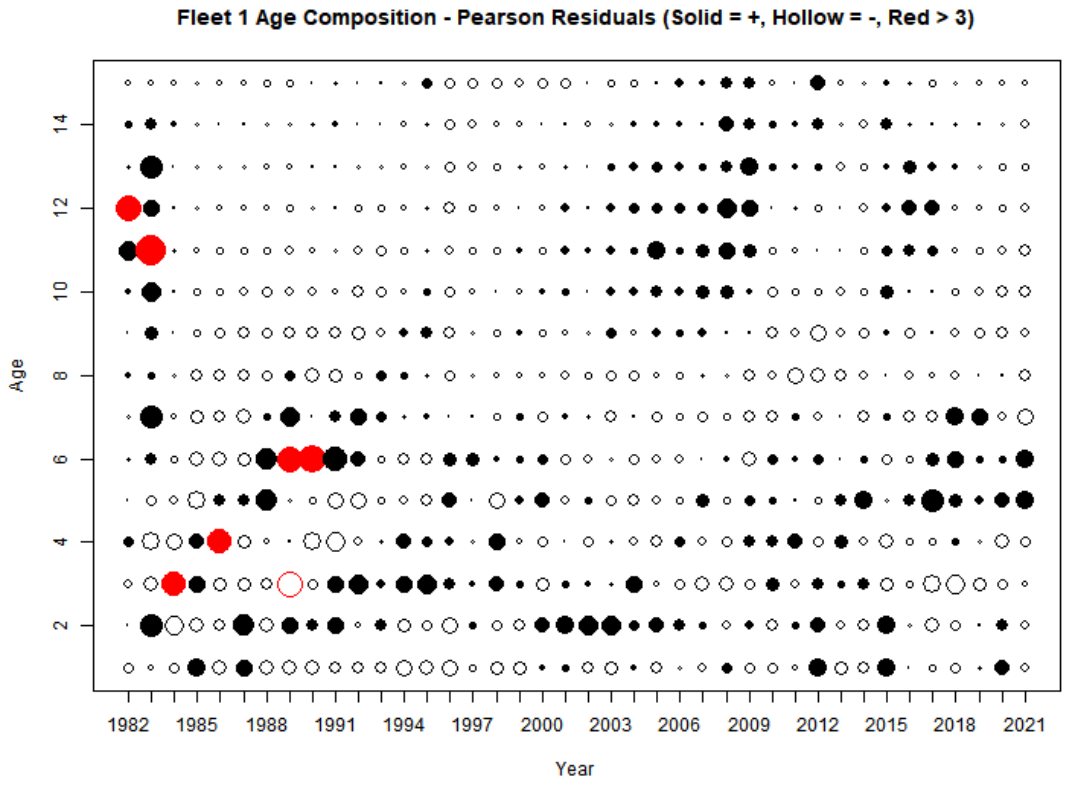


Fleet 1 Catch Age Composition By Year

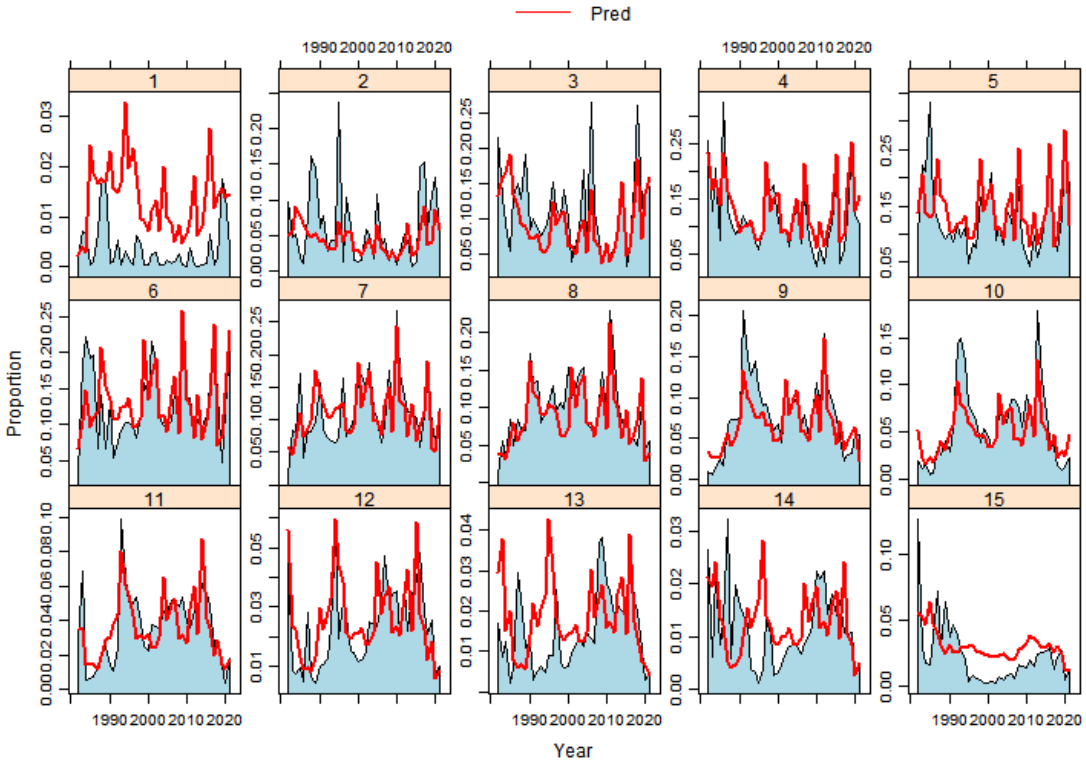



Fleet 1 Residuals of Age Composition By Age
1990 2000 2010 2020
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Standardized Residual
Year

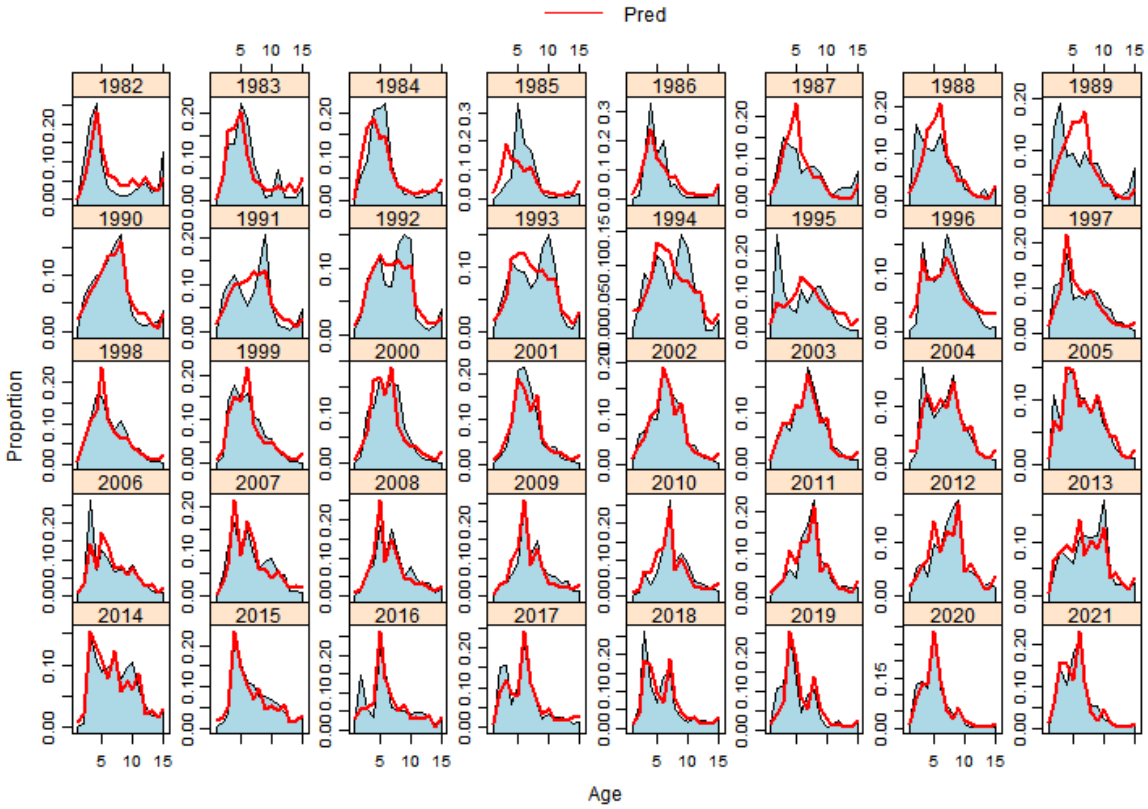

Fleet 1 Residuals of Age Composition By Year
5 10 15
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
Standardized Residual
Age

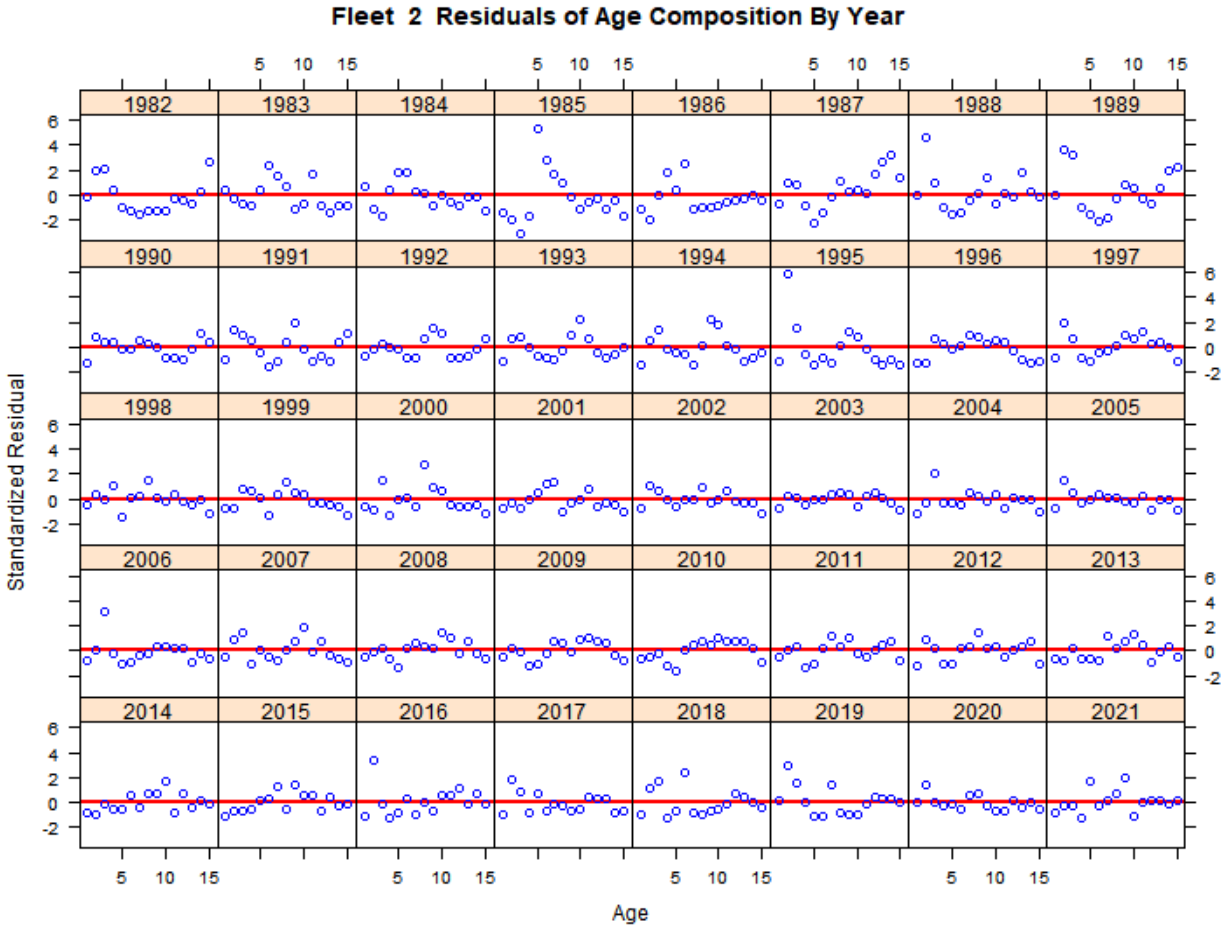

Fleet 1 Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)
Age
2
4
6
8
10
12
14
1982
1985
1988
1991
1994
1997
2000
2003
2006
2009
2012
2015
2018
2021
Year

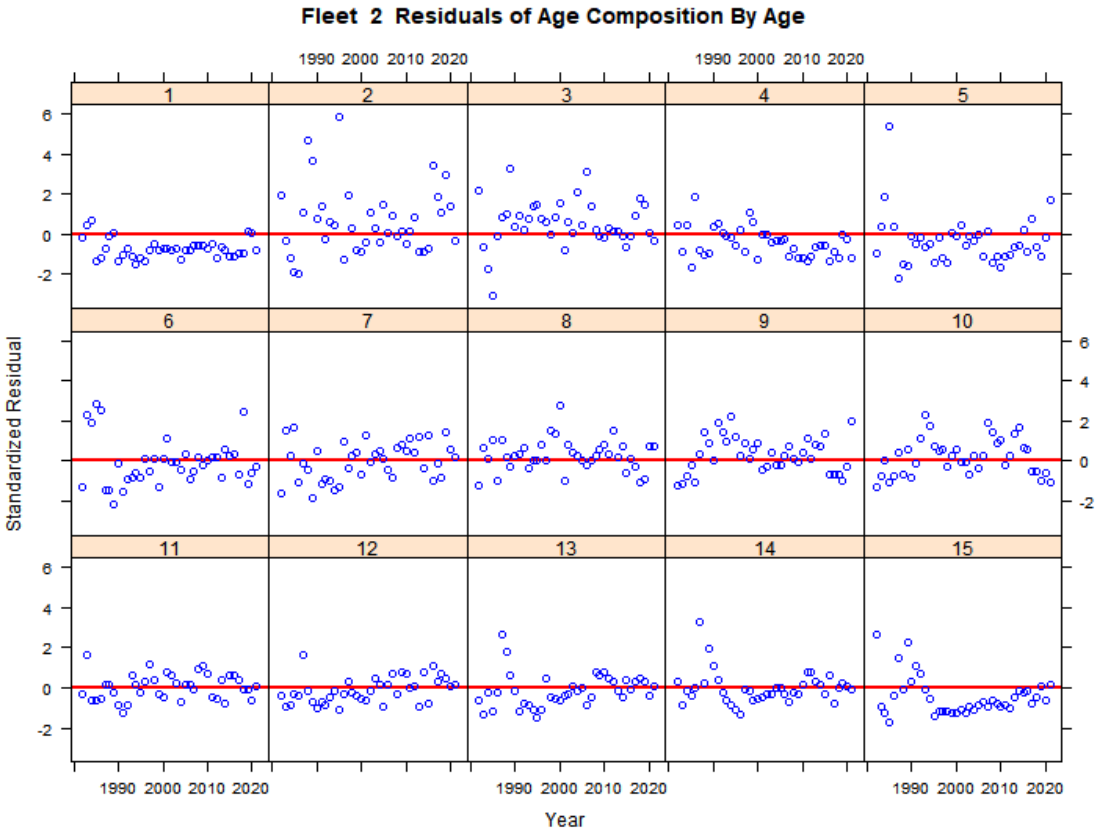
Fleet 2 Catch Age Composition By Age

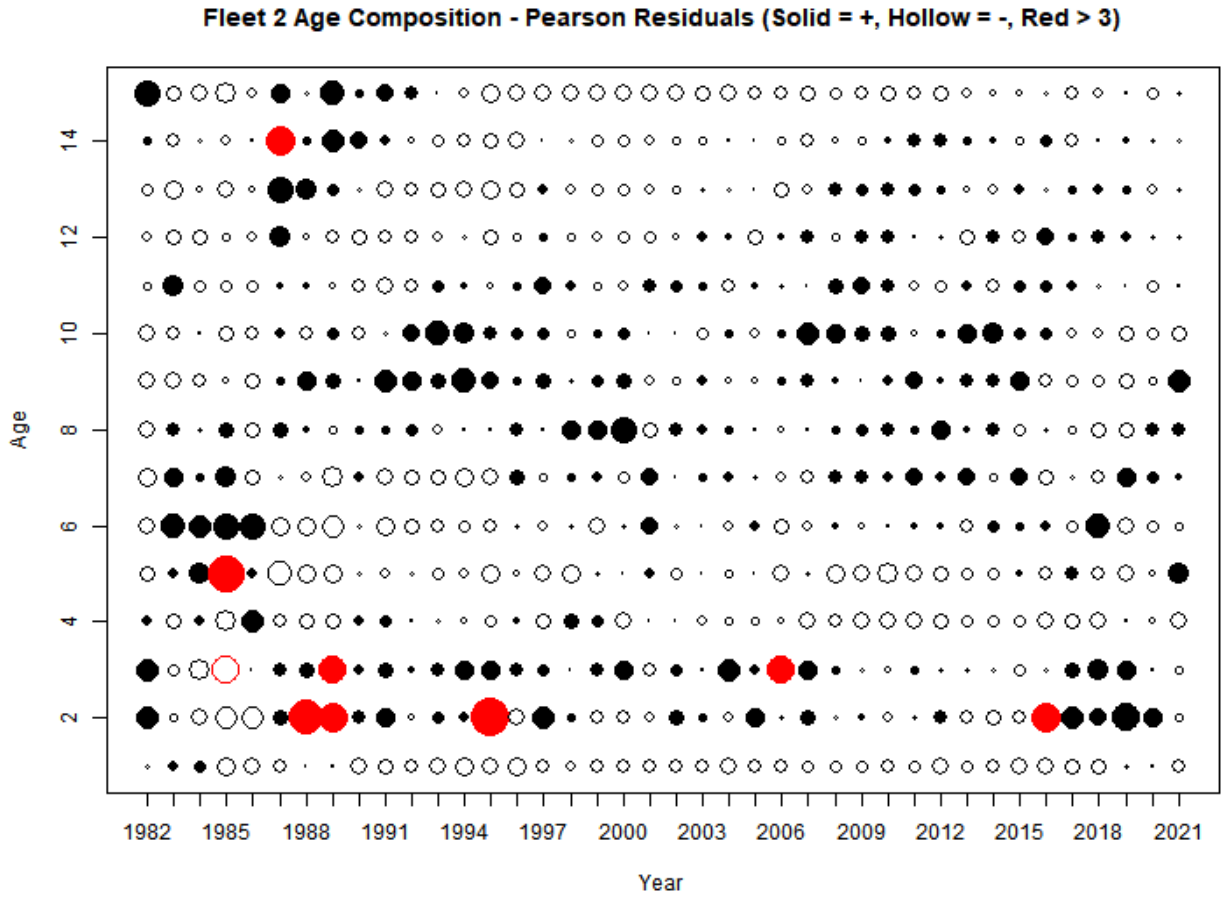


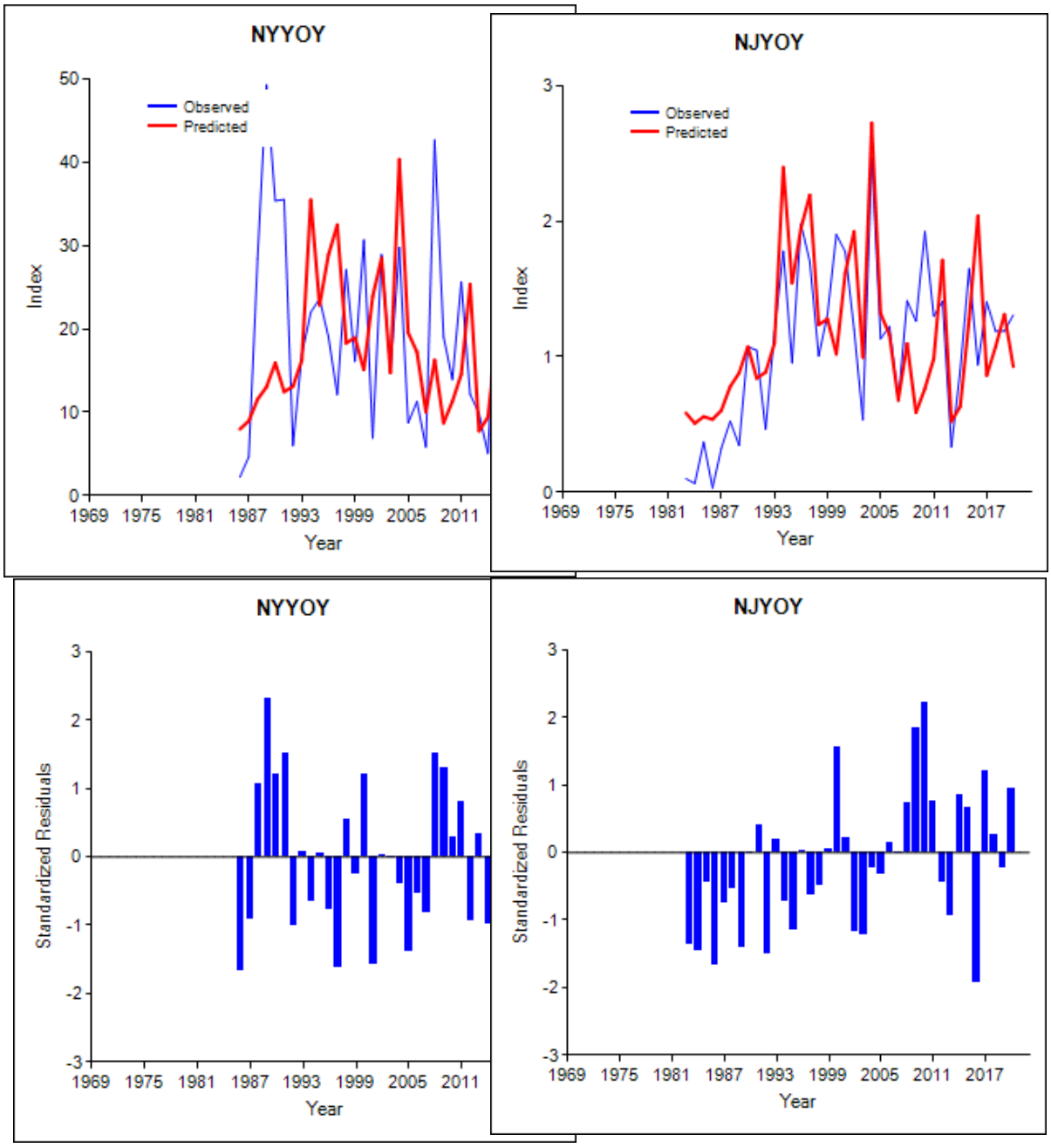
Fleet 2 Catch Age Composition By Year

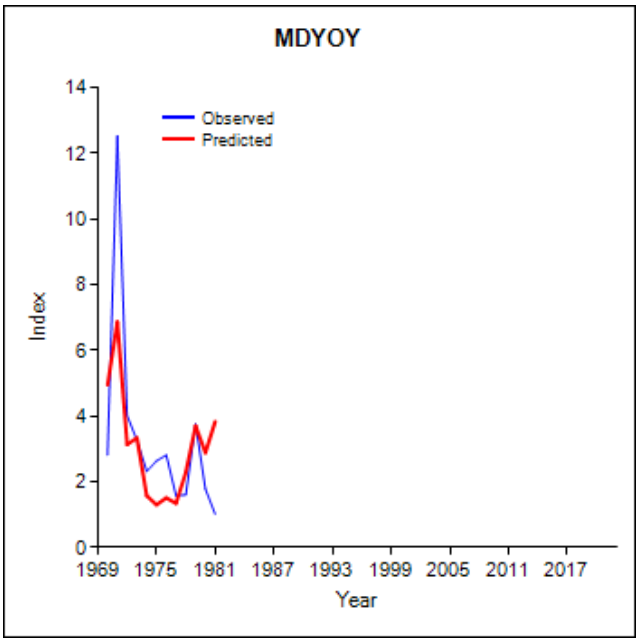


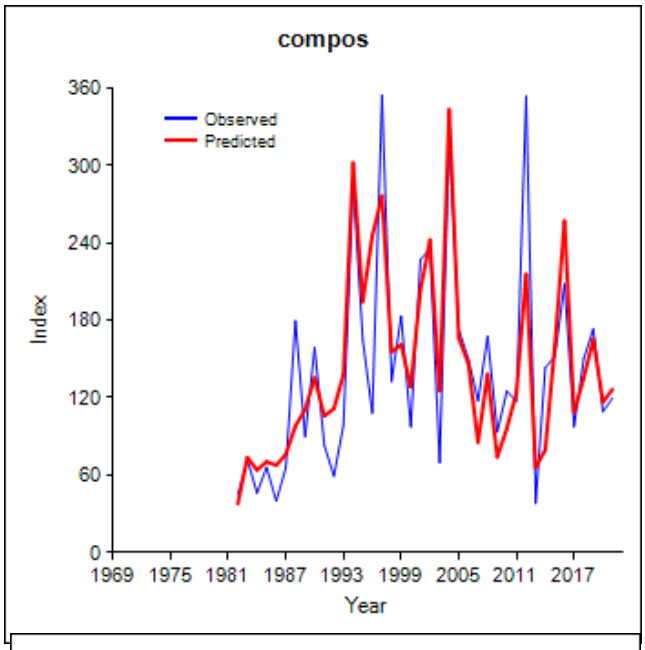

Fleet 2 Residuals of Age Composition By Year
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
Standardized Residual
Age

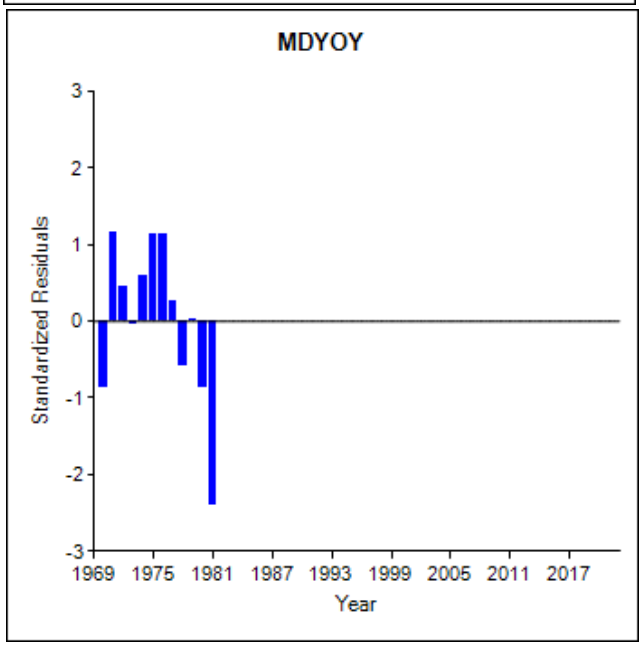

Fleet 2 Residuals of Age Composition By Age
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Standardized Residual
Year

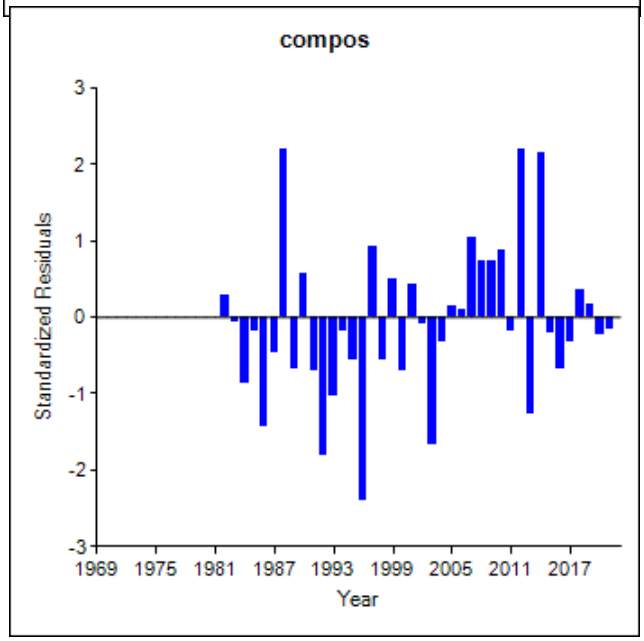

Fleet 2 Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)
Age
2
4
6
8
10
12
14
1982
1985
1988
1991
1994
1997
2000
2003
2006
2009
2012
2015
2018
2021
Year

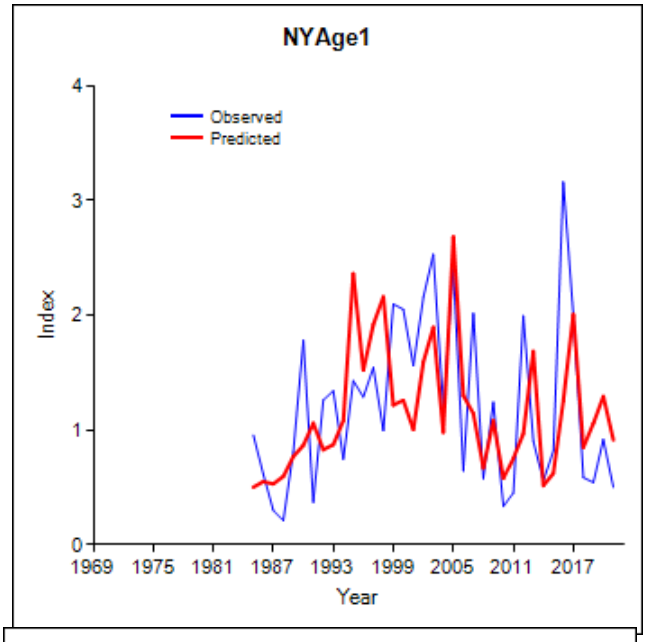

NYYOY
Observed
Predicted
Index
Year
NJYOY
Observed
Predicted
Index
Year
NYYOY
Standardized Residuals
Year
NJYOY
Standardized Residuals
Year

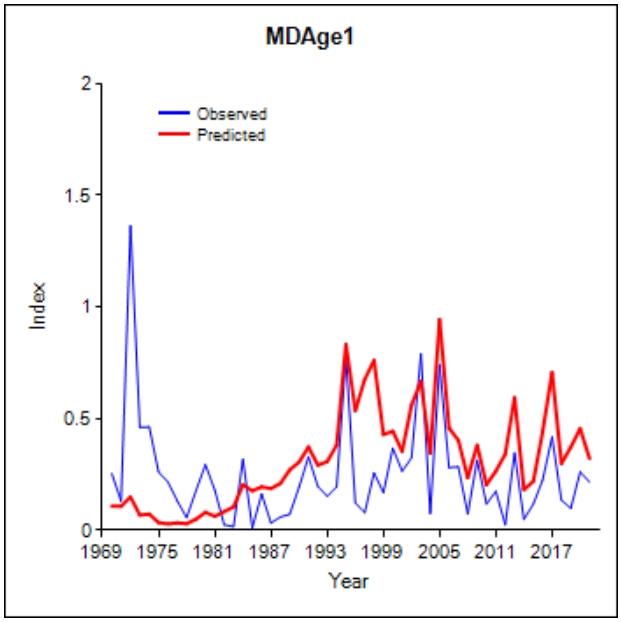

MDYOY
Observed
Predicted
Index
Year
0
2
4
6
8
10
12
14
1969
1975
1981
1987
1993
1999
2005
2011
2017

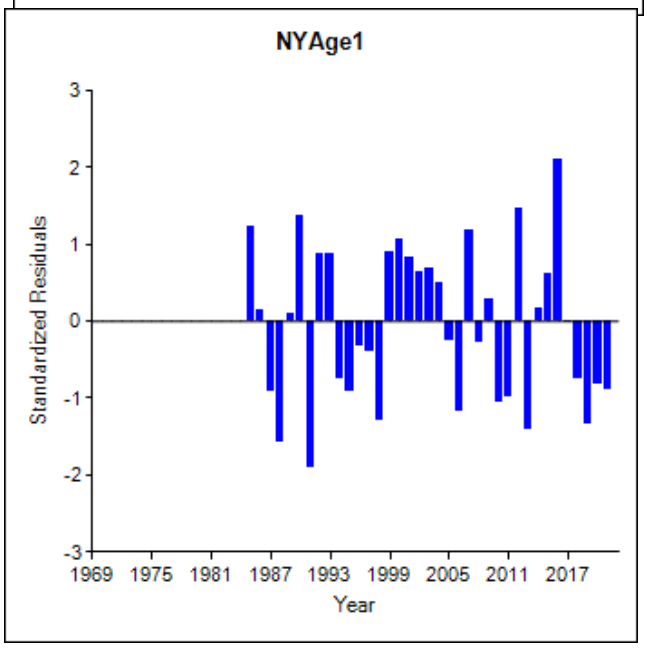

compos
Observed
Predicted
Index
Year
0
60
120
180
240
300
360
1969
1975
1981
1987
1993
1999
2005
2011
2017

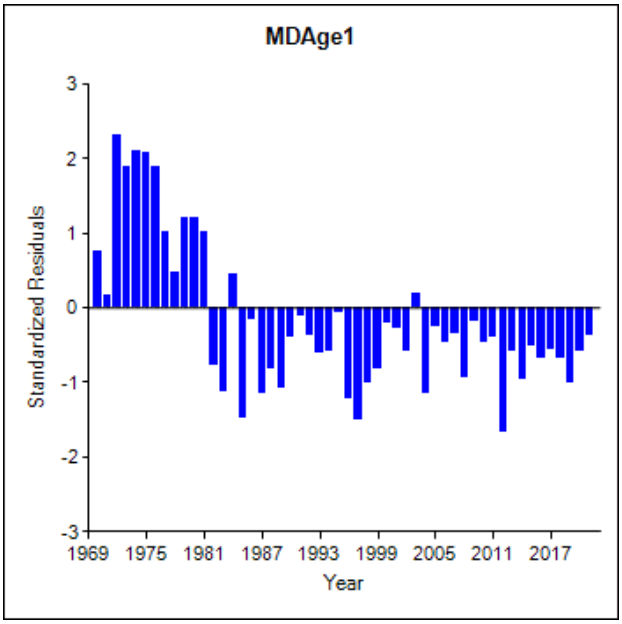

MDYOY
Standardized Residuals
Year
-3
-2
-1
0
1
2
3
1969
1975
1981
1987
1993
1999
2005
2011
2017

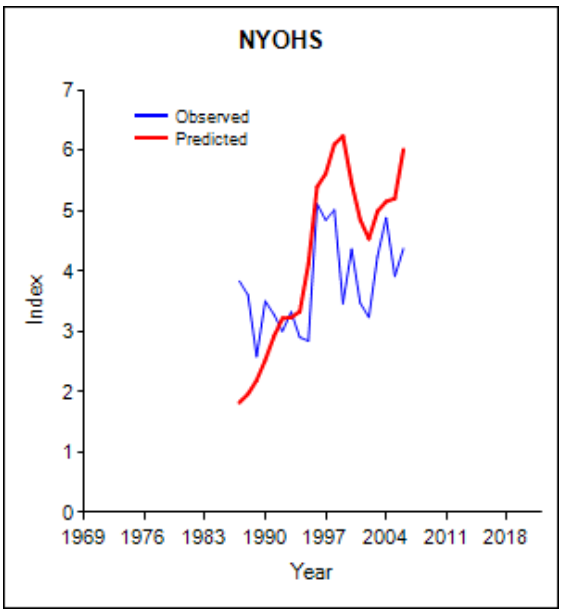

compos
Standardized Residuals
Year
-3
-2
-1
0
1
2
3
1969
1975
1981
1987
1993
1999
2005
2011
2017

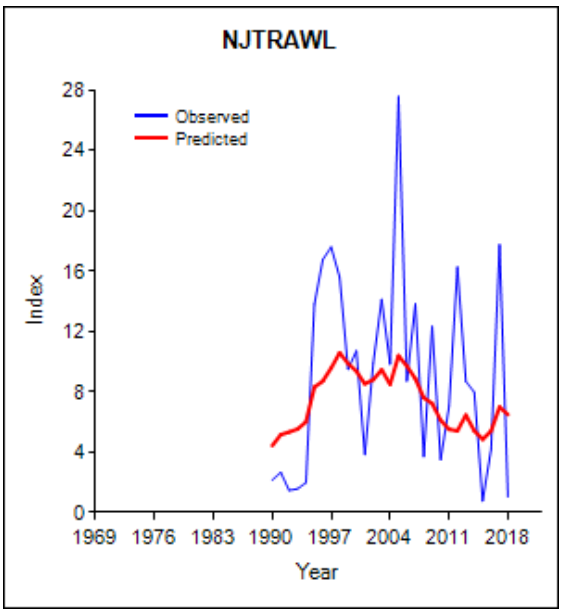

NYAge1
Observed
Predicted
Index
Year
0
1
2
3
4
1969
1975
1981
1987
1993
1999
2005
2011
2017

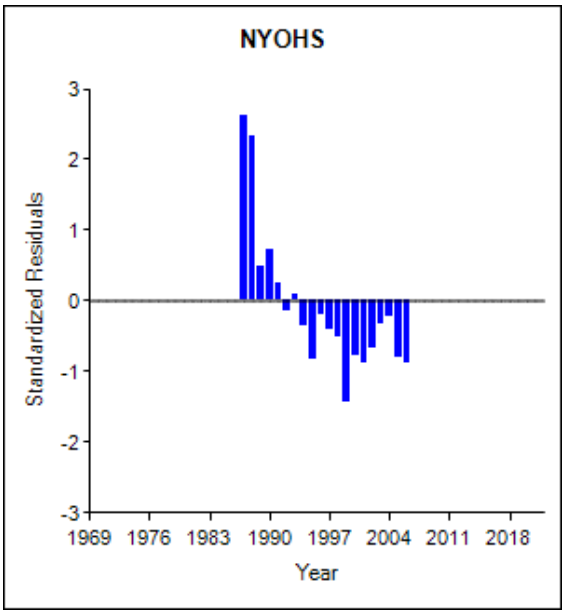

MDAge1
Observed
Predicted
Index
Year
0
0.5
1
1.5
2
1969
1975
1981
1987
1993
1999
2005
2011
2017

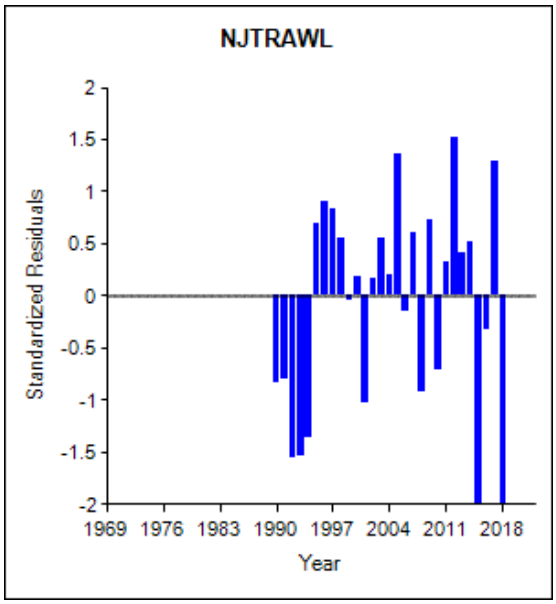

NYAge1
Standardized Residuals
Year
-3
-2
-1
0
1
2
3
1969
1975
1981
1987
1993
1999
2005
2011
2017

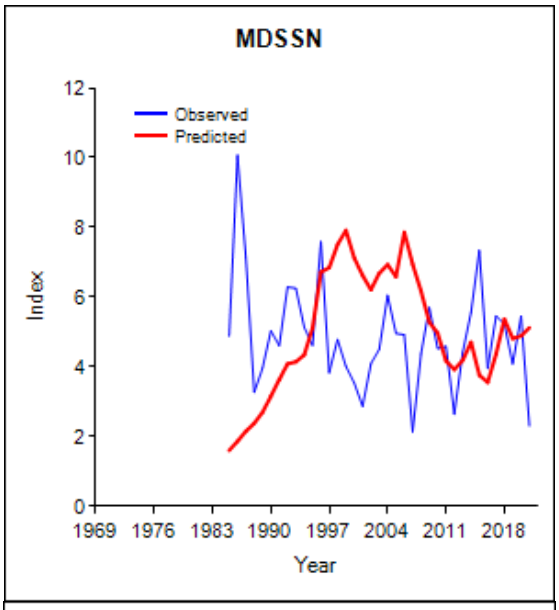

MDAge1
Standardized Residuals
Year
-3
-2
-1
0
1
2
3
1969
1975
1981
1987
1993
1999
2005
2011
2017

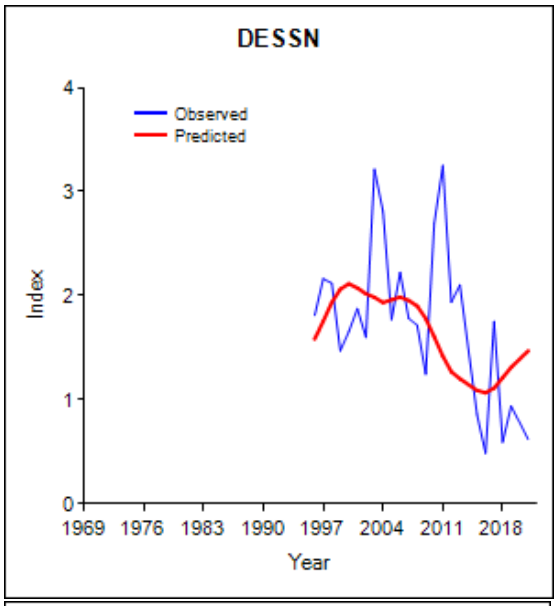

NYOHS
Observed
Predicted
Index
Year
0
1
2
3
4
5
6
7
1969
1976
1983
1990
1997
2004
2011
2018

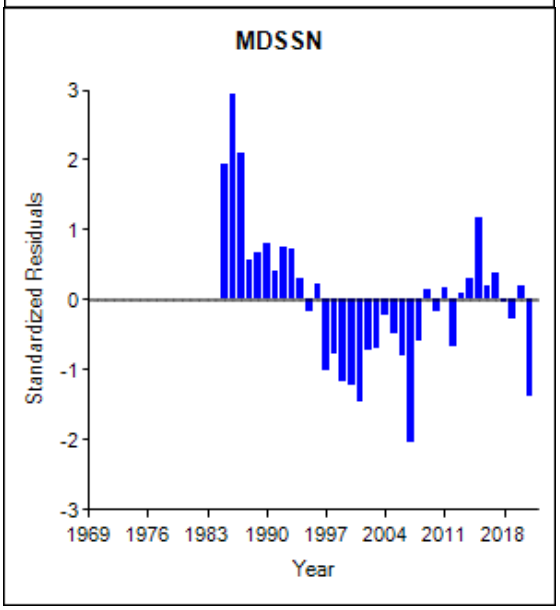

NJTRAWL
Observed
Predicted
Index
Year
0
4
8
12
16
20
24
28
1969
1976
1983
1990
1997
2004
2011
2018

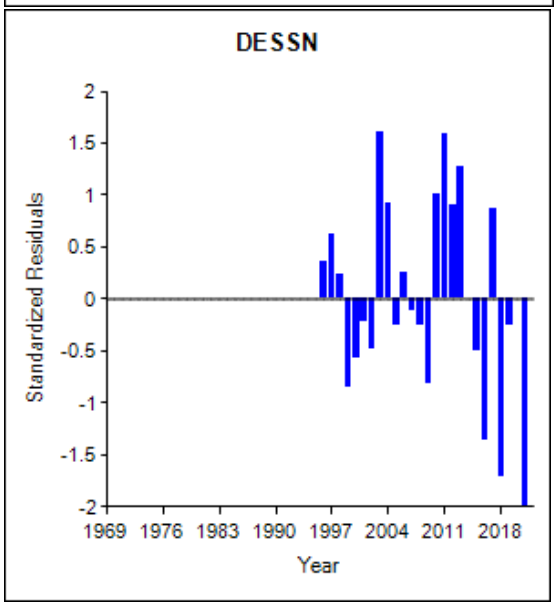

NYOHS
Standardized Residuals
Year
-3
-2
-1
0
1
2
3
1969
1976
1983
1990
1997
2004
2011
2018

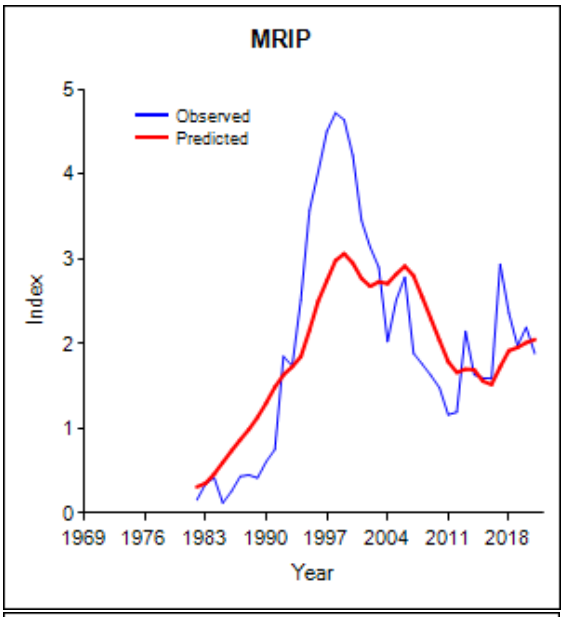

NJTRAWL
Standardized Residuals
Year
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
1969
1976
1983
1990
1997
2004
2011
2018

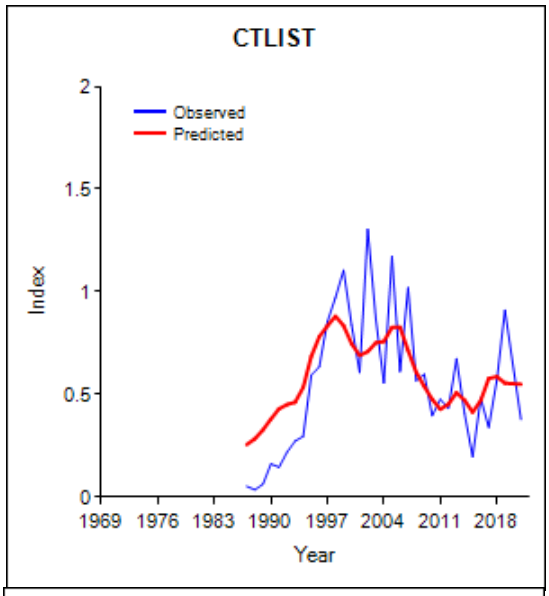

MDSSN
Observed
Predicted
Index
Year
0
2
4
6
8
10
12
1969
1976
1983
1990
1997
2004
2011
2018

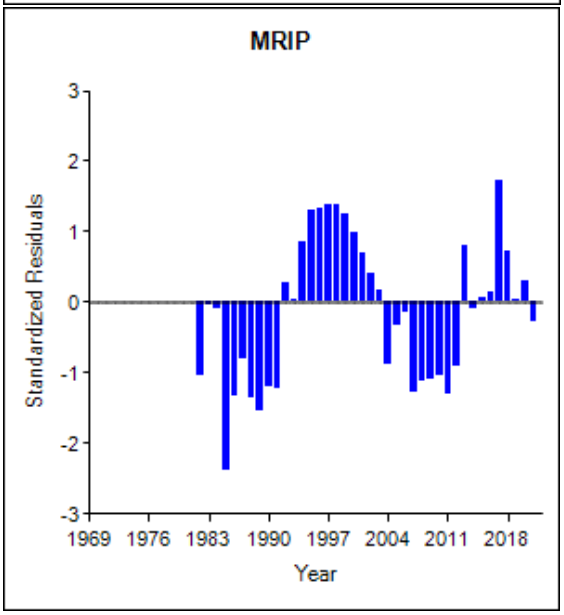

DESSN
Observed
Predicted
Index
Year
0
1
2
3
4
1969
1976
1983
1990
1997
2004
2011
2018

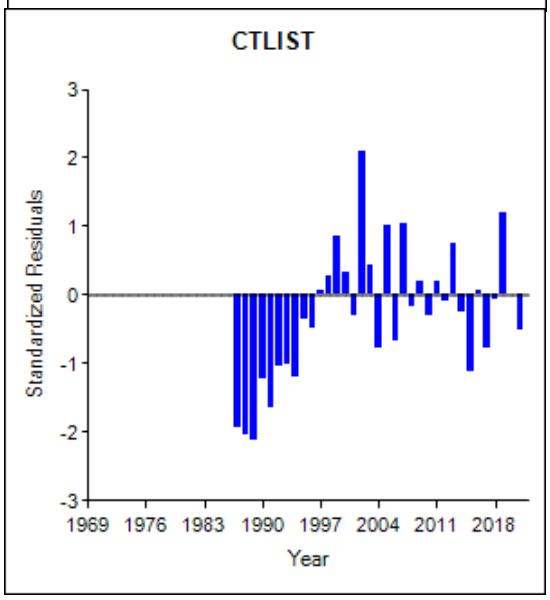

MDSSN
Standardized Residuals
Year
-3
-2
-1
0
1
2
3
1969
1976
1983
1990
1997
2004
2011
2018

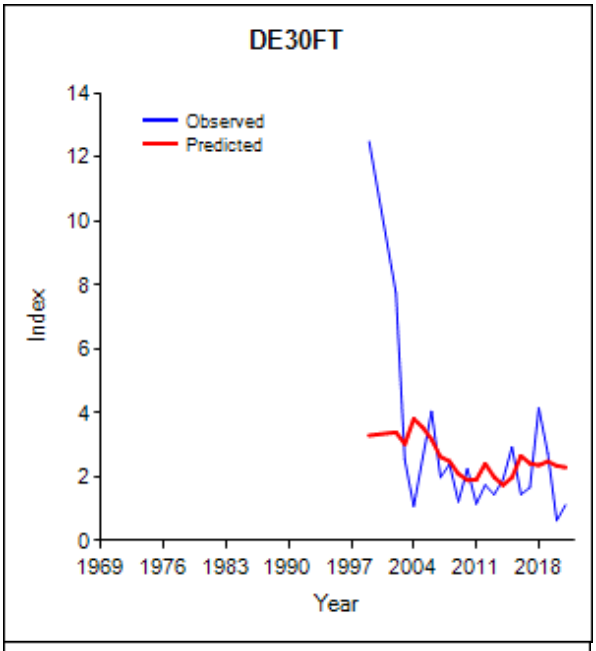

DESSN
Standardized Residuals
Year
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
1969
1976
1983
1990
1997
2004
2011
2018

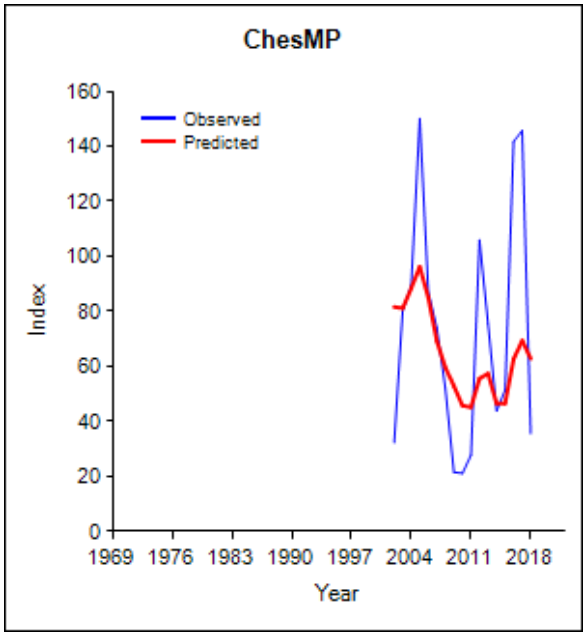

MRIP
Observed
Predicted
Index
Year
0
1
2
3
4
5
1969
1976
1983
1990
1997
2004
2011
2018

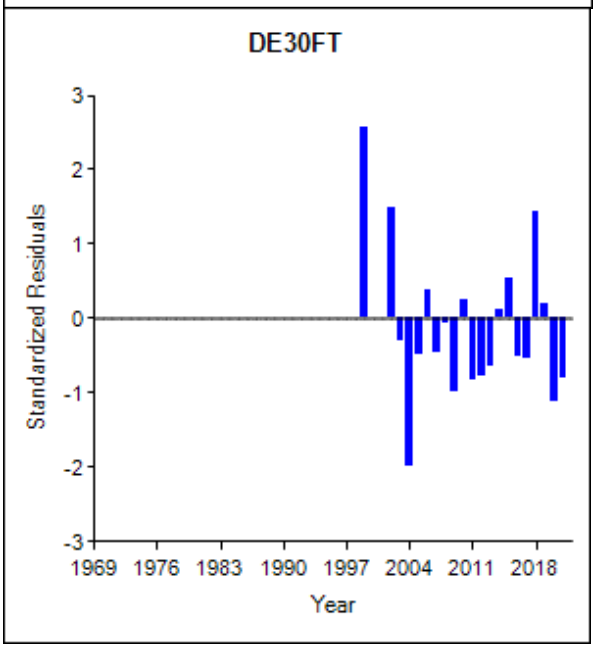

CTLIST
Observed
Predicted
Index
Year
0
0.5
1
1.5
2
1969
1976
1983
1990
1997
2004
2011
2018

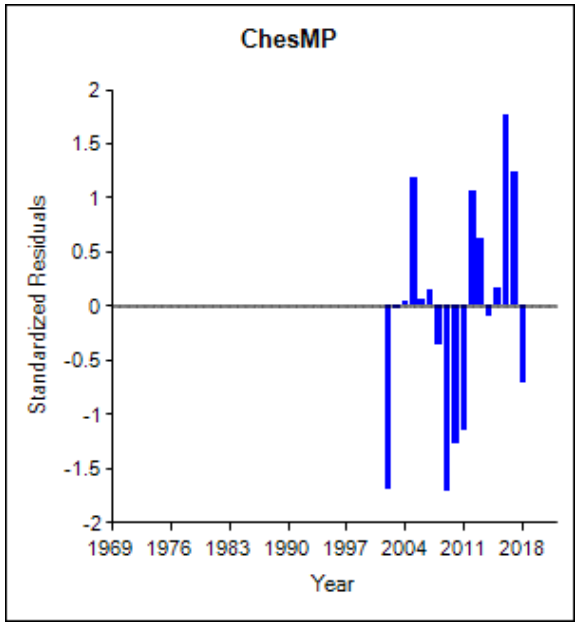

MRIP
Standardized Residuals
Year
-3
-2
-1
0
1
2
3
1969
1976
1983
1990
1997
2004
2011
2018

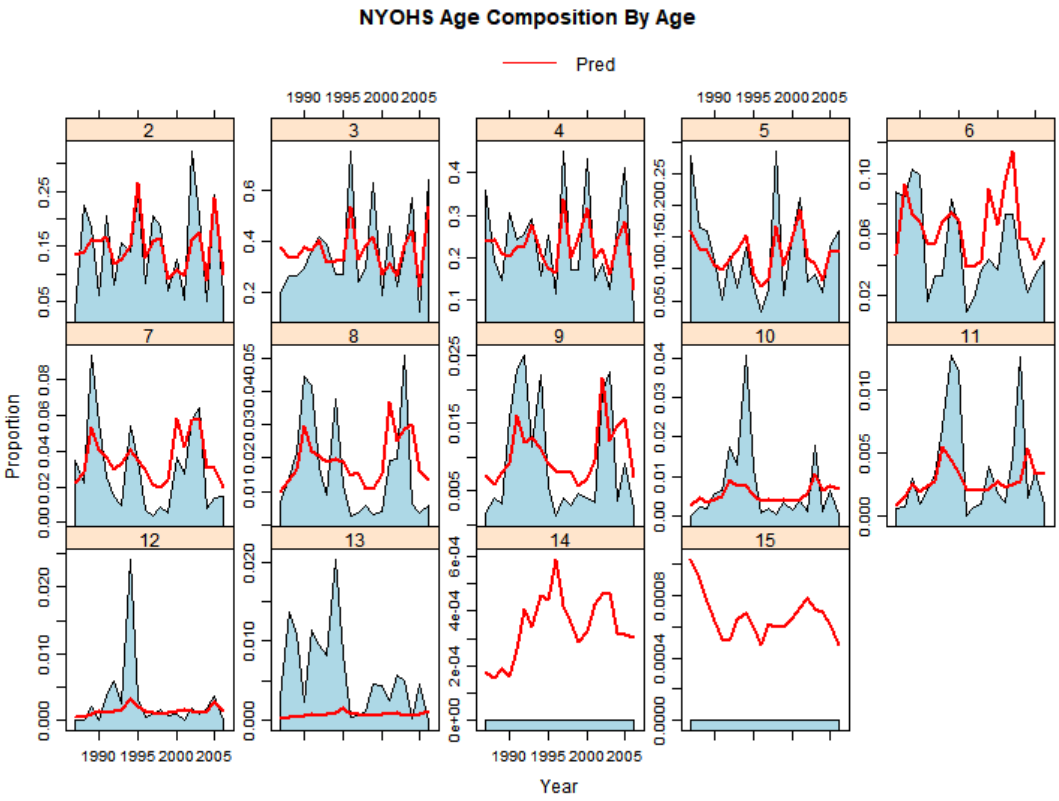

CTLIST
Standardized Residuals
Year
-3
-2
-1
0
1
2
3
1969
1976
1983
1990
1997
2004
2011
2018

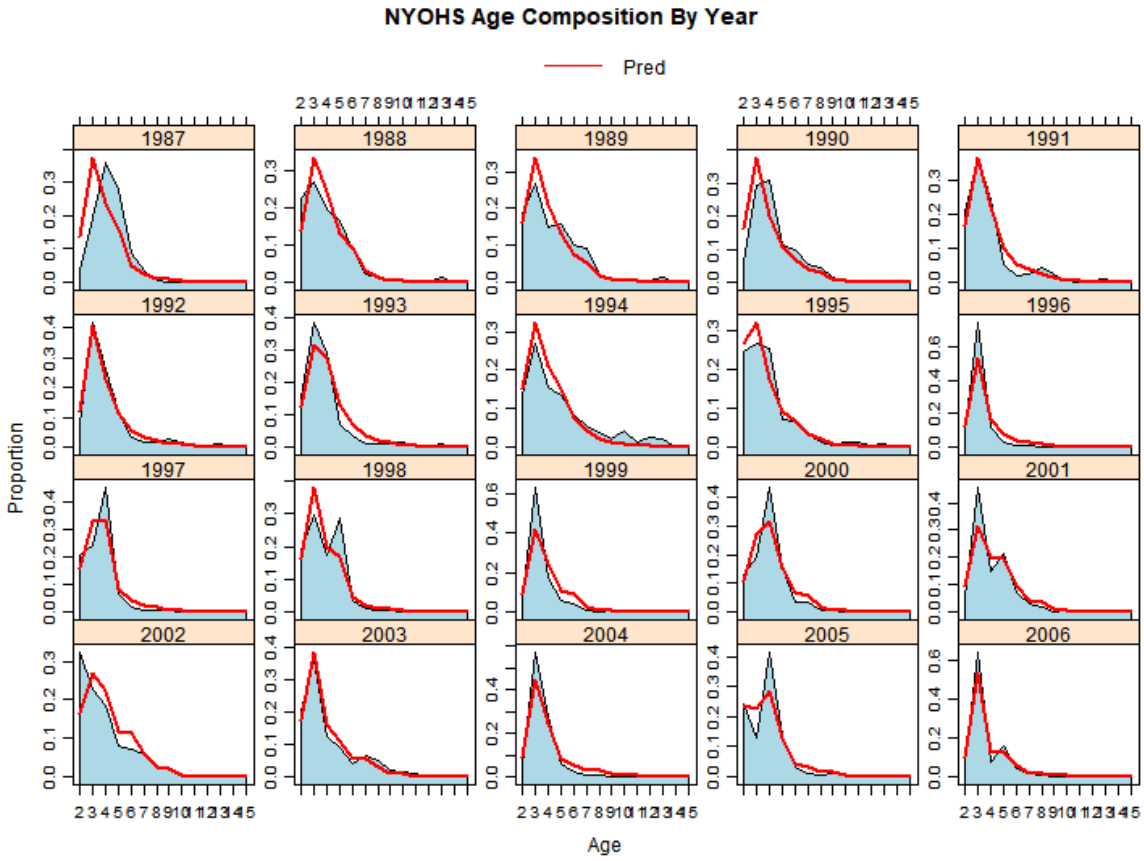

DE30FT
Observed
Predicted
Index
Year
0
2
4
6
8
10
12
14
1969
1976
1983
1990
1997
2004
2011
2018

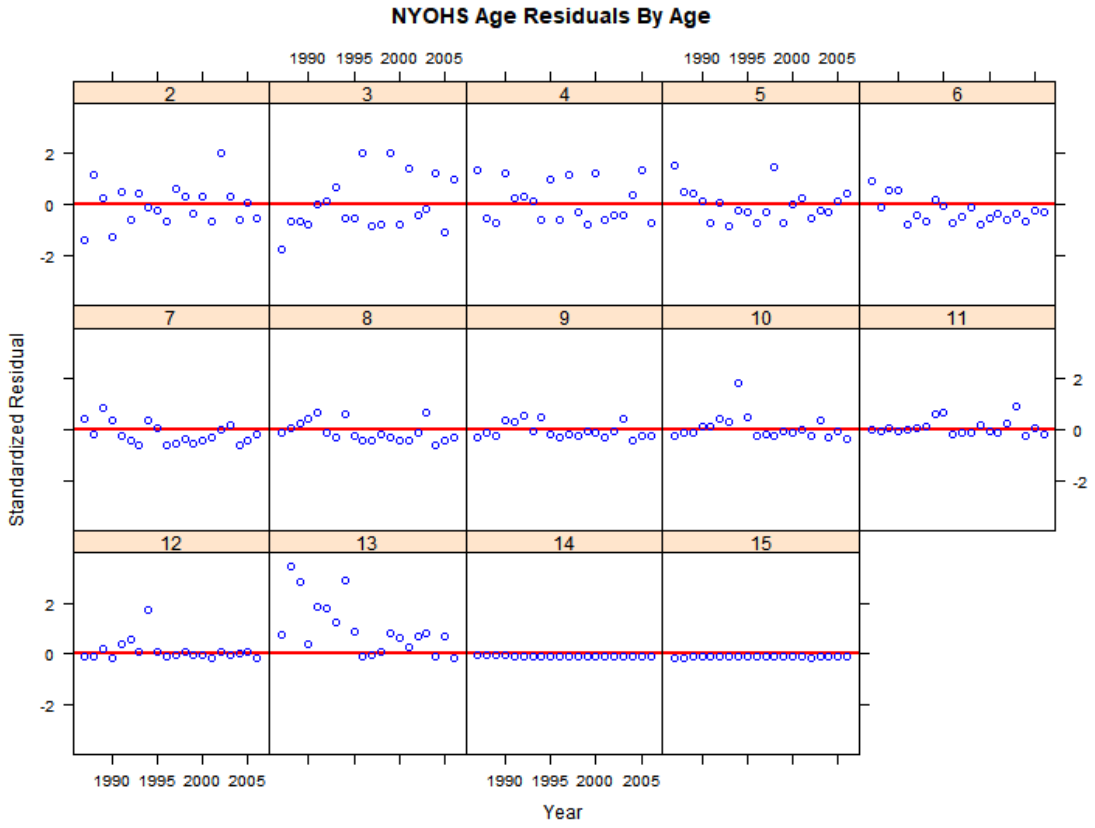

ChesMP
Observed
Predicted
Index
Year
0
20
40
60
80
100
120
140
160
1969
1976
1983
1990
1997
2004
2011
2018

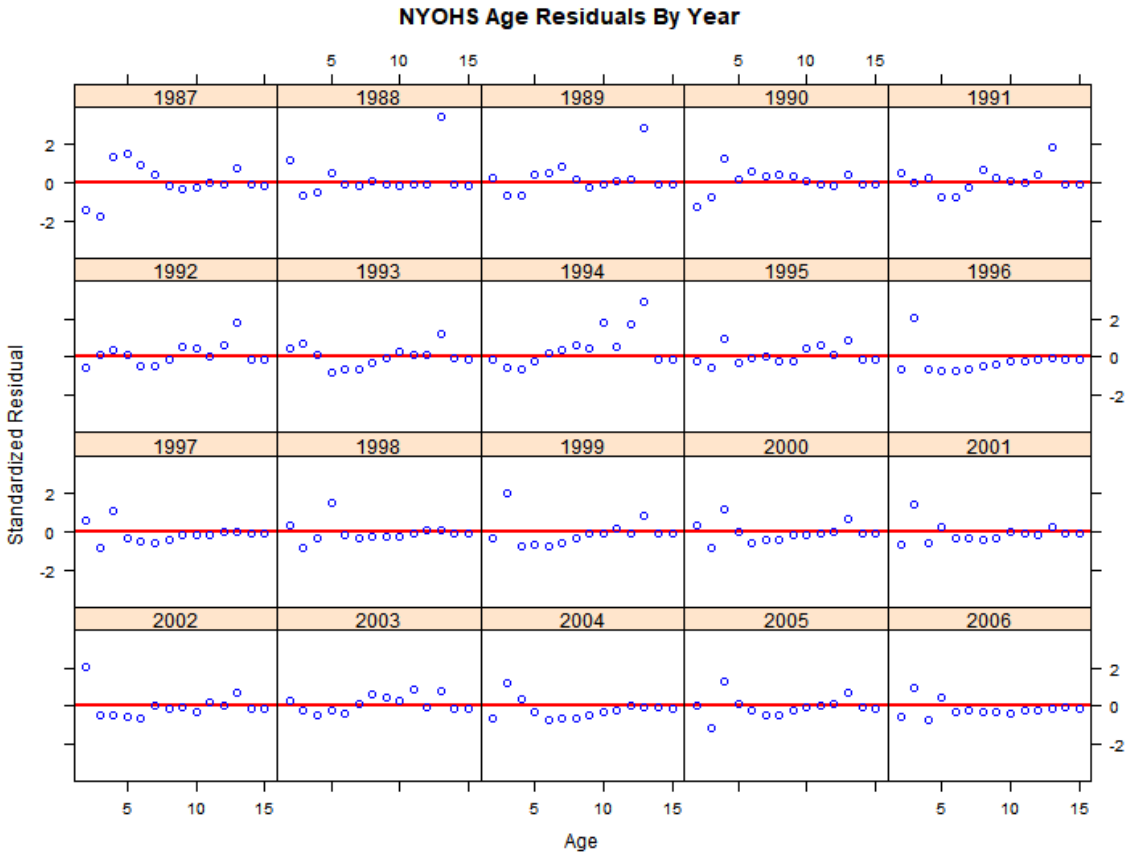

DE30FT
Standardized Residuals
Year
-3
-2
-1
0
1
2
3
1969
1976
1983
1990
1997
2004
2011
2018

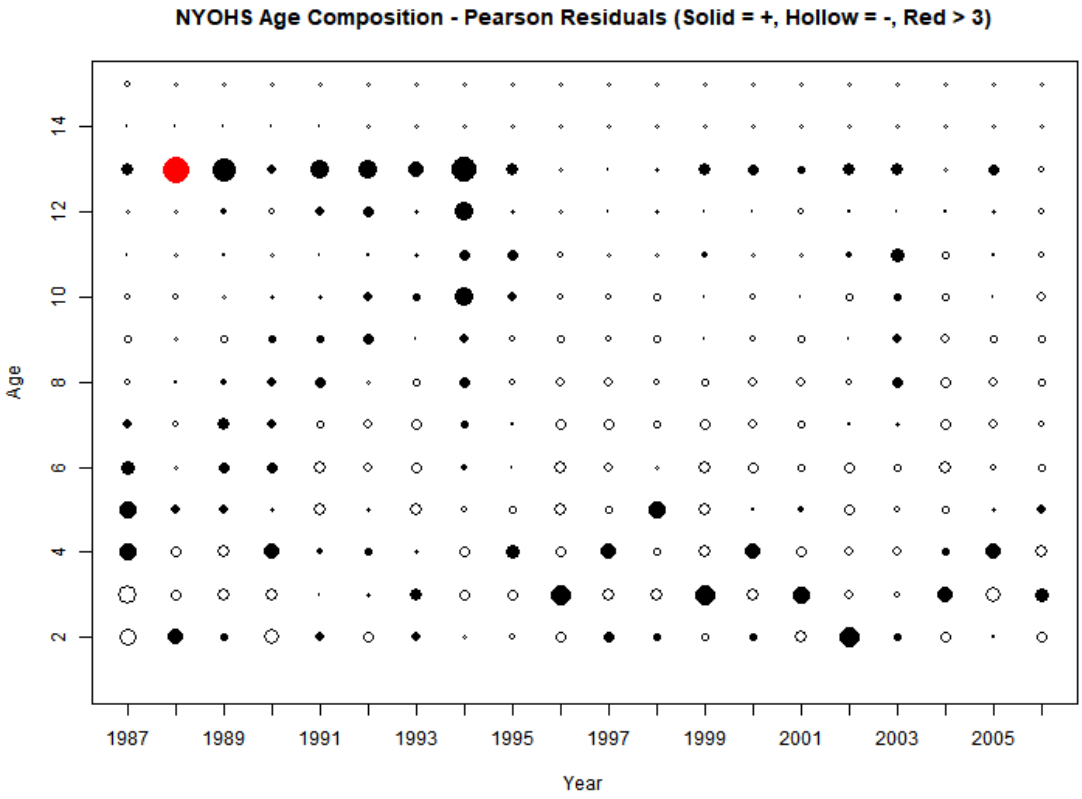

ChesMP
Standardized Residuals
Year
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
1969
1976
1983
1990
1997
2004
2011
2018

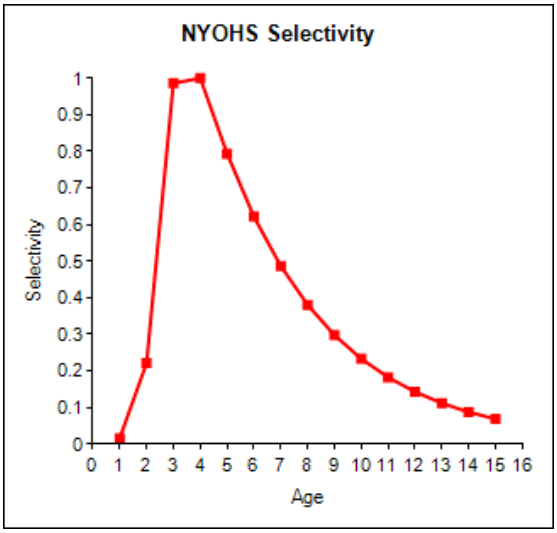

NYOHS Age Composition By Age
Pred
Proportion
Year
2
3
4
5
6
7
8
9
10
11
12
13
14
15

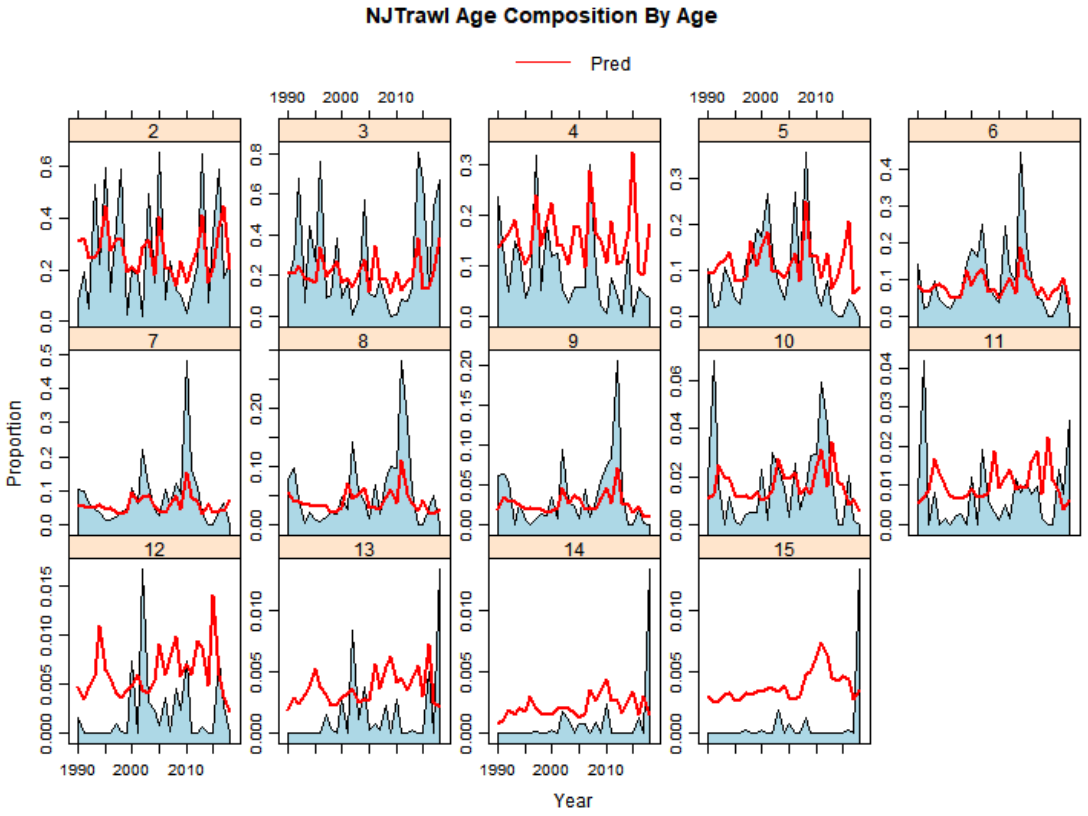

NYOHS Age Composition By Year
Pred
Proportion
Age
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006

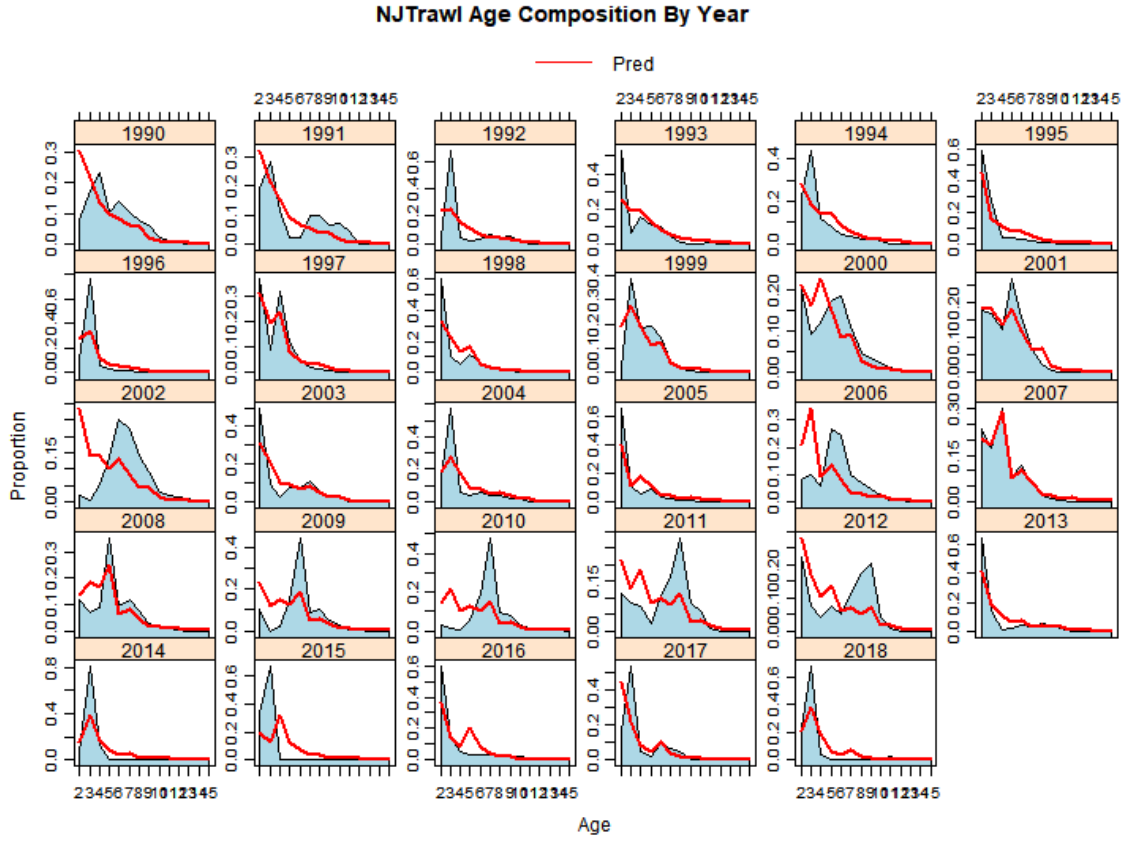

NYOHS Age Residuals By Age
2
3
4
5
6
7
8
9
10
11
12
13
14
15
1990 1995 2000 2005
Standardized Residual
Year

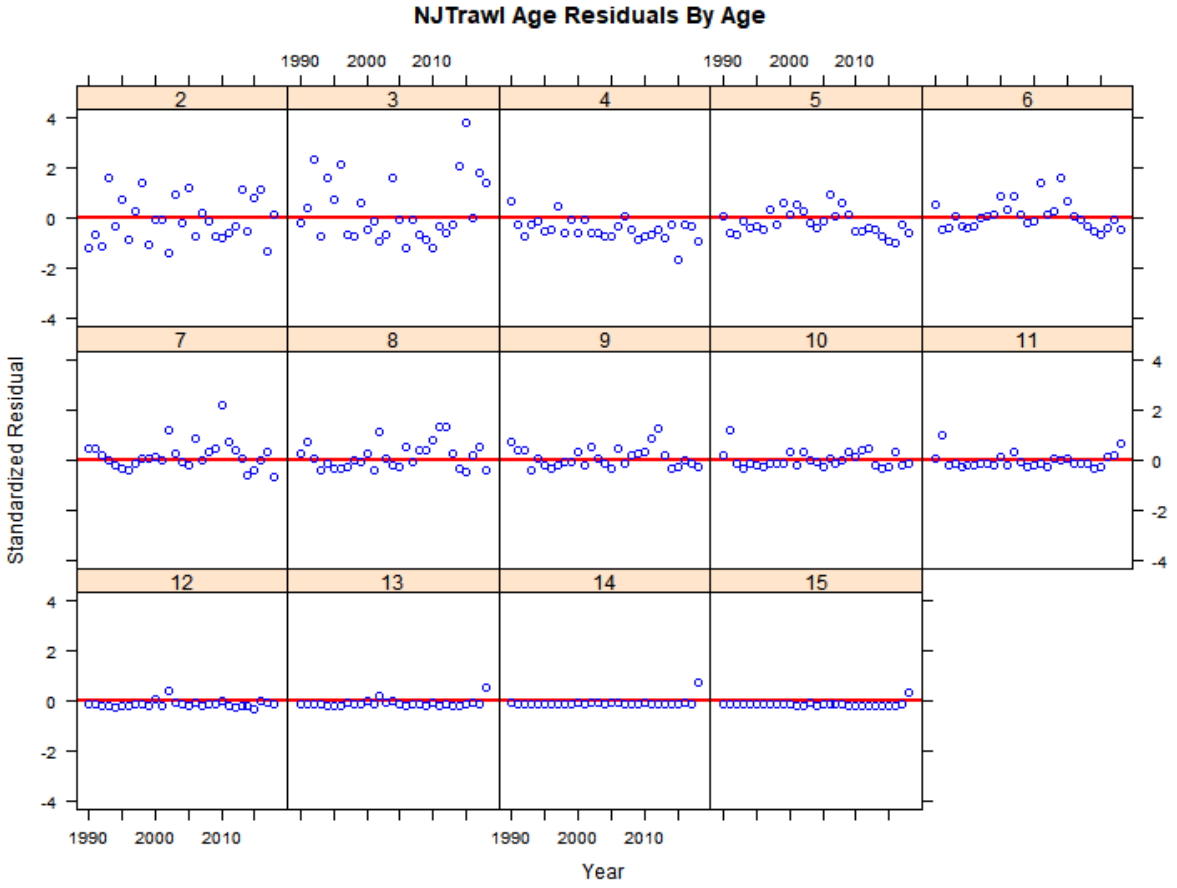

NYOHS Age Residuals By Year
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
5 10 15
Standardized Residual
Age

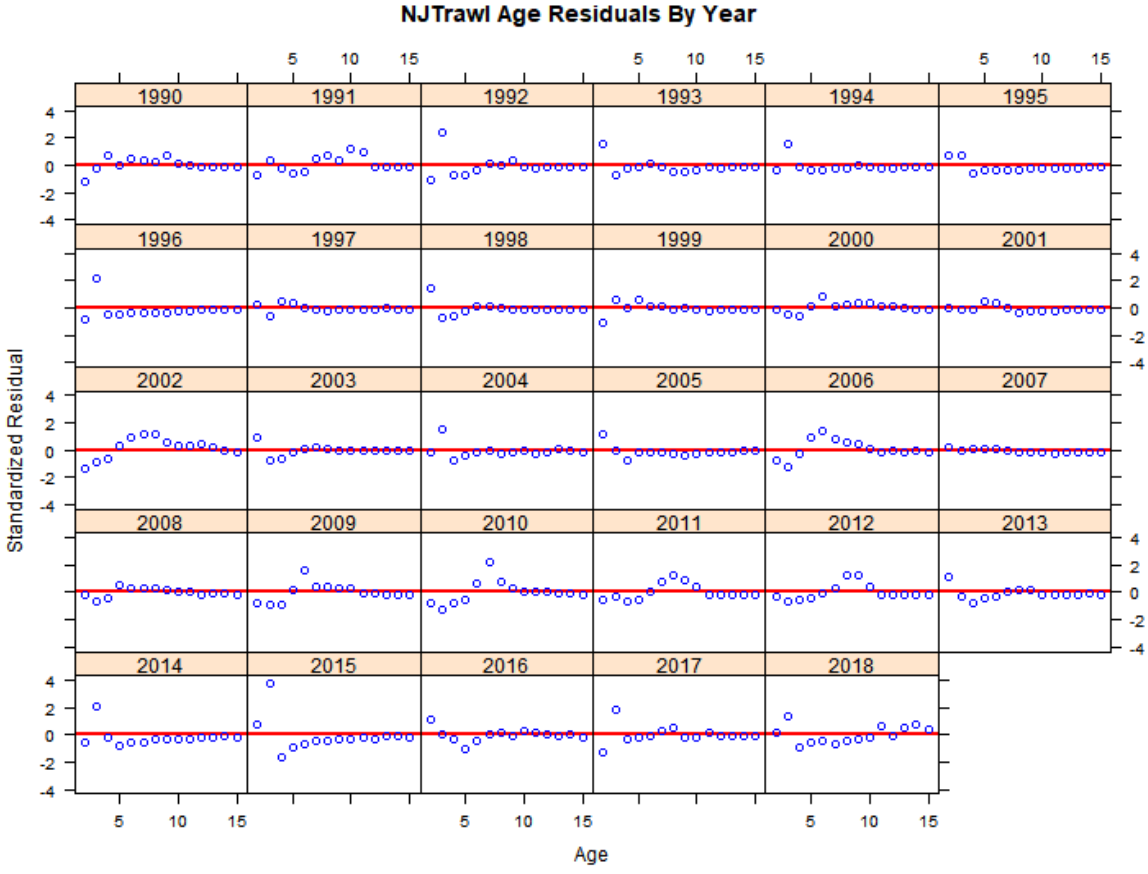

NYOHS Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)
Age
2
4
6
8
10
12
14
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
Year

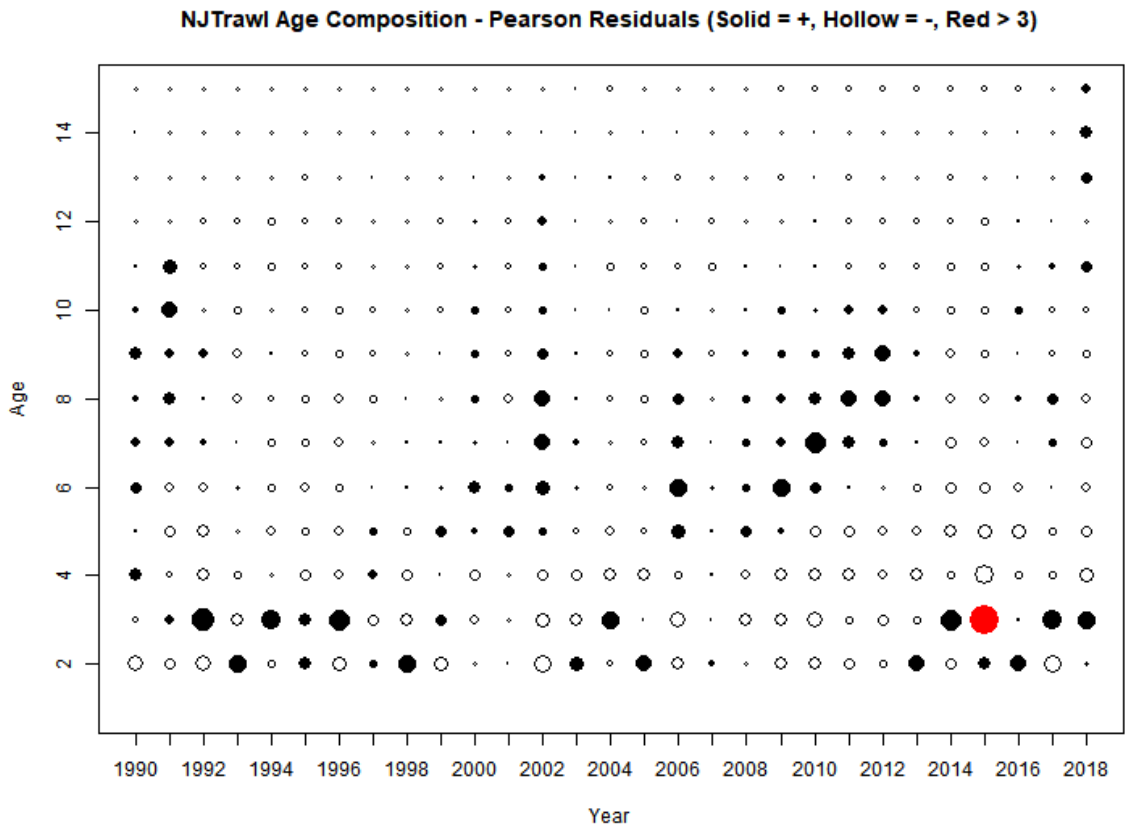

NYOHS Selectivity
Selectivity
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Age

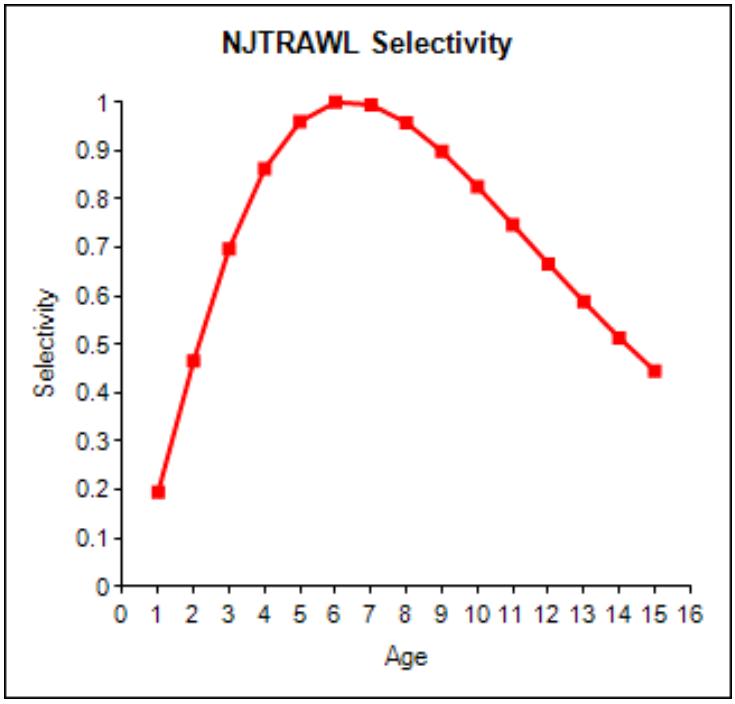

NJTrawl Age Composition By Age
Pred
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Proportion
Year

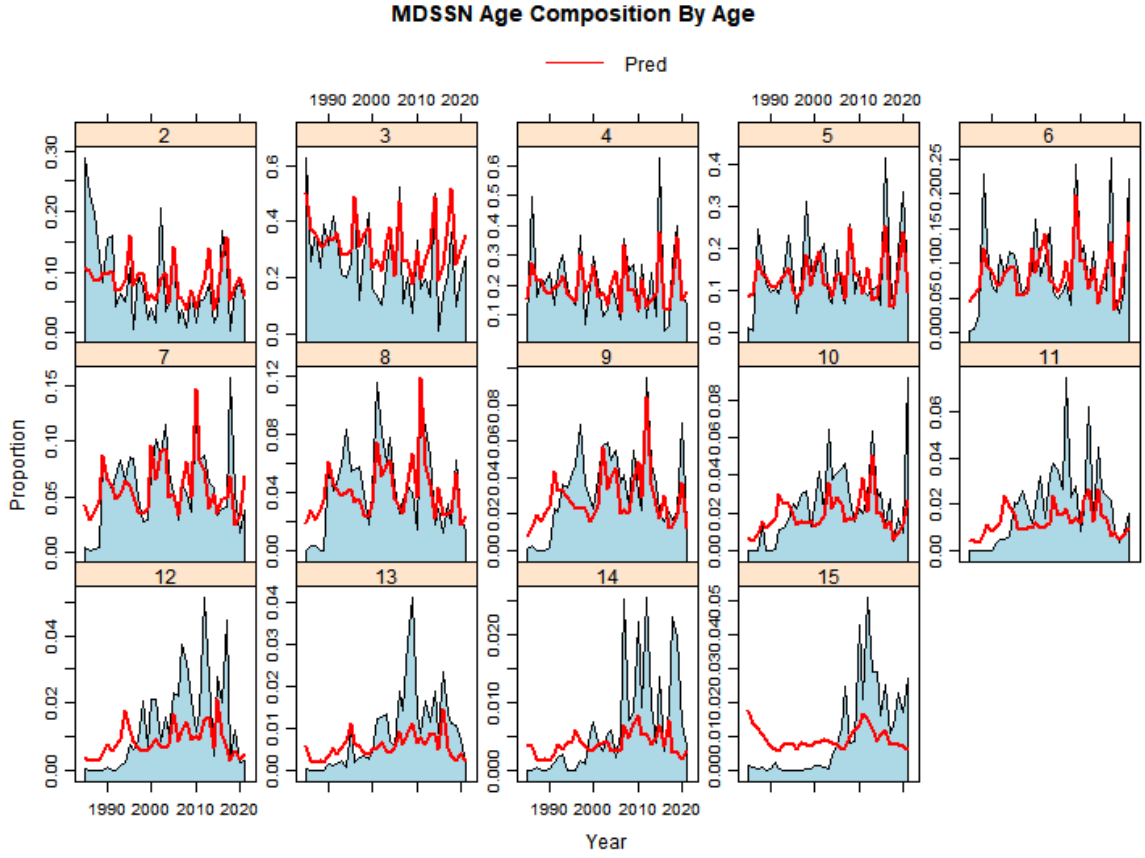

NJTrawl Age Composition By Year
Pred
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Proportion
Age

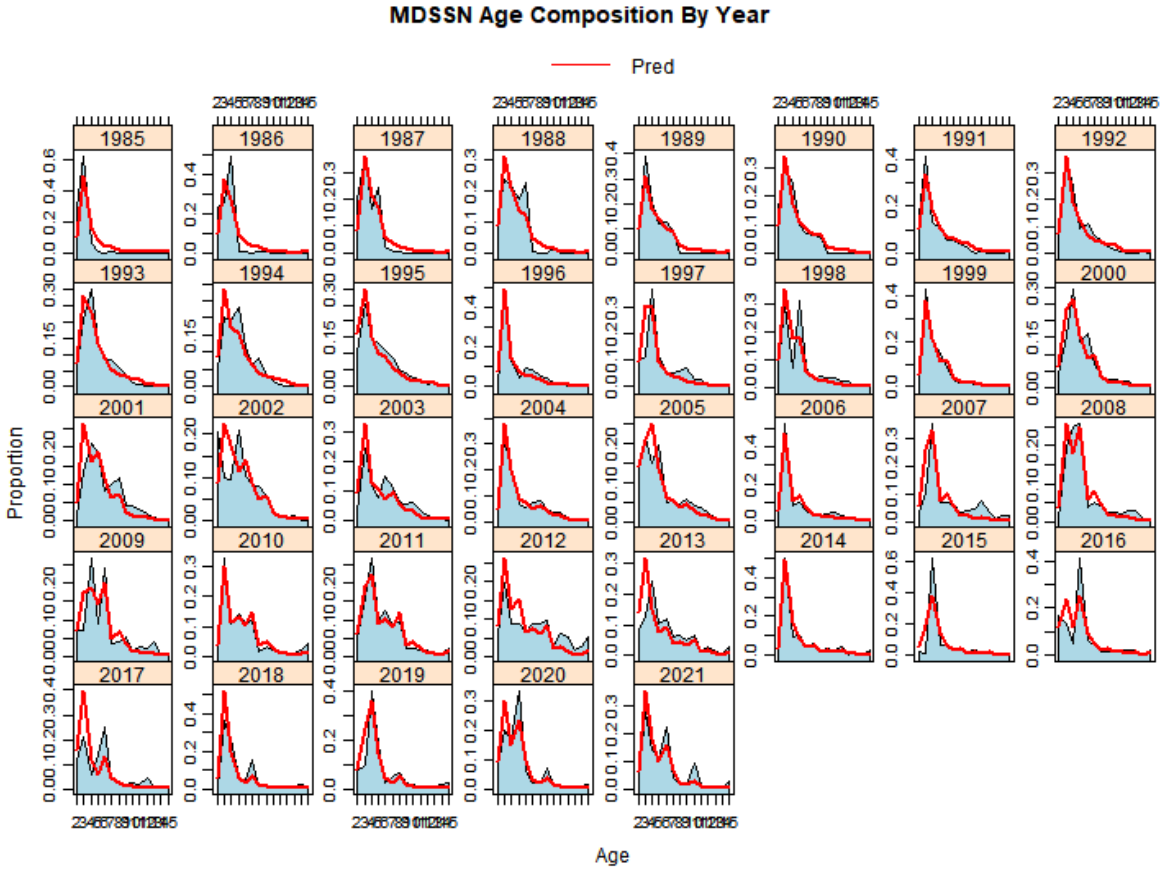

NJTrawl Age Residuals By Age
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Standardized Residual
Year
1990
2000
2010

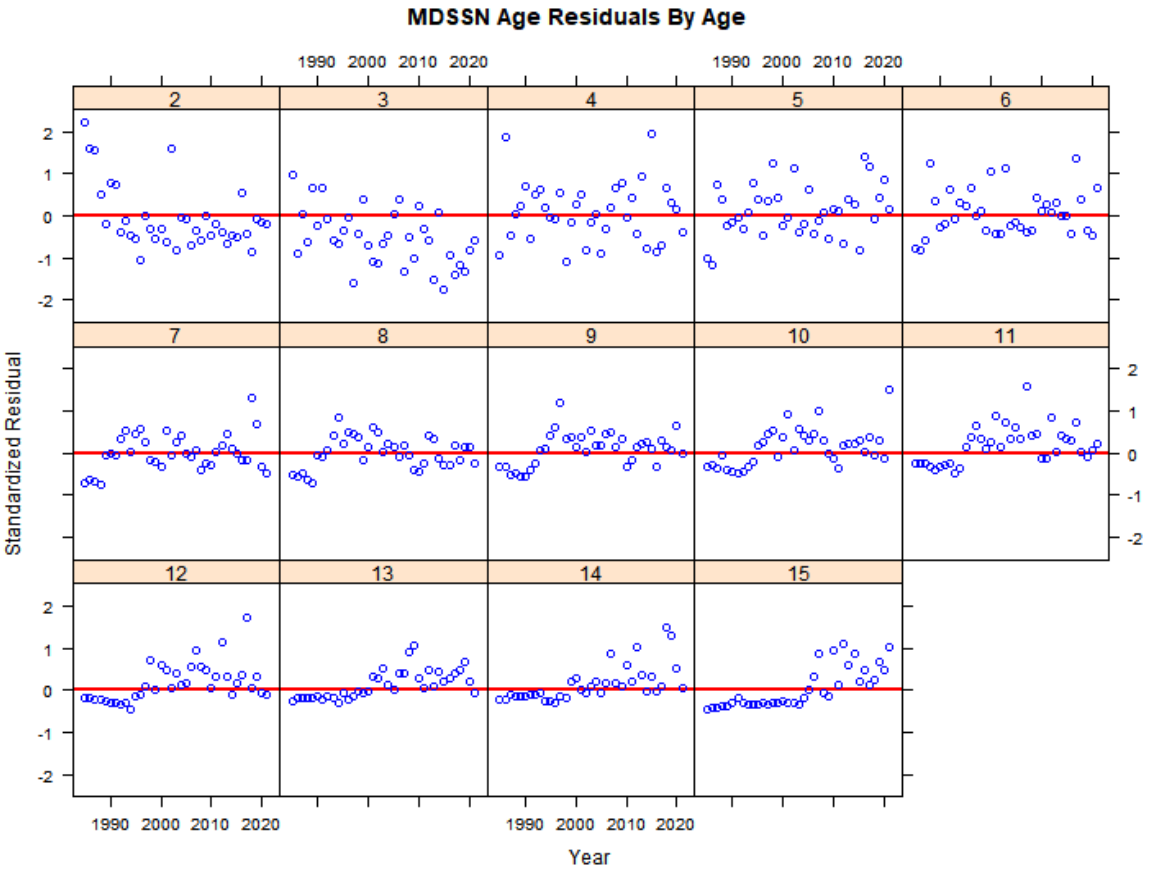

NJTrawl Age Residuals By Year
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Standardized Residual
Age
5
10
15

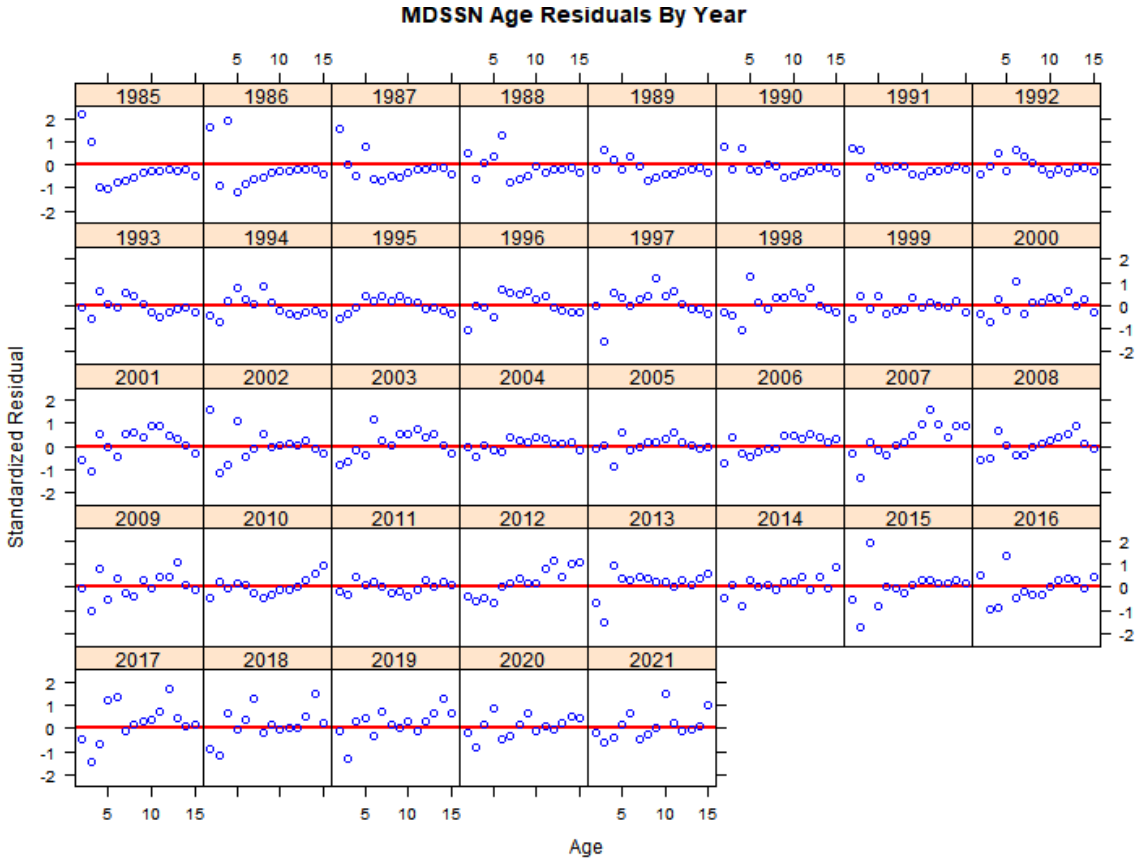

NJTrawl Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)
Age
2
4
6
8
10
12
14
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Year

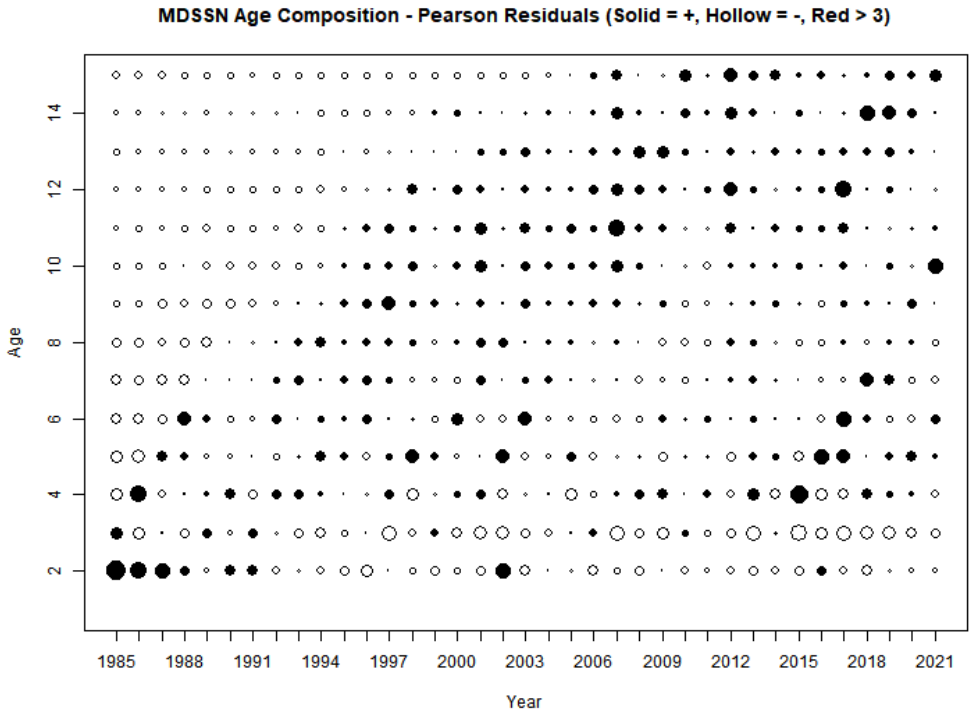

NJTRAWL Selectivity
Selectivity
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Age

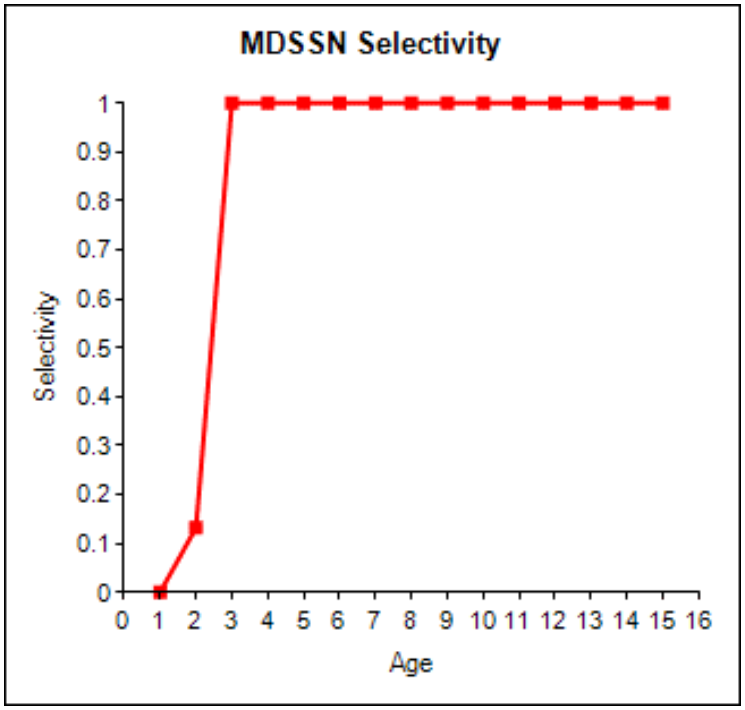

MDSSN Age Composition By Age
Pred
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Proportion
Year

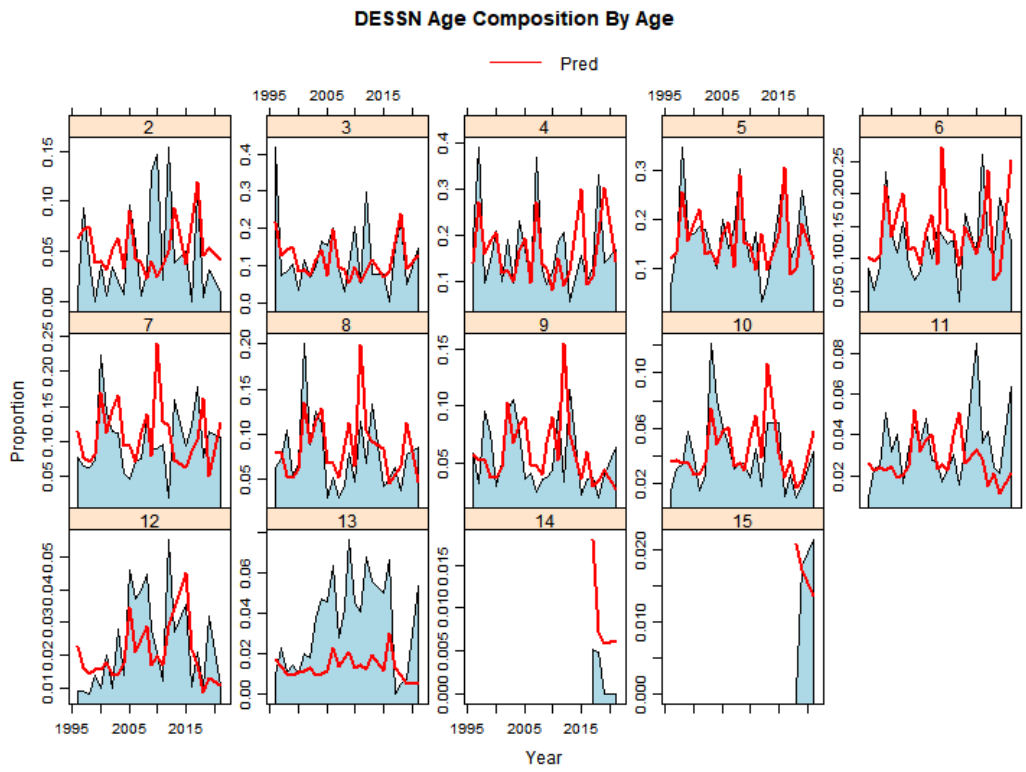

MDSSN Age Composition By Year
Pred
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
Proportion
Age

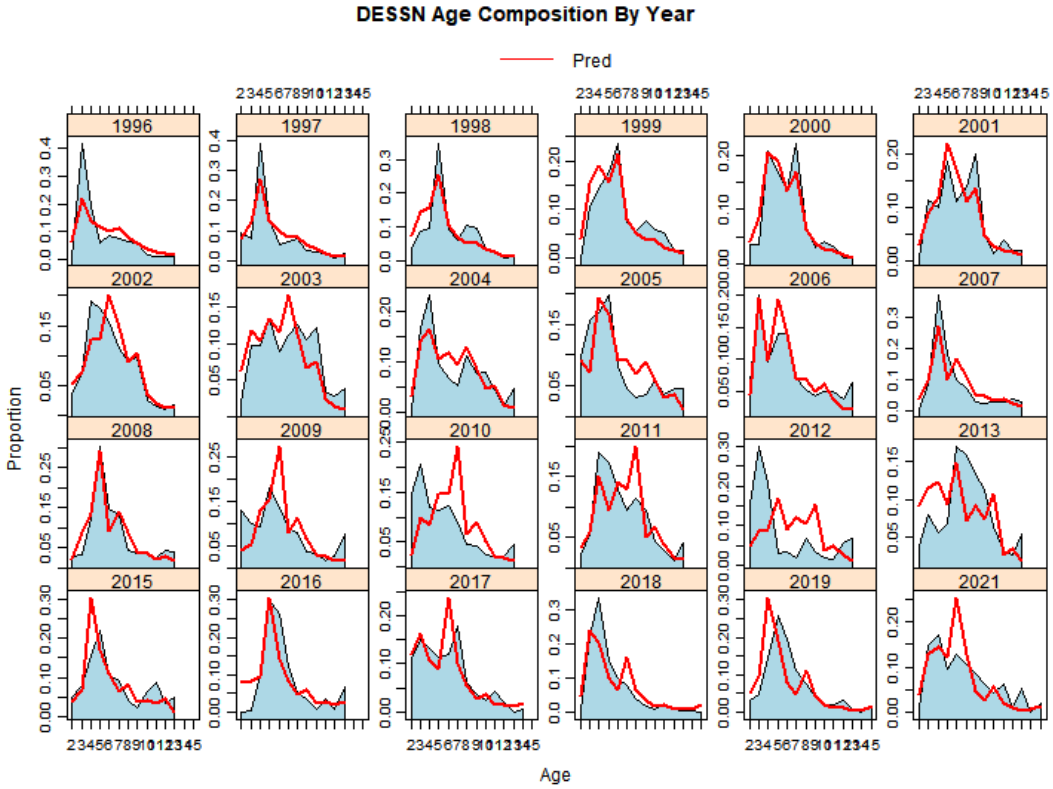

MDSSN Age Residuals By Age
2
3
4
5
6
7
8
9
10
11
12
13
14
15
1990 2000 2010 2020
Standardized Residual
Year

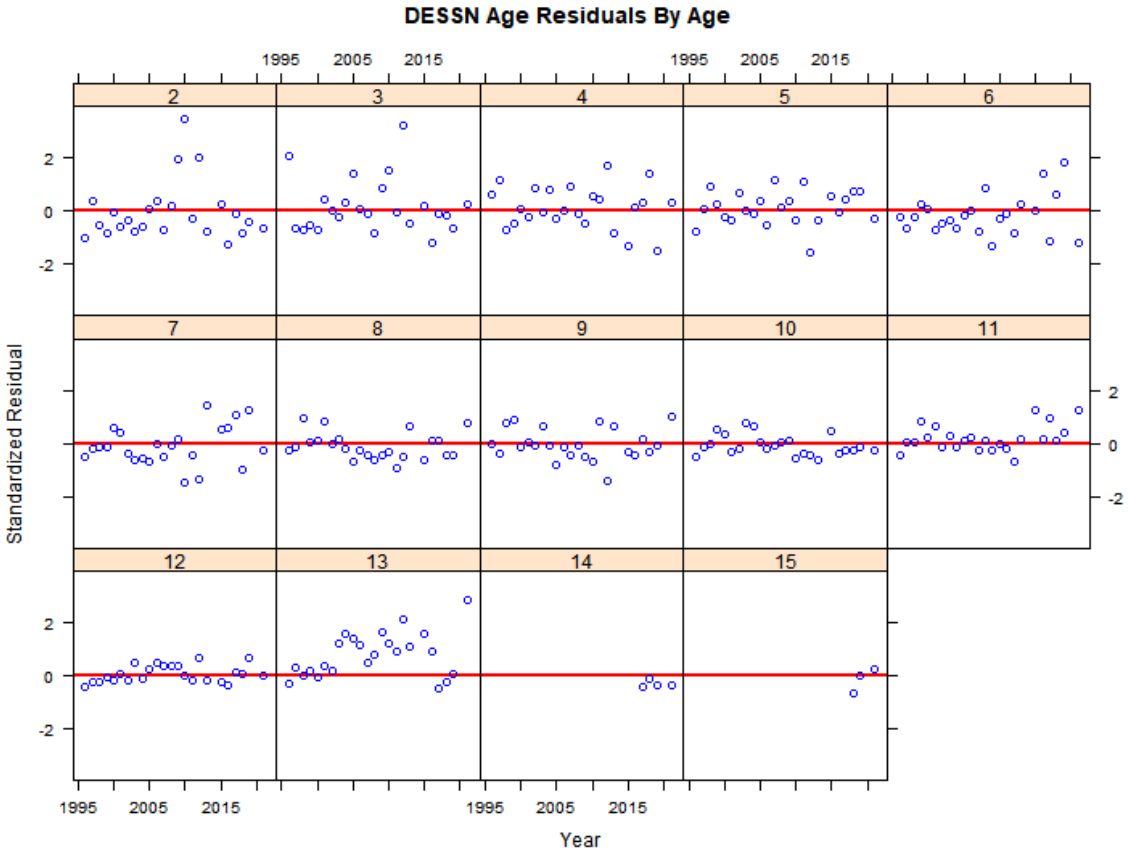

MDSSN Age Residuals By Year
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
5 10 15
Standardized Residual
Age

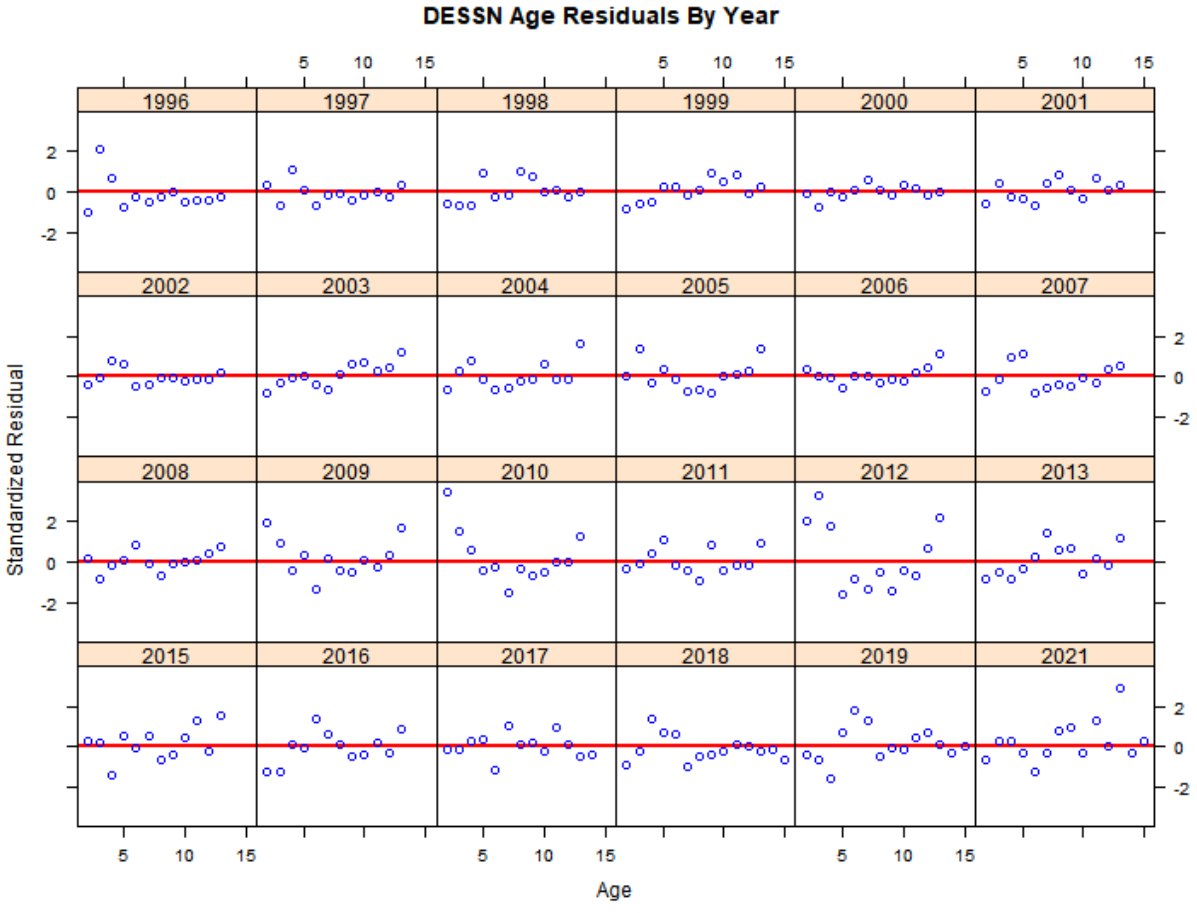

MDSSN Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)
Age
2
4
6
8
10
12
14
1985
1988
1991
1994
1997
2000
2003
2006
2009
2012
2015
2018
2021
Year

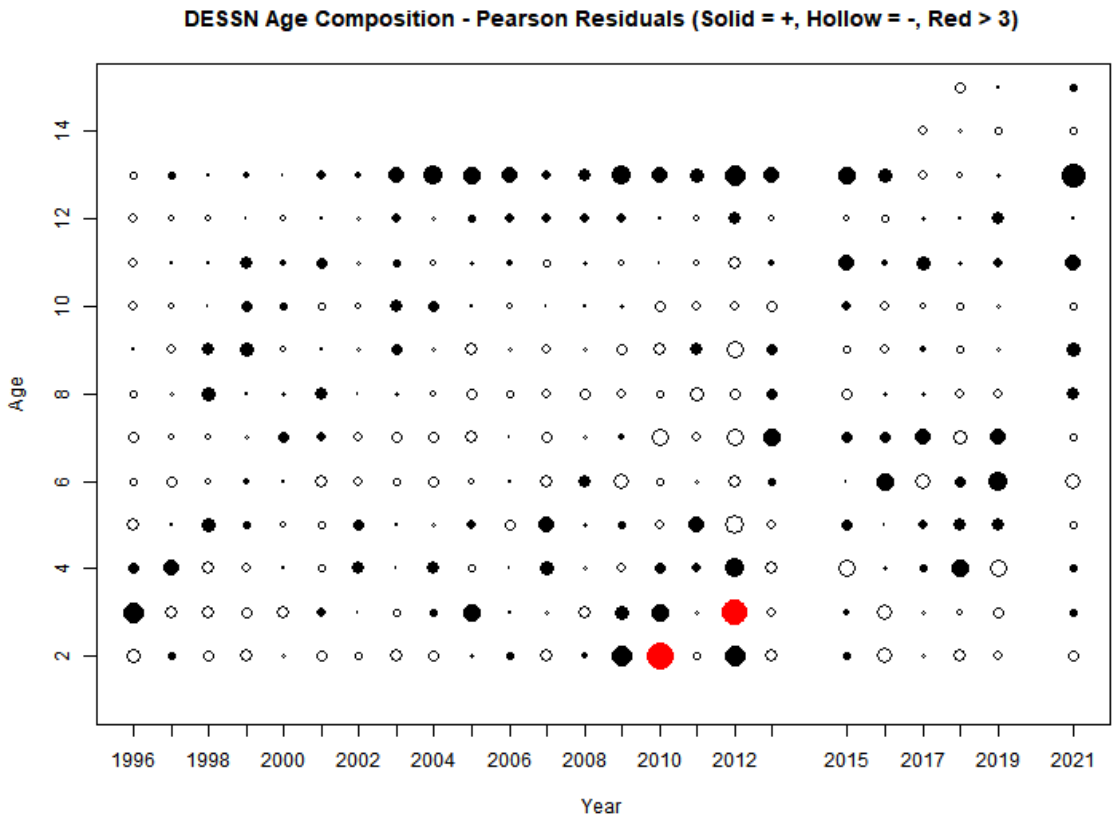

MDSSN Selectivity
Selectivity
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Age

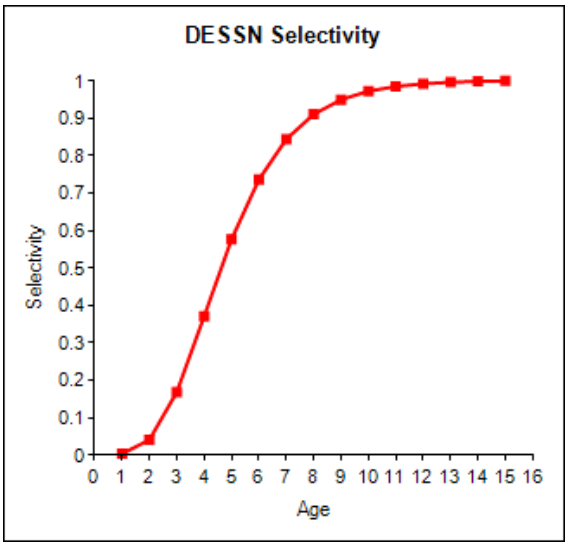

DESSN Age Composition By Age
Pred
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Proportion
Year

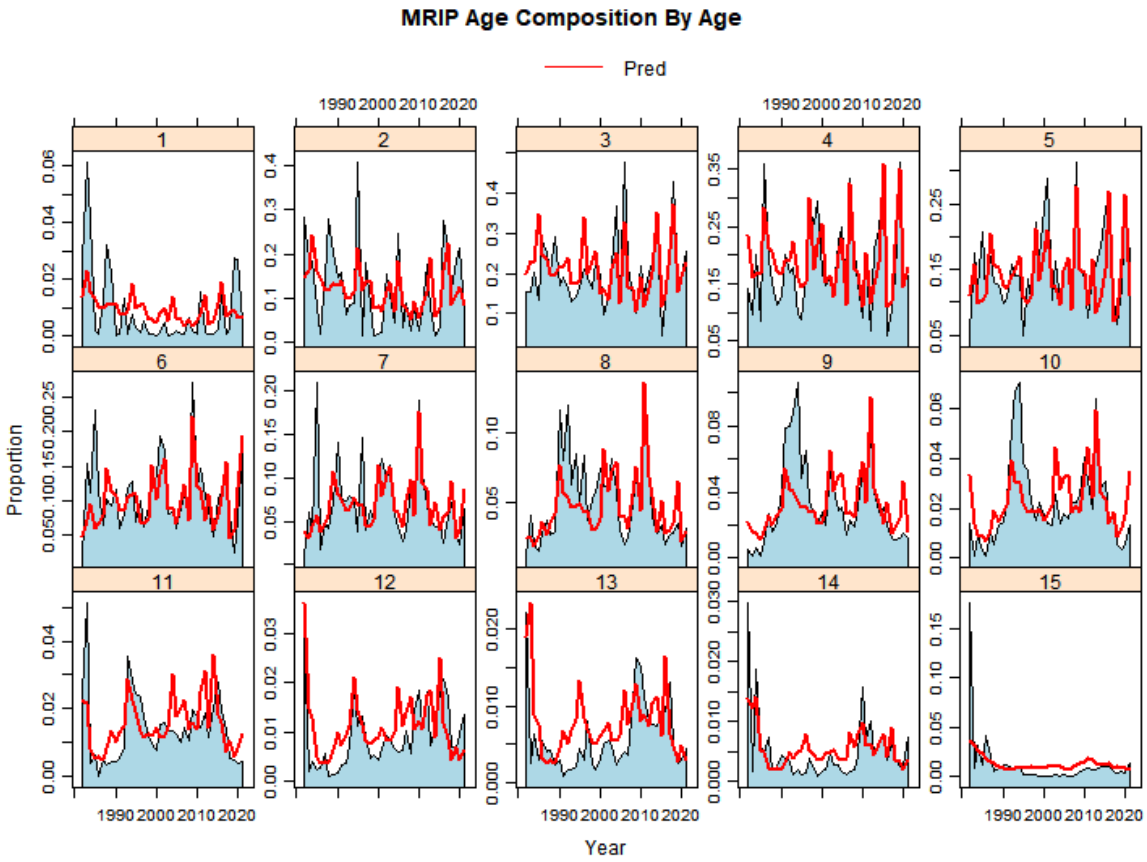

DESSN Age Composition By Year
Pred
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2015
2016
2017
2018
2019
2021
Proportion
Age

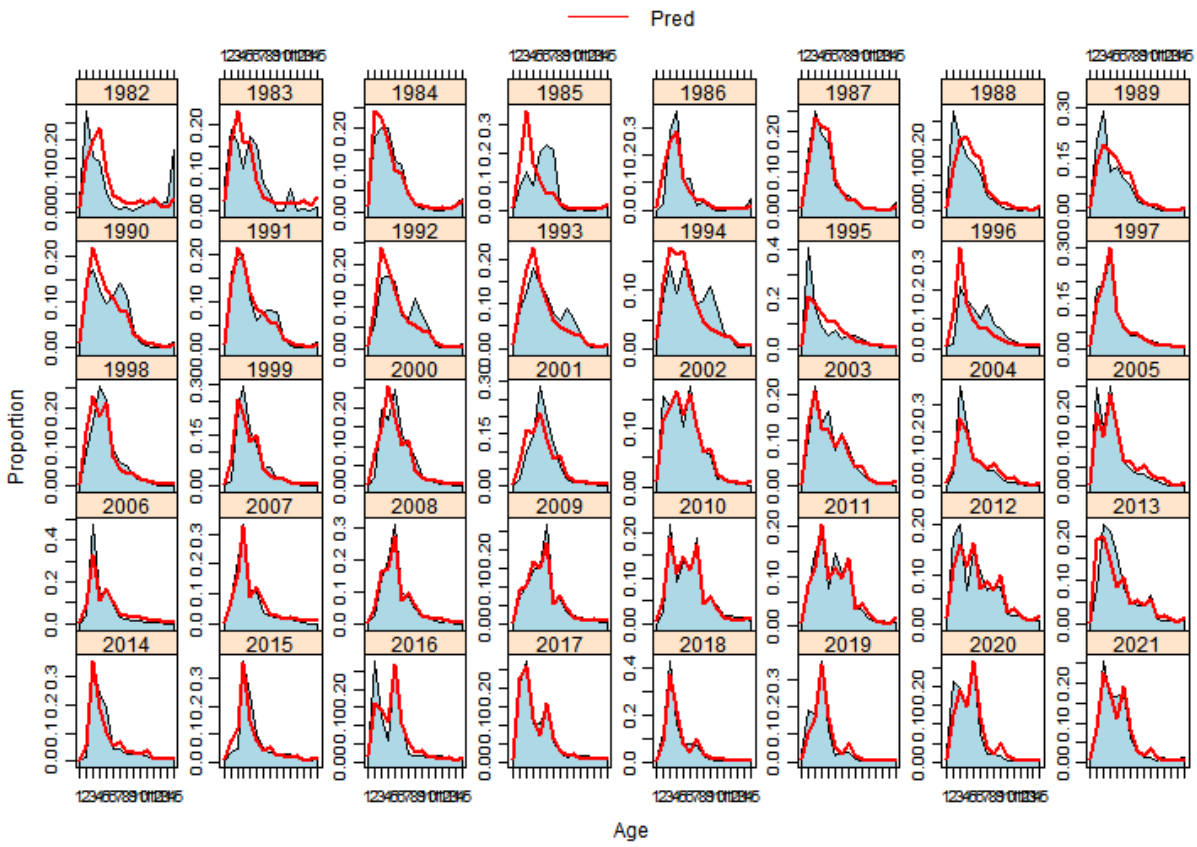

DESSN Age Residuals By Age
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Standardized Residual
Year
1995
2005
2015

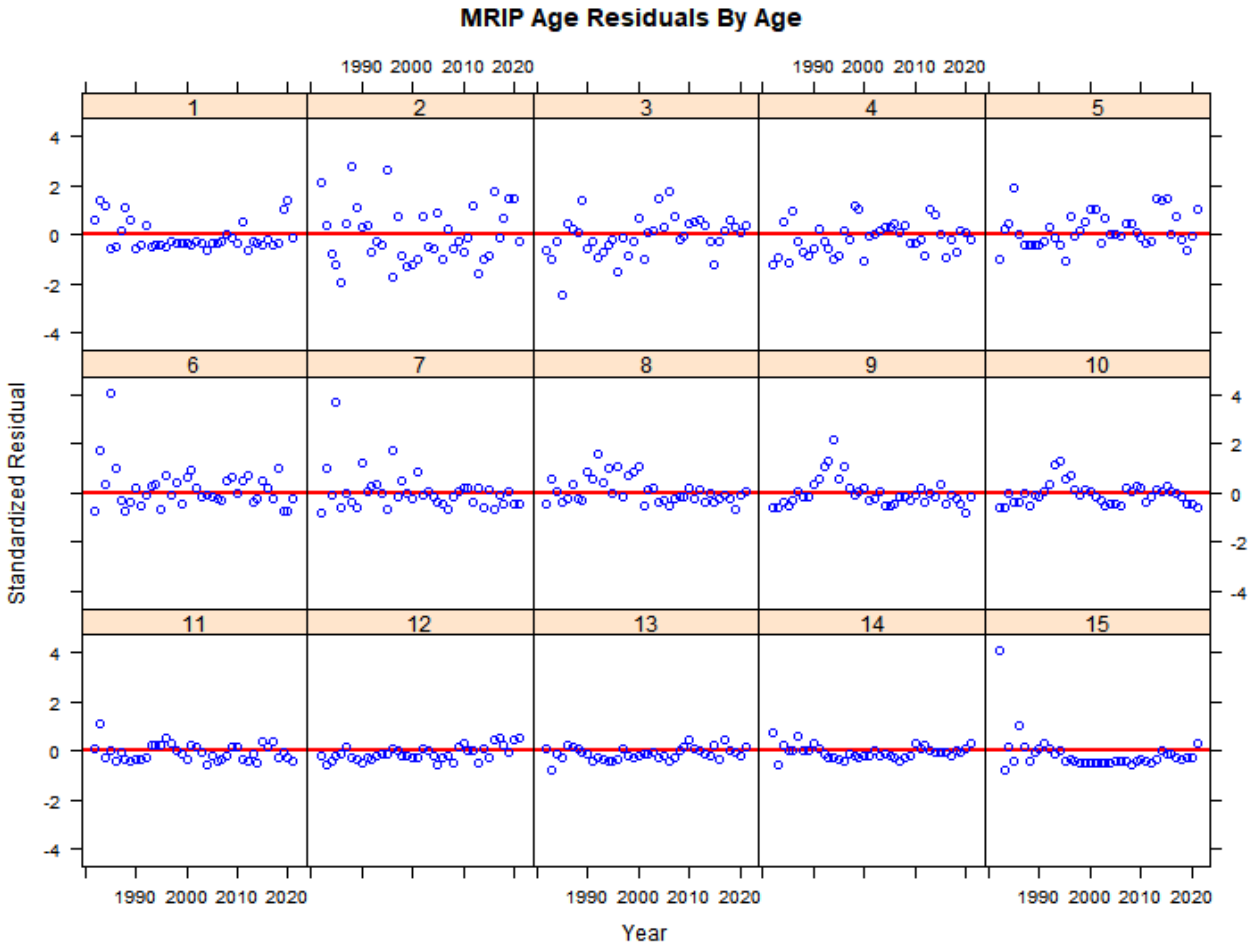

DESSN Age Residuals By Year
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2015
2016
2017
2018
2019
2021
Standardized Residual
Age
5
10
15

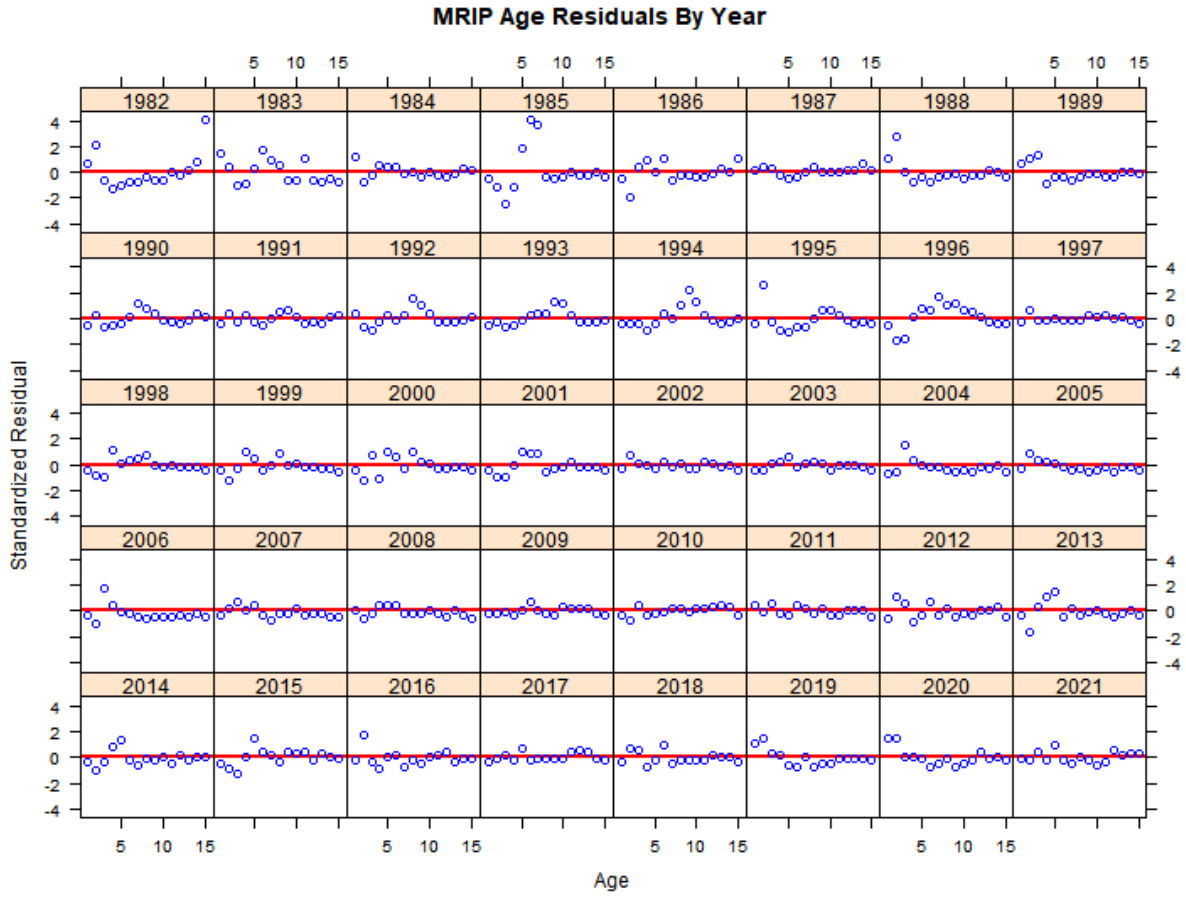

DESSN Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)
Age
2
4
6
8
10
12
14
1996
1998
2000
2002
2004
2006
2008
2010
2012
2015
2017
2019
2021
Year


DESSN Selectivity
Selectivity
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Age


MRIP Age Composition By Age
Pred
Proportion
Year


MRIP Age Composition By Year
Pred
Proportion
Age


MRIP Age Residuals By Age
1990 2000 2010 2020
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Standardized Residual
Year


MRIP Age Residuals By Year
5 10 15
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
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2011
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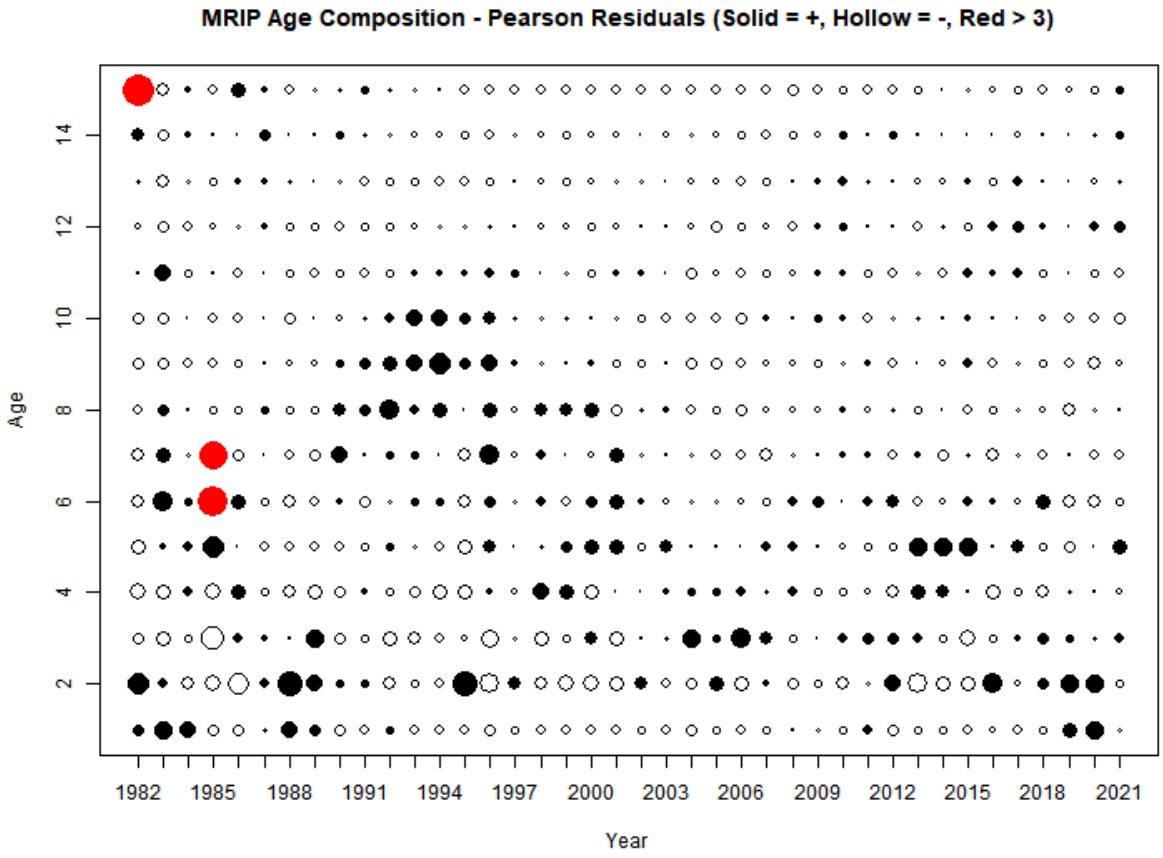
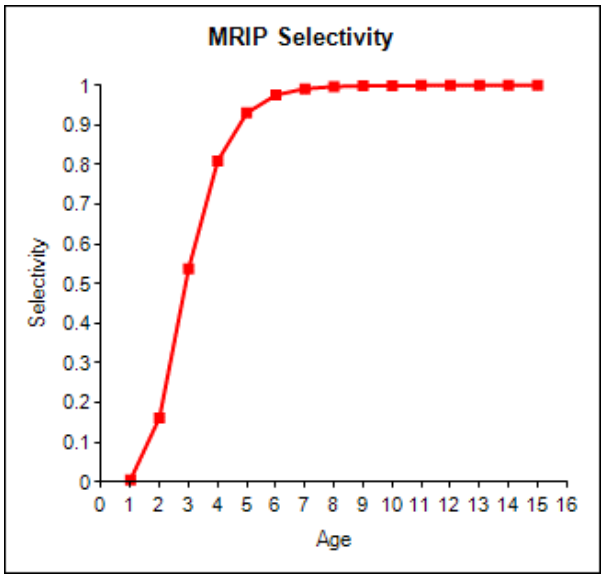
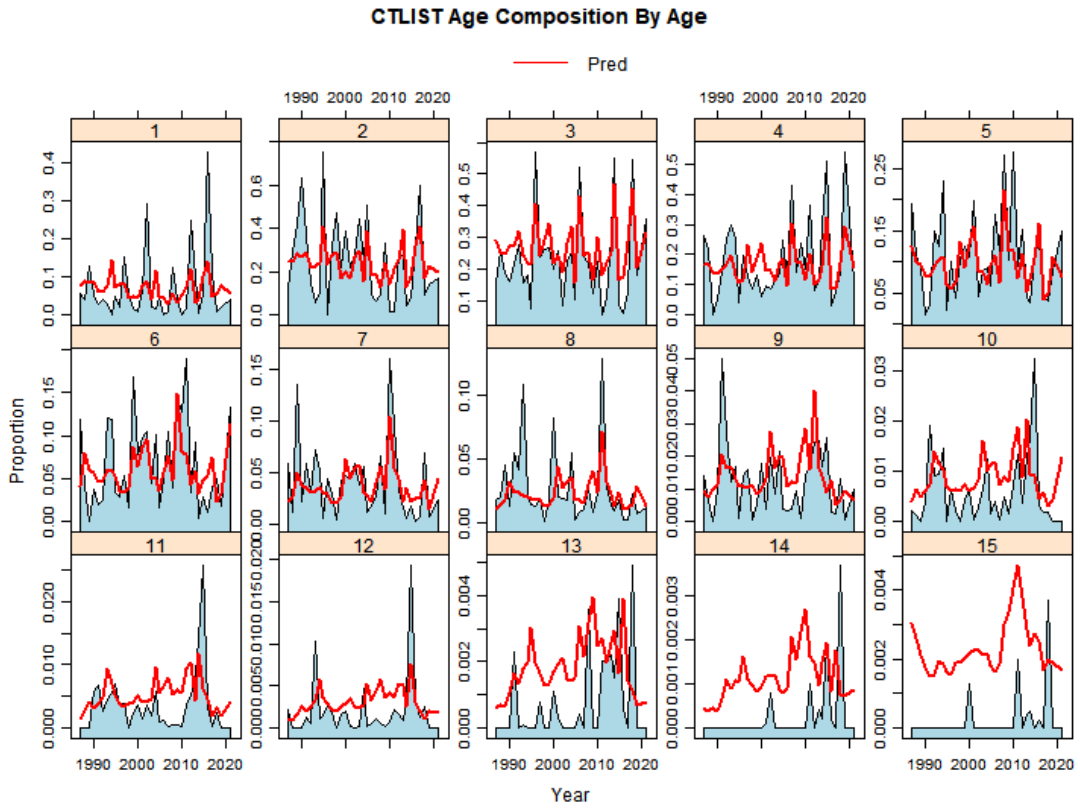
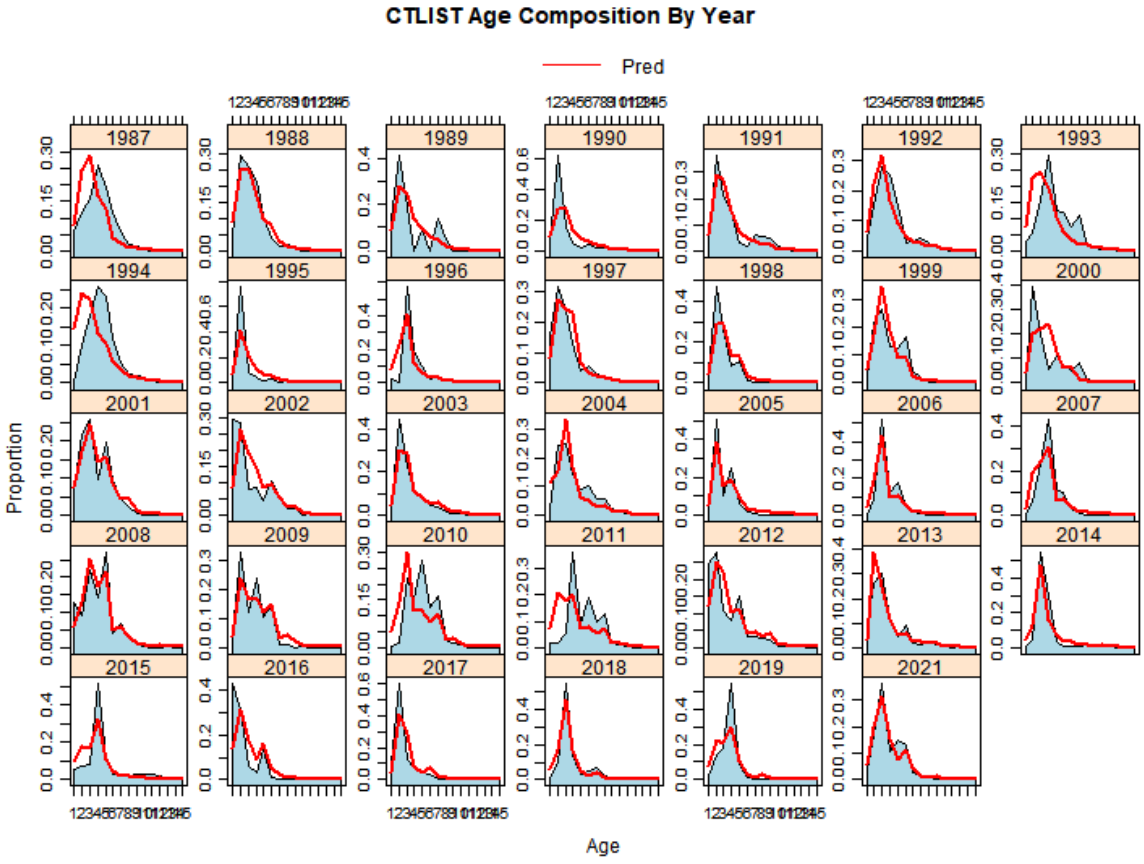
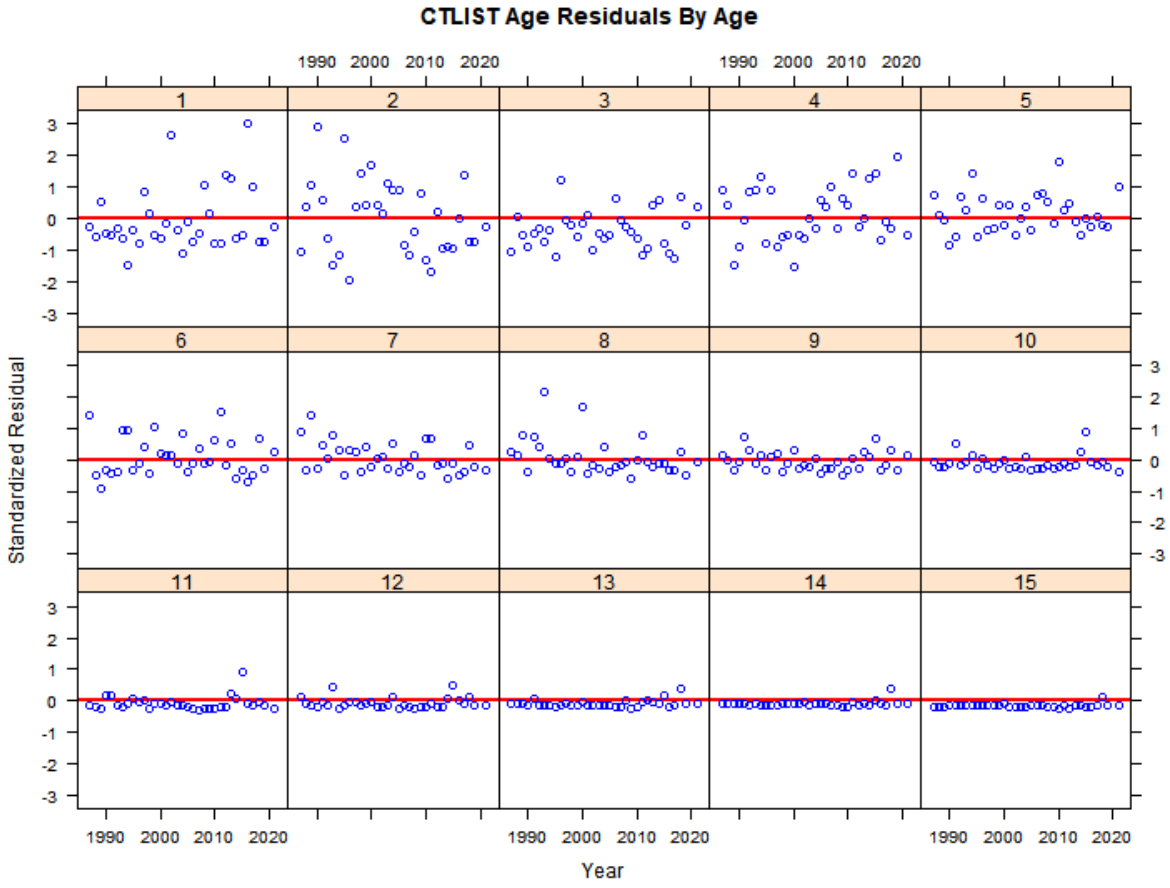
2016
2017
2018
2019
2020
2021
Standardized Residual
Age

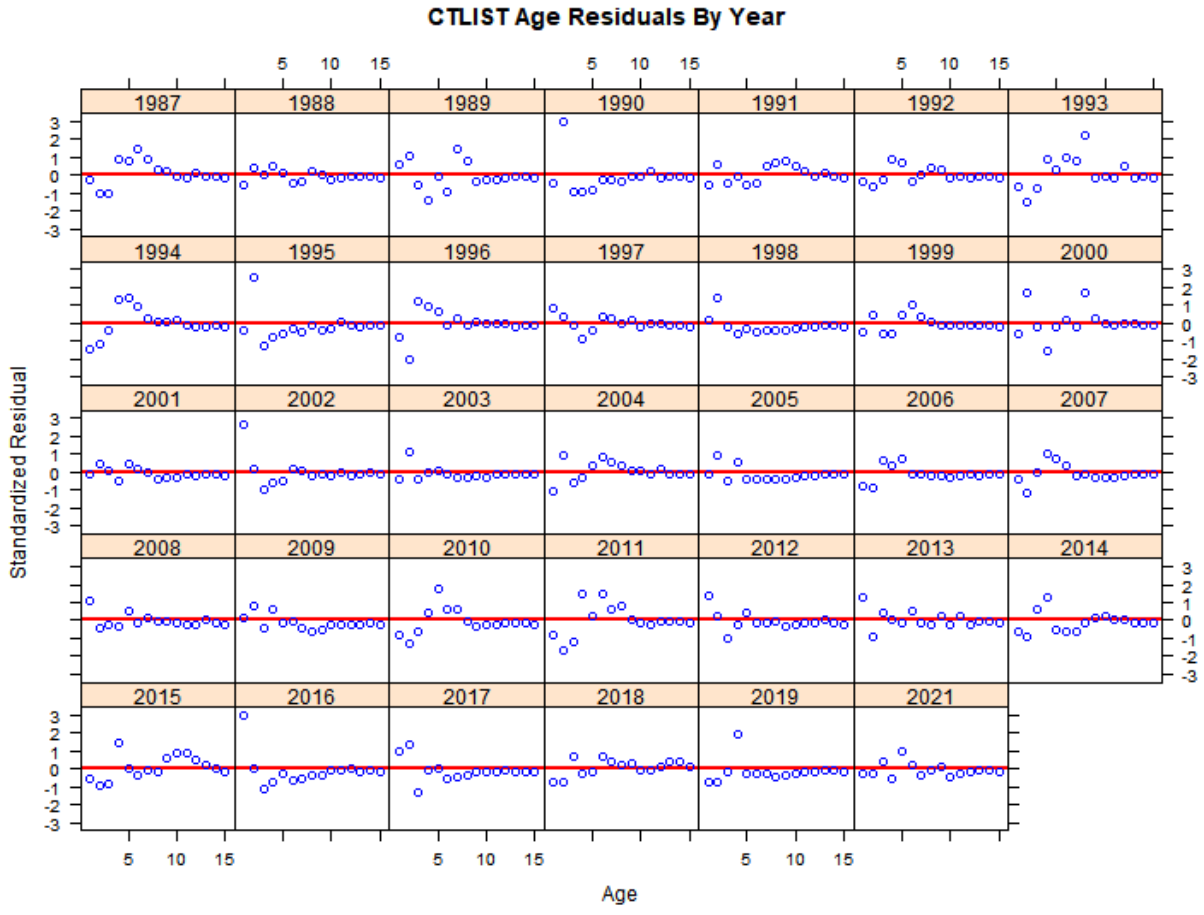

MRIP Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)
Age
2
4
6
8
10
12
14
1982
1985
1988
1991
1994
1997
2000
2003
2006
2009
2012
2015
2018
2021
Year

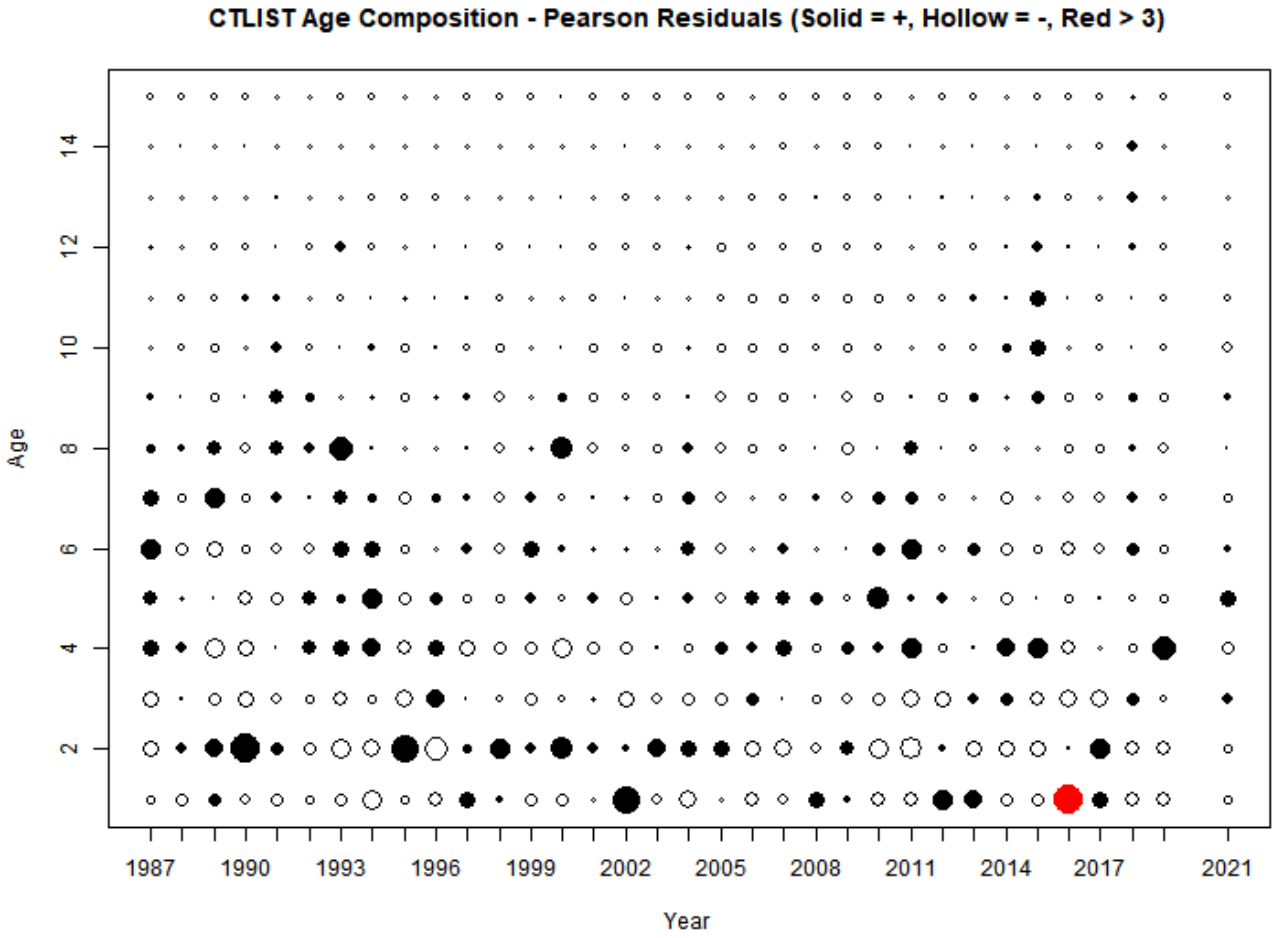

MRIP Selectivity
Selectivity
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Age

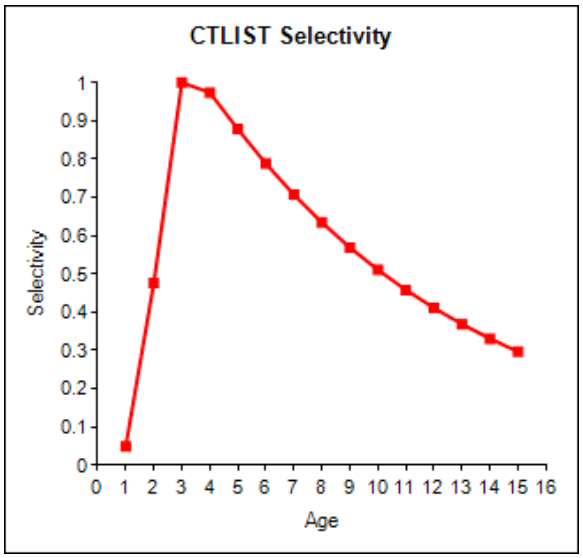

CTLIST Age Composition By Age
Pred
Proportion
Year

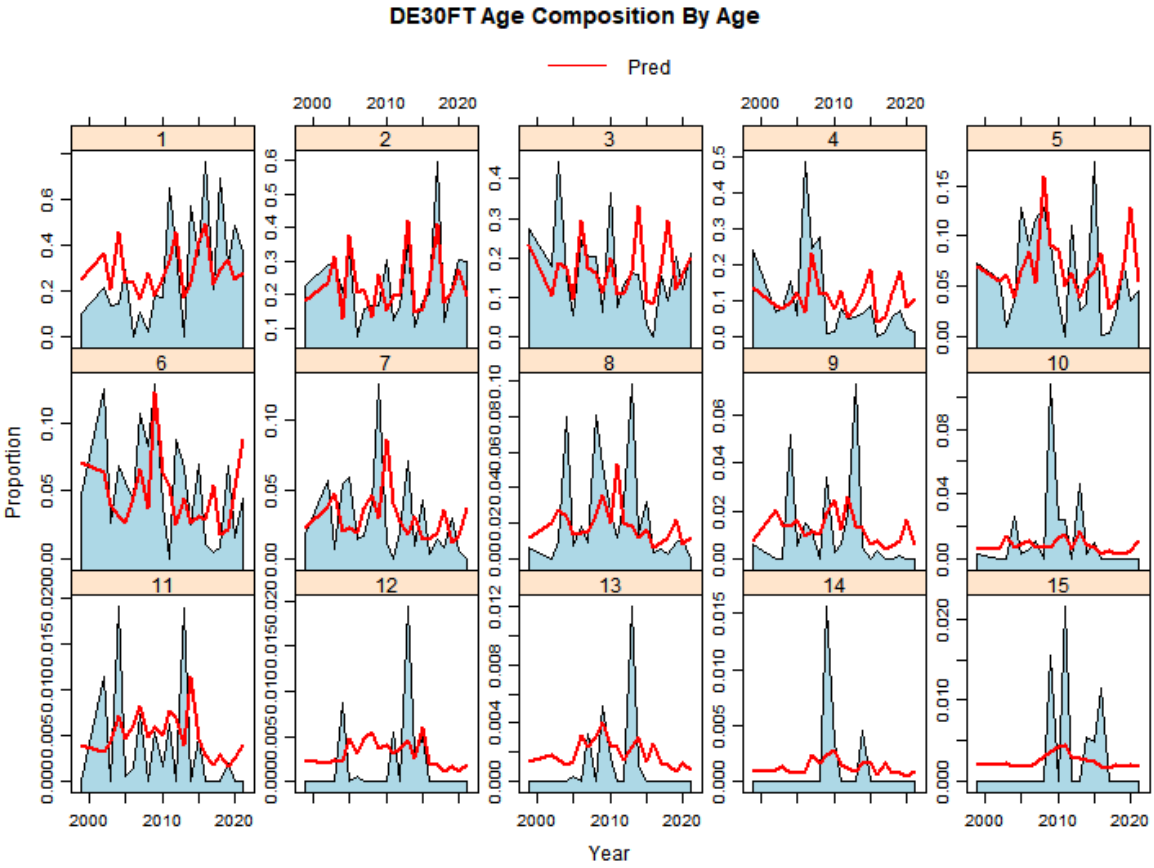

CTLIST Age Composition By Year
Pred
Proportion
Age

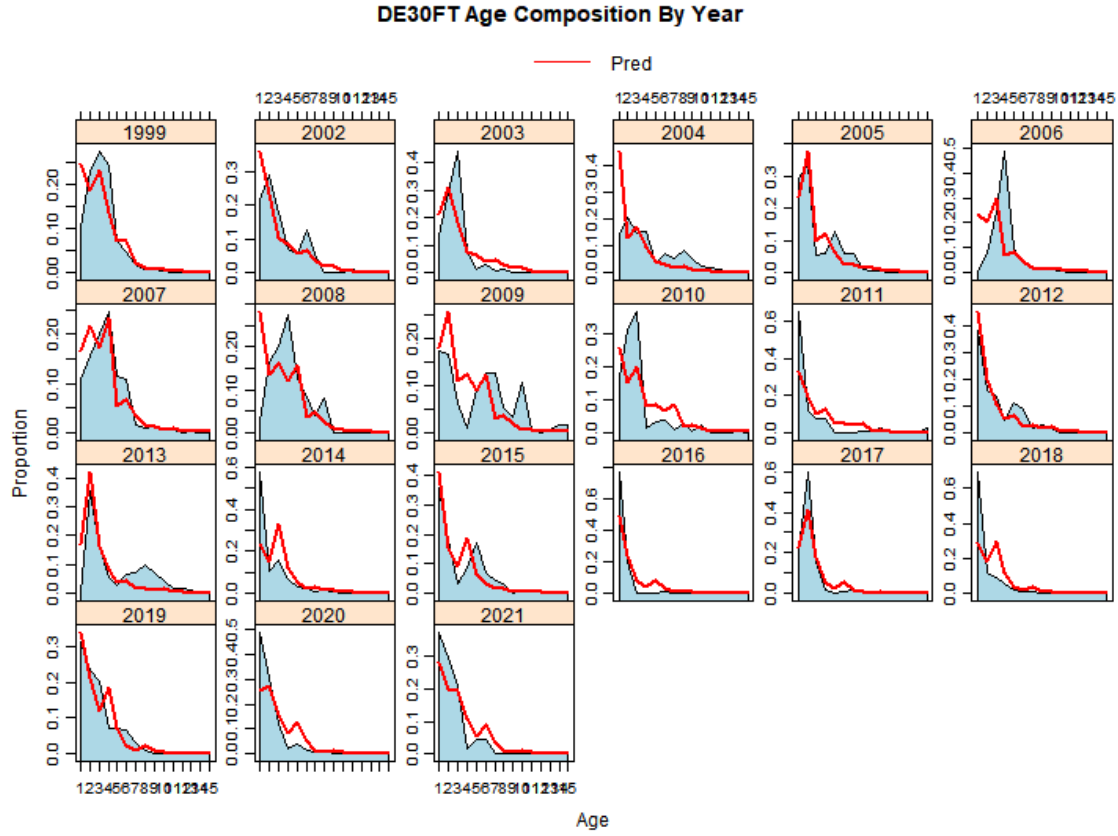

CTLIST Age Residuals By Age
1 2 3 4 5
6 7 8 9 10
11 12 13 14 15
Standardized Residual
Year

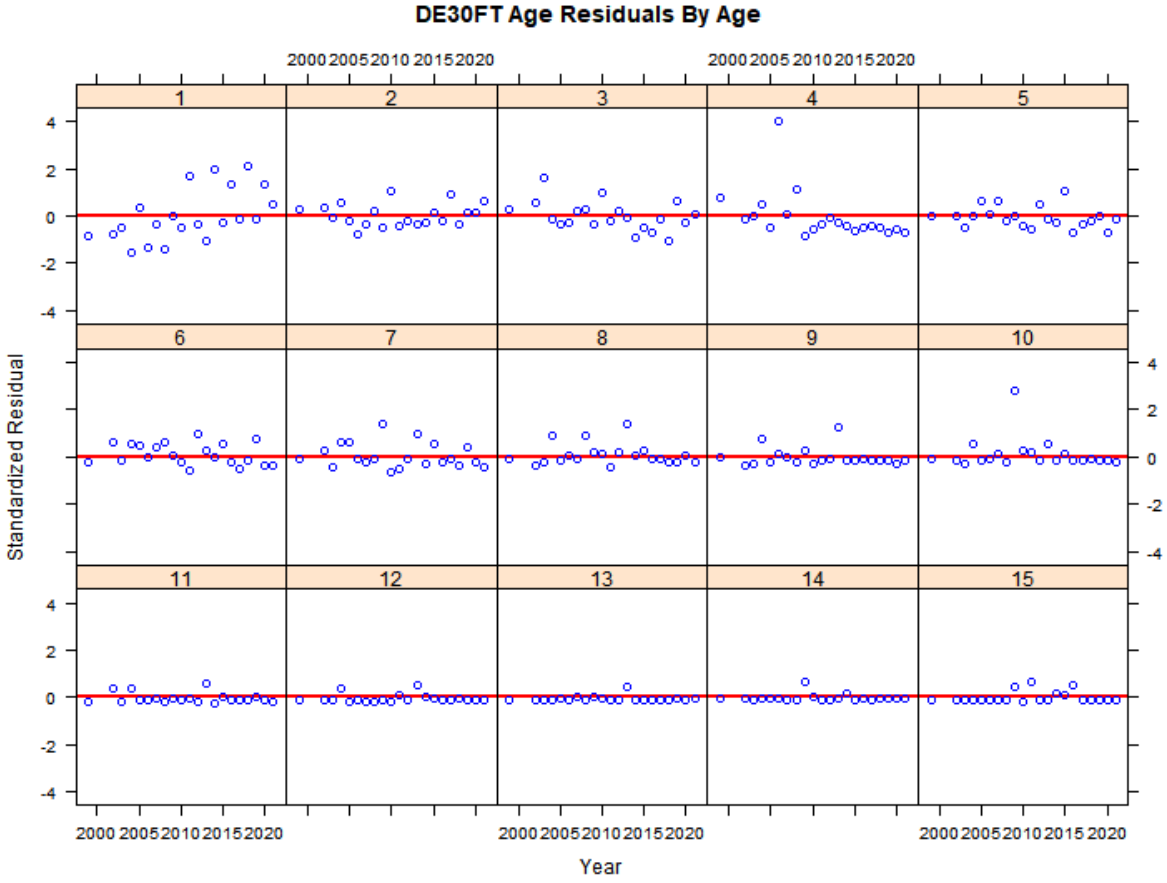

CTLIST Age Residuals By Year
1987 1988 1989 1990 1991 1992 1993
1994 1995 1996 1997 1998 1999 2000
2001 2002 2003 2004 2005 2006 2007
2008 2009 2010 2011 2012 2013 2014
2015 2016 2017 2018 2019 2021
Standardized Residual
Age

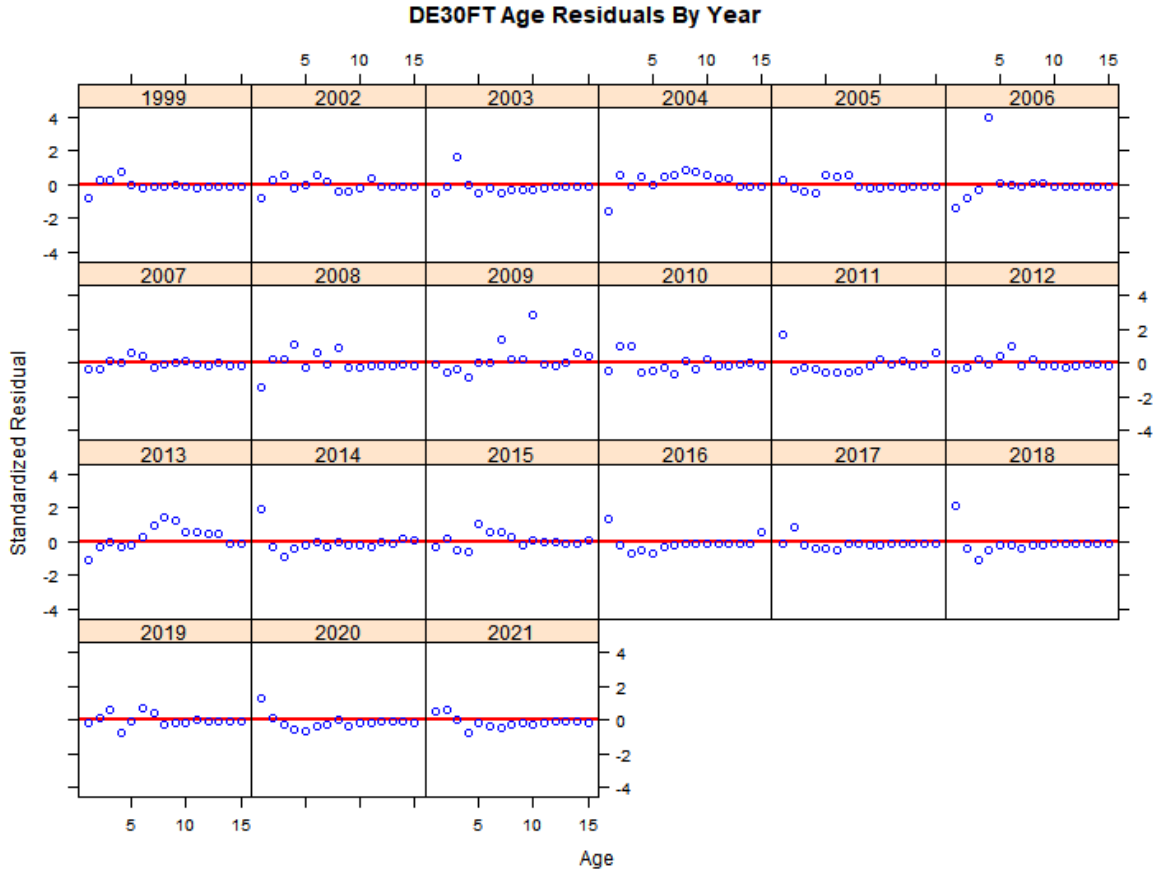

CTLIST Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)
Age
2
4
6
8
10
12
14
1987
1990
1993
1996
1999
2002
2005
2008
2011
2014
2017
2021
Year

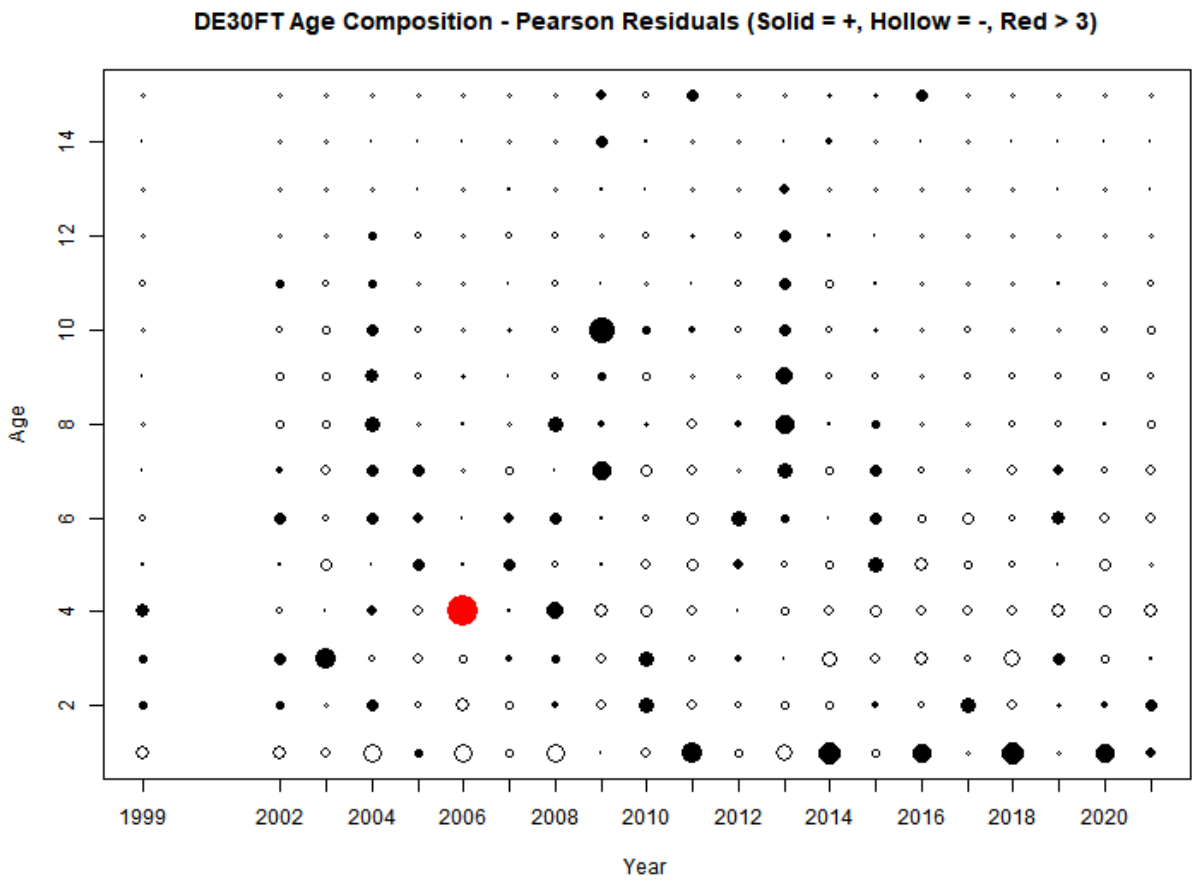

CTLIST Selectivity
Selectivity
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Age

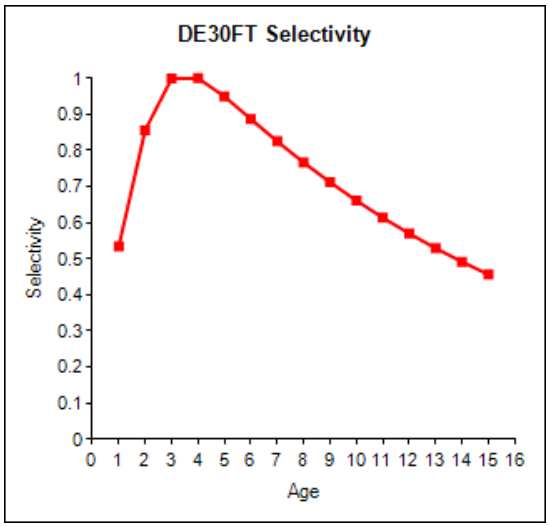

DE30FT Age Composition By Age
Pred
Proportion
Year
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15


DE30FT Age Composition By Year
Pred
Proportion
Age
1999
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021


DE30FT Age Residuals By Age
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Standardized Residual
Year


DE30FT Age Residuals By Year
1999
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
Standardized Residual
Age


DE30FT Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)
Age
2
4
6
8
10
12
14
1999
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Year


DE30FT Selectivity
Selectivity
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0.1
0.2
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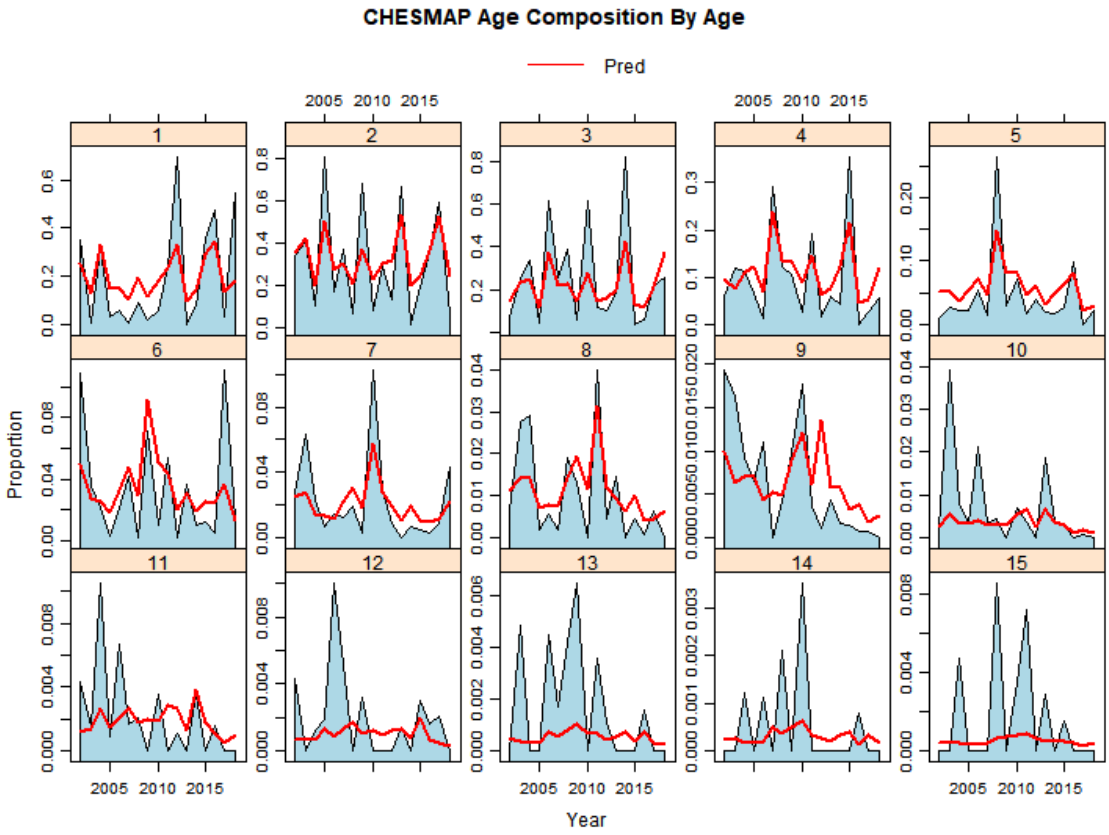
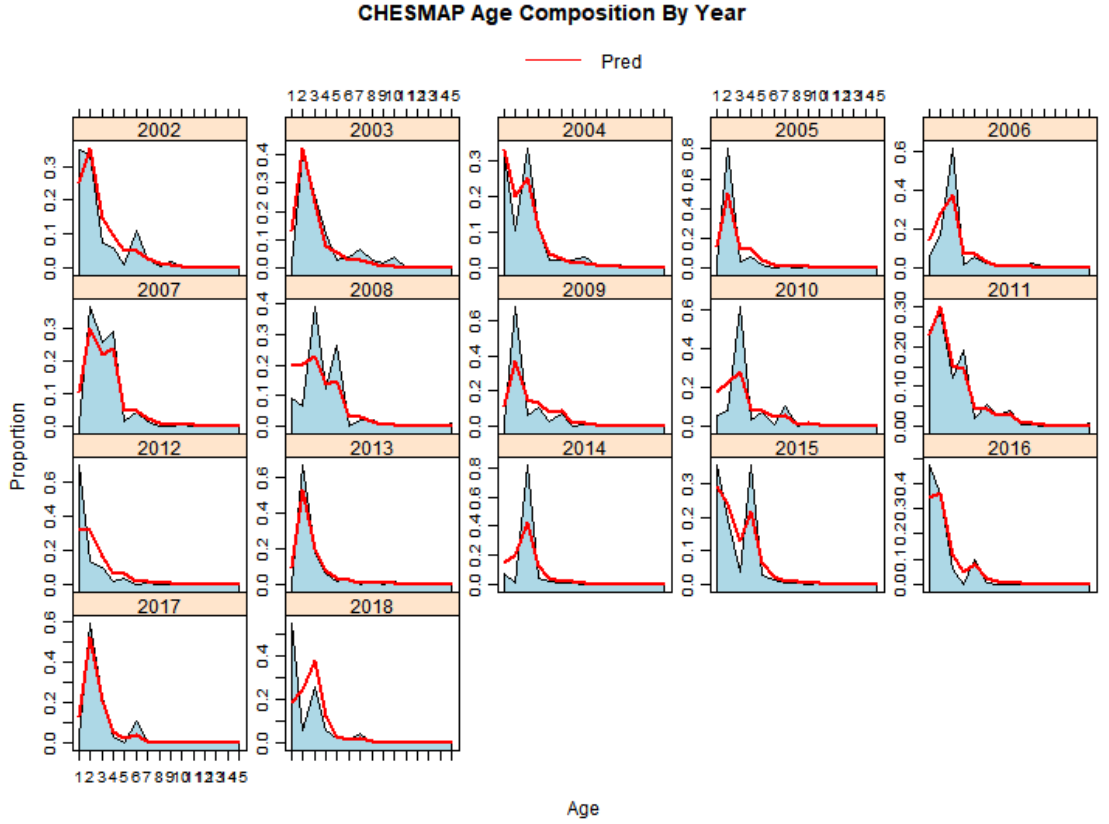
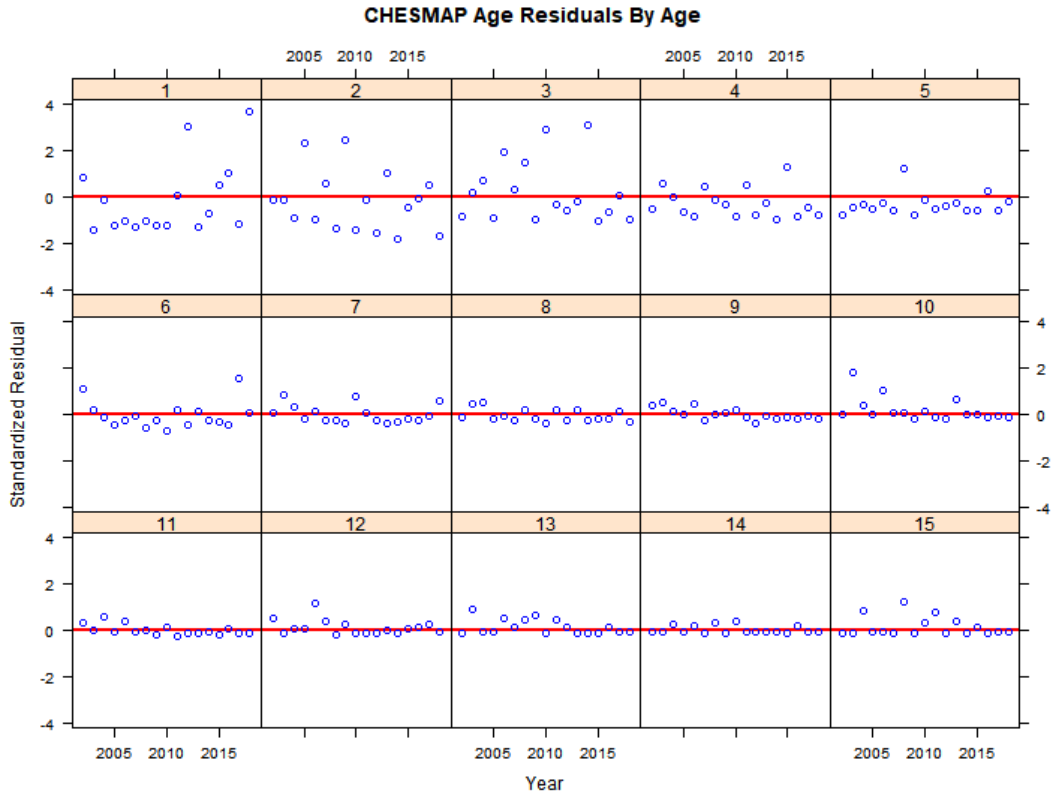
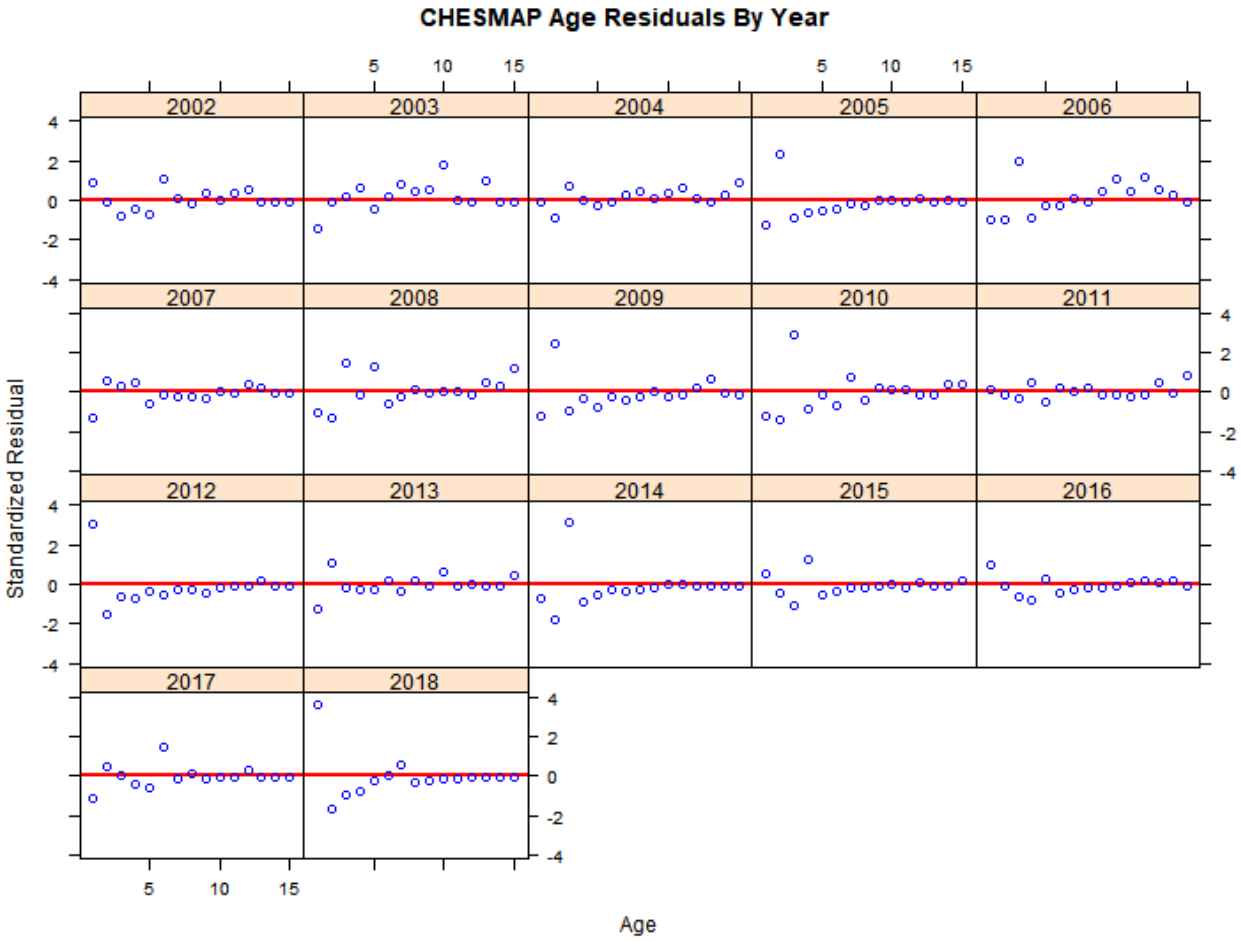
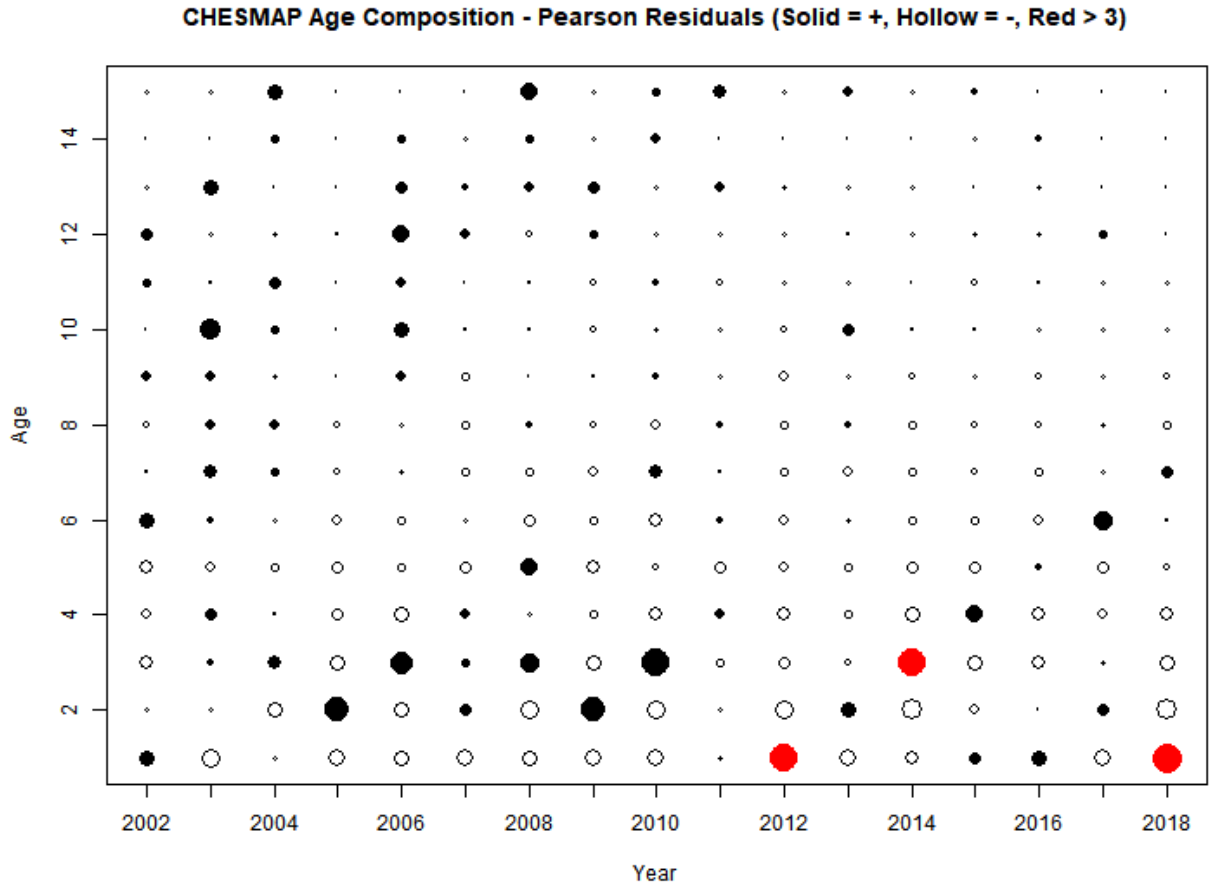
0.4
0.5
0.6
0.7
0.8
0.9
1
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Age

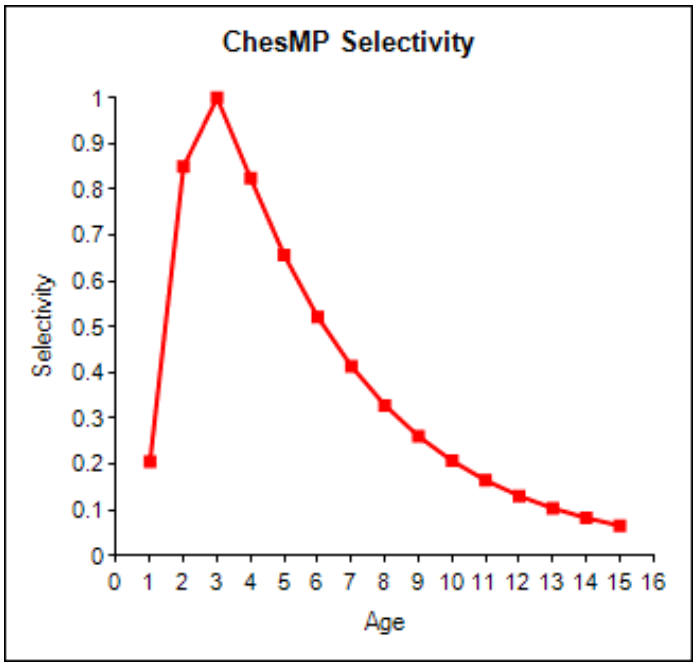

CHESMAP Age Composition By Age
Pred
Proportion
Year
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15


CHESMAP Age Composition By Year
Pred
Proportion
Age
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018

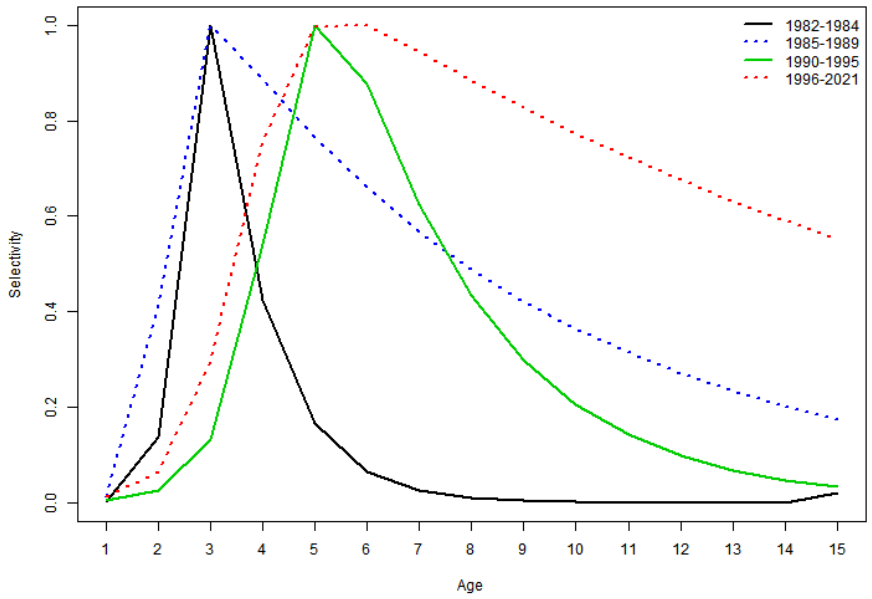

CHESMAP Age Residuals By Age
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Standardized Residual
Year


CHESMAP Age Residuals By Year
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Standardized Residual
Age

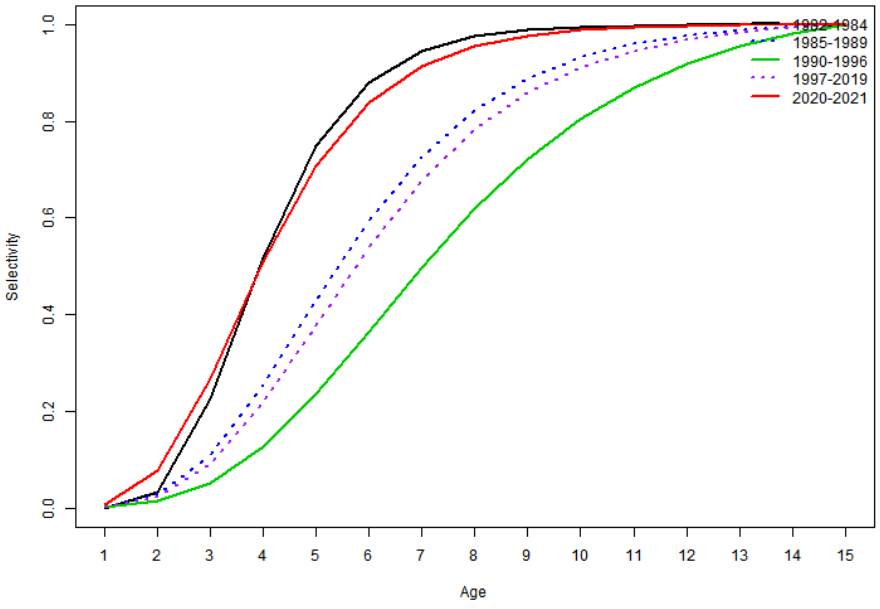

CHESMAP Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)
Age
2
4
6
8
10
12
14
2002
2004
2006
2008
2010
2012
2014
2016
2018
Year


ChesMP Selectivity
Selectivity
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Age

Bay

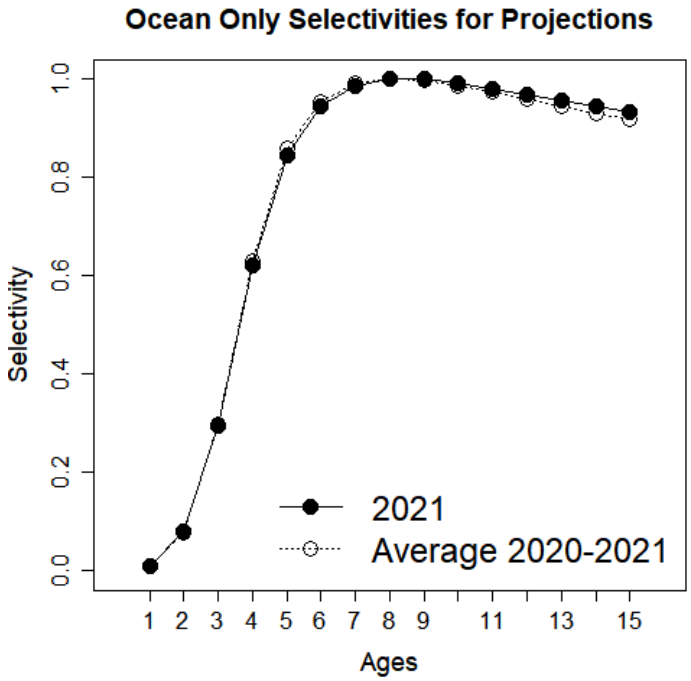

1982-1984
1985-1989
1990-1995
1996-2021
Selectivity
Age
0.0
0.2
0.4
0.6
0.8
1.0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

Ocean


1982-1984
1985-1989
1990-1996
1997-2019
2020-2021
Selectivity
Age
0.0
0.2
0.4
0.6
0.8
1.0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

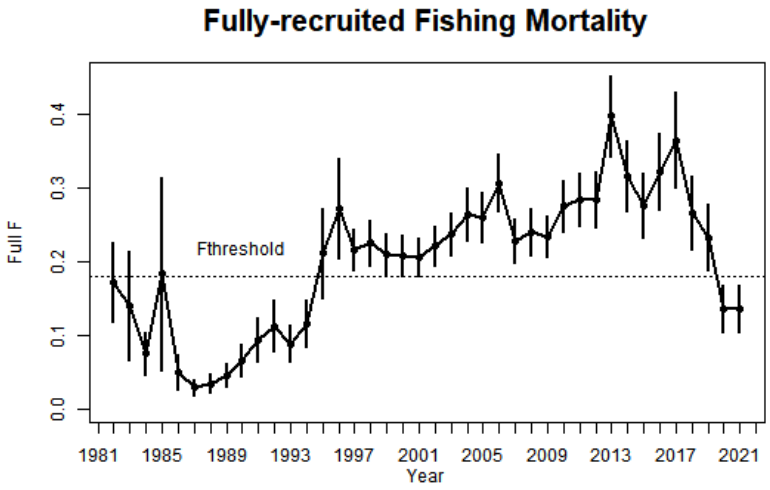
	Likelihood Weight	RSS
Fleet 1 Total Catch:	2	0.203941
Fleet 2 Total Catch:	2	1.64944
Aggregate Abundance Indices		
NYYOY	1	27.9845
NJYOY	1	30.2953
MDYOY	1	10.3757
Compos	1	37.8359
NYAge1	1	32.1299
MDAge1	1	24.3735
Age Comp Abundance Indices		
NYOHS	1	18.844
NJTRAWL	1	20.5861
MDSSN	1	31.1651
DESSN	1	21.9651
MRIP	1	36.0729
CTLIST	1	27.1042
DE30FT	1	17.2646
ChesMap	1	14.7549
Total RSS		352.605
No. of Obs		517
Conc. Likel.		-98.9265
Age Composition Data	Likelihood	
Fleet 1 Age Comp:	1	4757.8
Fleet 2 Age Comp:	1	7441.8
NYOHS	1	735.133
NJTRAWL	1	309.569
MDSSN	1	1099.63
DESSN	1	1011.45
MRIP	1	2604.06
CTLIST	1	824.734
DE30FT	1	232.384
ChesMap	1	397.019
Recr Devs :	1	42.4776
Total Likelihood :		19287.9
AIC :		38951.7

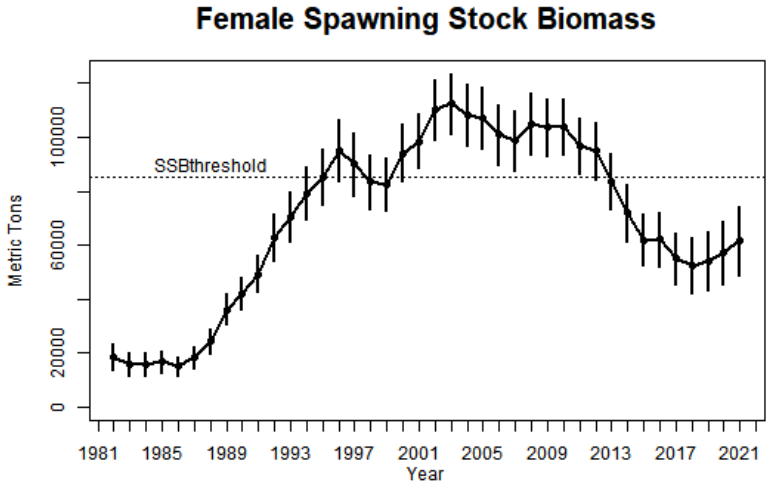
Index	n	RMSE	CV Weight	Effective Sample
NYYOY	36	0.990473	2.97	
NJYOY	38	1.0041	1.75	
MDYOY	12	1.00956	2.14	
compos	40	0.996992	0.98	
NYAge1	37	0.99948	1.19	
MDAge1	52	0.998066	3.25	
NYOHS	20	0.997169	2.65	22.09
NJTRAWL	29	1.00089	2.95	5.68
MDSSN	37	0.998892	2.5	14.53
DESSN	24	1.00292	1.17	18.3
MRIP	40	1.00968	2.28	30.43
CTLIST	34	0.996532	3	13.07
DE30FT	21	1.00038	0.85	5.88
ChesMP	17	1.00036	2.45	15.06


Ocean Only Selectivities for Projections
Selectivity
0.0
0.2
0.4
0.6
0.8
1.0
1 2 3 4 5 6 7 8 9 11 13 15
Ages
2021
Average 2020-2021

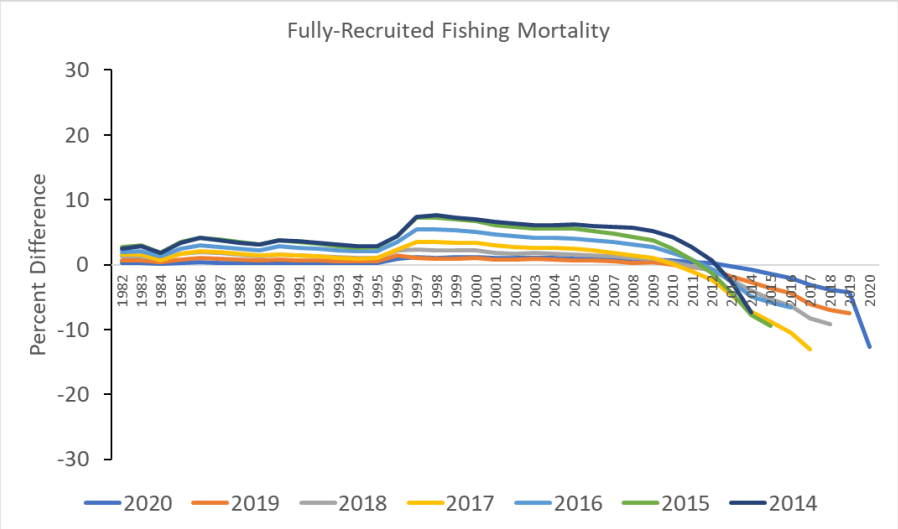
SSBthreshold=85333.6; Fthreshold=0.1807
SSBtarget=106667;Ftarget=0.1495
Fcurrent=0.1355

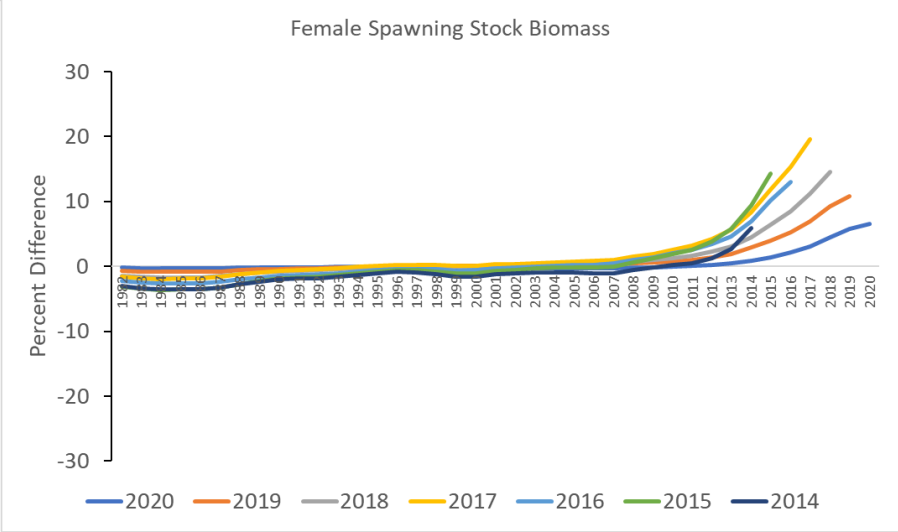
Estimates with 95% Confidence Intervals

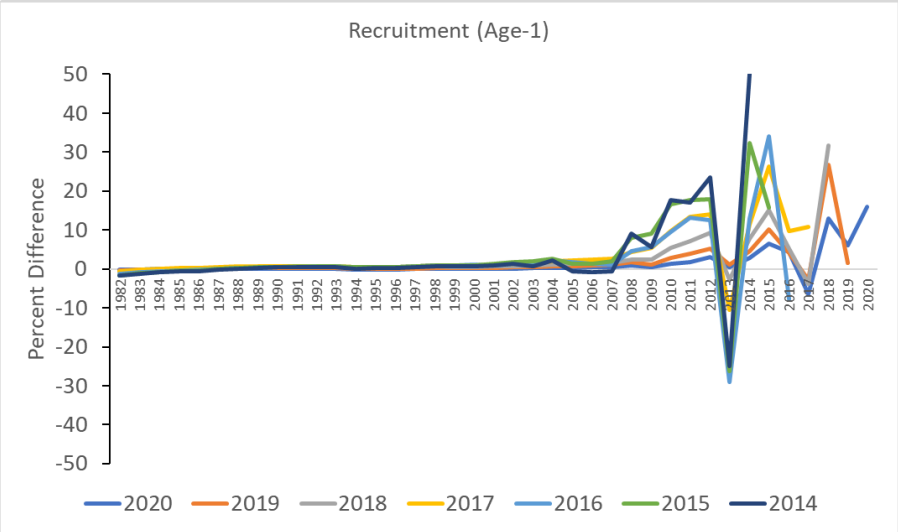




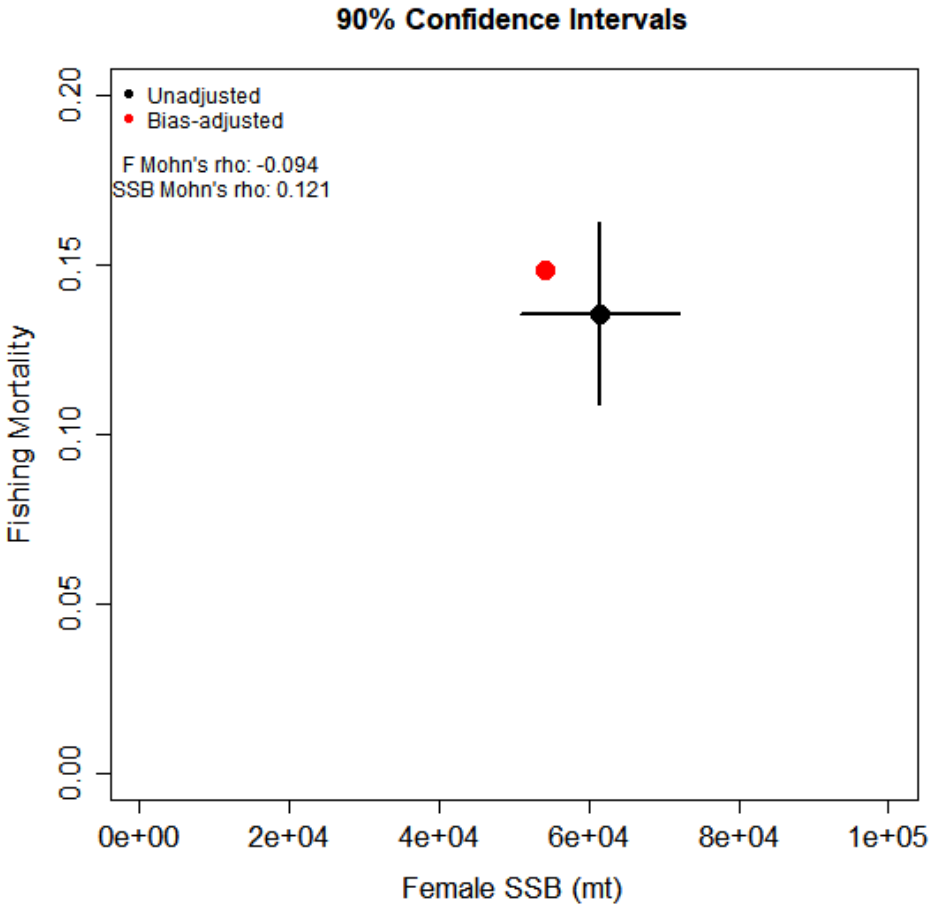
Number of peels = 7 (NMFS standard)



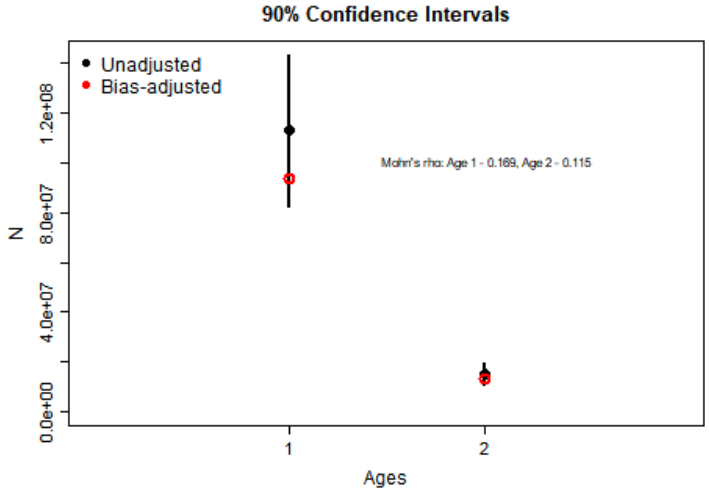


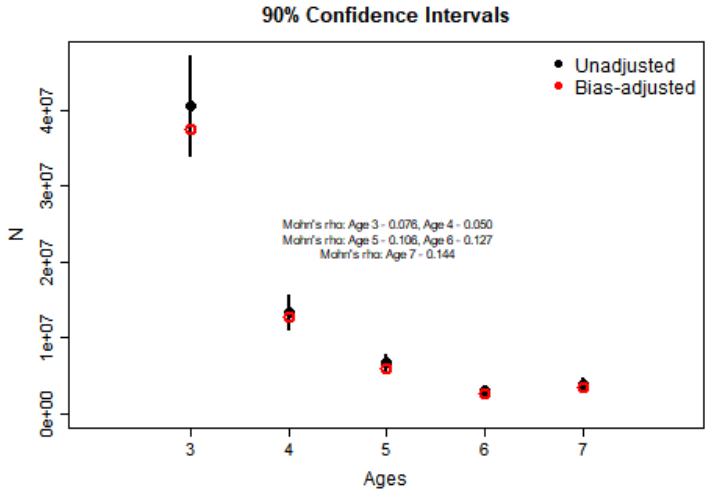


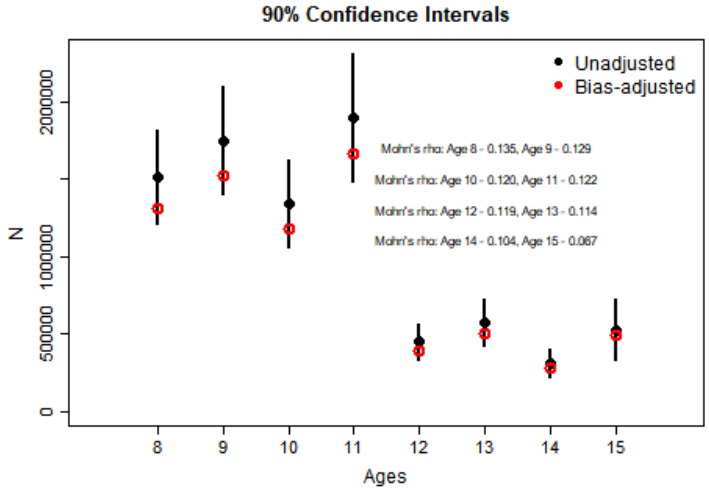
Retrospective bias corrected values within 90% confidence intervals of original values, so bias-correction not required.



Most retro corrected N values inside 90% CIs of original estimates – Bias-correction not required.

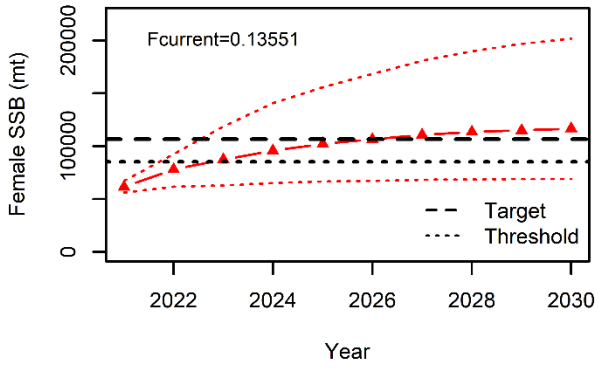




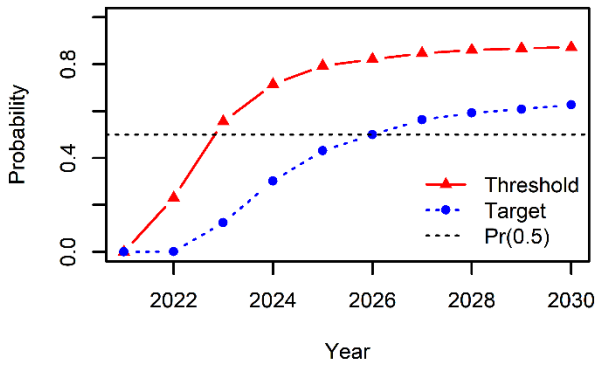


using non-bias-corrected estimates of F and N-at-age
SSBtarget reached by 2026 at current F and 2028 at target F

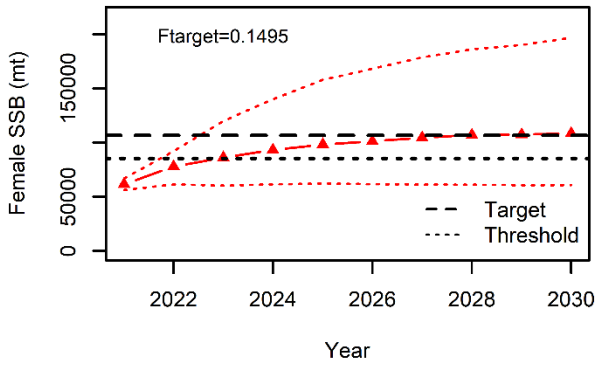
SSB with 2.5/97.5 Percentiles



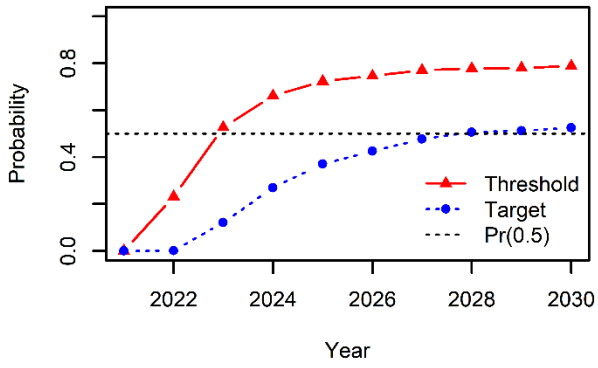
Pr(SSB>=SSBx)



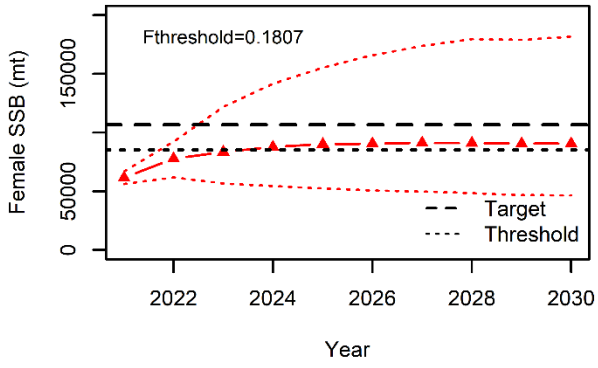
SSB with 2.5/97.5 Percentiles



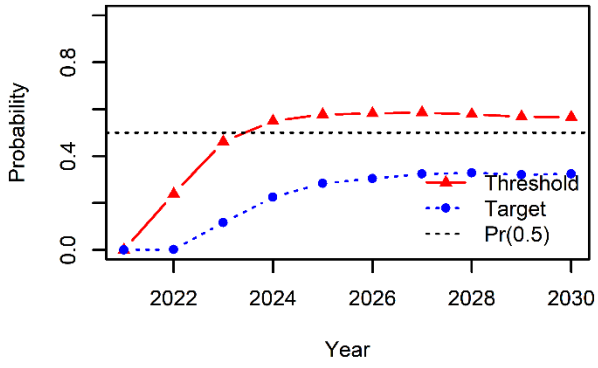
Pr(SSB>=SSBx)



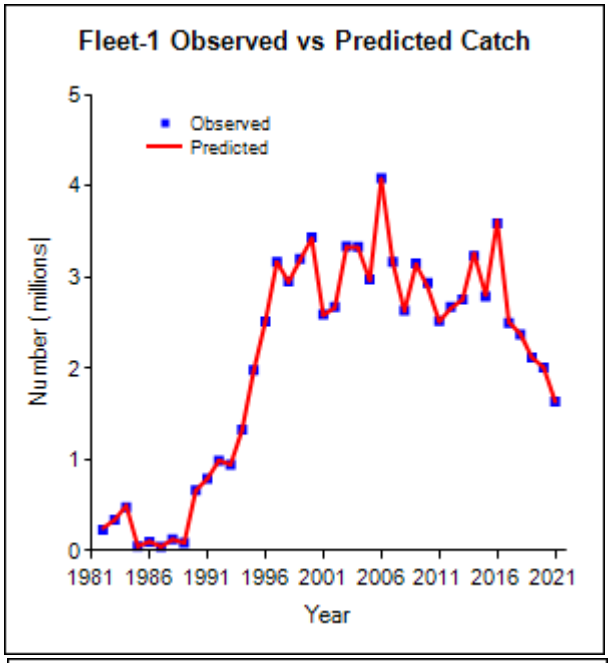
SSB with 2.5/97.5 Percentiles

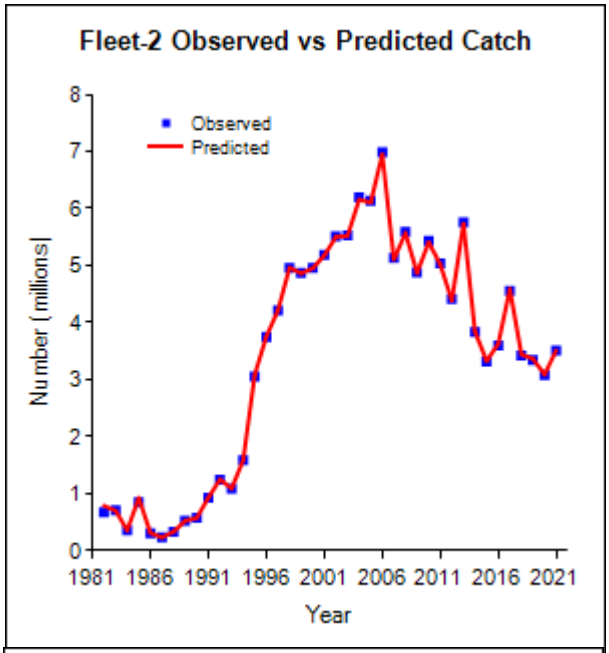


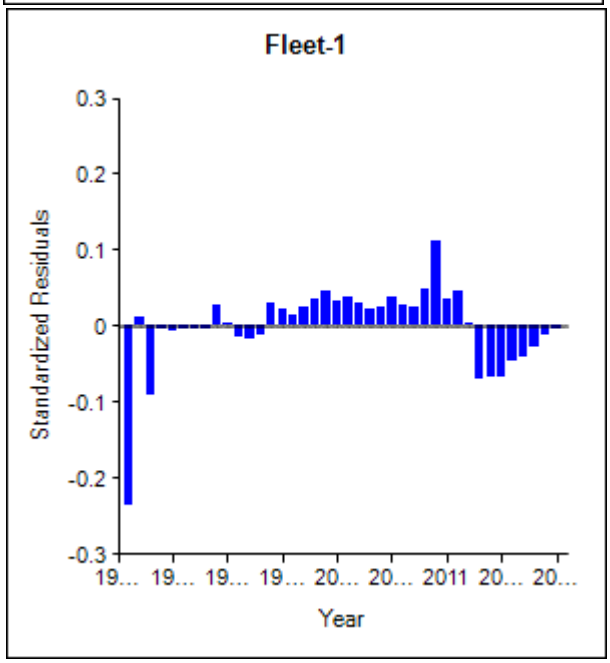
Pr(SSB>=SSBx)

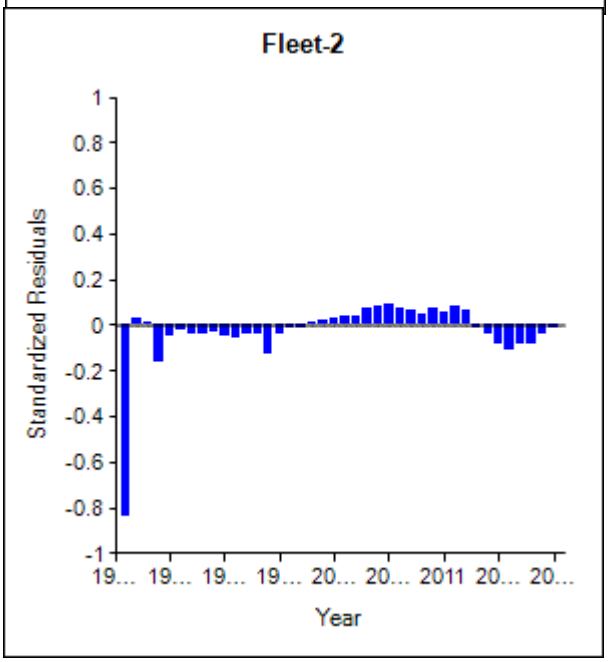


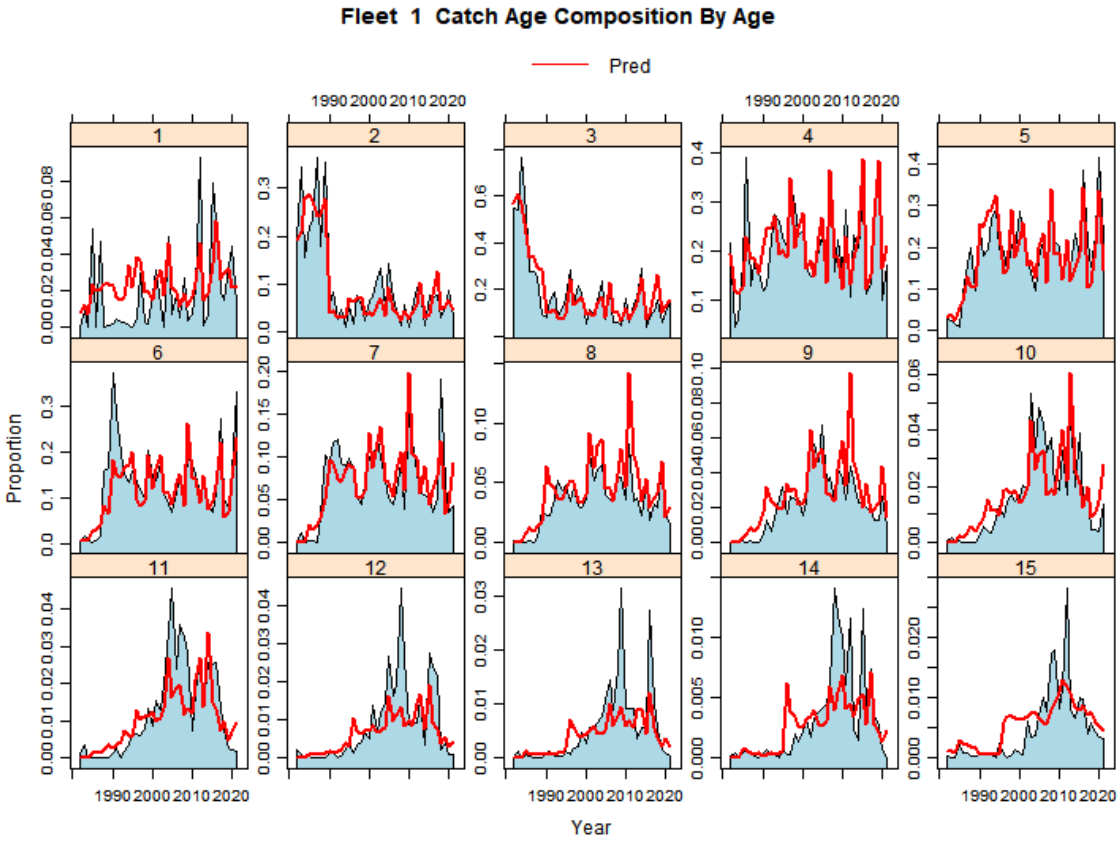
Appendix 4. Diagnostic plots and results from the SCA model with no new selectivity blocks added to the model.

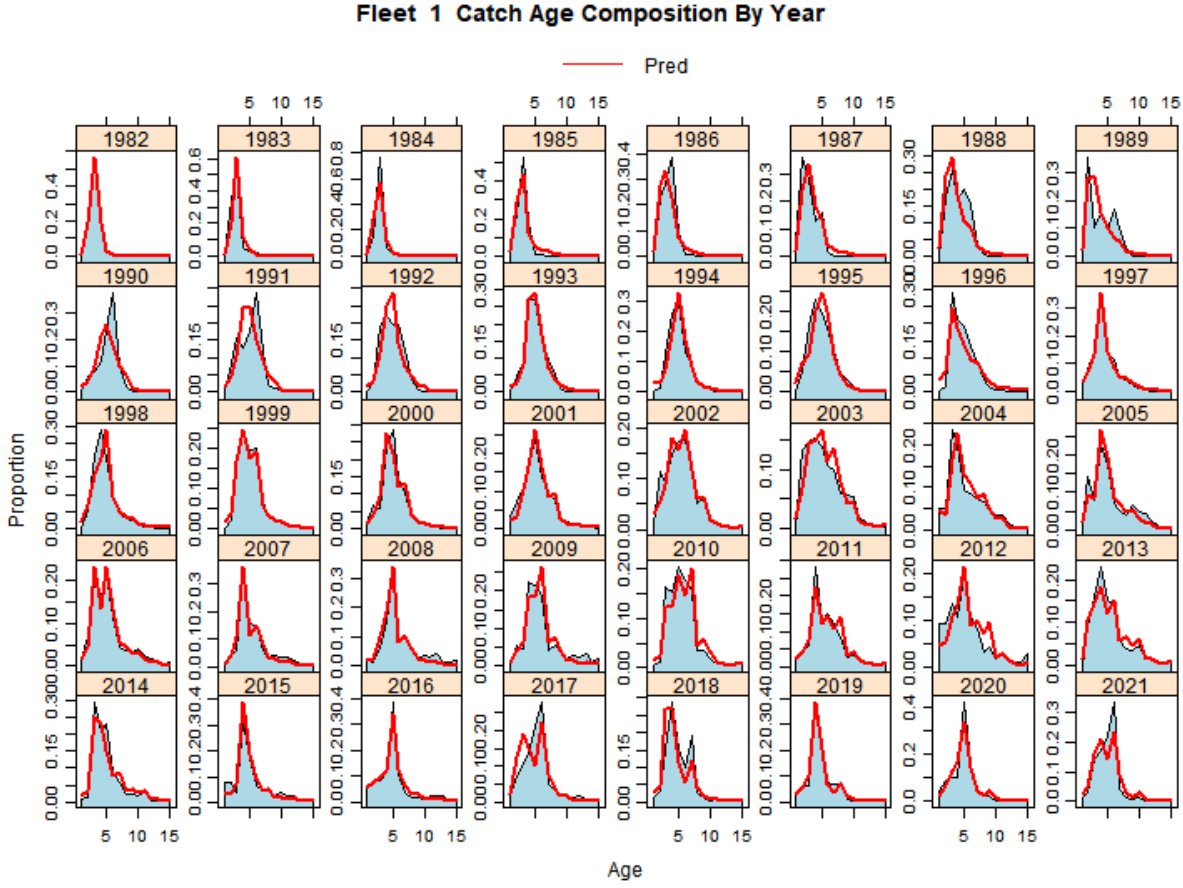

Fleet-1 Observed vs Predicted Catch
Observed
Predicted
Number [millions]
Year
0
1
2
3
4
5
1981 1986 1991 1996 2001 2006 2011 2016 2021

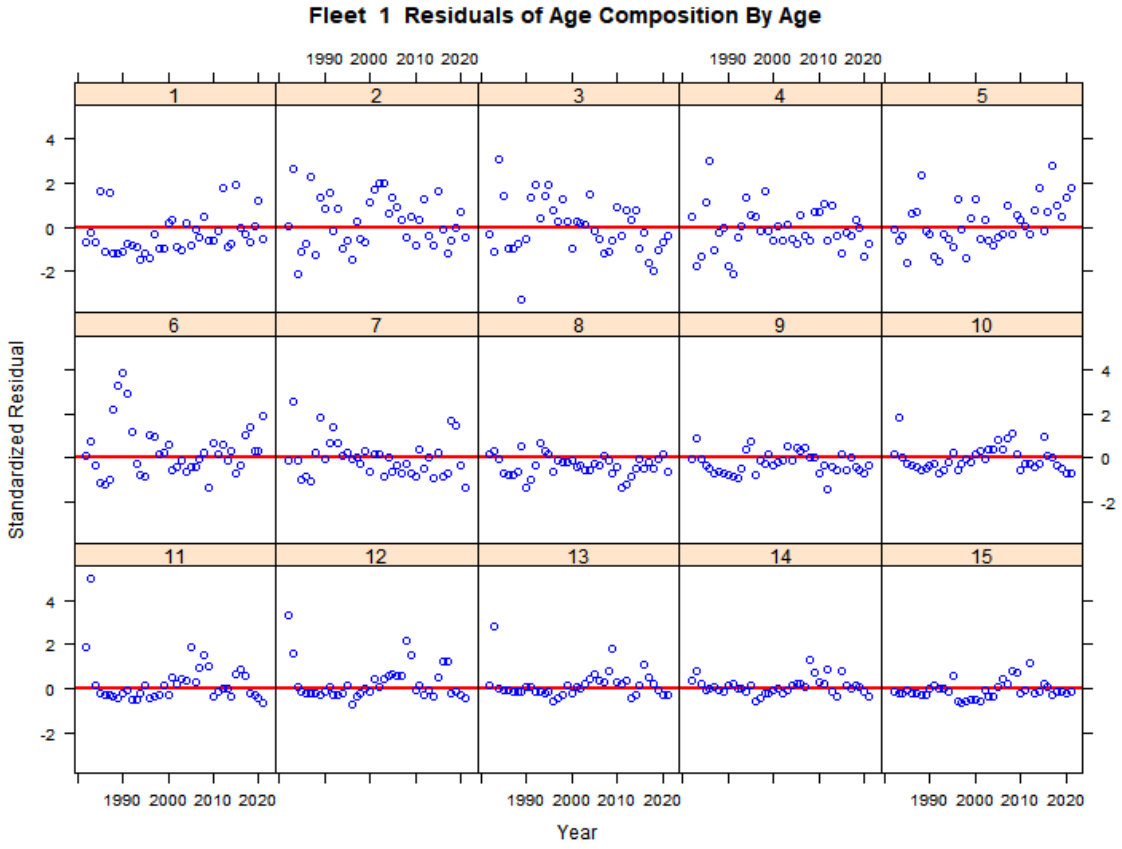

Fleet-2 Observed vs Predicted Catch
Observed
Predicted
Number [millions]
Year
0
1
2
3
4
5
6
7
8
1981 1986 1991 1996 2001 2006 2011 2016 2021

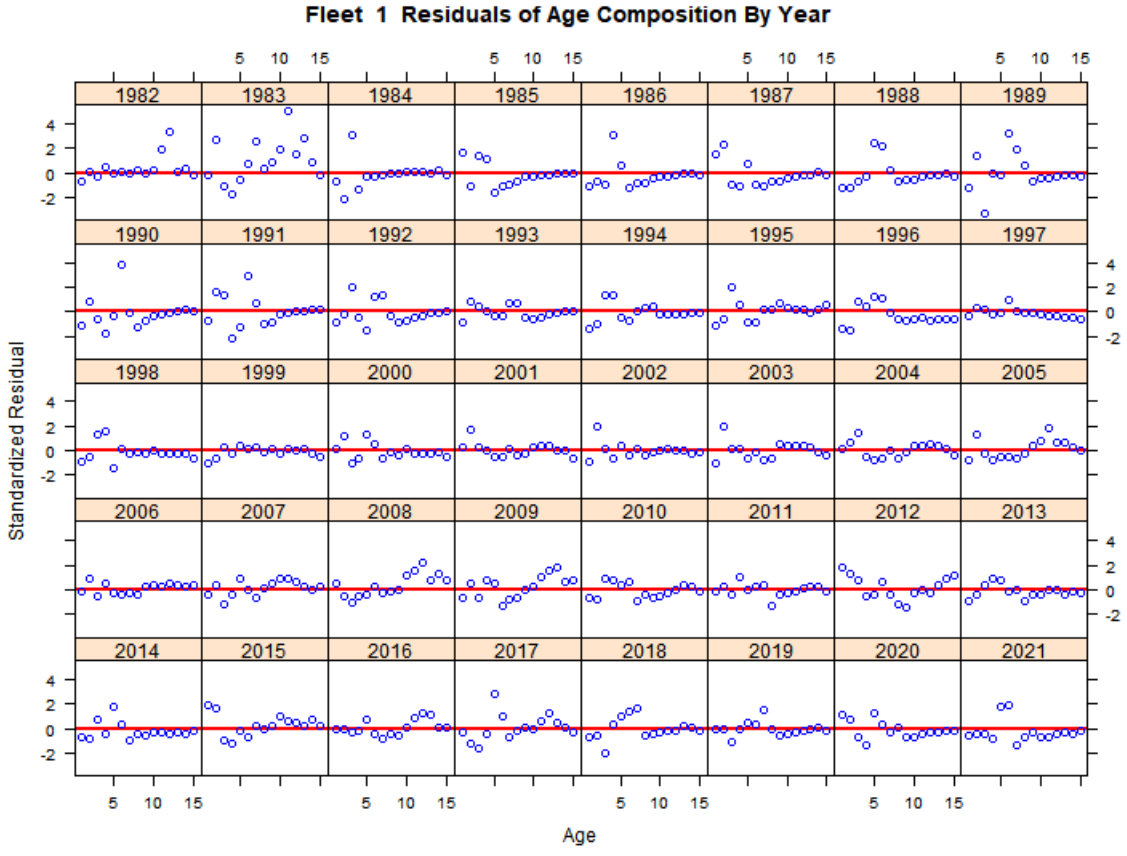

Fleet-1
Standardized Residuals
Year
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
19... 19... 19... 19... 20... 20... 2011 20... 20...

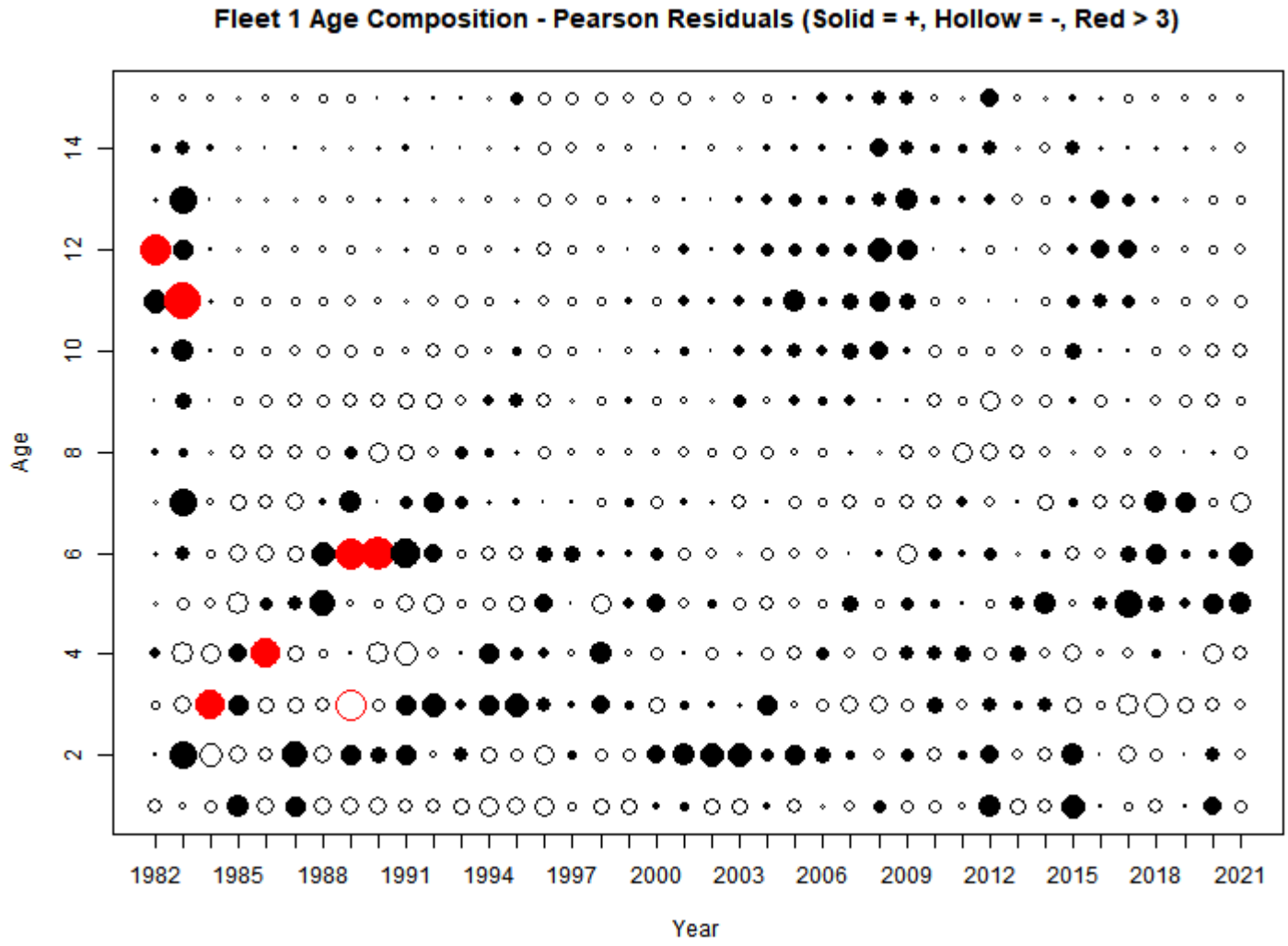

Fleet-2
Standardized Residuals
Year
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
19... 19... 19... 19... 20... 20... 2011 20... 20...


Fleet 1 Catch Age Composition By Age
Pred
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Proportion
Year

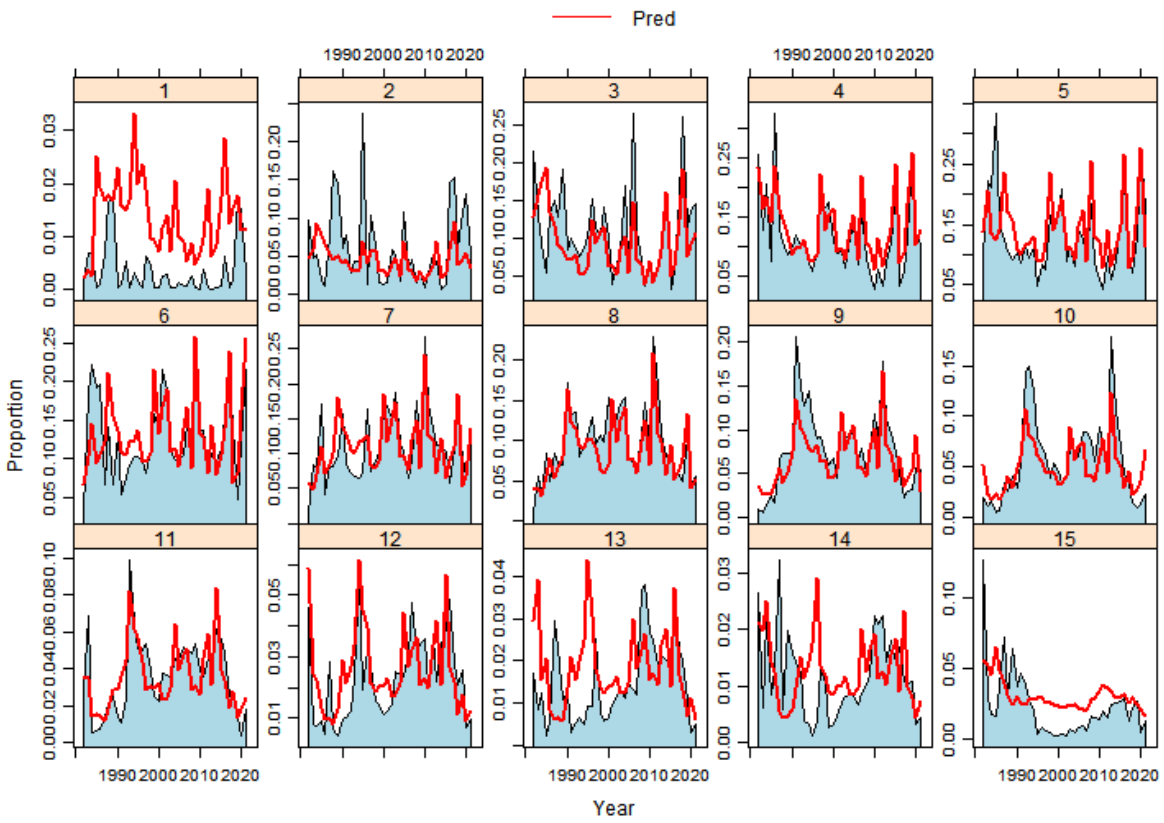

Fleet 1 Catch Age Composition By Year
Pred
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
Proportion
Age


Fleet 1 Residuals of Age Composition By Age
Standardized Residual
Year
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
1990 2000 2010 2020

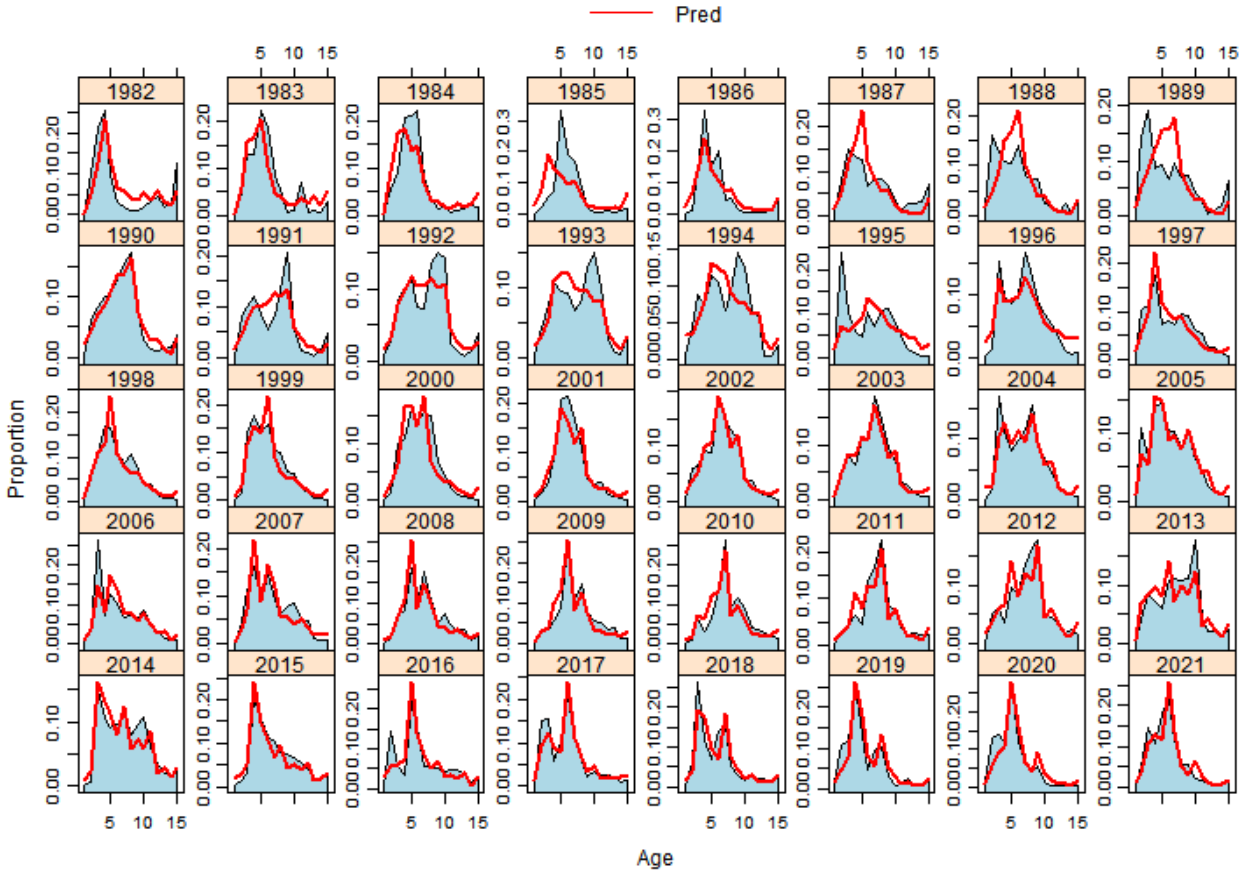

Fleet 1 Residuals of Age Composition By Year
Standardized Residual
Age
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
5 10 15

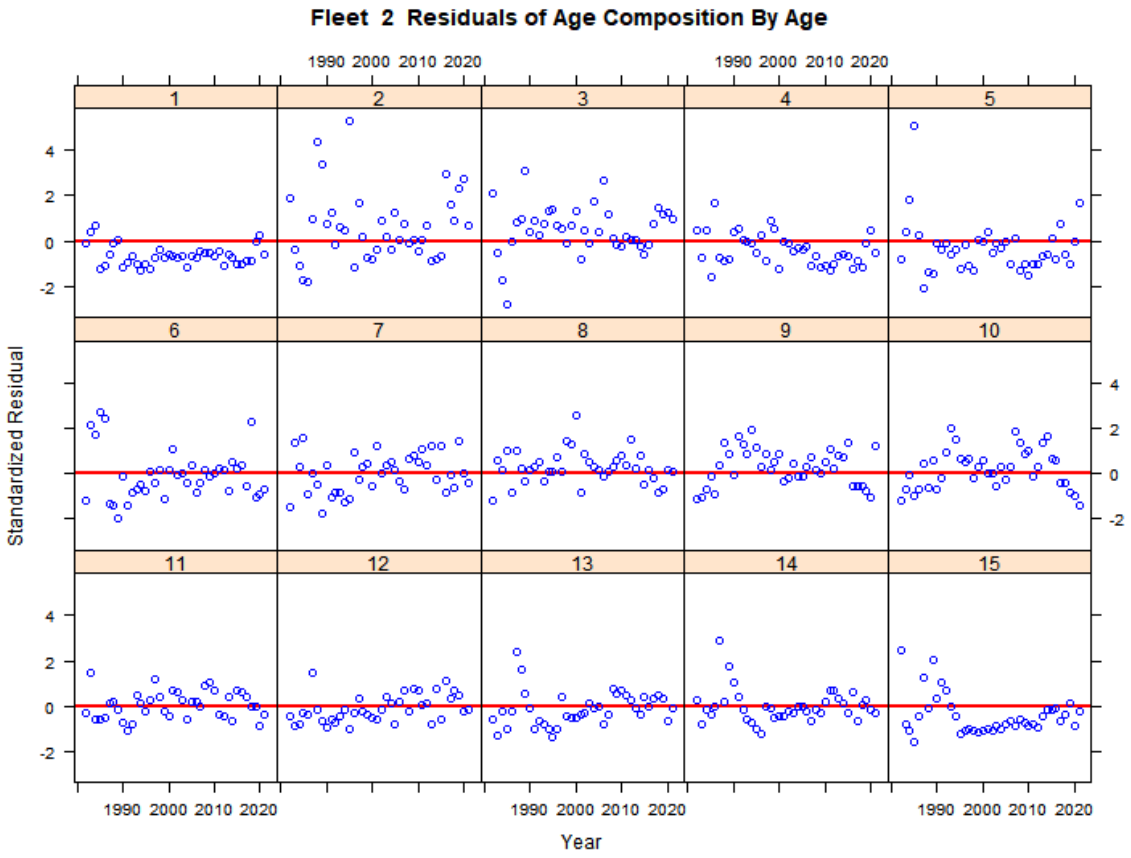

Fleet 1 Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)
Age
2
4
6
8
10
12
14
1982
1985
1988
1991
1994
1997
2000
2003
2006
2009
2012
2015
2018
2021
Year

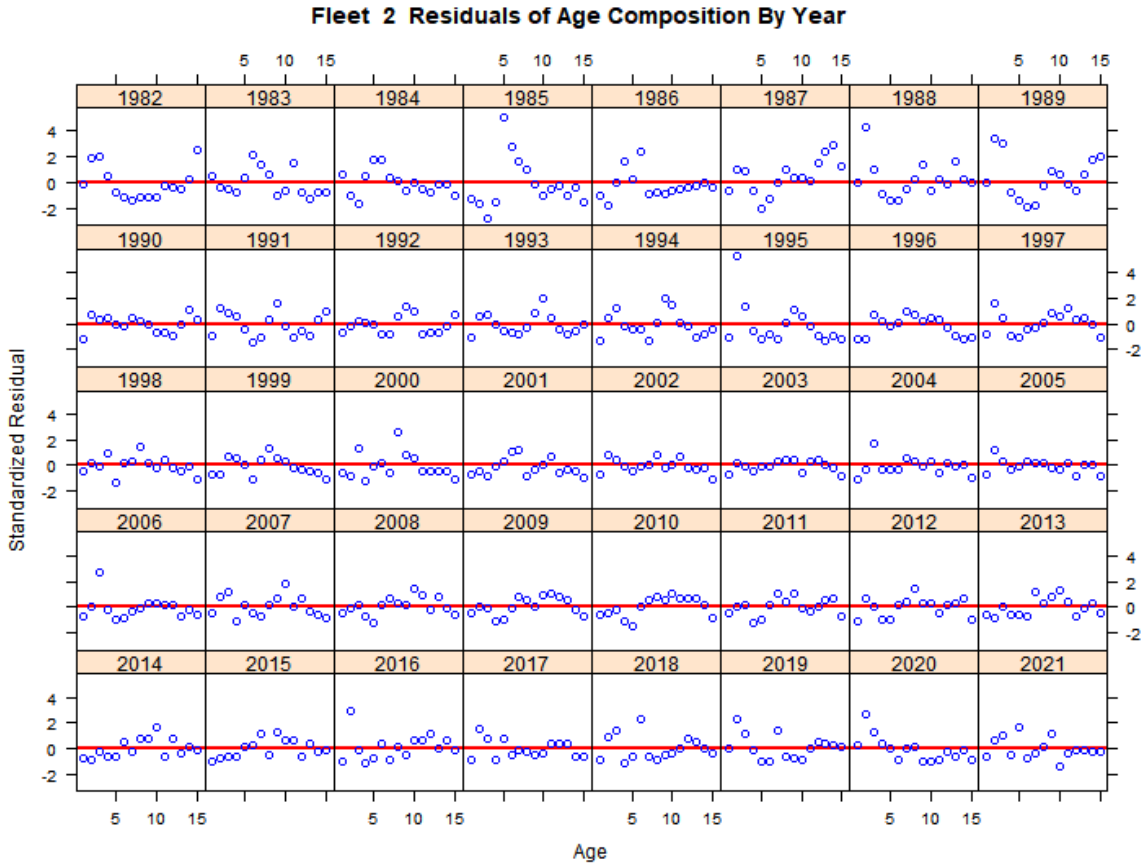
Fleet 2 Catch Age Composition By Age

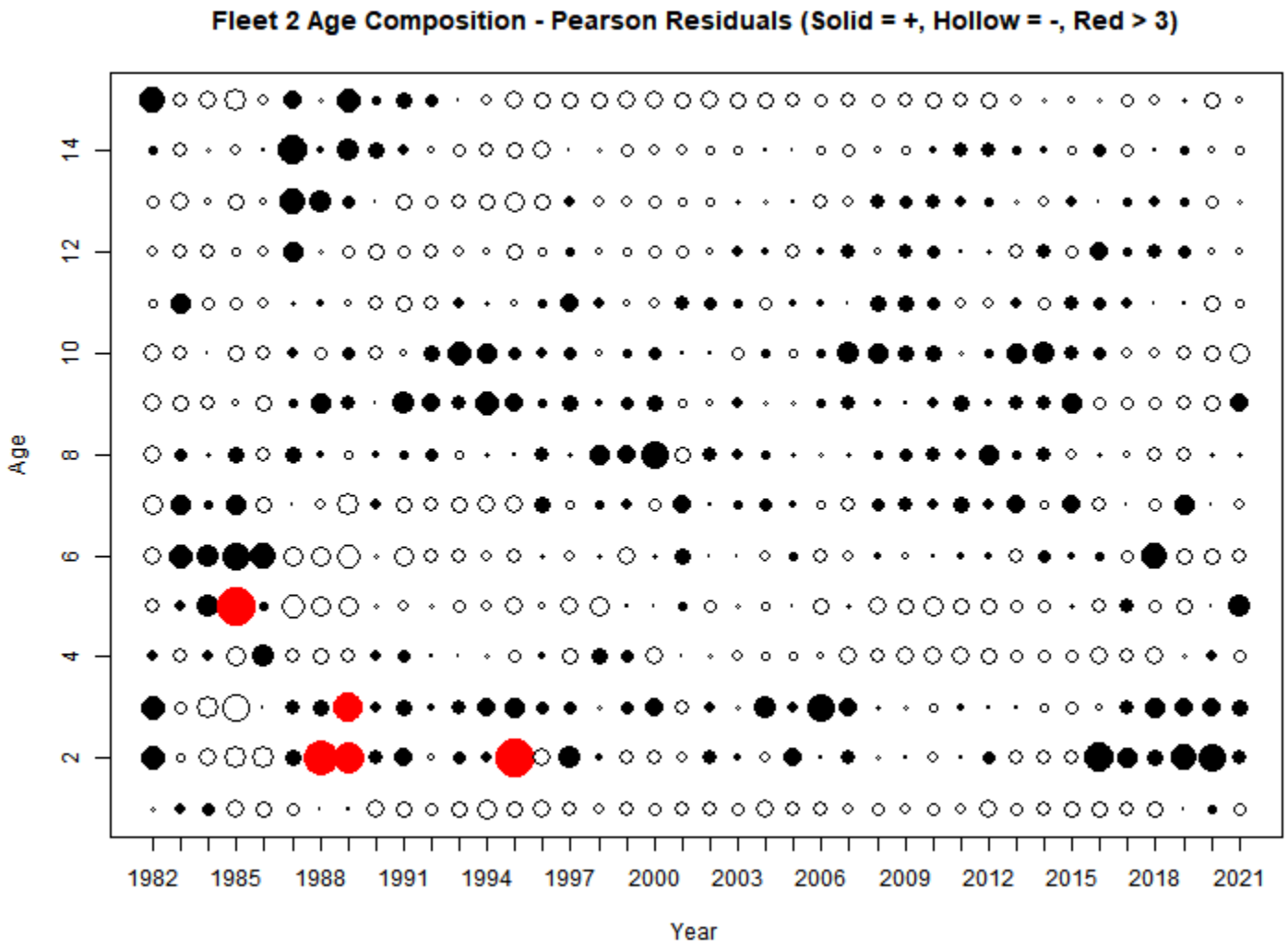


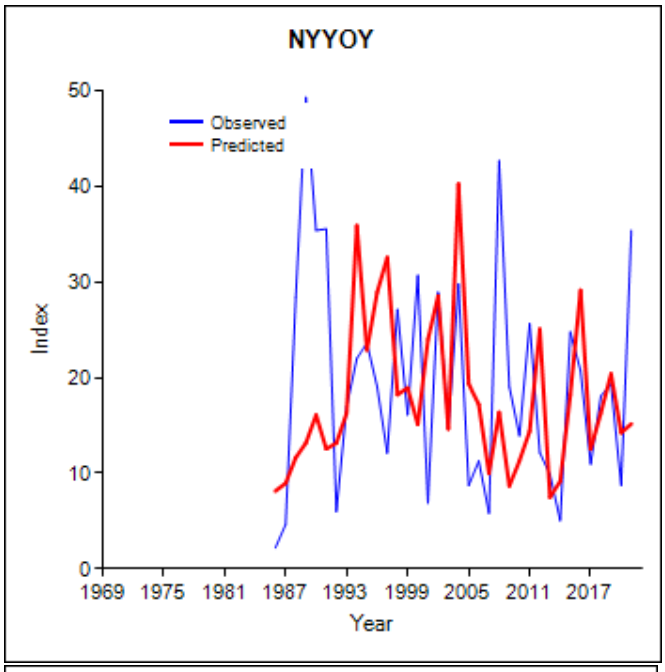
Fleet 2 Catch Age Composition By Year

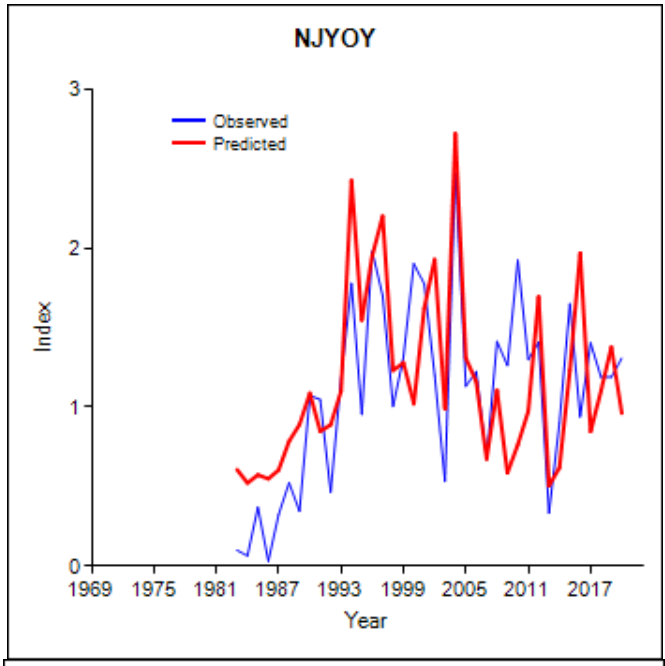


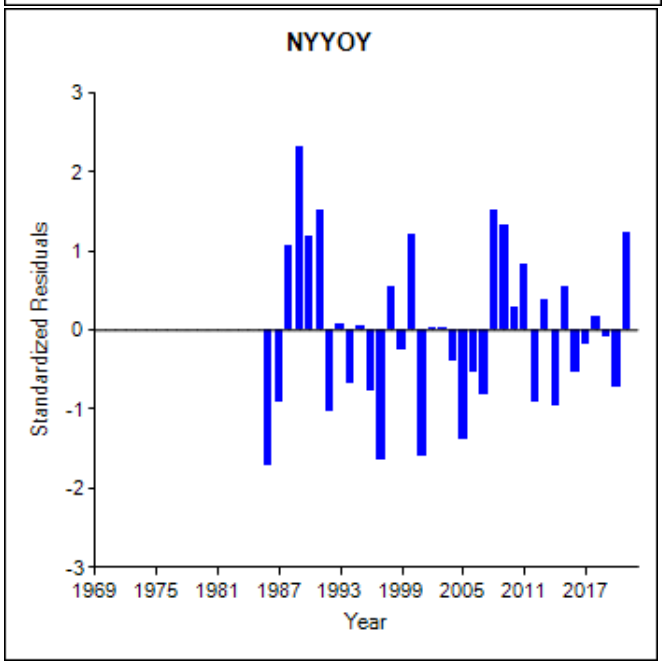

Fleet 2 Residuals of Age Composition By Age
1 2 3 4 5
6 7 8 9 10
11 12 13 14 15
1990 2000 2010 2020
Standardized Residual
Year

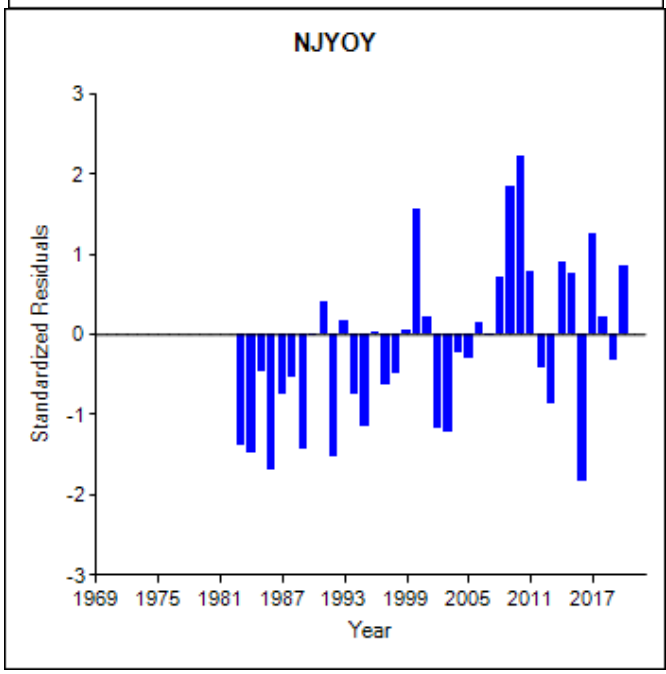

Fleet 2 Residuals of Age Composition By Year
1982 1983 1984 1985 1986 1987 1988 1989
1990 1991 1992 1993 1994 1995 1996 1997
1998 1999 2000 2001 2002 2003 2004 2005
2006 2007 2008 2009 2010 2011 2012 2013
2014 2015 2016 2017 2018 2019 2020 2021
5 10 15
Standardized Residual
Age

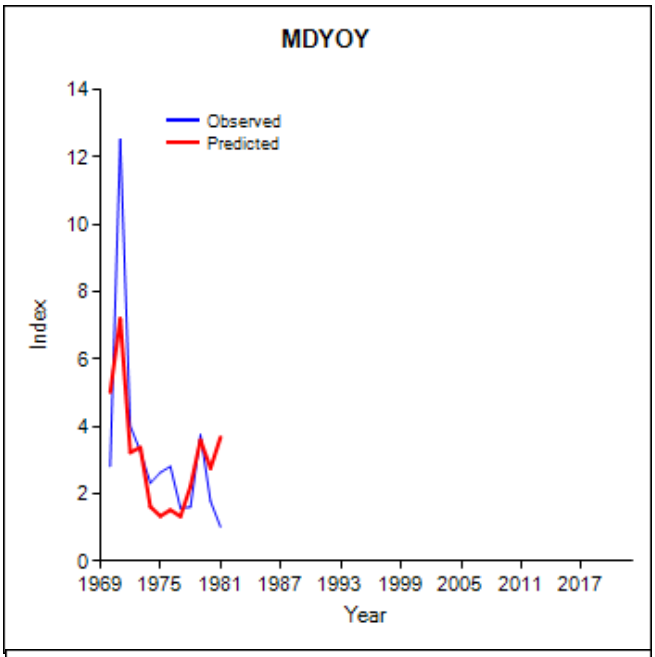

Fleet 2 Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)
Age
2
4
6
8
10
12
14
1982
1985
1988
1991
1994
1997
2000
2003
2006
2009
2012
2015
2018
2021
Year

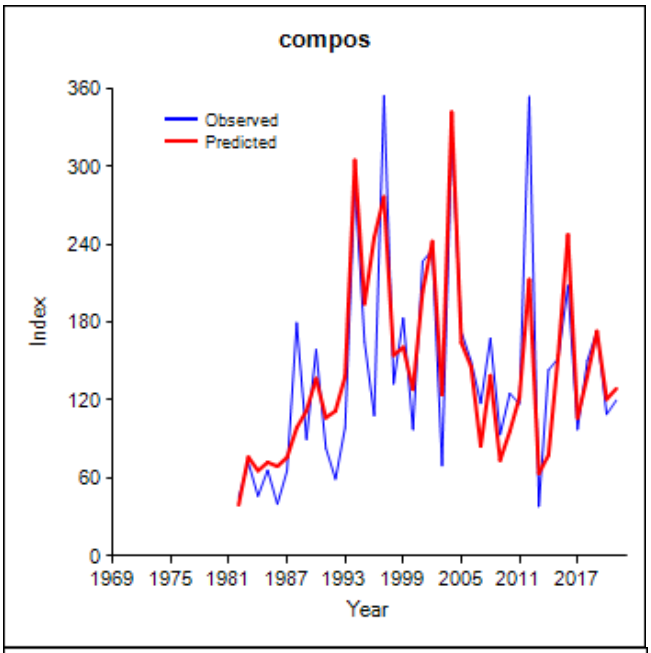

NYYOY
Observed
Predicted
Index
Year
50
40
30
20
10
0
1969 1975 1981 1987 1993 1999 2005 2011 2017

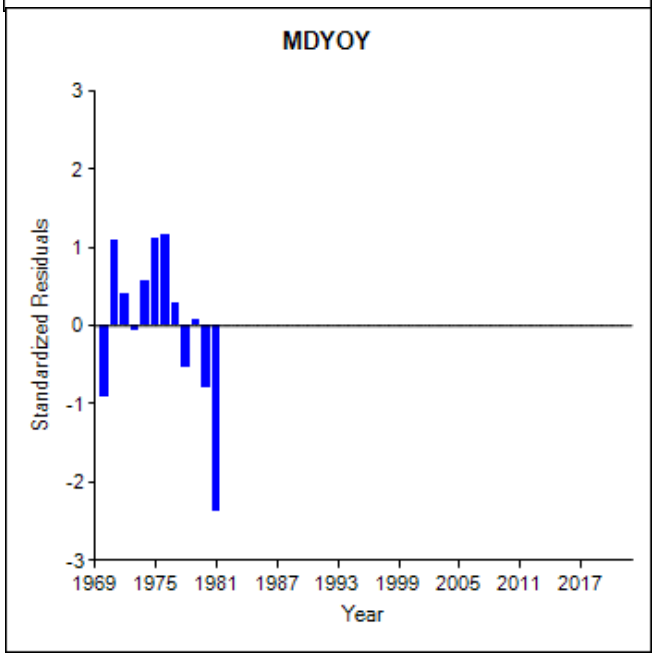

NJYOY
Observed
Predicted
Index
Year
3
2
1
0
1969 1975 1981 1987 1993 1999 2005 2011 2017

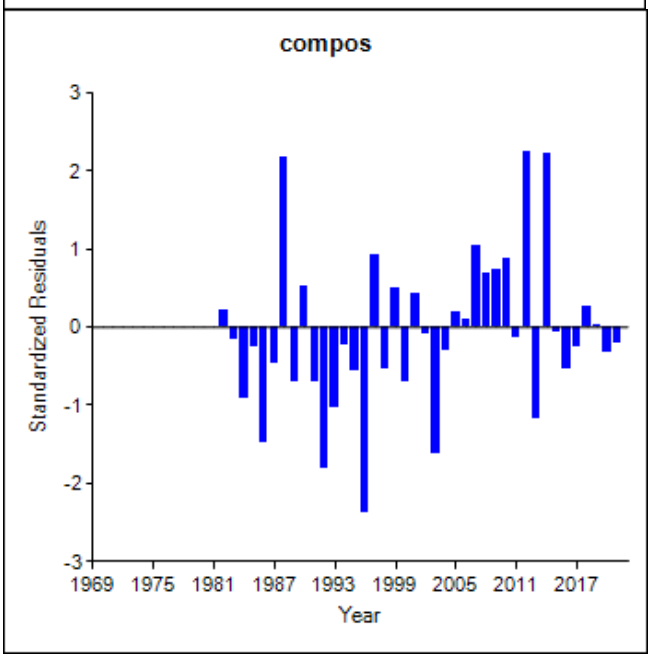

NYYOY
Standardized Residuals
Year
3
2
1
0
-1
-2
-3
1969 1975 1981 1987 1993 1999 2005 2011 2017

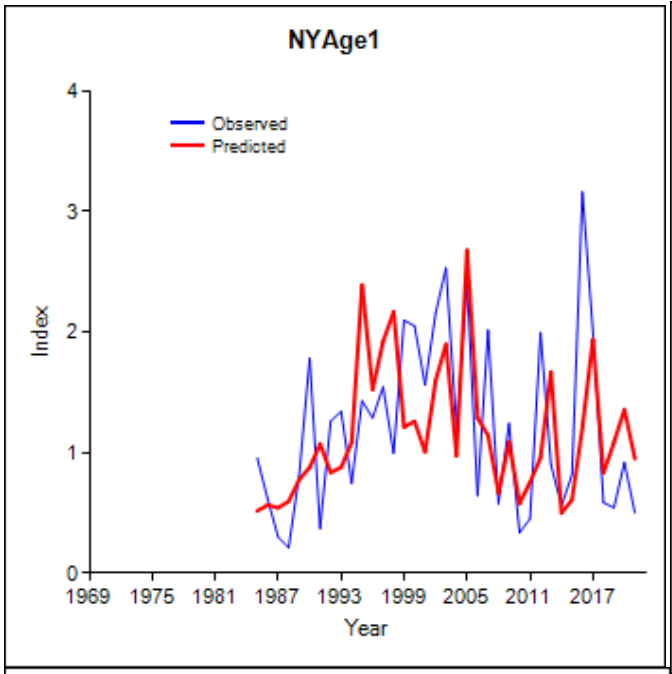

NJYOY
Standardized Residuals
Year
3
2
1
0
-1
-2
-3
1969 1975 1981 1987 1993 1999 2005 2011 2017

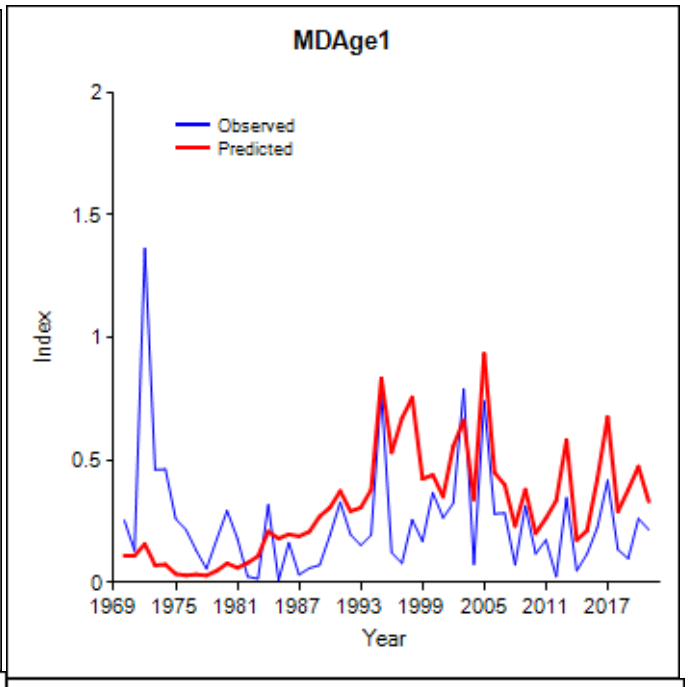

MDYOY
Observed
Predicted
Index
Year
0
2
4
6
8
10
12
14
1969
1975
1981
1987
1993
1999
2005
2011
2017

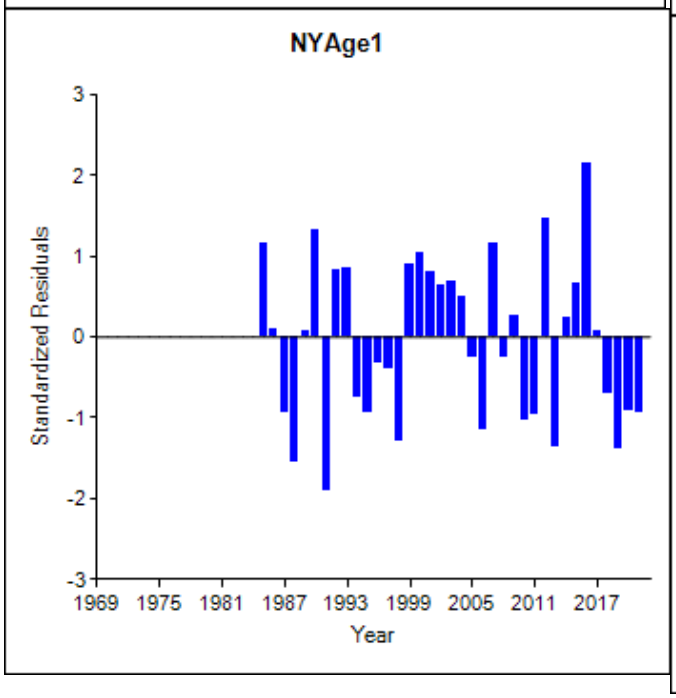

compos
Observed
Predicted
Index
Year
0
60
120
180
240
300
360
1969
1975
1981
1987
1993
1999
2005
2011
2017

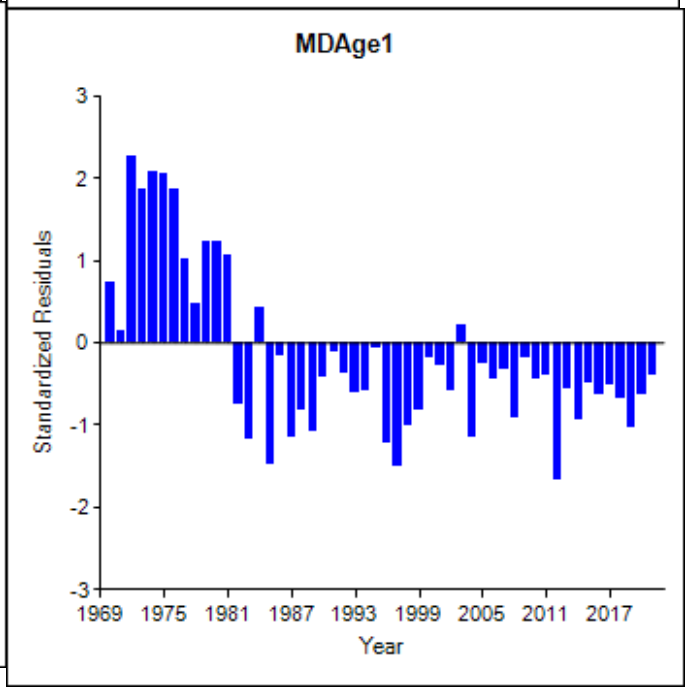

MDYOY
Standardized Residuals
Year
-3
-2
-1
0
1
2
3
1969
1975
1981
1987
1993
1999
2005
2011
2017

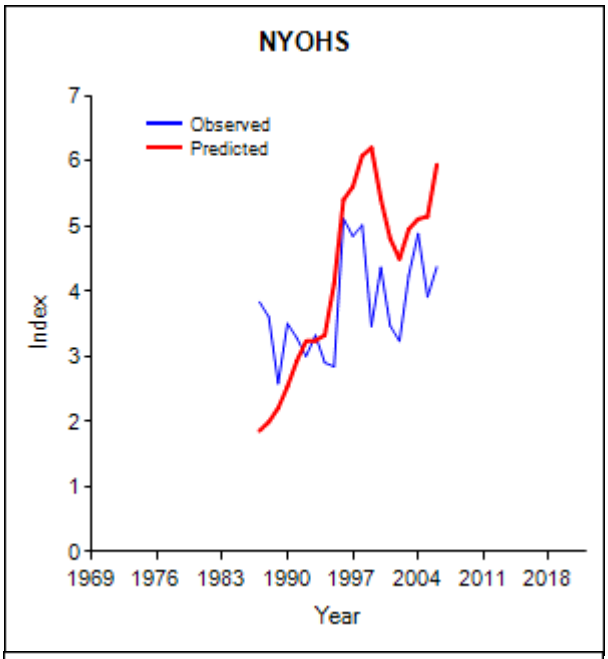

compos
Standardized Residuals
Year
-3
-2
-1
0
1
2
3
1969
1975
1981
1987
1993
1999
2005
2011
2017


NYAge1
Observed
Predicted
Index
Year
0
1
2
3
4
1969
1975
1981
1987
1993
1999
2005
2011
2017


MDAge1
Observed
Predicted
Index
Year
0
0.5
1
1.5
2
1969
1975
1981
1987
1993
1999
2005
2011
2017


NYAge1
Standardized Residuals
Year
-3
-2
-1
0
1
2
3
1969
1975
1981
1987
1993
1999
2005
2011
2017


MDAge1
Standardized Residuals
Year
-3
-2
-1
0
1
2
3
1969
1975
1981
1987
1993
1999
2005
2011
2017


NYOHS
Observed
Predicted
Index
Year
0
1
2
3
4
5
6
7
1969
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1997
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2011
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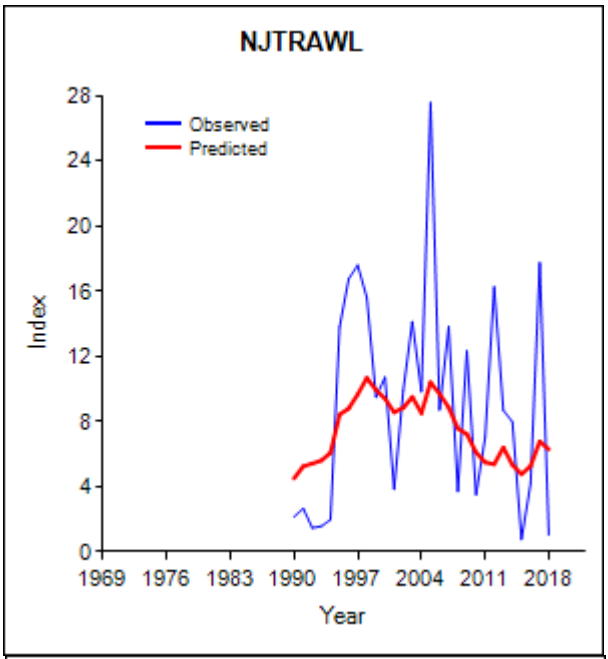
NJTRAWL
Observed
Predicted
Index
Year
0
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16
20
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1969
1976
1983
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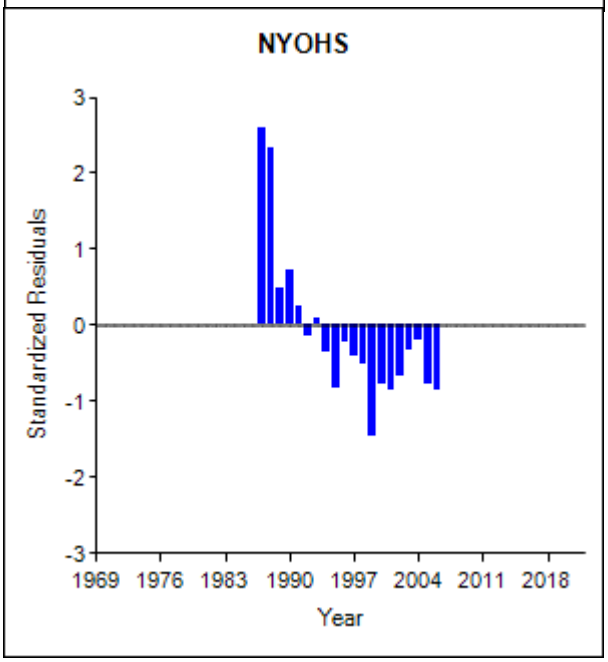
1997
2004
2011
2018


NYOHS
Standardized Residuals
Year
-3
-2
-1
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2
3
1969
1976
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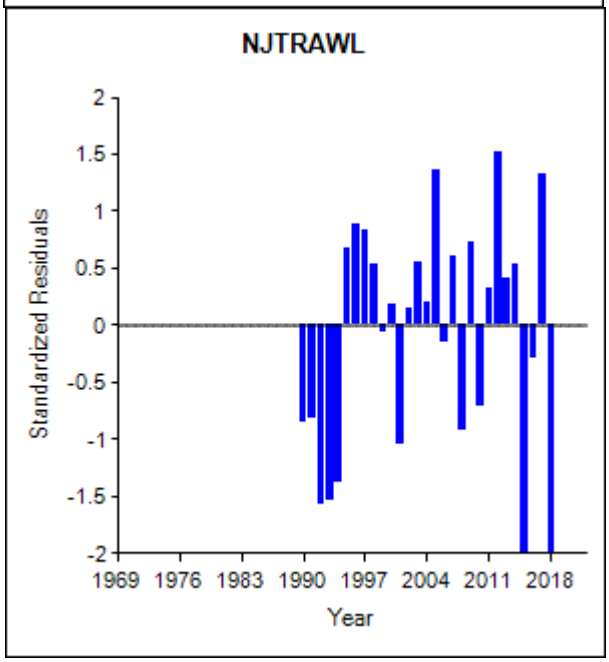
1990
1997
2004
2011
2018


NJTRAWL
Standardized Residuals
Year
-2
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1969
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2011
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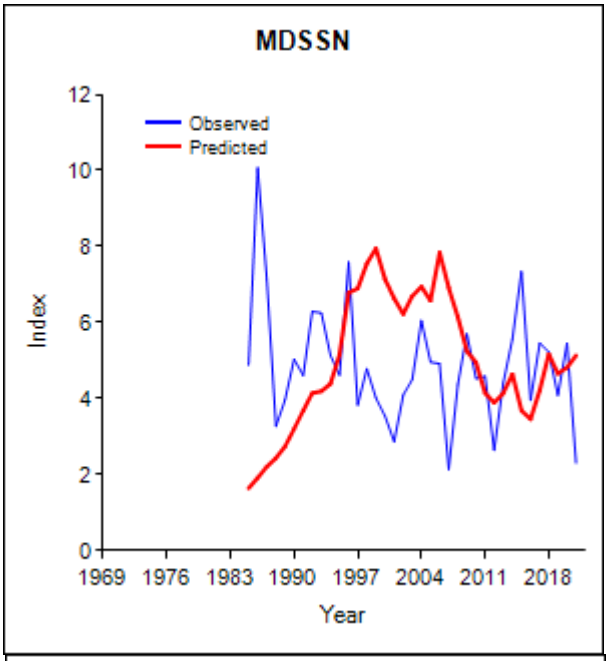
MDSSN
Observed
Predicted
Index
Year
0
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4
6
8
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12
1969
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1990
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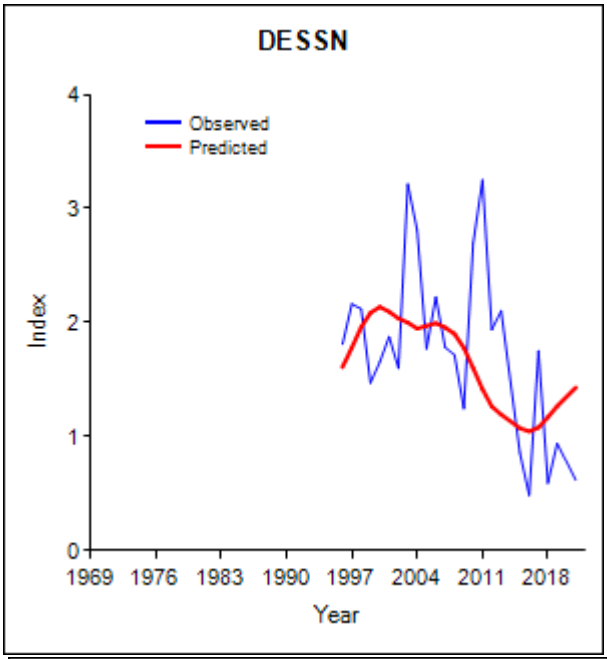
2004
2011
2018


DESSN
Observed
Predicted
Index
Year
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1969
1976
1983
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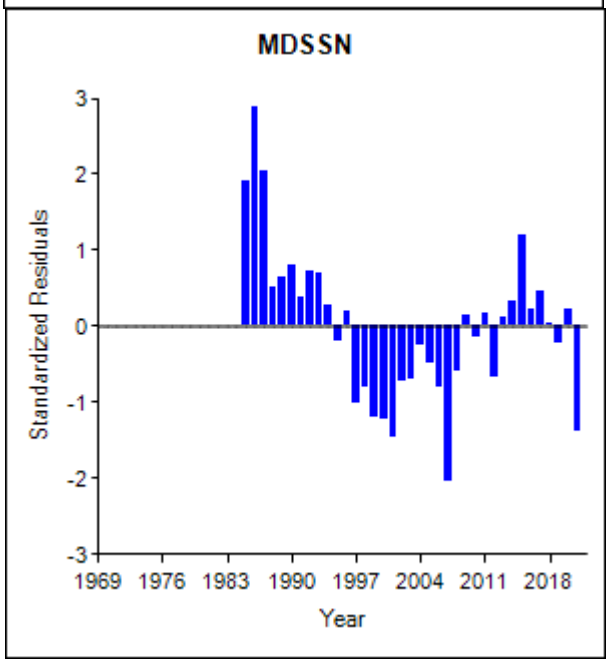
1997
2004
2011
2018


MDSSN
Standardized Residuals
Year
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1969
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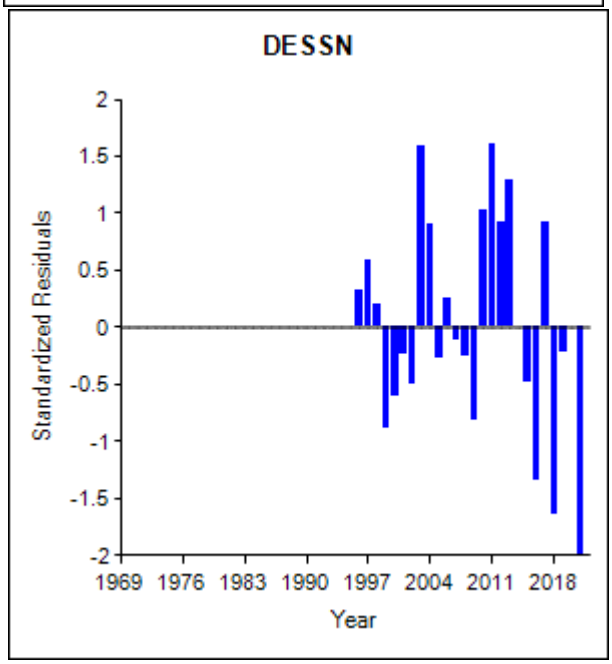
2004
2011
2018


DESSN
Standardized Residuals
Year
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2011
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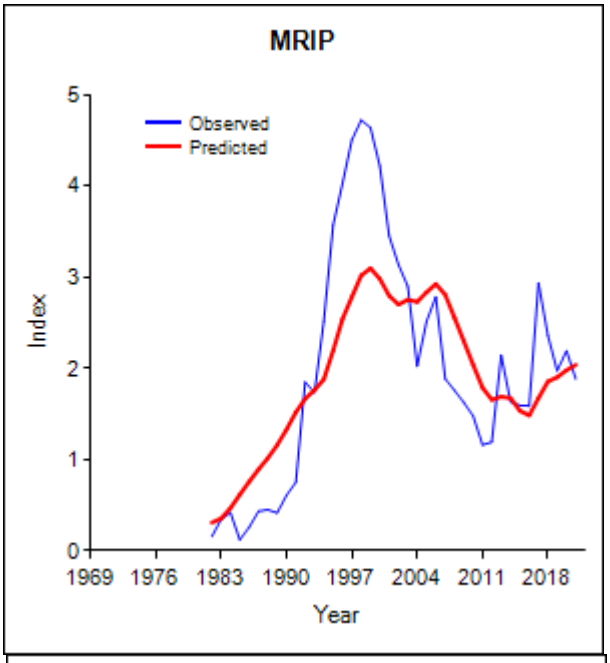
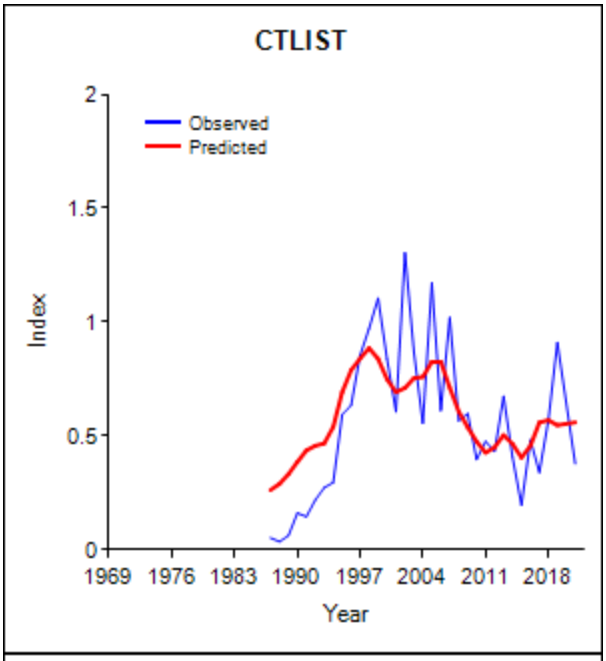

MRIP
Observed
Predicted
Index
Year
0
1
2
3
4
5
1969
1976
1983
1990
1997
2004
2011
2018


CTLIST
Observed
Predicted
Index
Year
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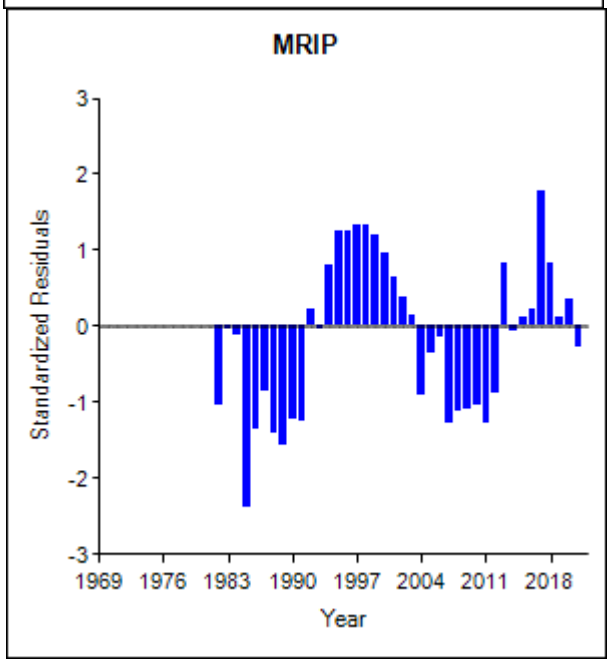
1
1.5
2
1969
1976
1983
1990
1997
2004
2011
2018


MRIP
Standardized Residuals
Year
-3
-2
-1
0
1
2
3
1969
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2004
2011
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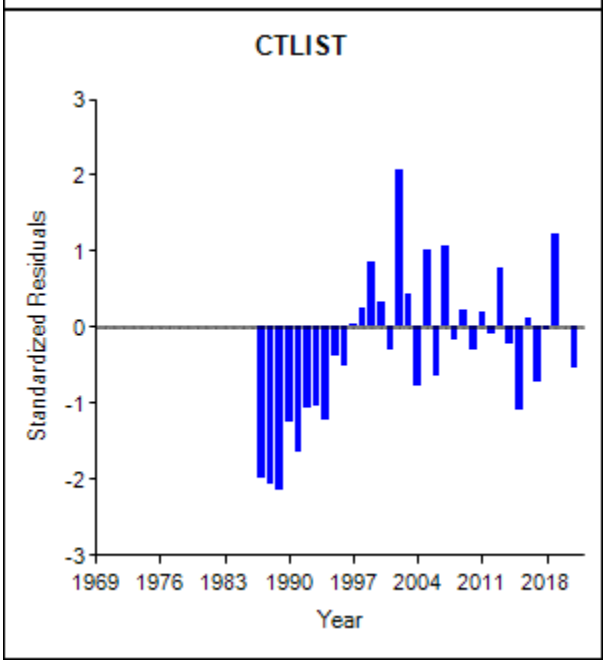
CTLIST
Standardized Residuals
Year
-3
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-1
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3
1969
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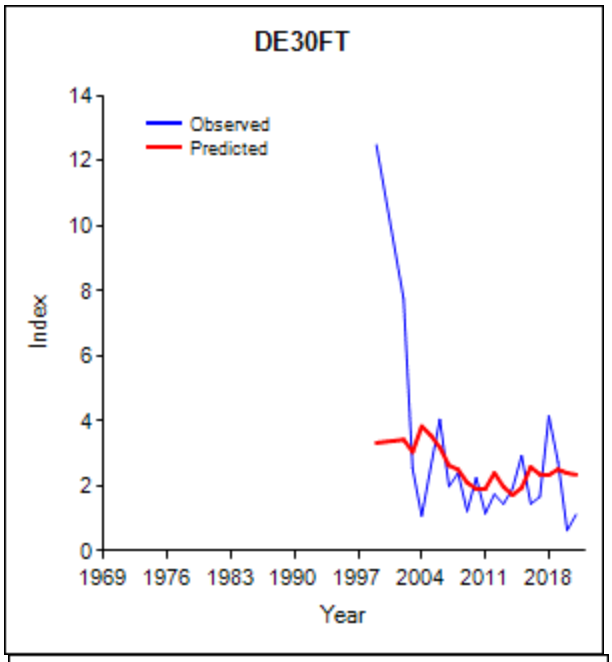
2004
2011
2018


DE30FT
Observed
Predicted
Index
Year
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2
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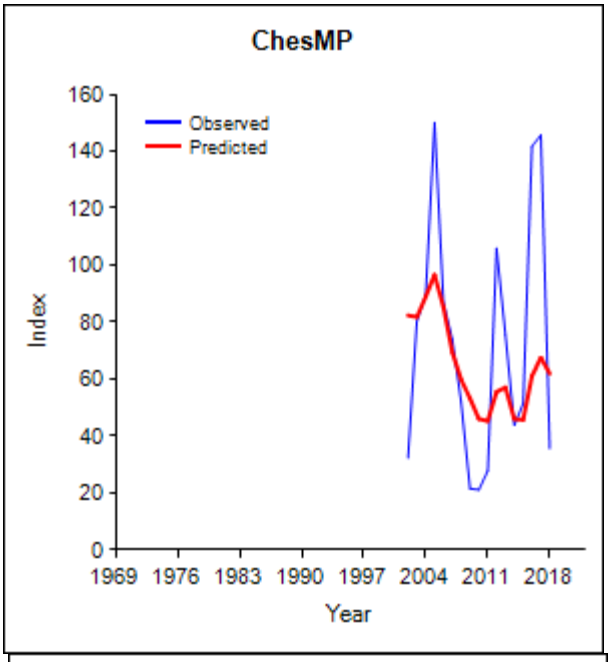
10
12
14
1969
1976
1983
1990
1997
2004
2011
2018


ChesMP
Observed
Predicted
Index
Year
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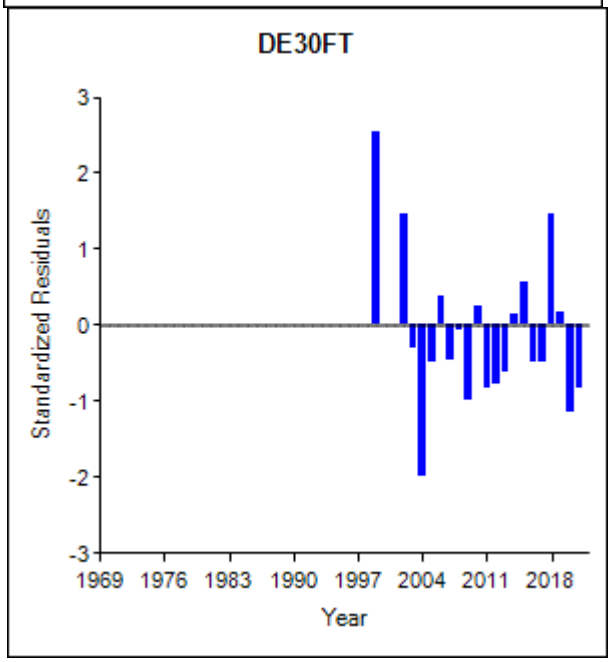
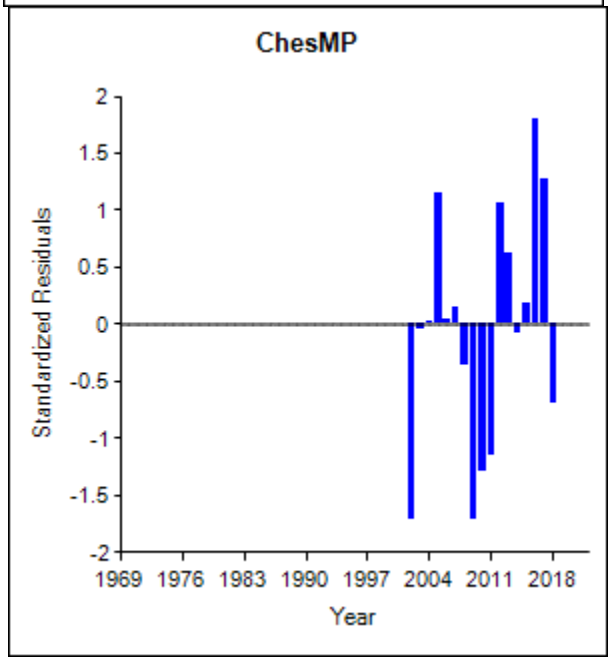
20
40
60
80
100
120
140
160
1969
1976
1983
1990
1997
2004
2011
2018


DE30FT
Standardized Residuals
Year
-3
-2
-1
0
1
2
3
1969
1976
1983
1990
1997
2004
2011
2018


ChesMP
Standardized Residuals
Year
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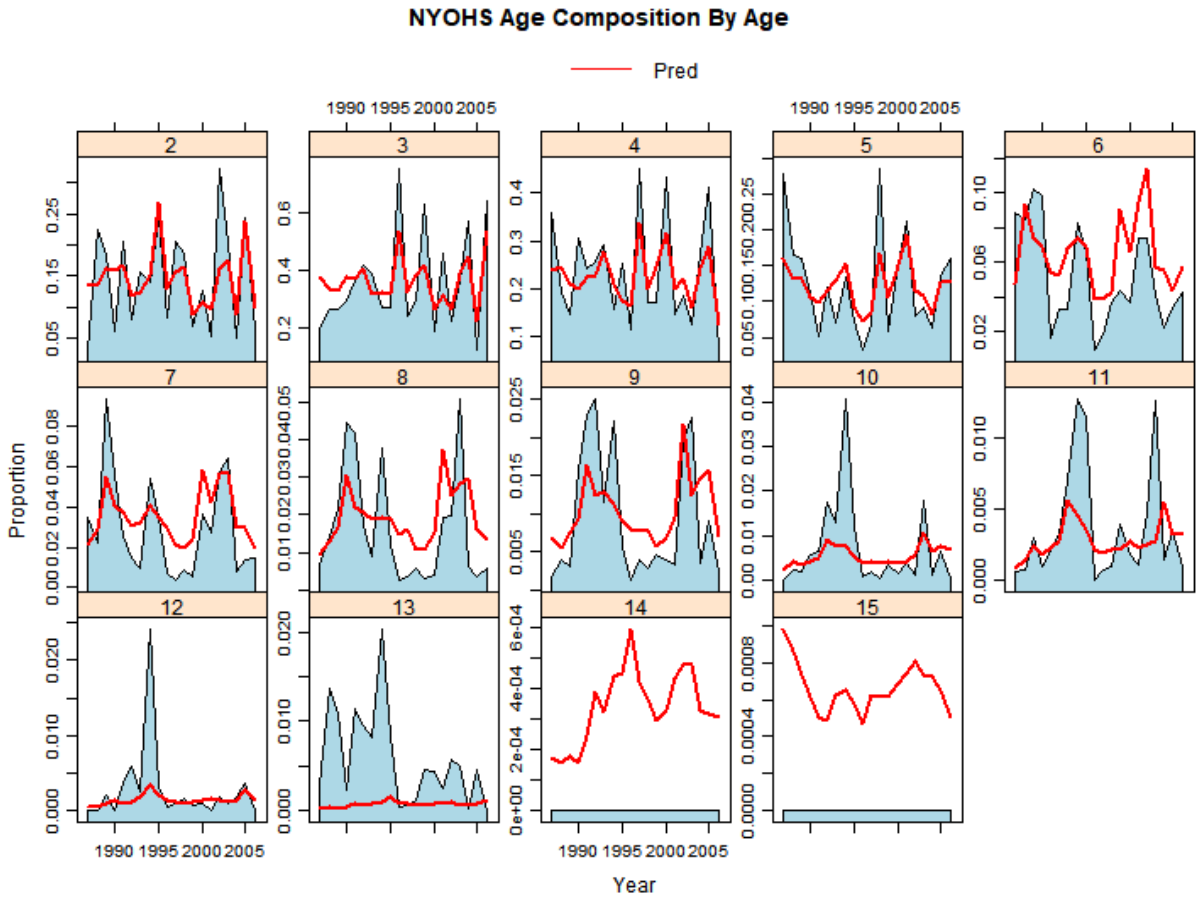
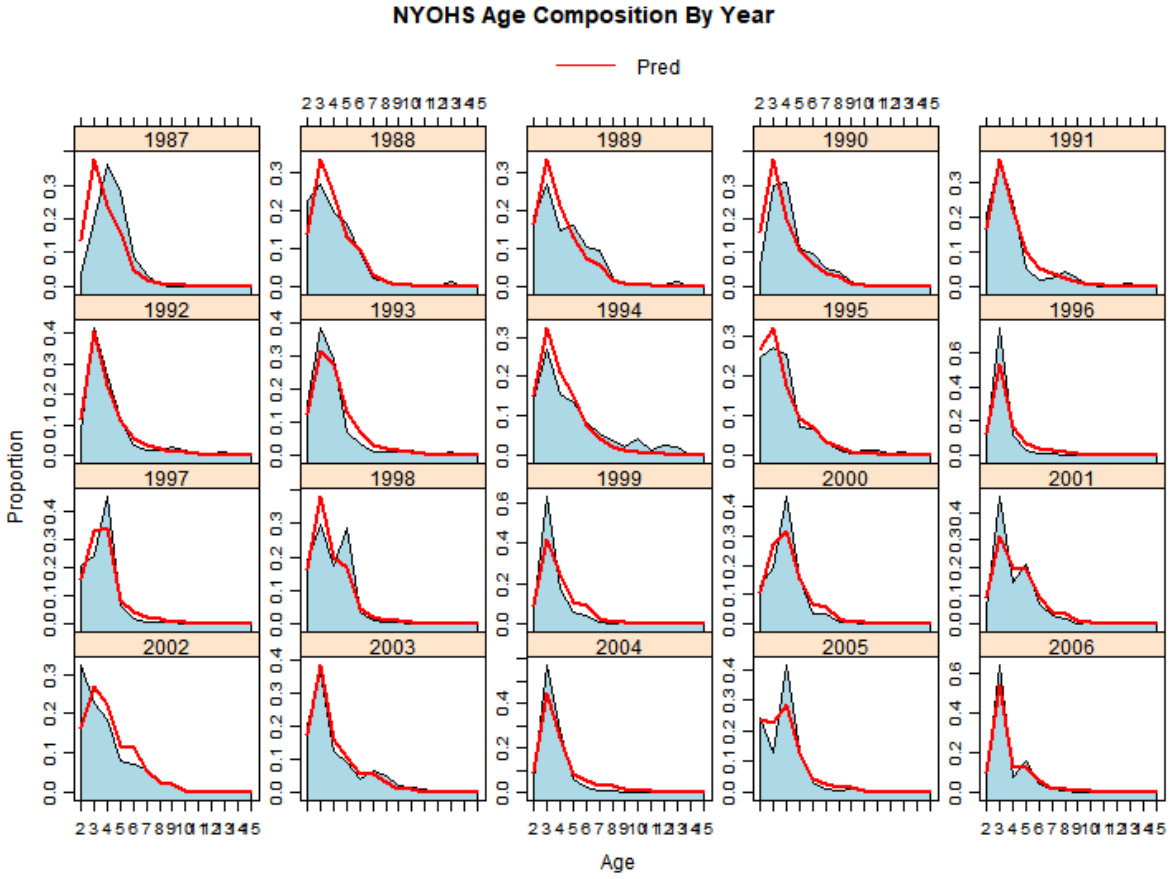
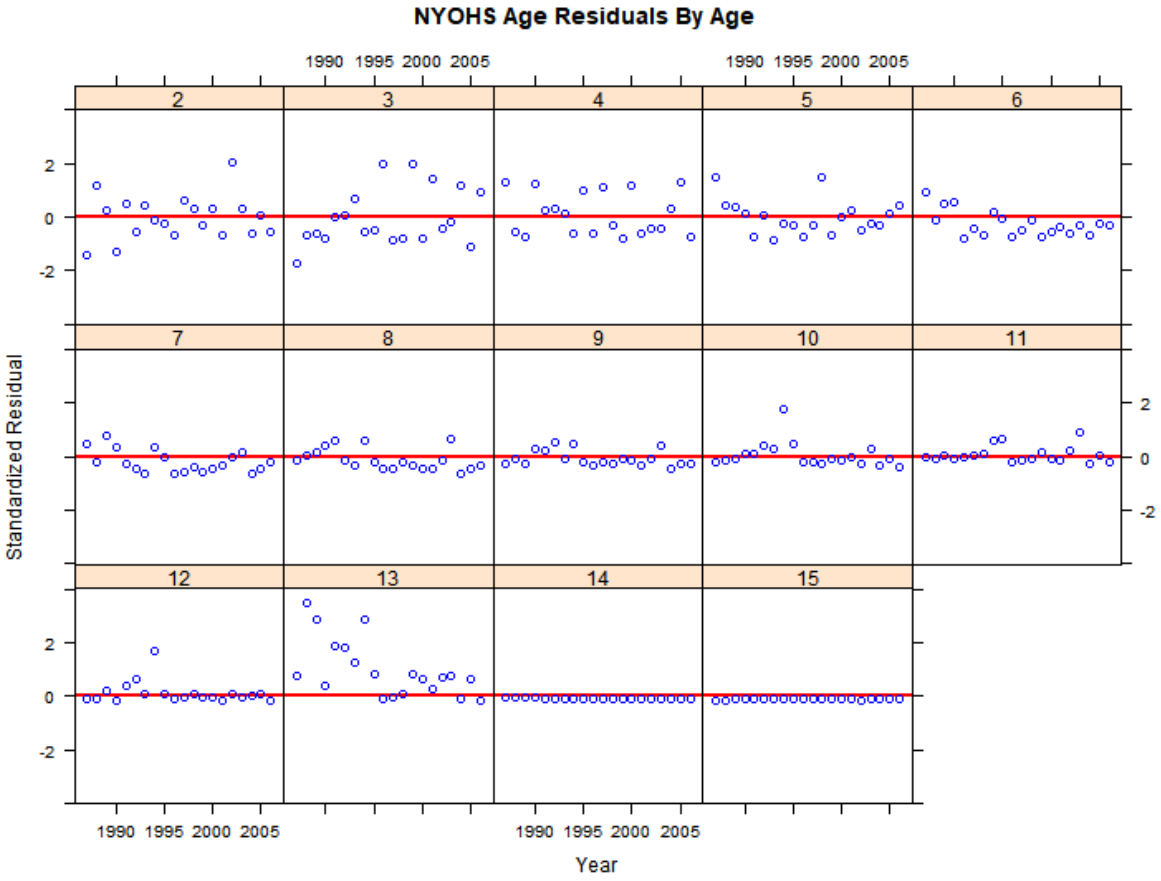
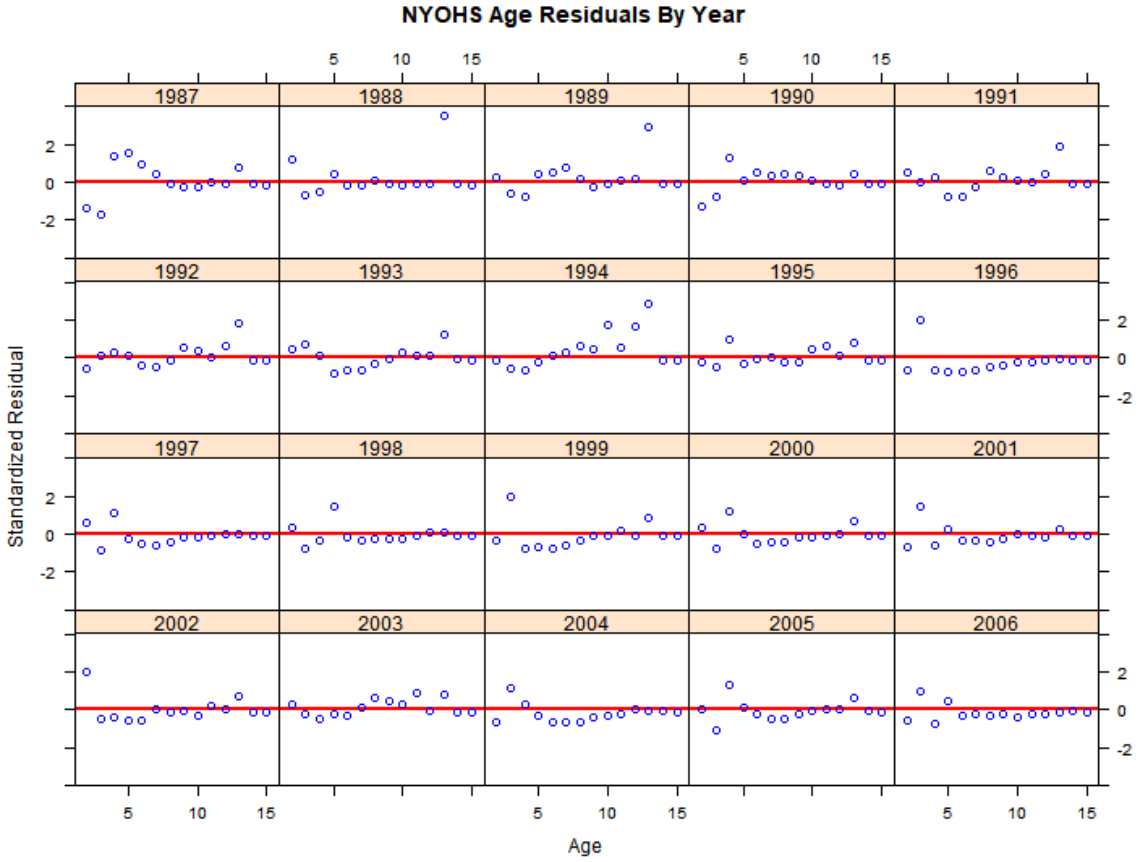
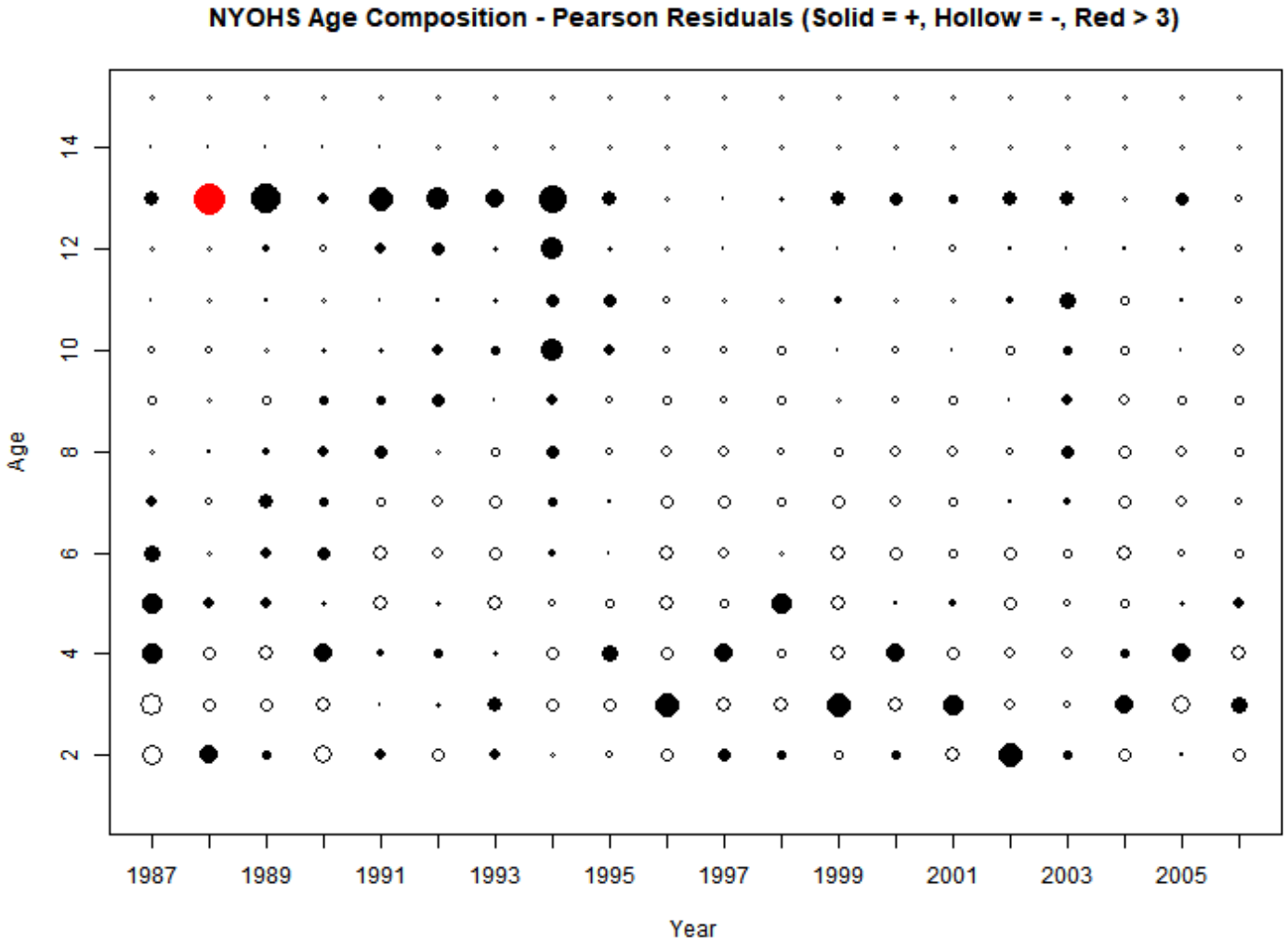
-1
-0.5
0
0.5
1
1.5
2
1969
1976
1983
1990
1997
2004
2011
2018

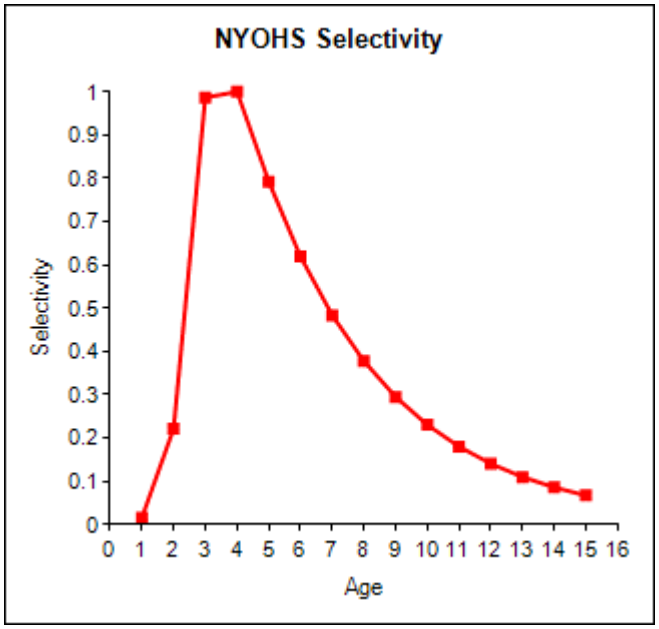

NYOHS Age Composition By Age
Pred
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Proportion
Year

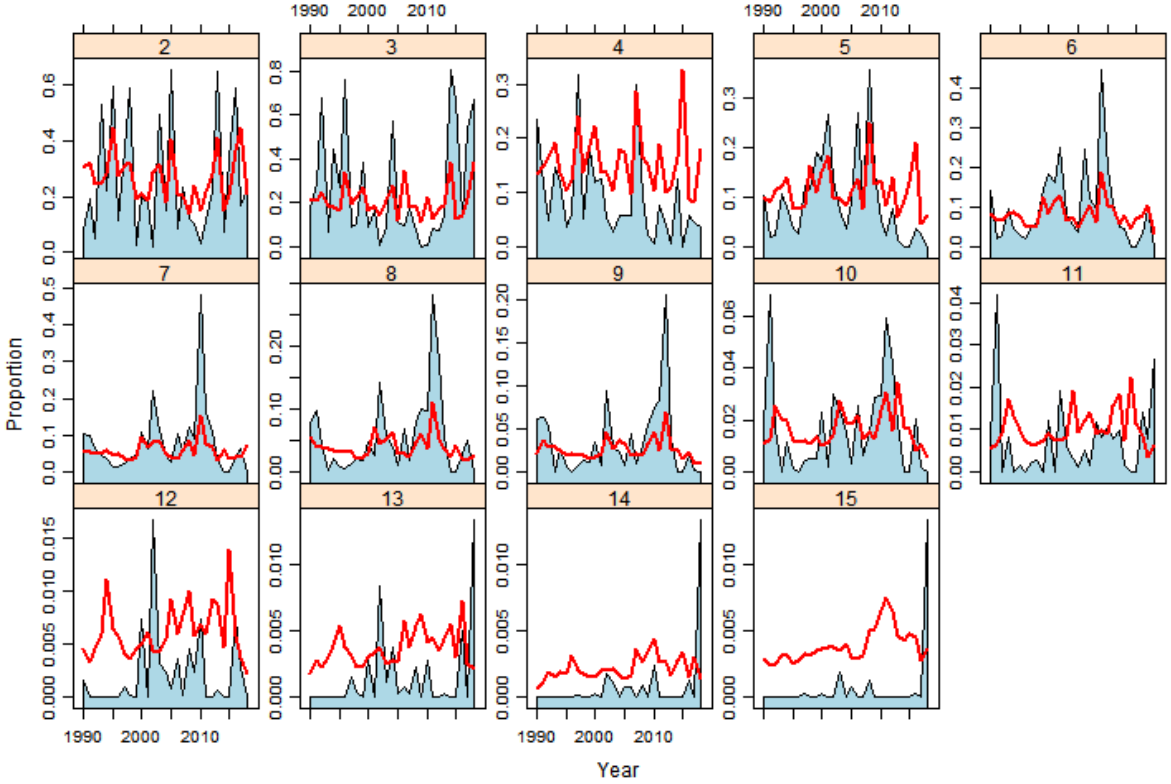

NYOHS Age Composition By Year
Pred
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Proportion
Age


NYOHS Age Residuals By Age
2
3
4
5
6
7
8
9
10
11
12
13
14
15
1990 1995 2000 2005
Standardized Residual
Year


NYOHS Age Residuals By Year
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Standardized Residual
Age


NYOHS Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)
Age
2
4
6
8
10
12
14
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
Year


NYOHS Selectivity
Selectivity
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Age


NJTrawl Age Composition By Age
Pred
2
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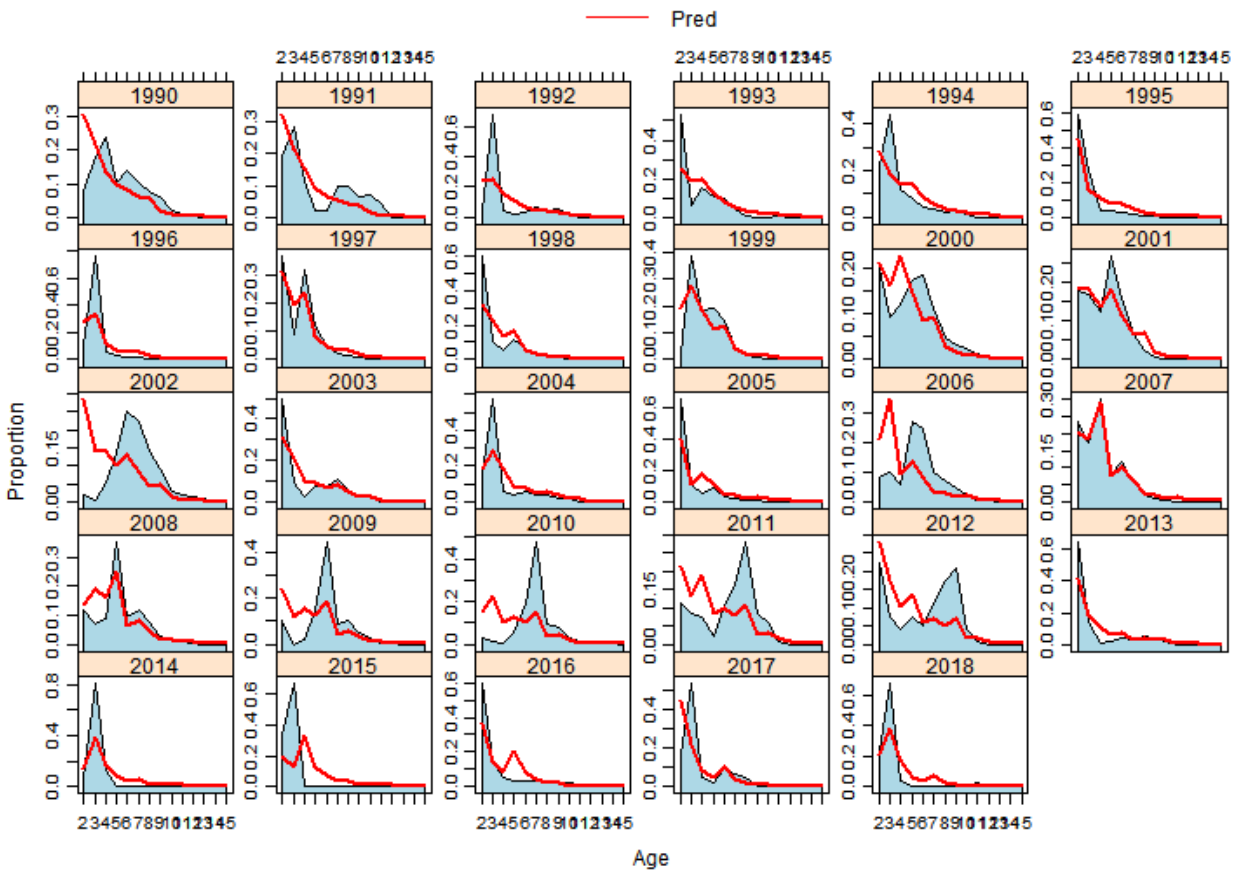
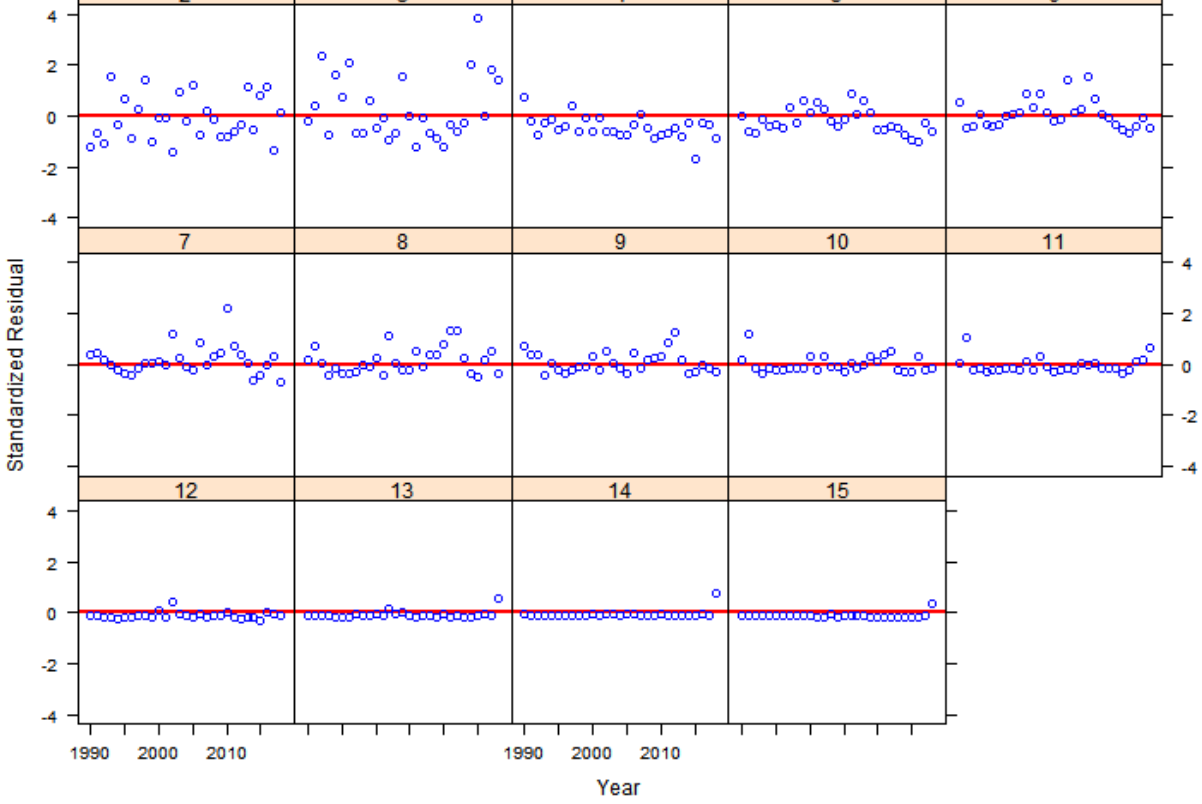
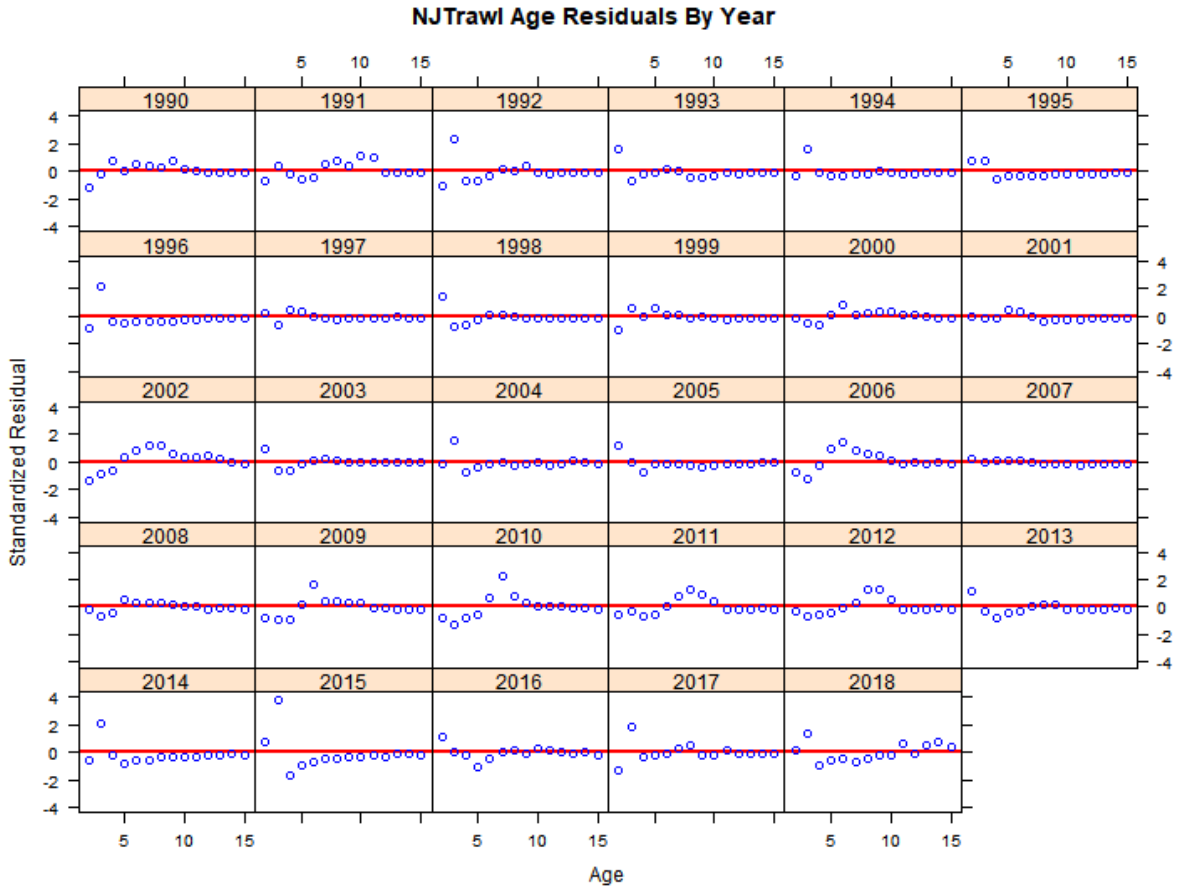
5
6
7
8
9
10
11
12
13
14
15
Proportion
Year


NJTrawl Age Composition By Year
Pred
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Proportion
Age


NJTrawl Age Residuals By Age
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Standardized Residual
Year
1990
2000
2010


NJTrawl Age Residuals By Year
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
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2008
2009
2010
2011
2012
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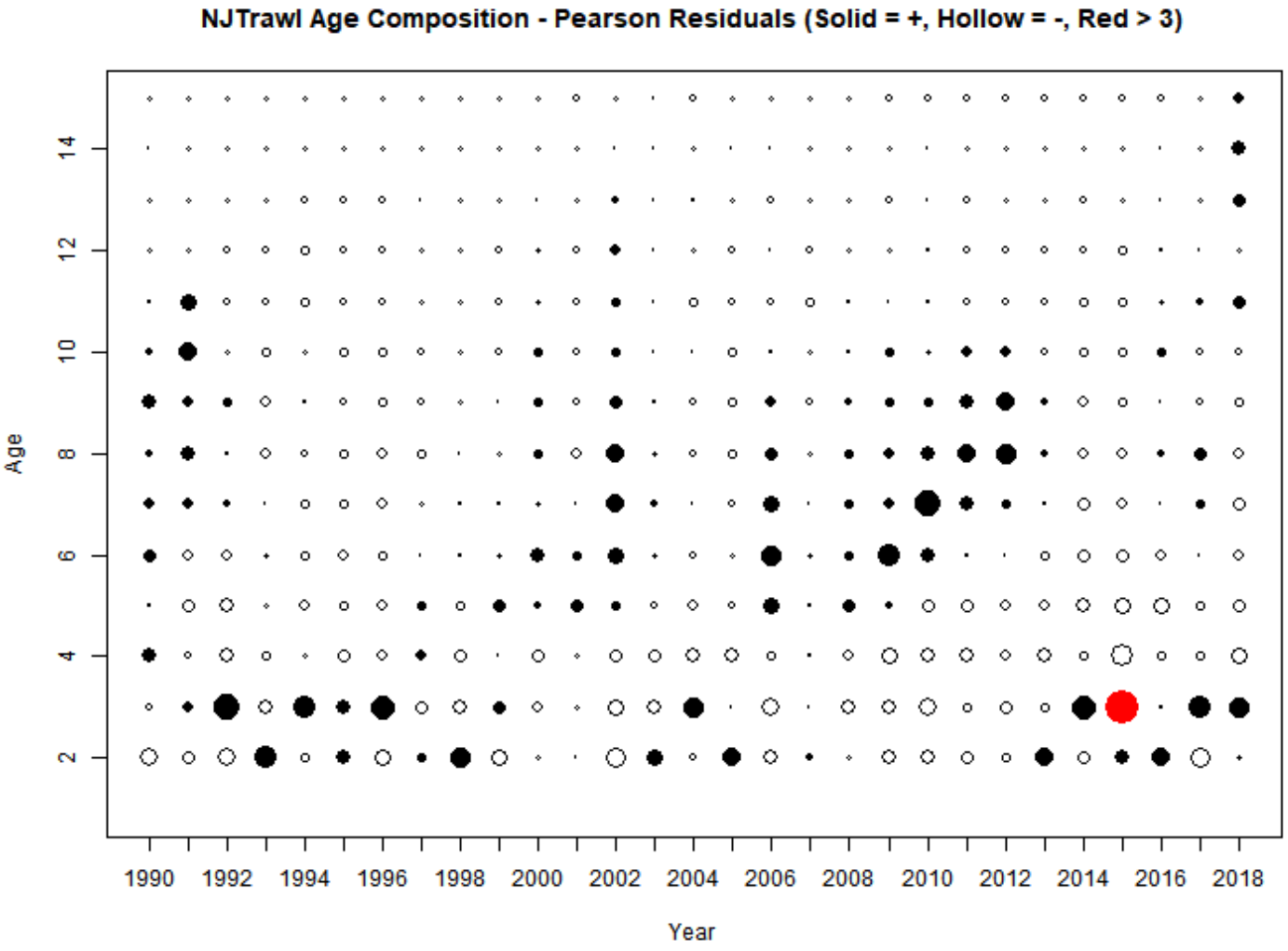
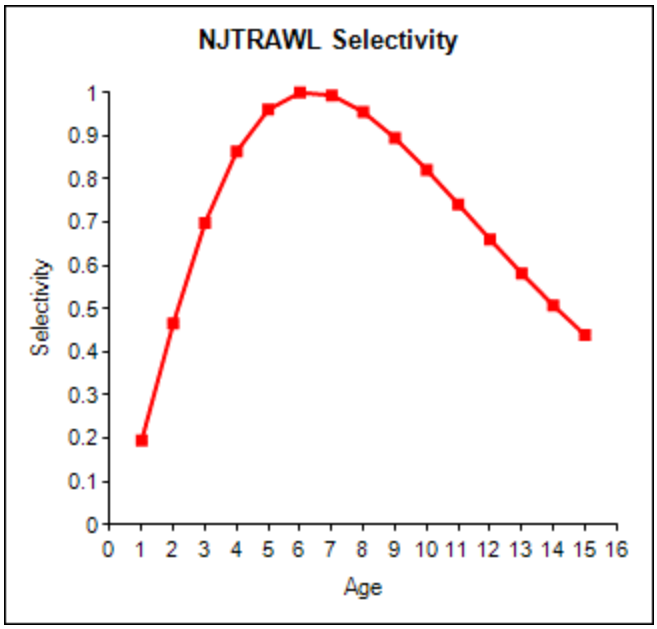
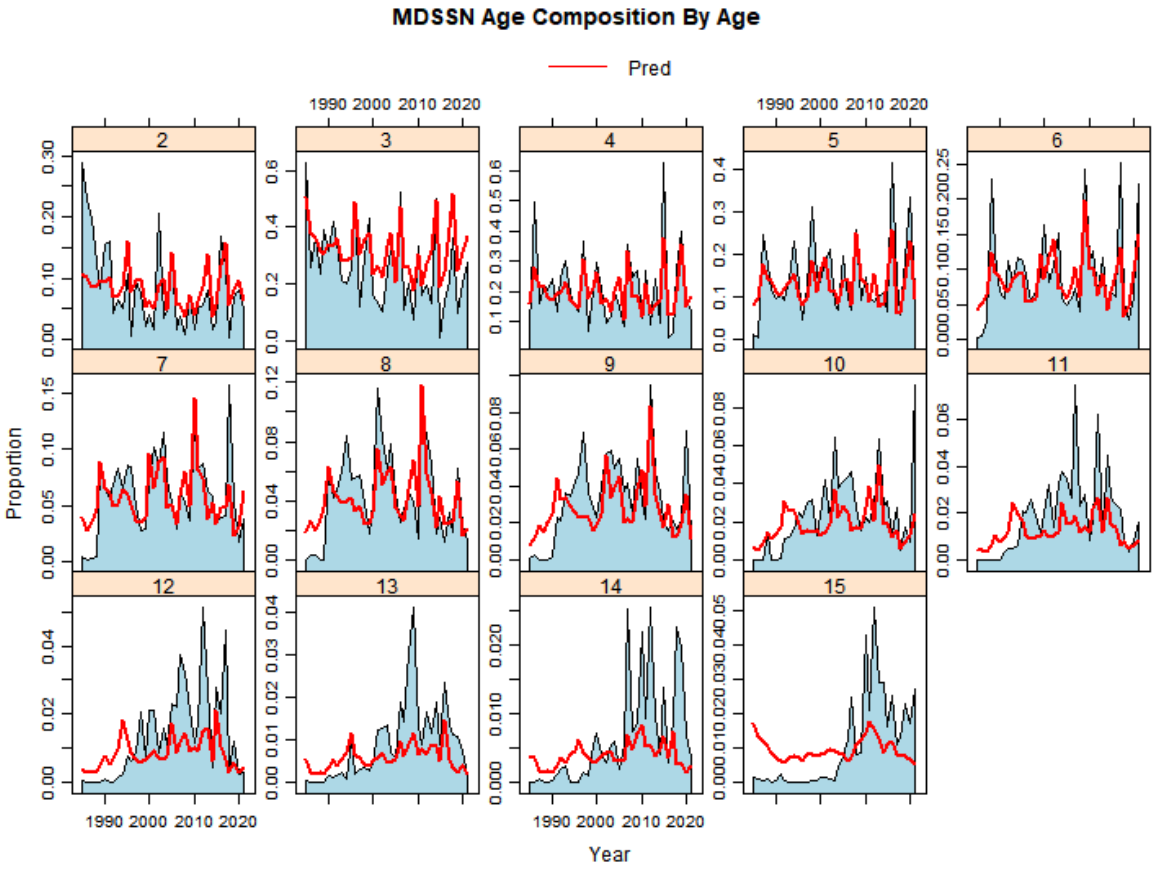
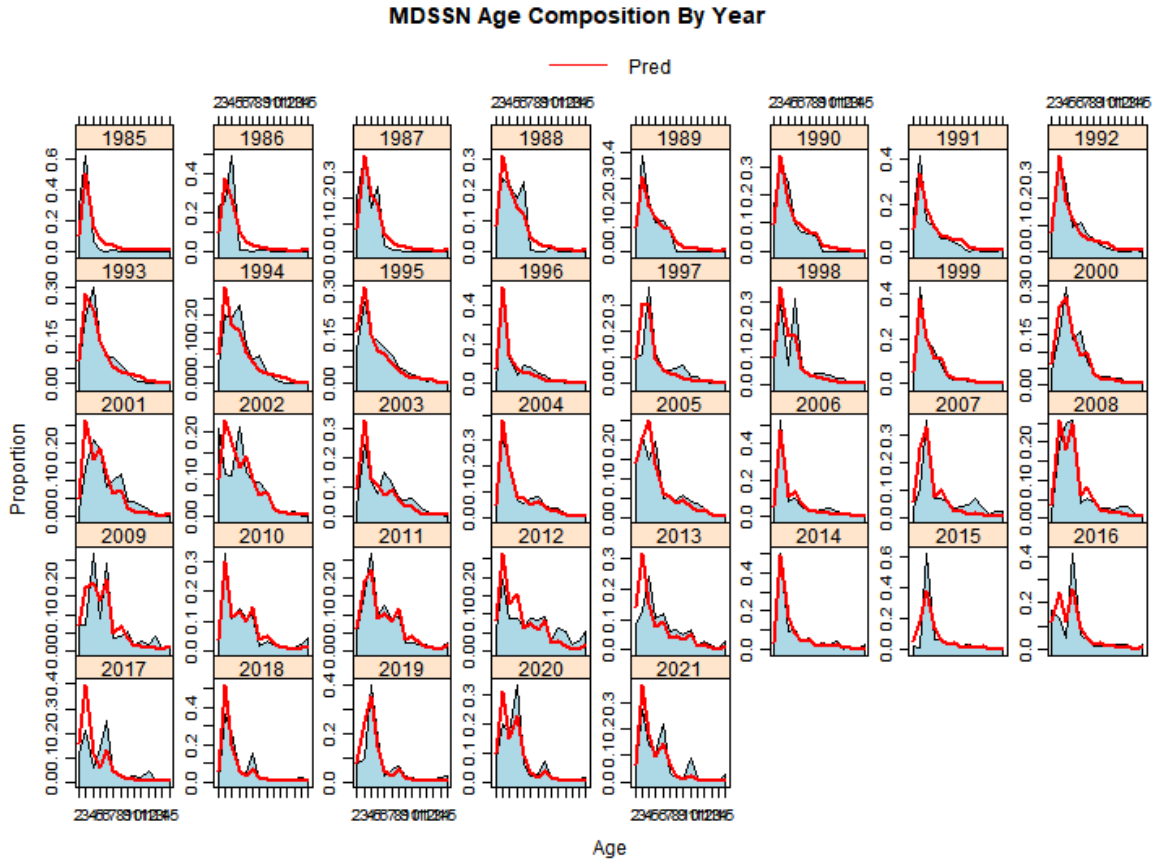
2014
2015
2016
2017
2018
Standardized Residual
Age


NJTrawl Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)
Age
2
4
6
8
10
12
14
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Year


NJTRAWL Selectivity
Selectivity
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Age


MDSSN Age Composition By Age
Pred
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Proportion
Year


MDSSN Age Composition By Year
Pred
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
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2006
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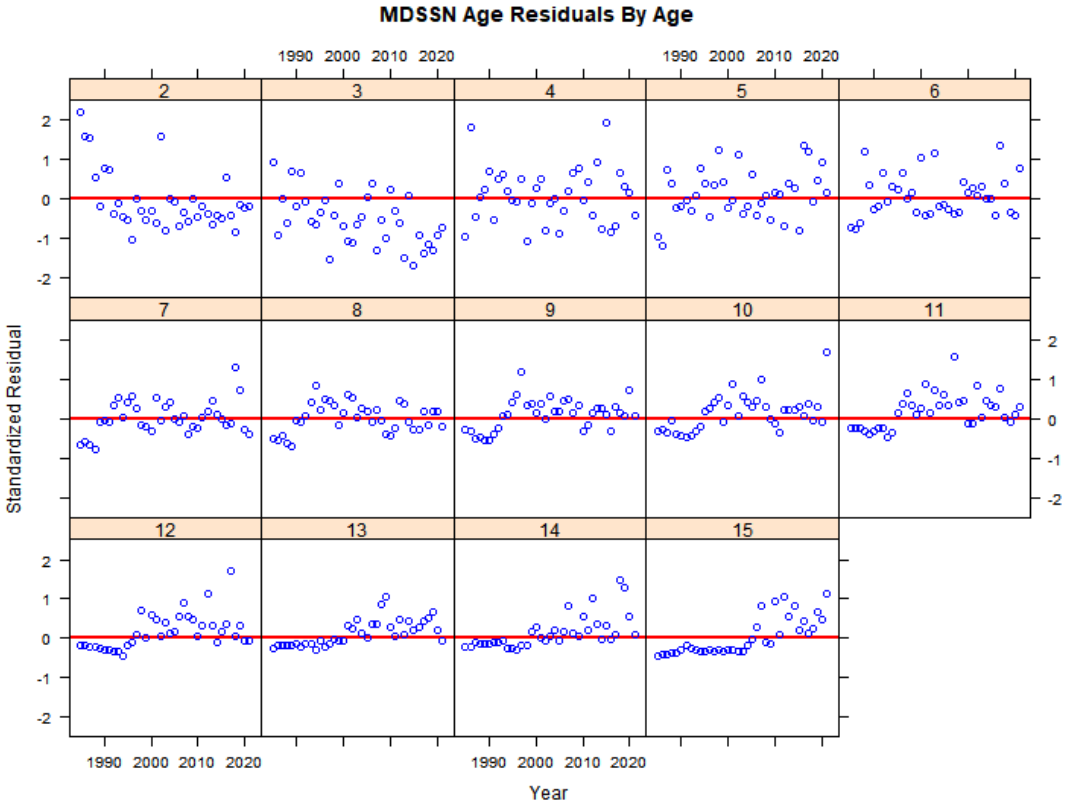
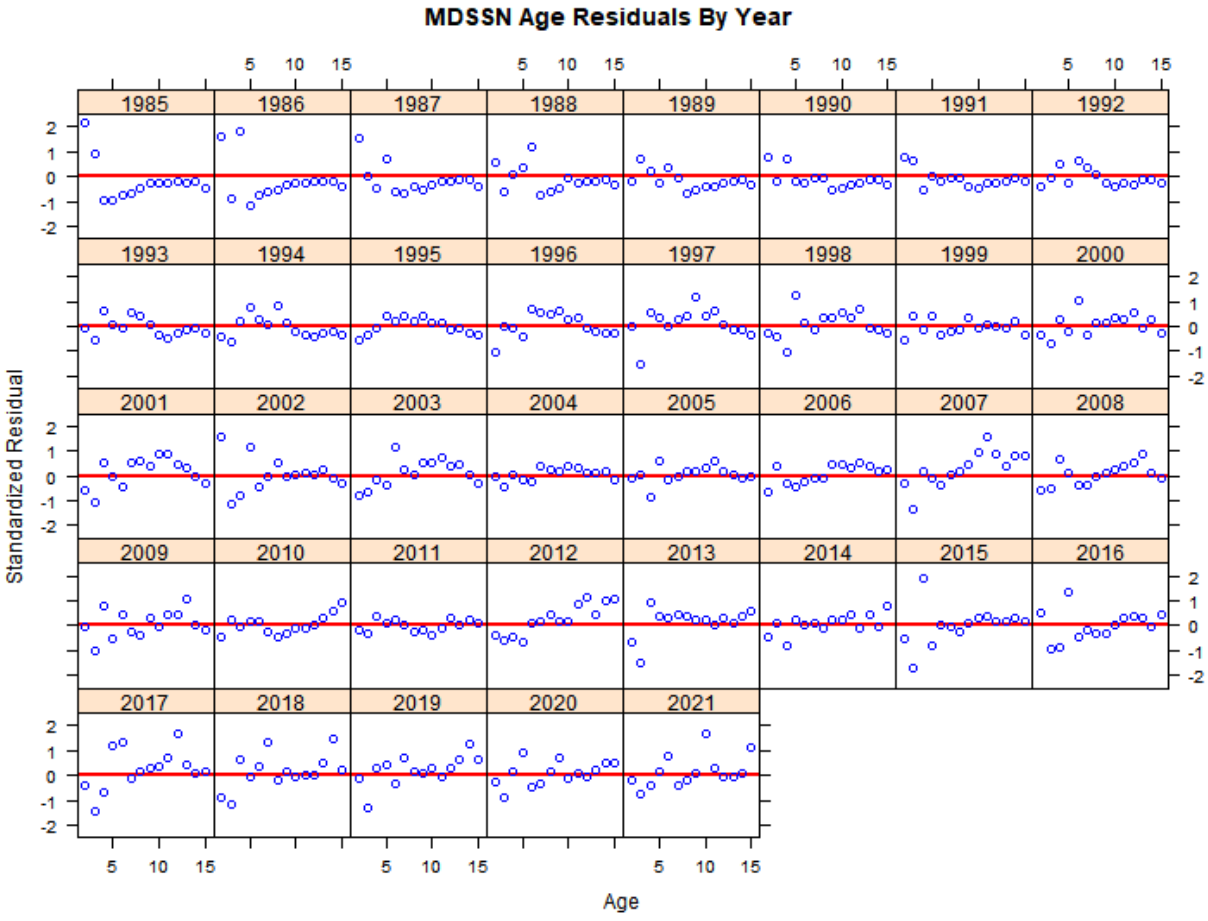
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
Proportion
Age


MDSSN Age Residuals By Age
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Standardized Residual
Year
1990 2000 2010 2020


MDSSN Age Residuals By Year
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
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2011
2012
2013
2014
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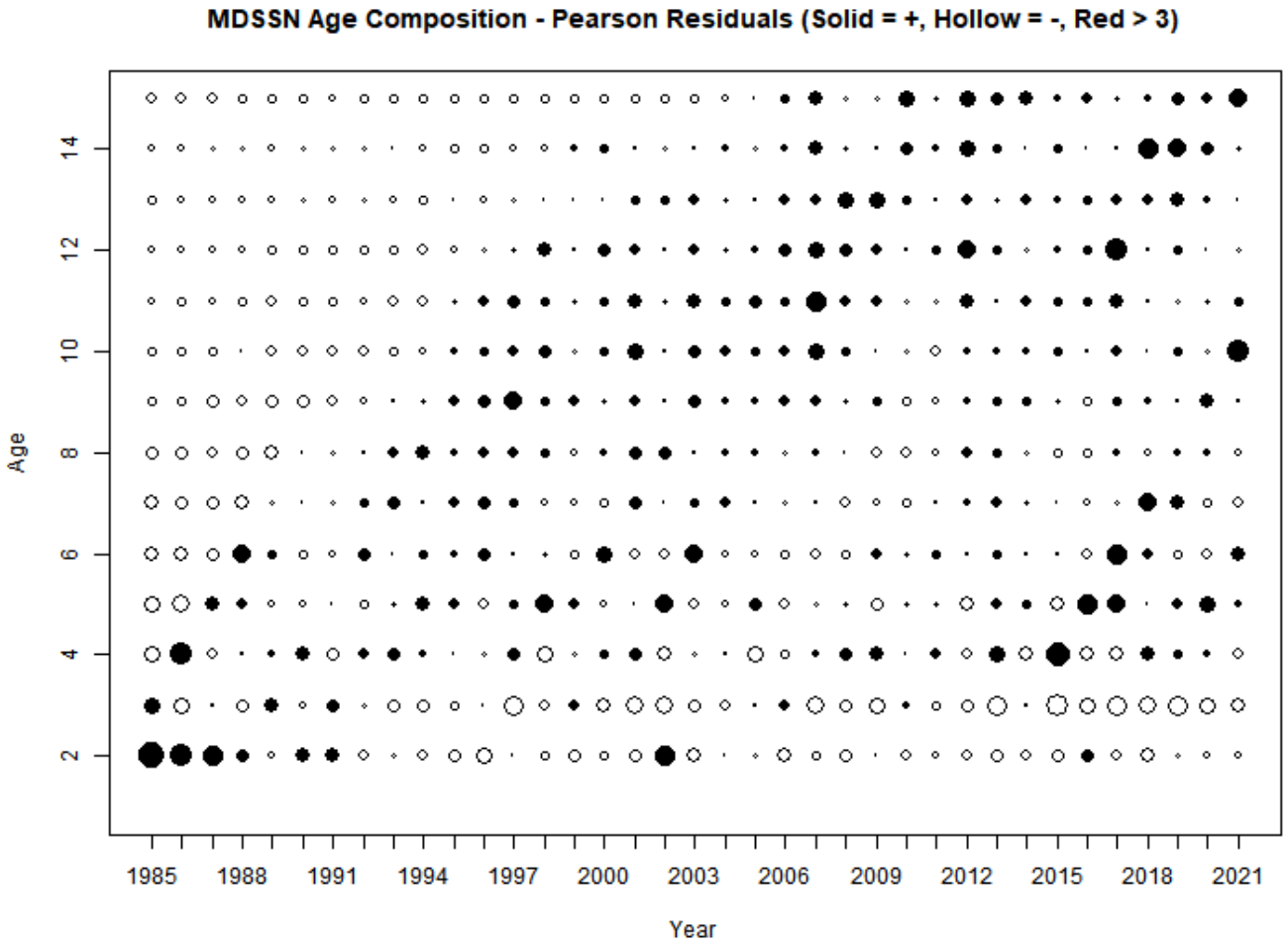
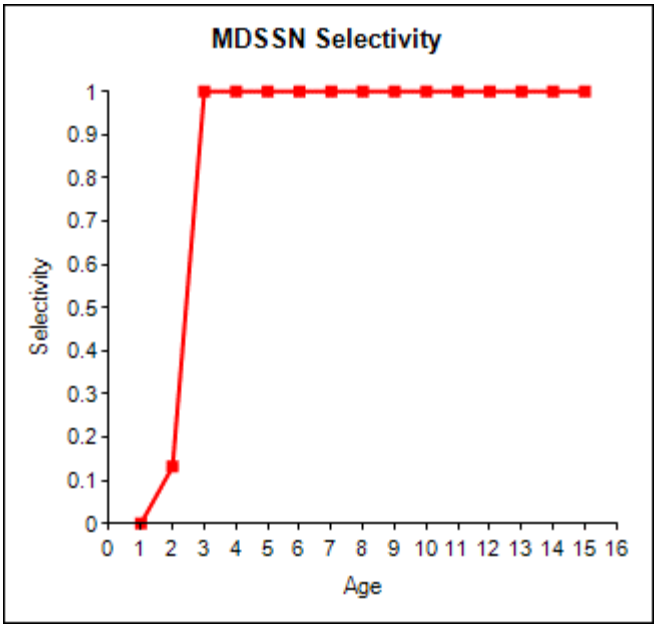
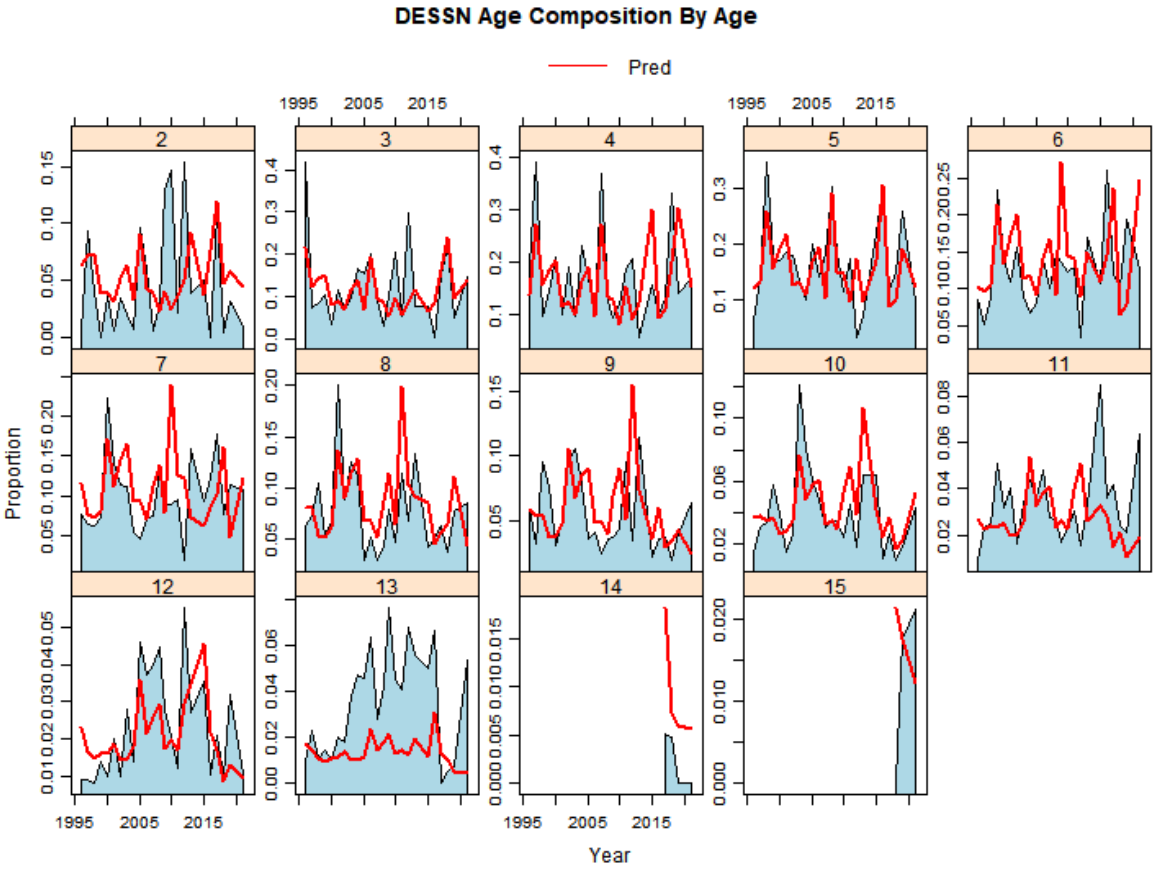
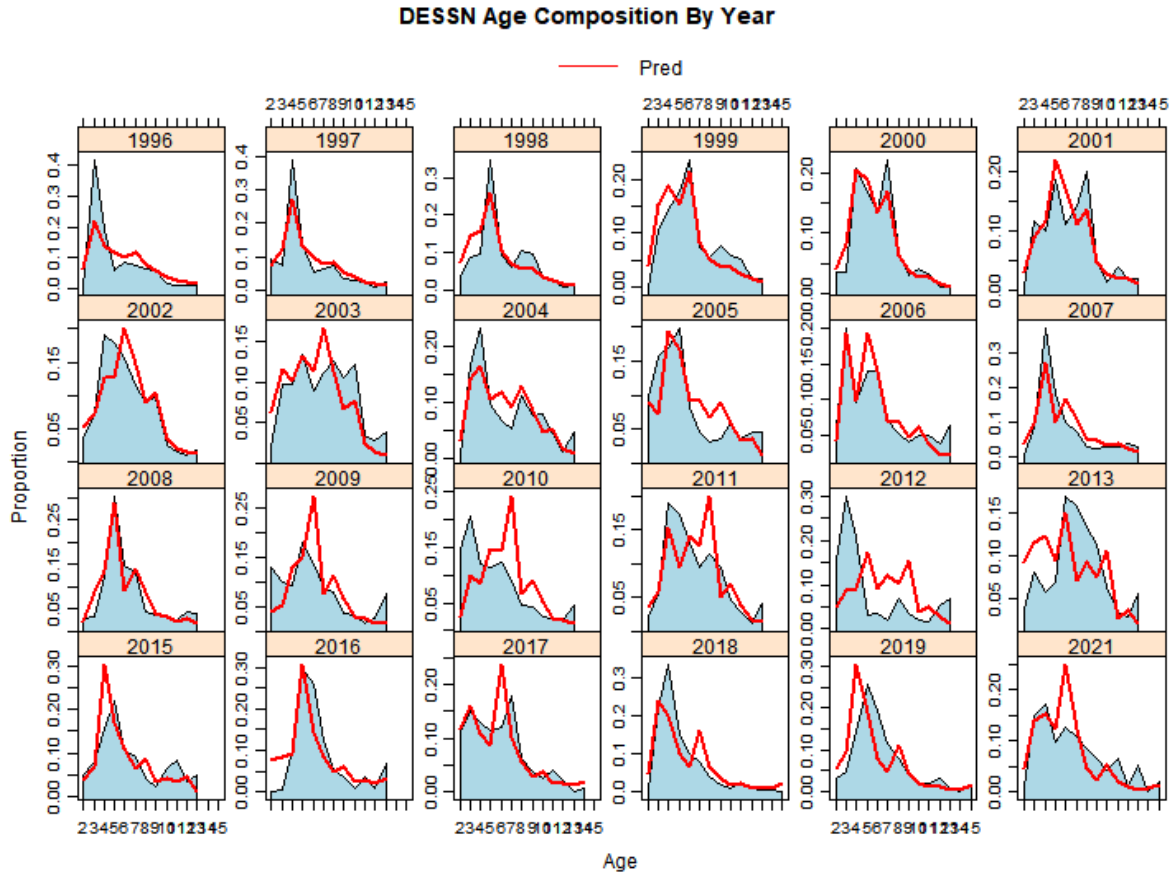
2018
2019
2020
2021
Standardized Residual
Age


MDSSN Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)
Age
2
4
6
8
10
12
14
1985
1988
1991
1994
1997
2000
2003
2006
2009
2012
2015
2018
2021
Year


MDSSN Selectivity
Selectivity
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Age


DESSN Age Composition By Age
Pred
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Proportion
Year


DESSN Age Composition By Year
Pred
1996
1997
1998
1999
2000
2001
2002
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2007
2008
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2010
2011
2012
2013
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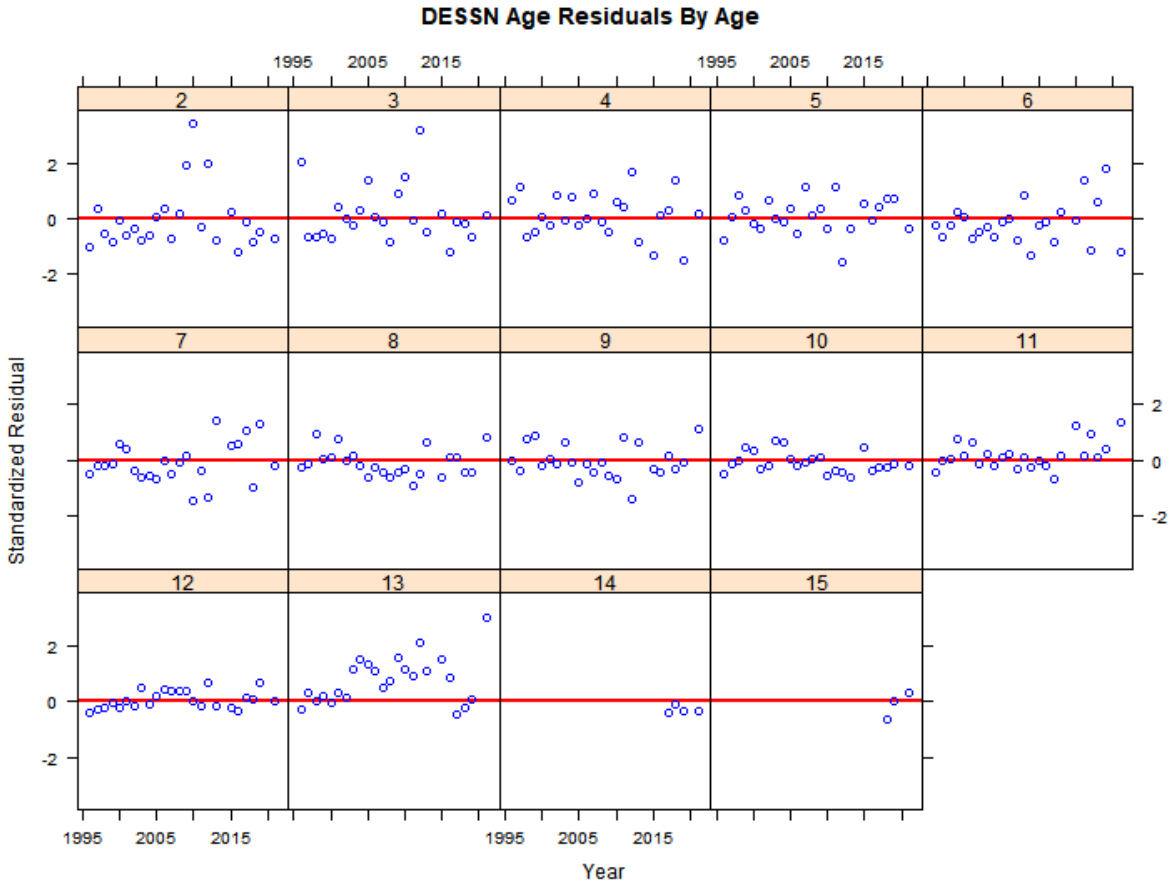
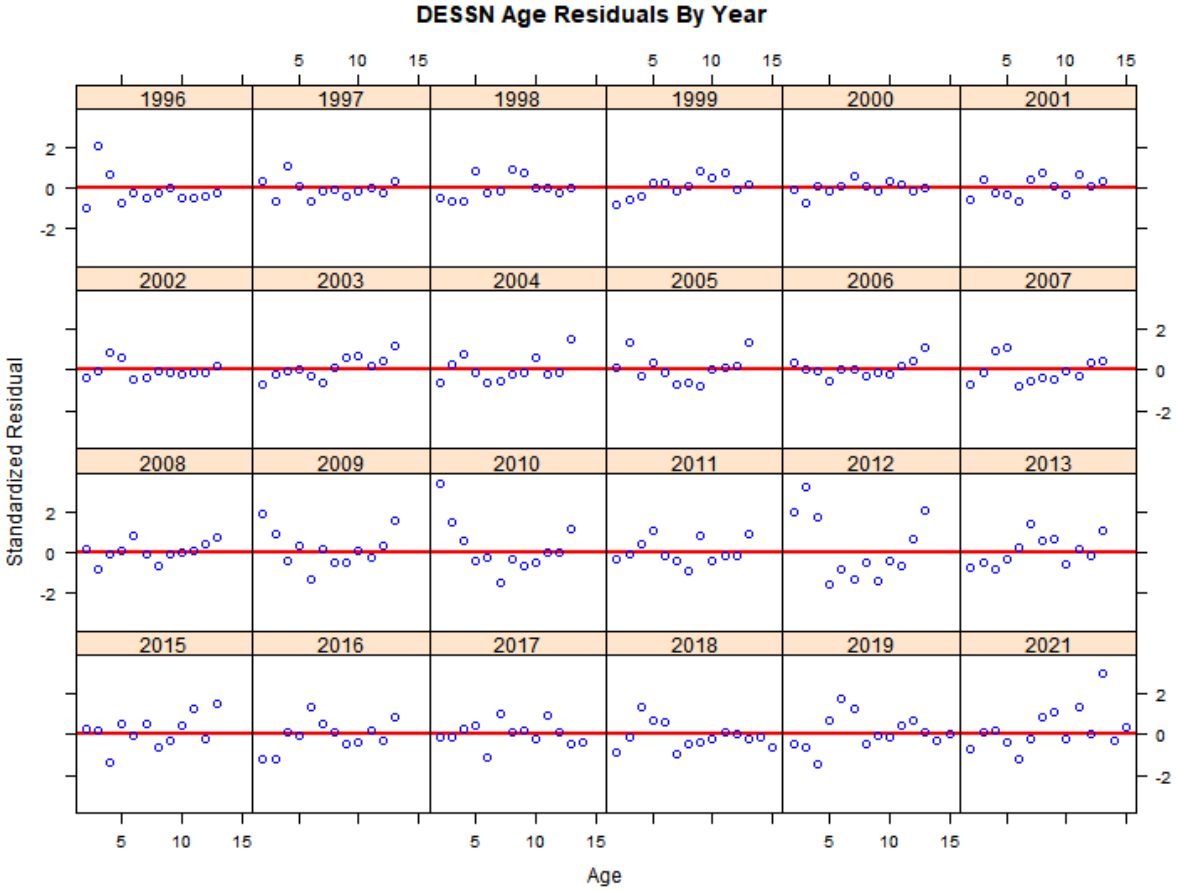
2016
2017
2018
2019
2021
Proportion
Age


DESSN Age Residuals By Age
2
3
4
5
6
7
8
9
10
11
12
13
14
15
1995
2005
2015
Standardized Residual
Year


DESSN Age Residuals By Year
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
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2008
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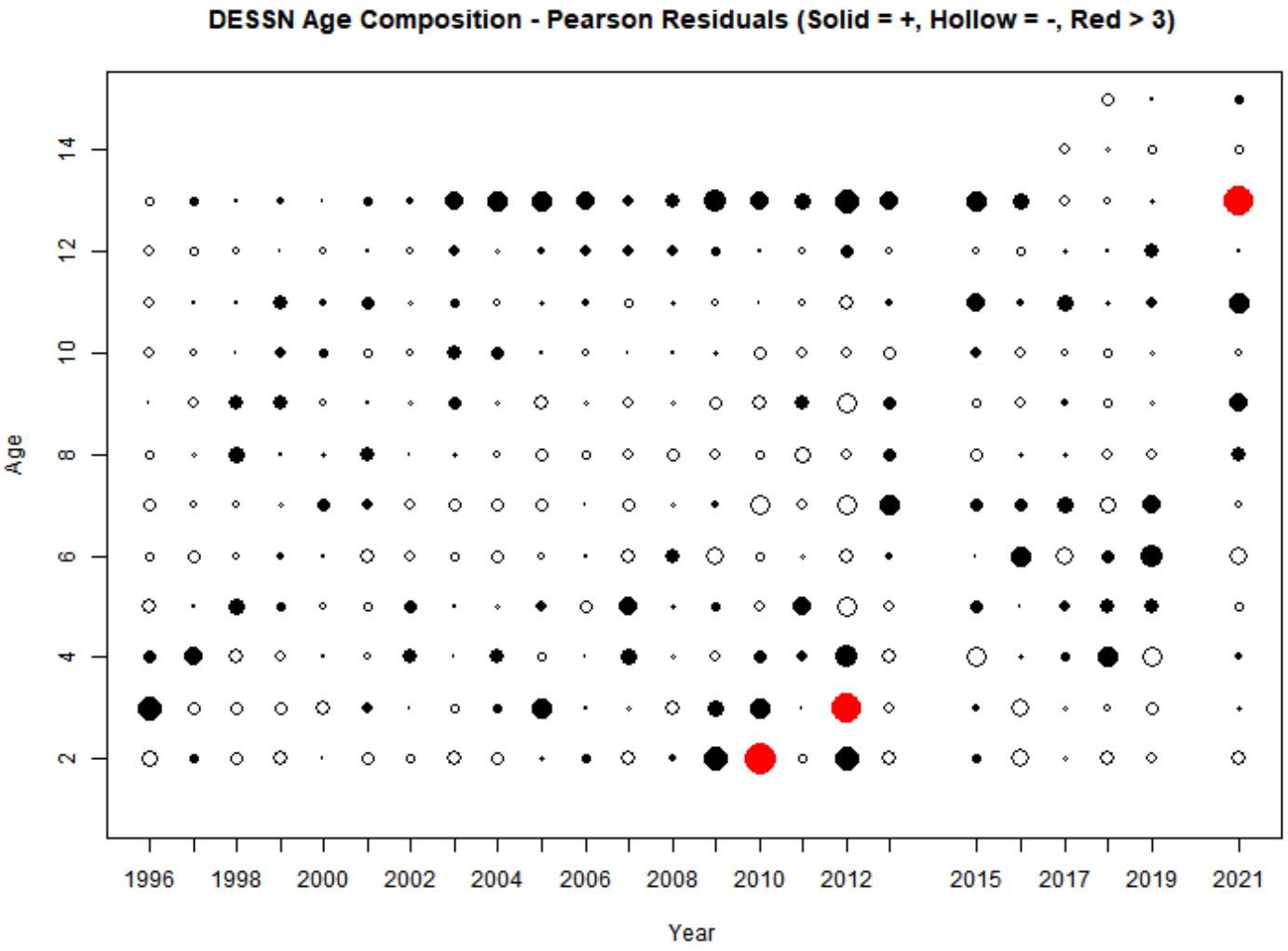
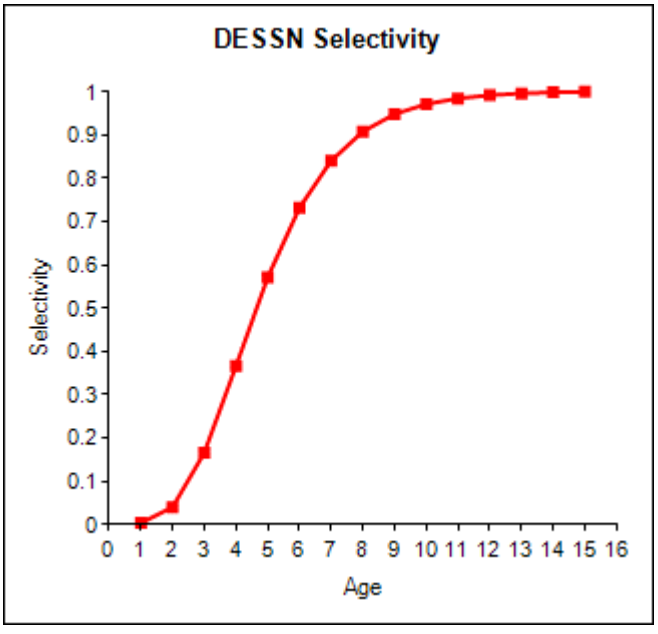
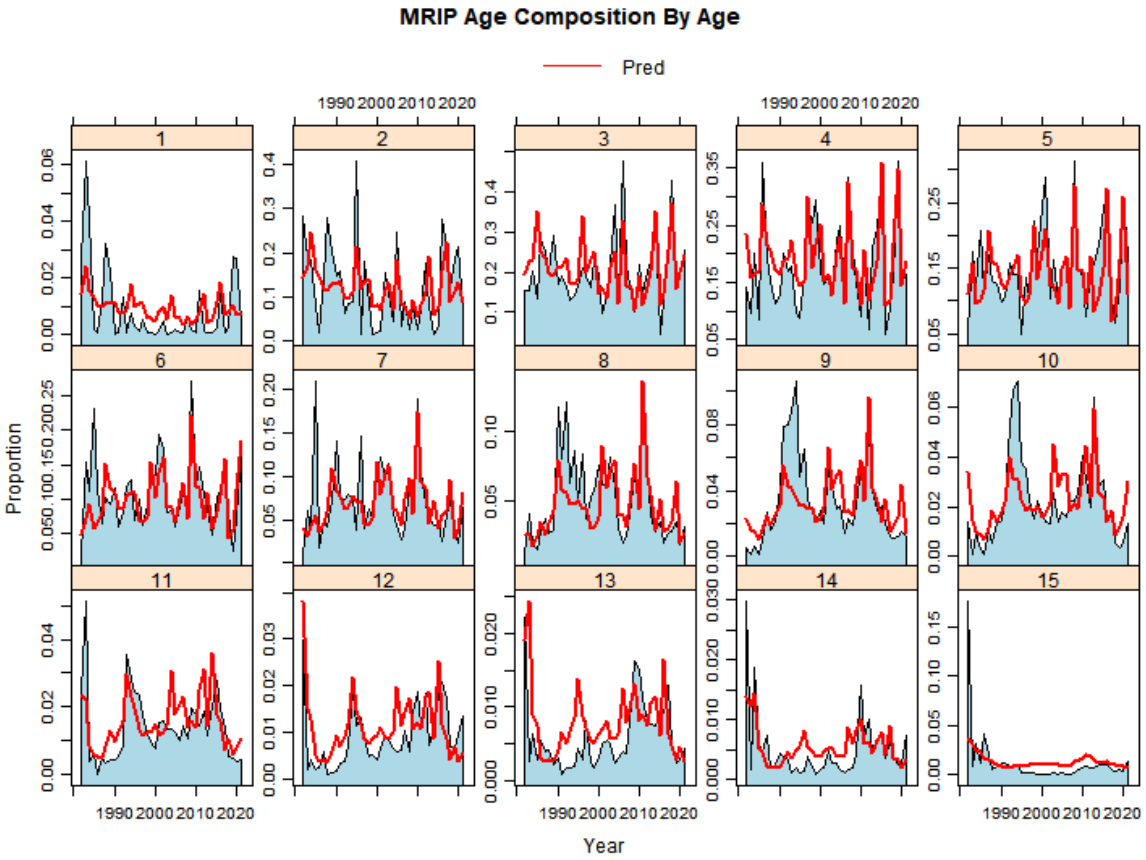
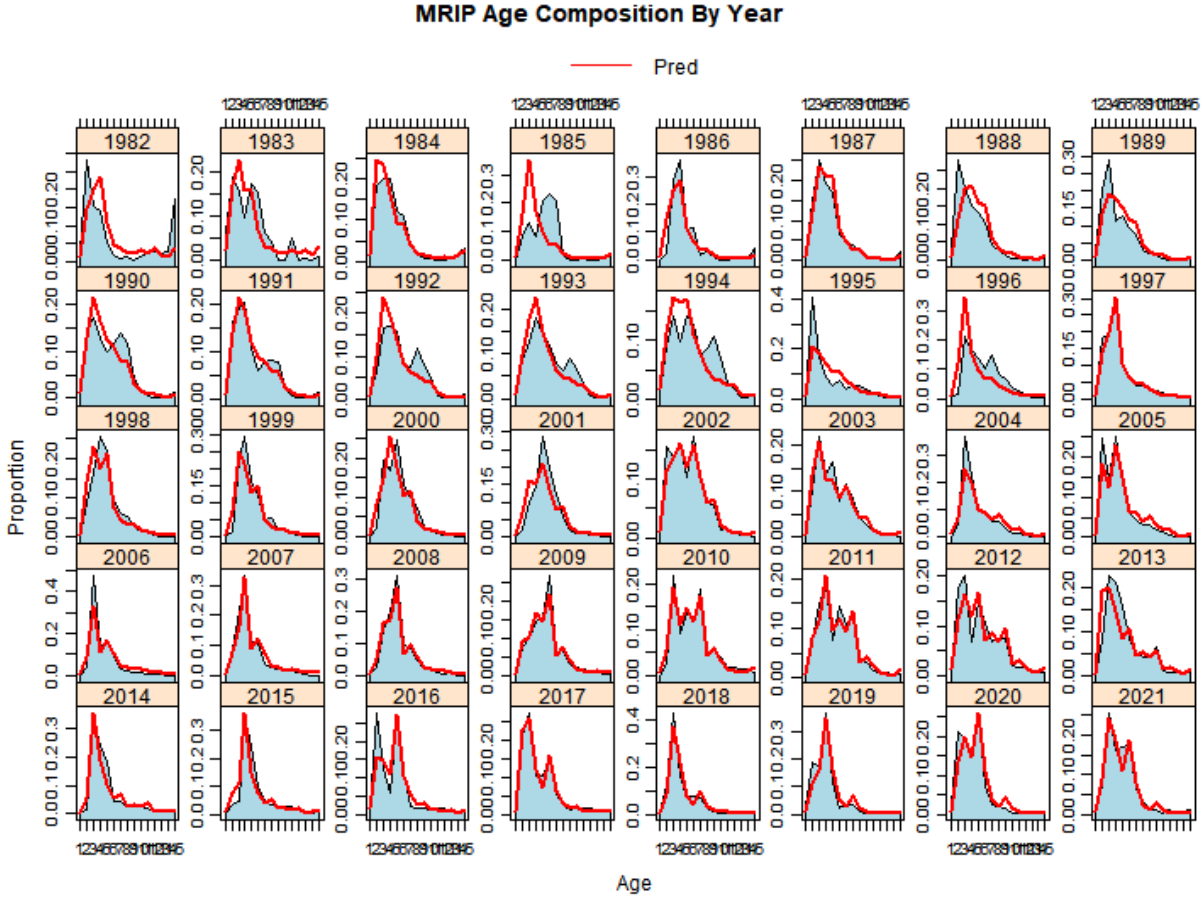
2010
2011
2012
2013
2015
2016
2017
2018
2019
2021
5
10
15
Standardized Residual
Age


DESSN Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)
Age
2
4
6
8
10
12
14
1996
1998
2000
2002
2004
2006
2008
2010
2012
2015
2017
2019
2021
Year


DESSN Selectivity
Selectivity
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Age


MRIP Age Composition By Age
Pred
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
1990 2000 2010 2020
Proportion
Year


MRIP Age Composition By Year
Pred
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
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2007
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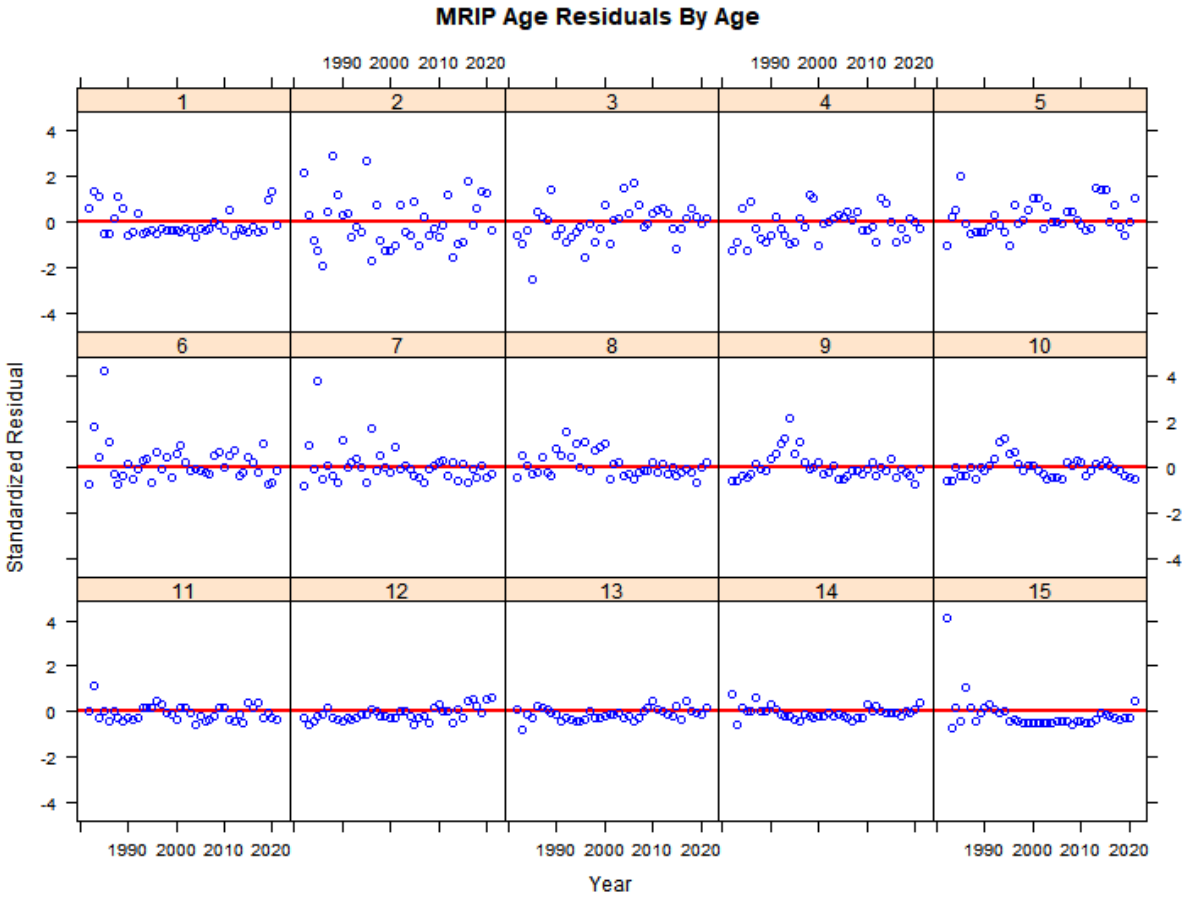
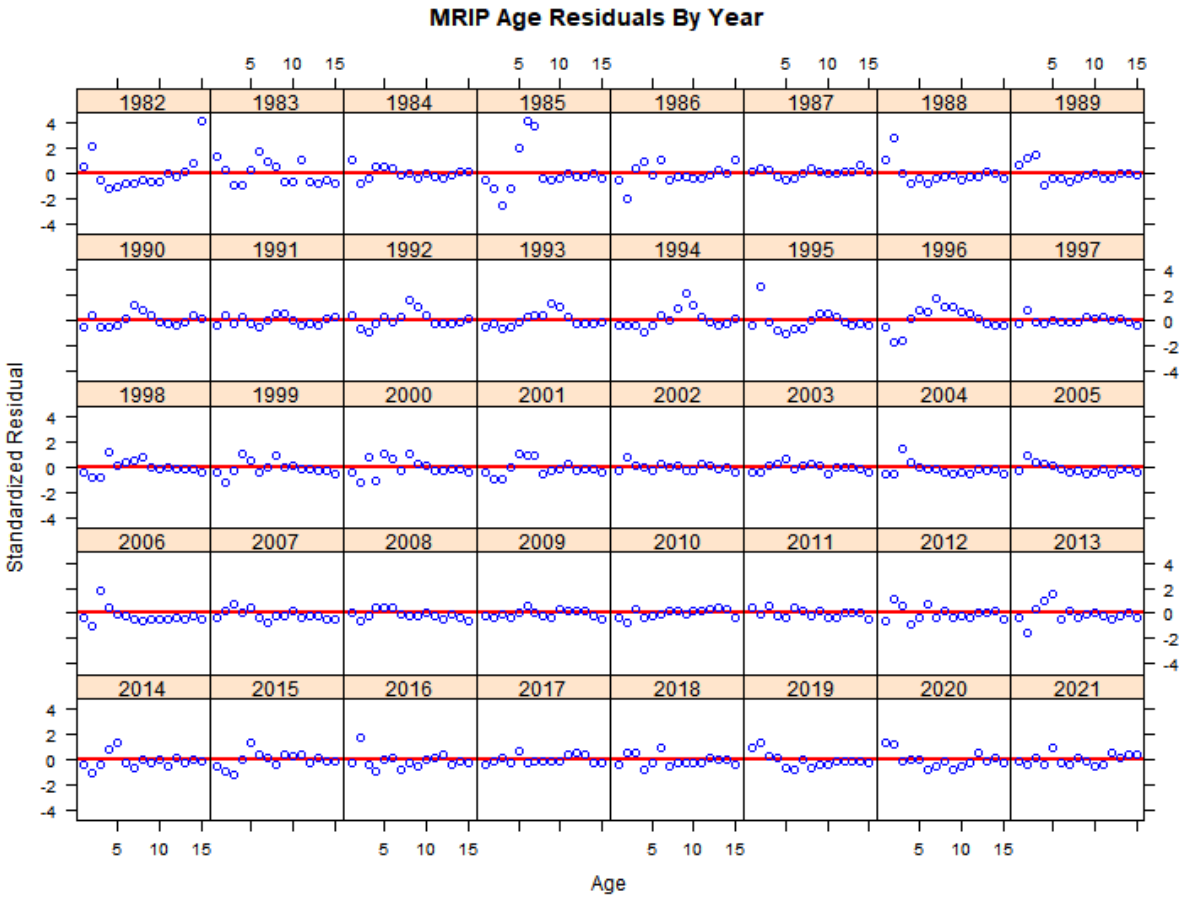
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
Proportion
Age


MRIP Age Residuals By Age
1990 2000 2010 2020
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Standardized Residual
Year


MRIP Age Residuals By Year
5 10 15
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
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2012
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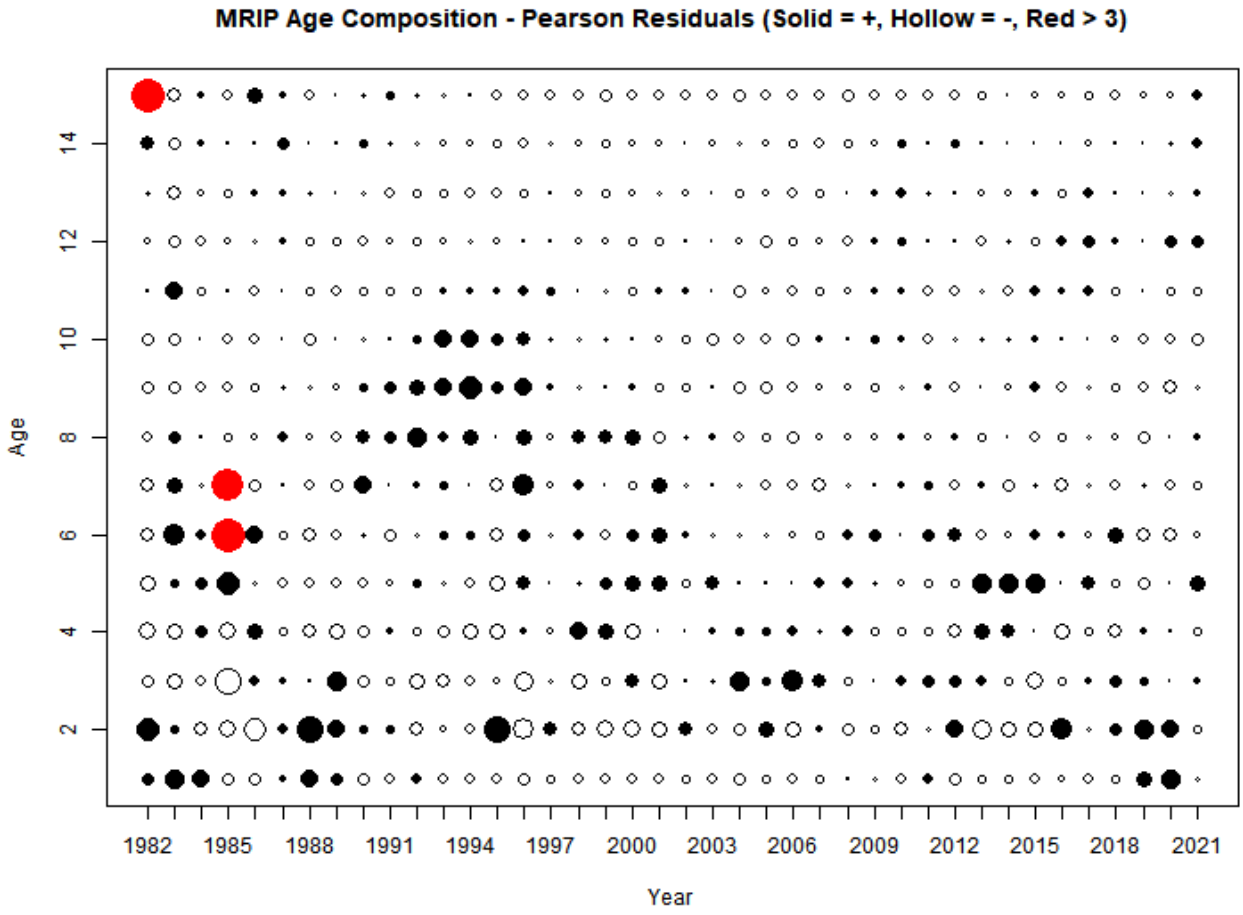
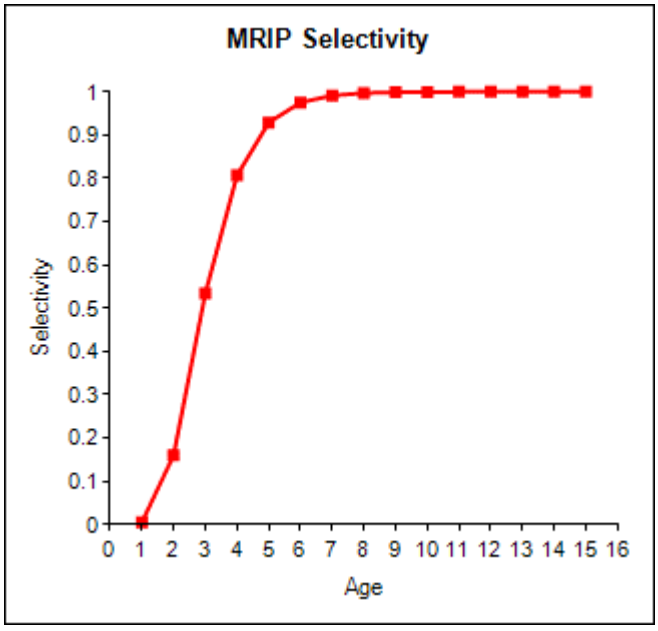
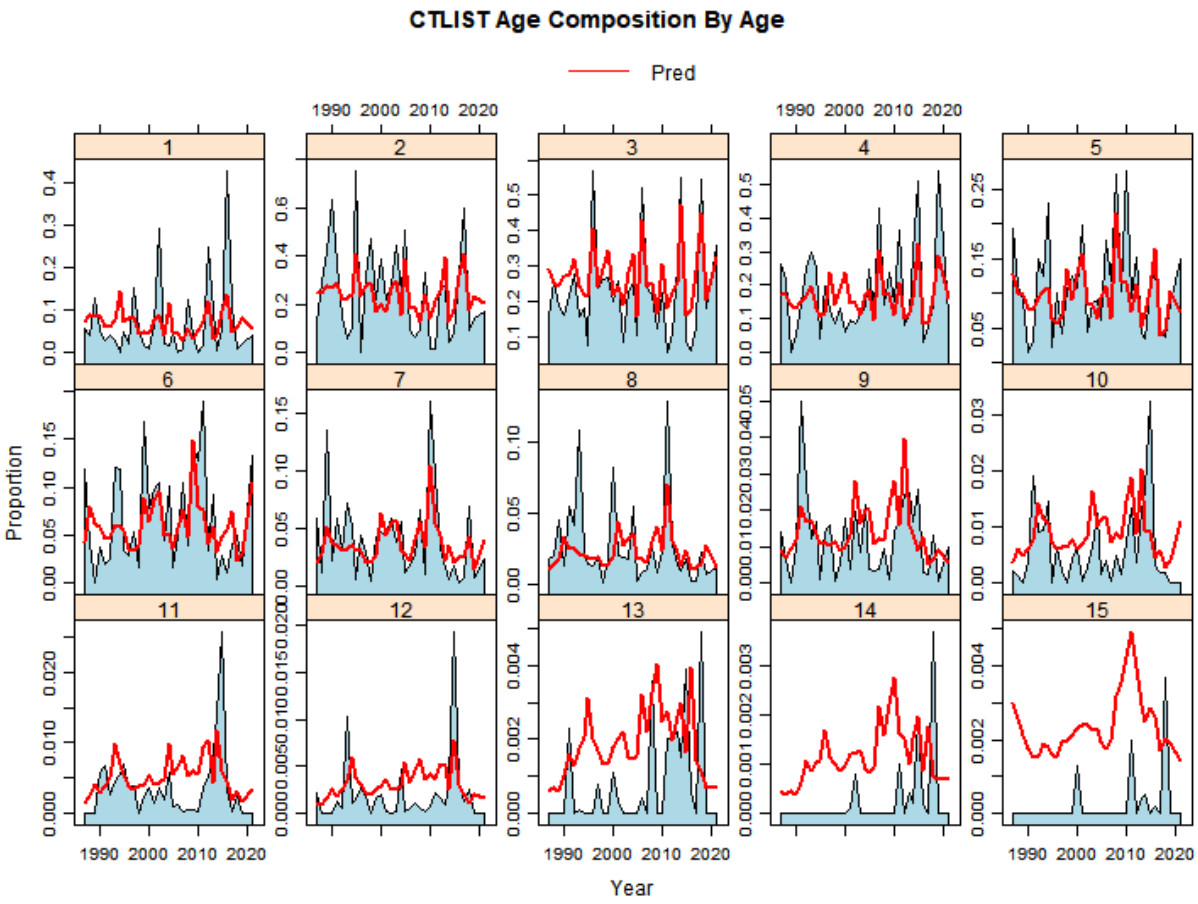
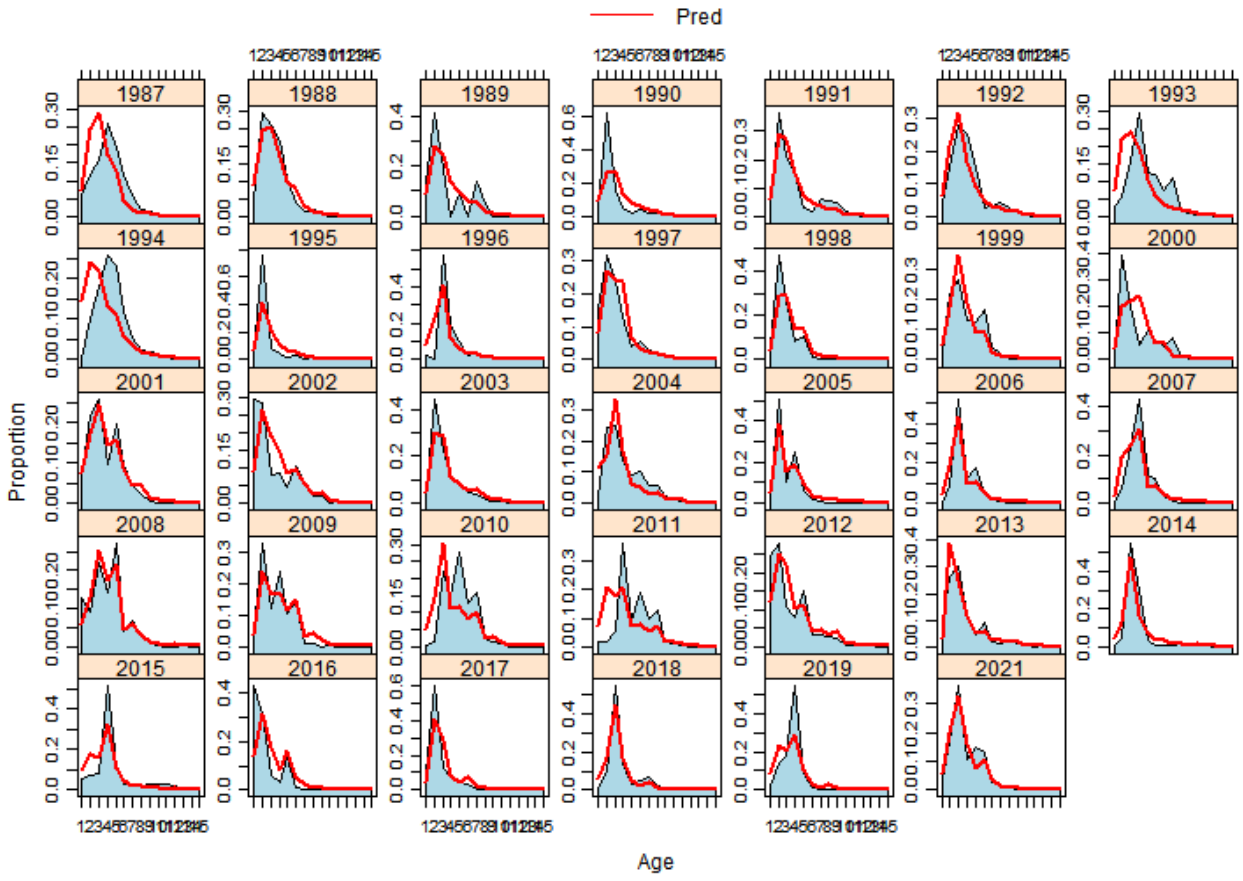
2014
2015
2016
2017
2018
2019
2020
2021
Standardized Residual
Age


MRIP Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)
Age
2
4
6
8
10
12
14
1982
1985
1988
1991
1994
1997
2000
2003
2006
2009
2012
2015
2018
2021
Year


MRIP Selectivity
Selectivity
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Age


CTLIST Age Composition By Age
Pred
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Proportion
Year


CTLIST Age Composition By Year
Pred
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
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2006
2007
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2009
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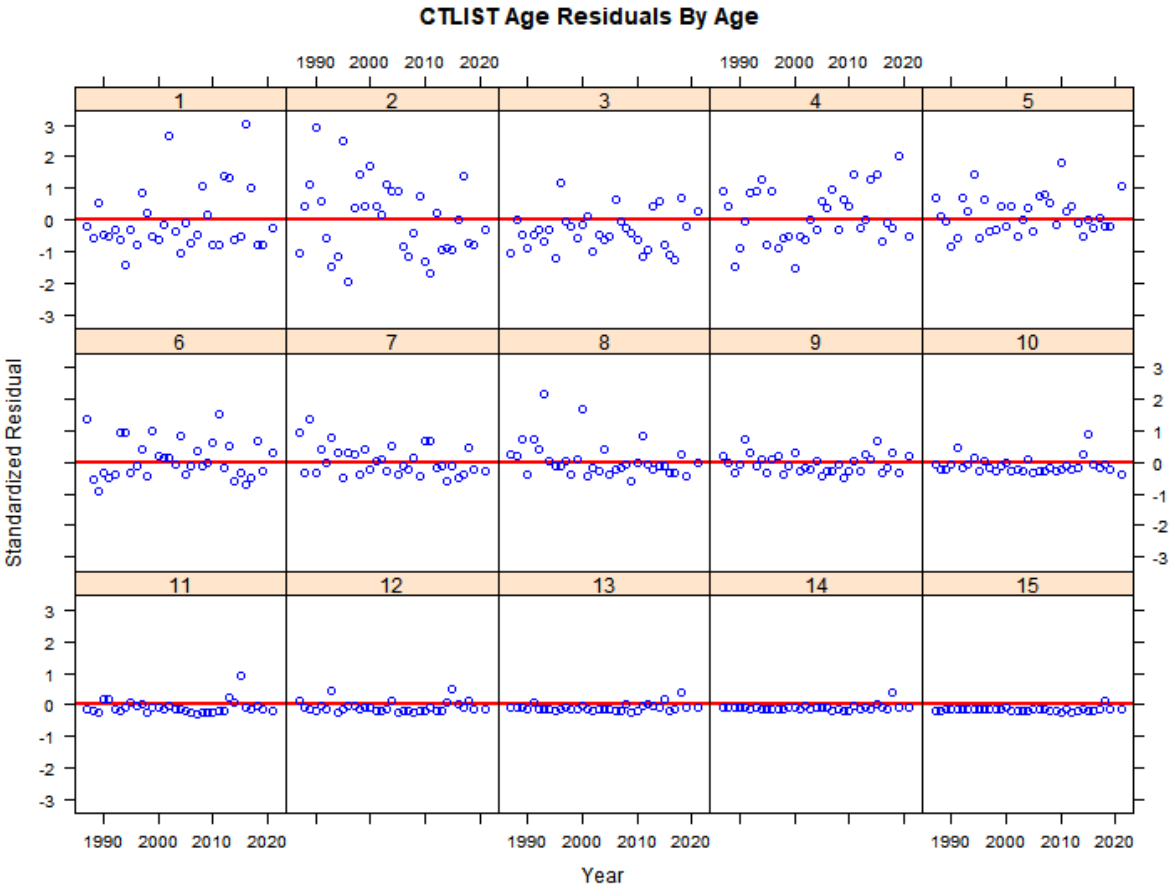
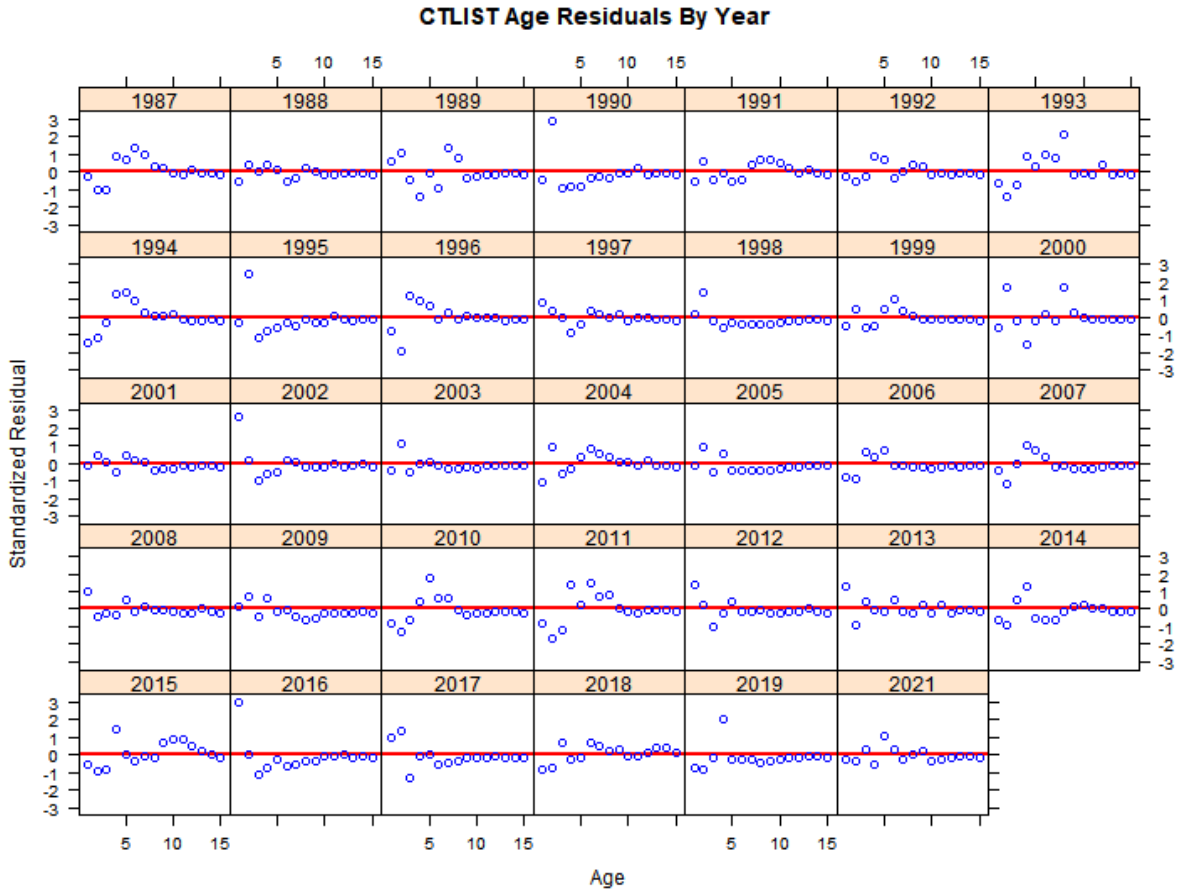
2011
2012
2013
2014
2015
2016
2017
2018
2019
2021
Proportion
Age


CTLIST Age Residuals By Age
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
1990 2000 2010 2020
Standardized Residual
Year


CTLIST Age Residuals By Year
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
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2008
2009
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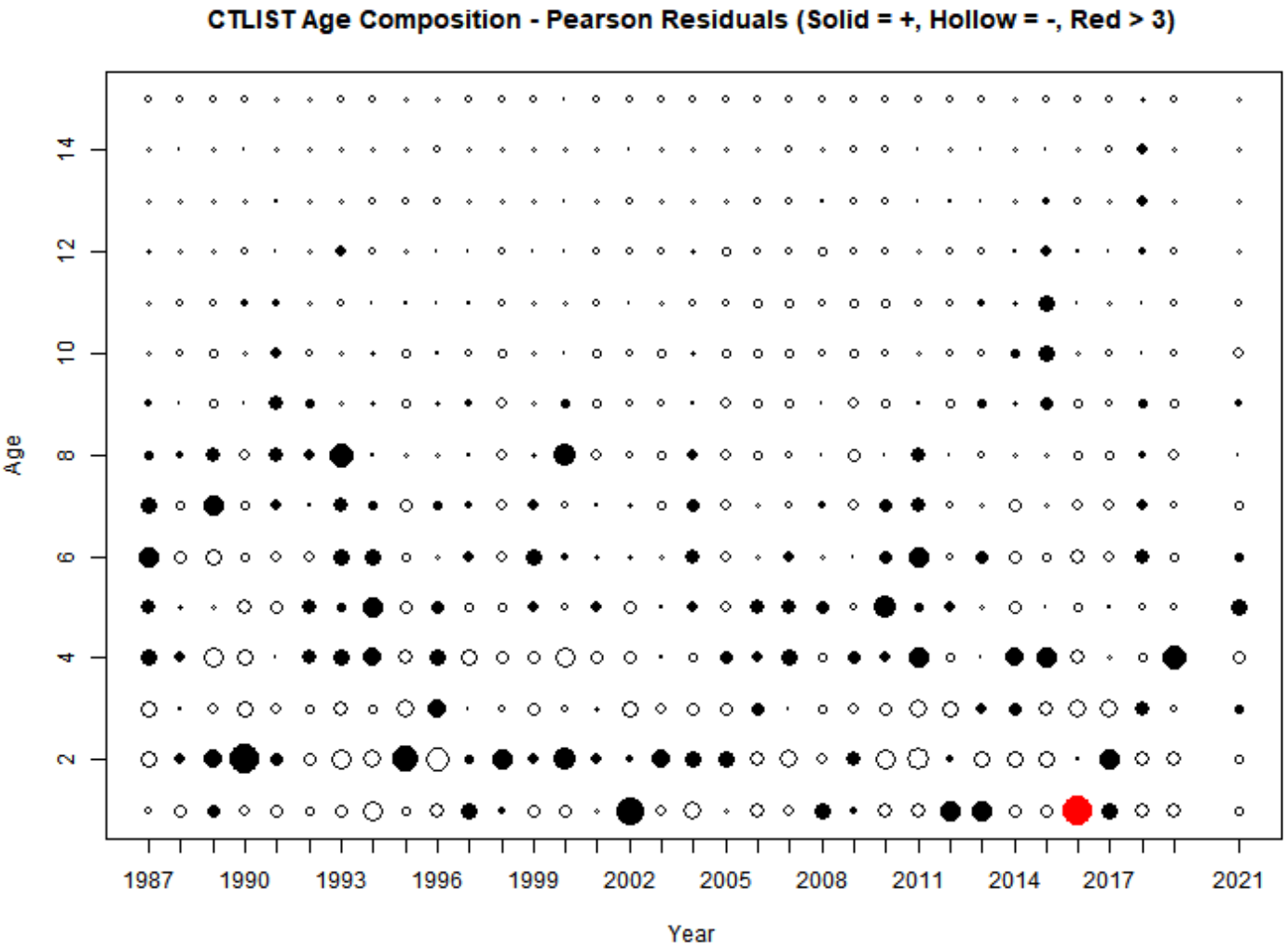
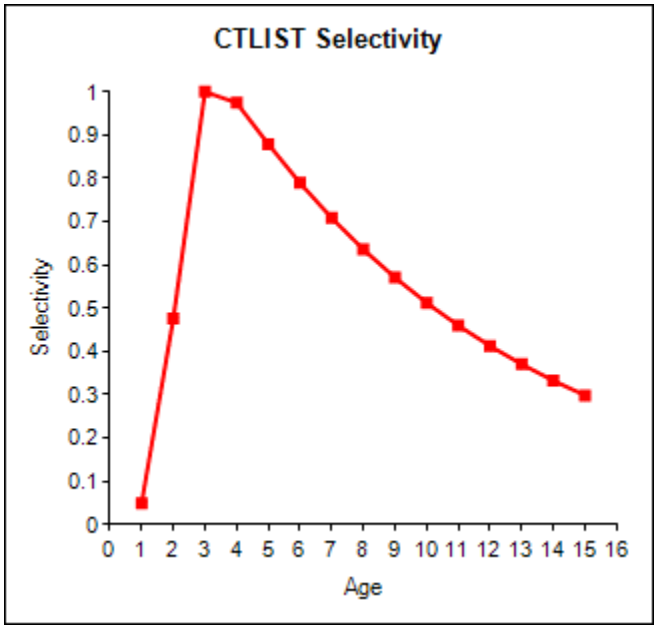
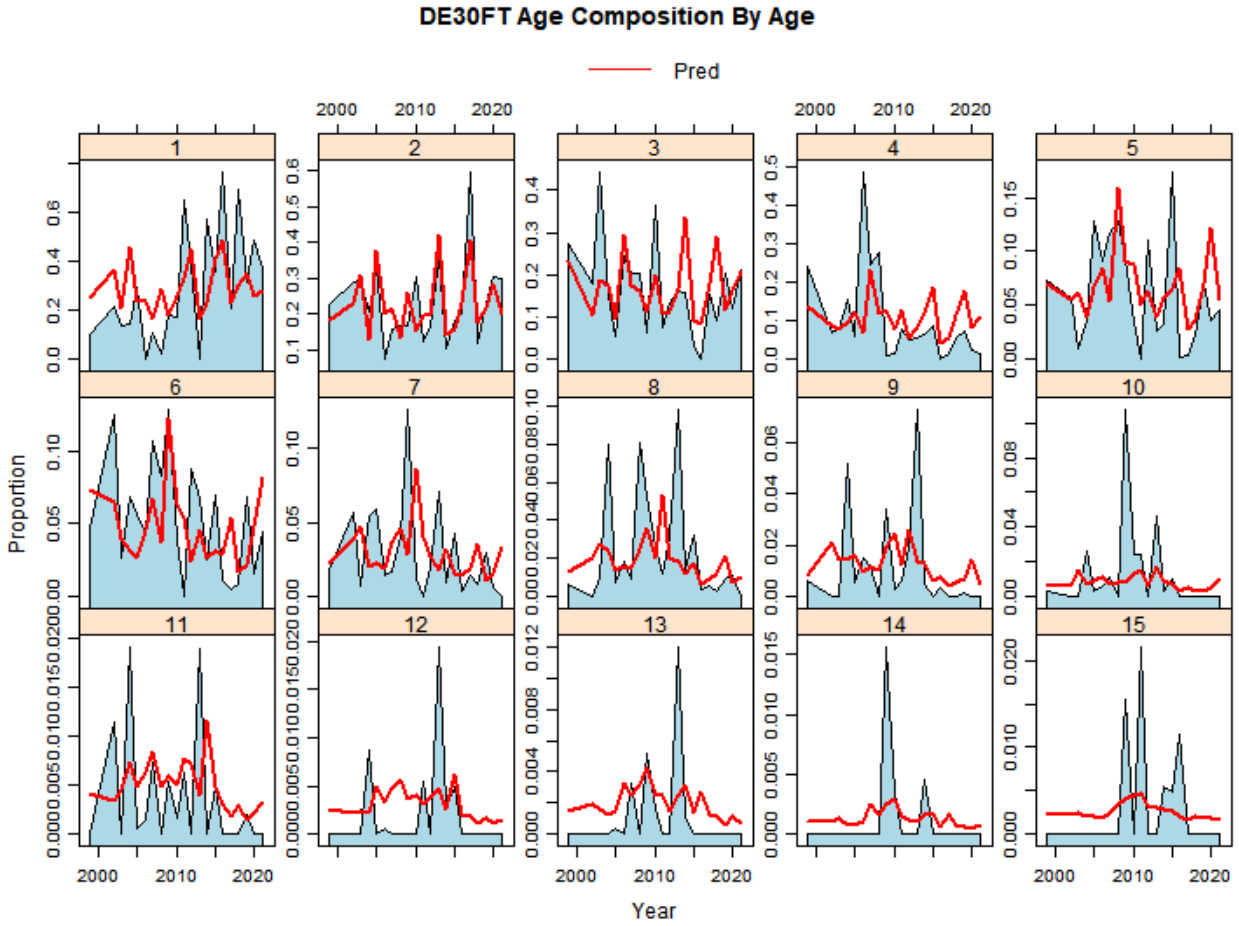
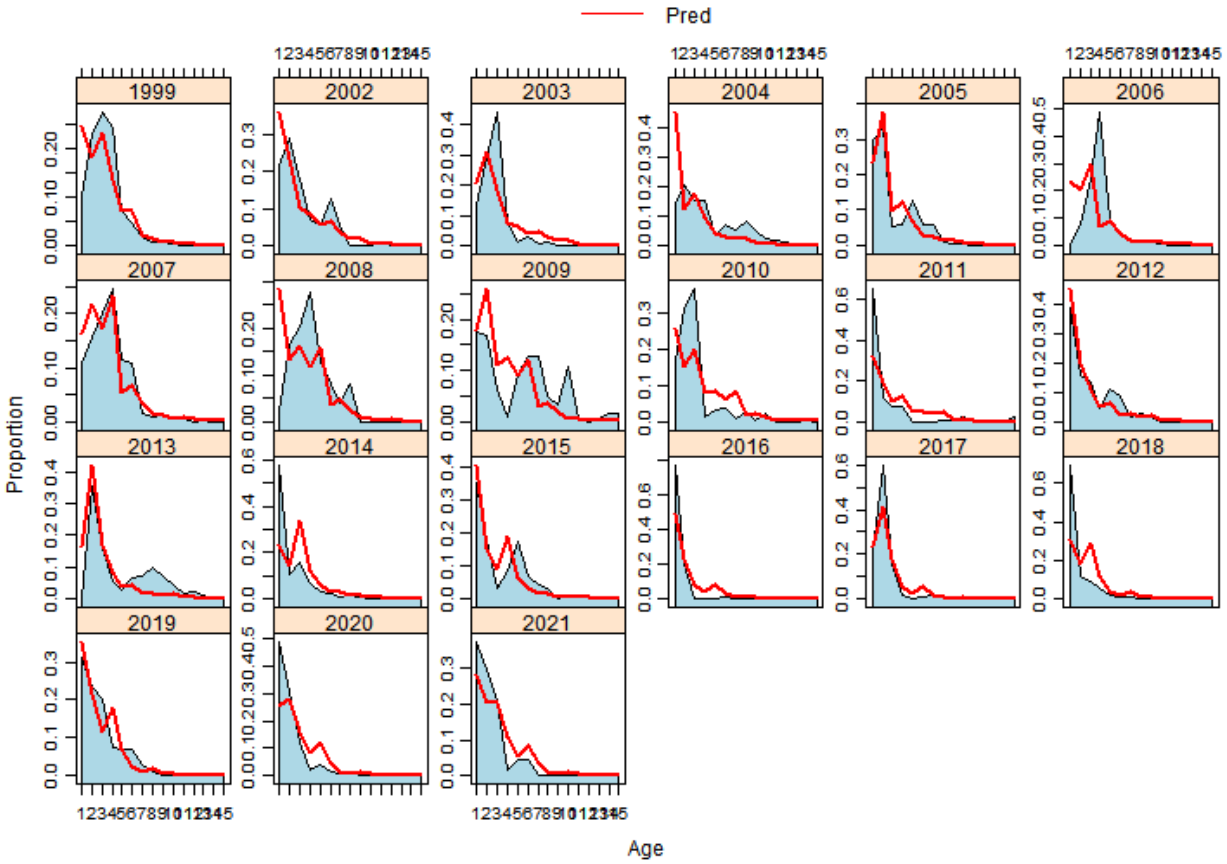
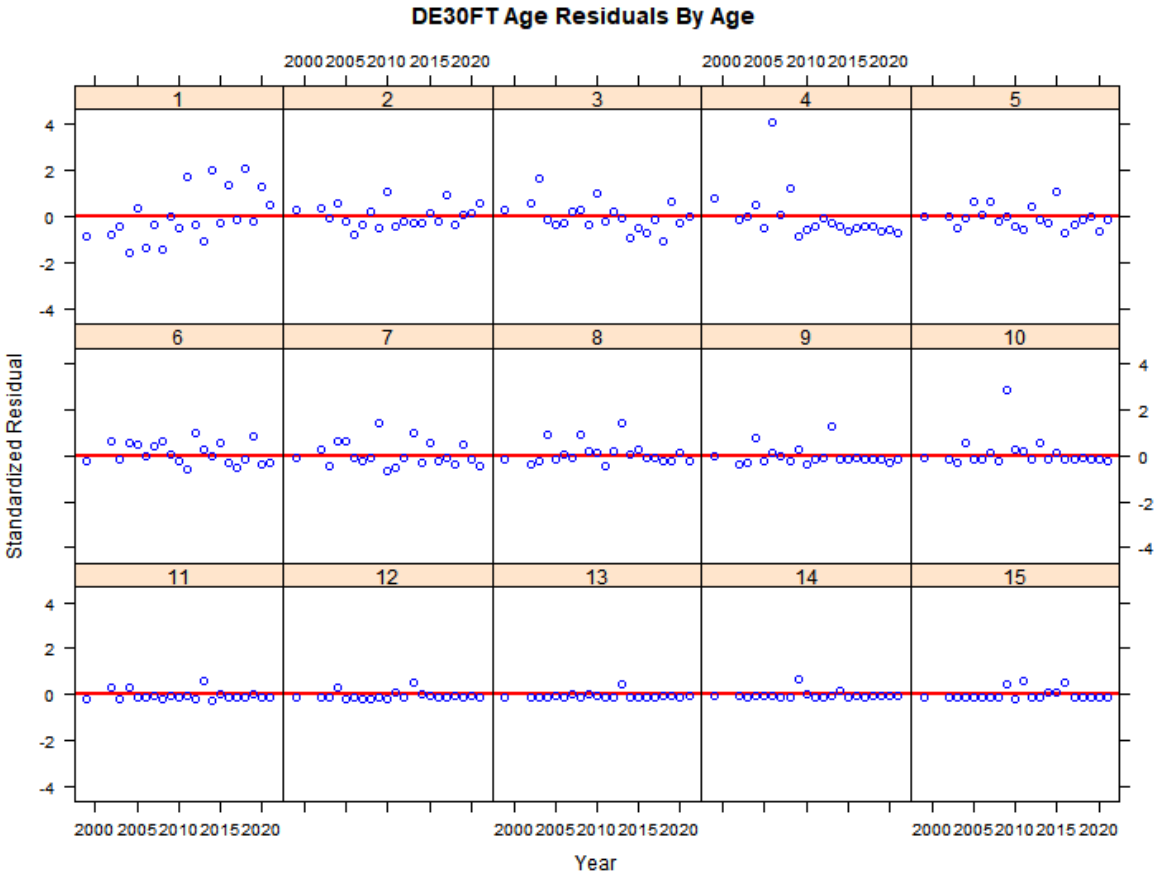
2011
2012
2013
2014
2015
2016
2017
2018
2019
2021
5 10 15
Standardized Residual
Age


CTLIST Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)
Age
2
4
6
8
10
12
14
1987
1990
1993
1996
1999
2002
2005
2008
2011
2014
2017
2021
Year


CTLIST Selectivity
Selectivity
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Age


DE30FT Age Composition By Age
Pred
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Proportion
Year


DE30FT Age Composition By Year
Pred
1999
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
Proportion
Age


DE30FT Age Residuals By Age
1
2
3
4
5
6
7
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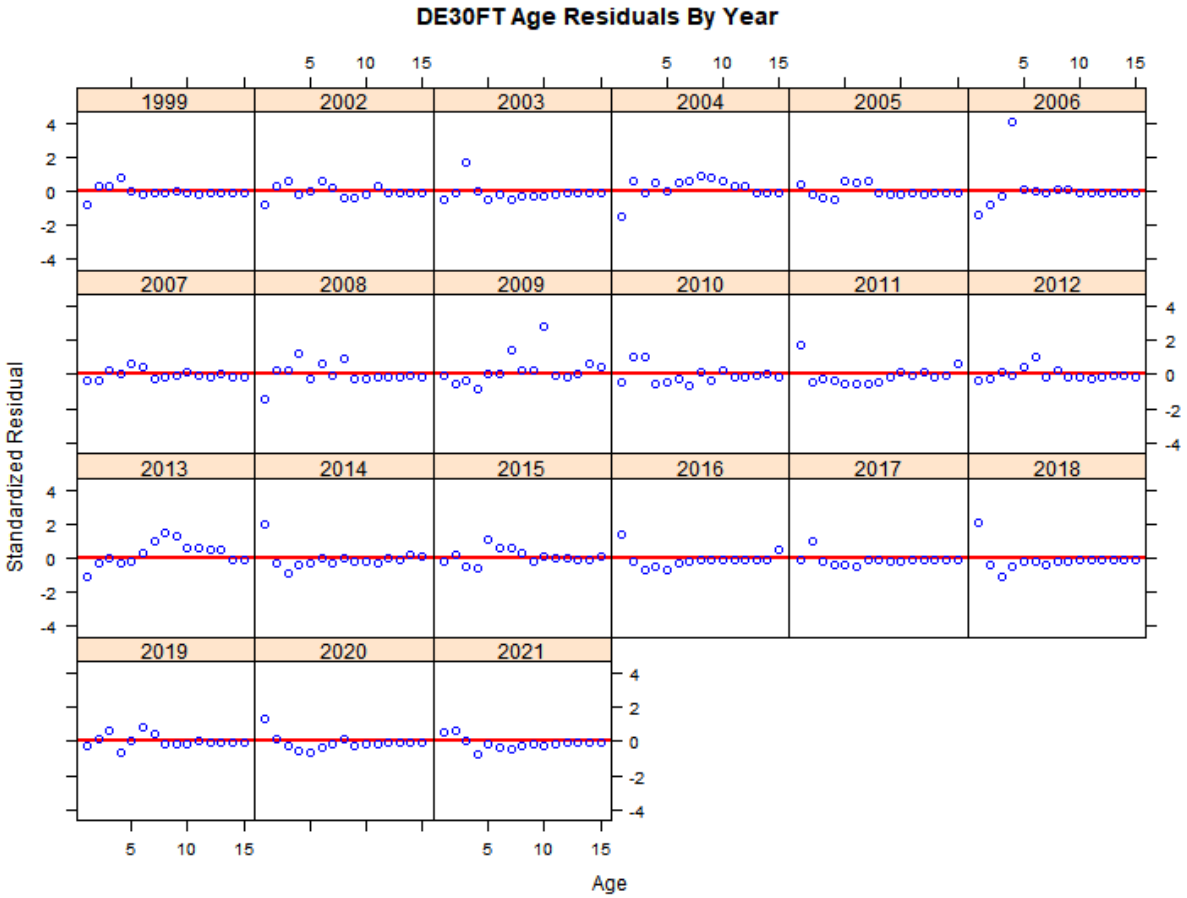
9
10
11
12
13
14
15
Standardized Residual
Year
2000 2005 2010 2015 2020


DE30FT Age Residuals By Year
1999
2002
2003
2004
2005
2006
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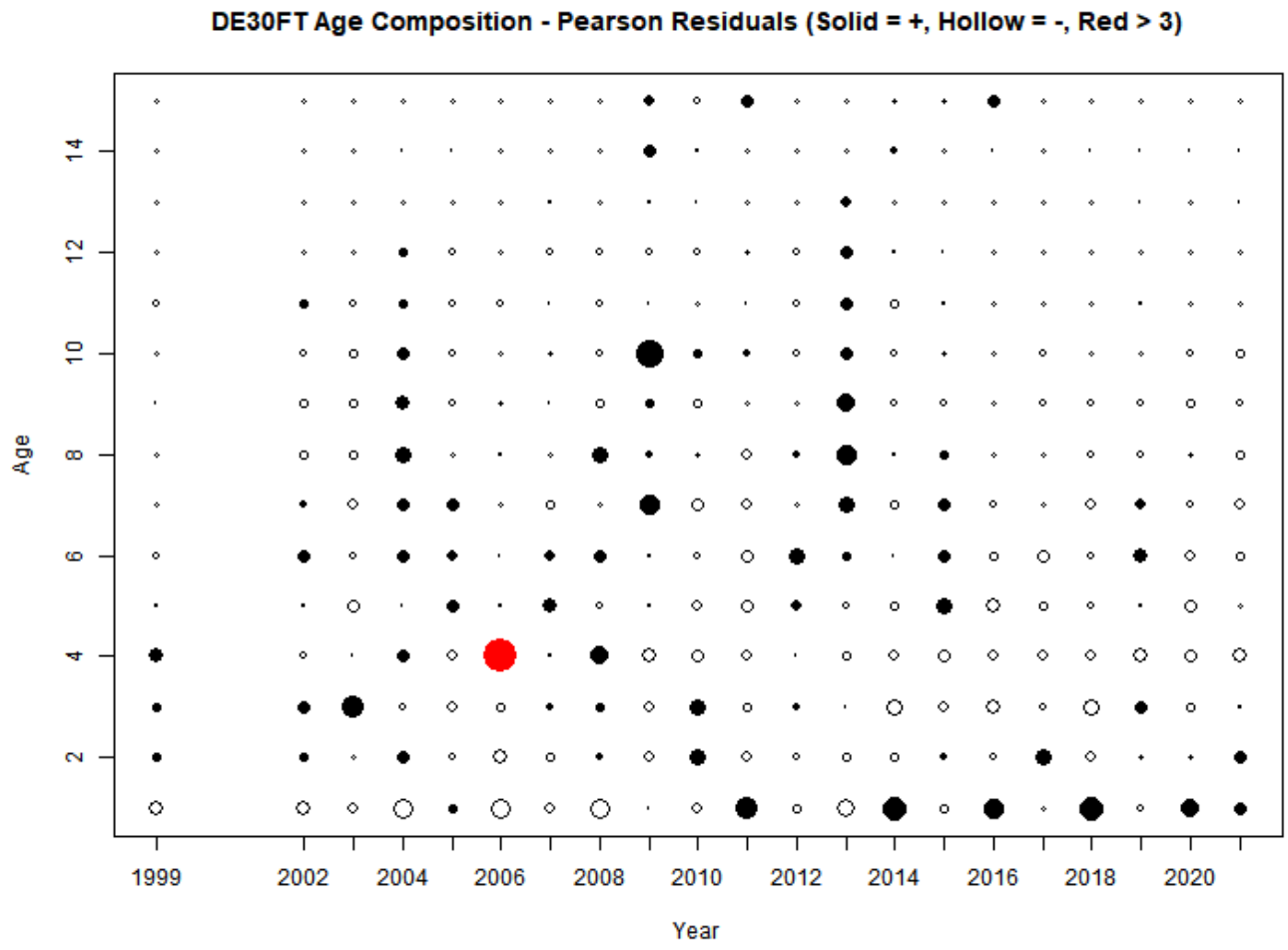
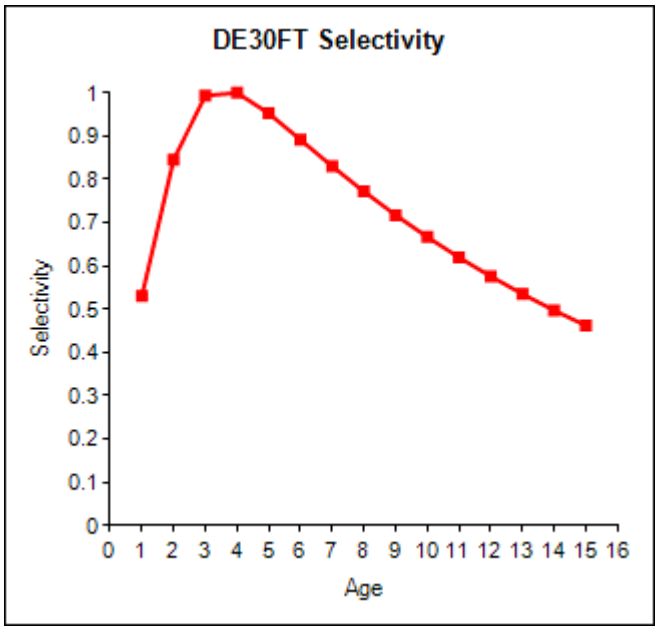
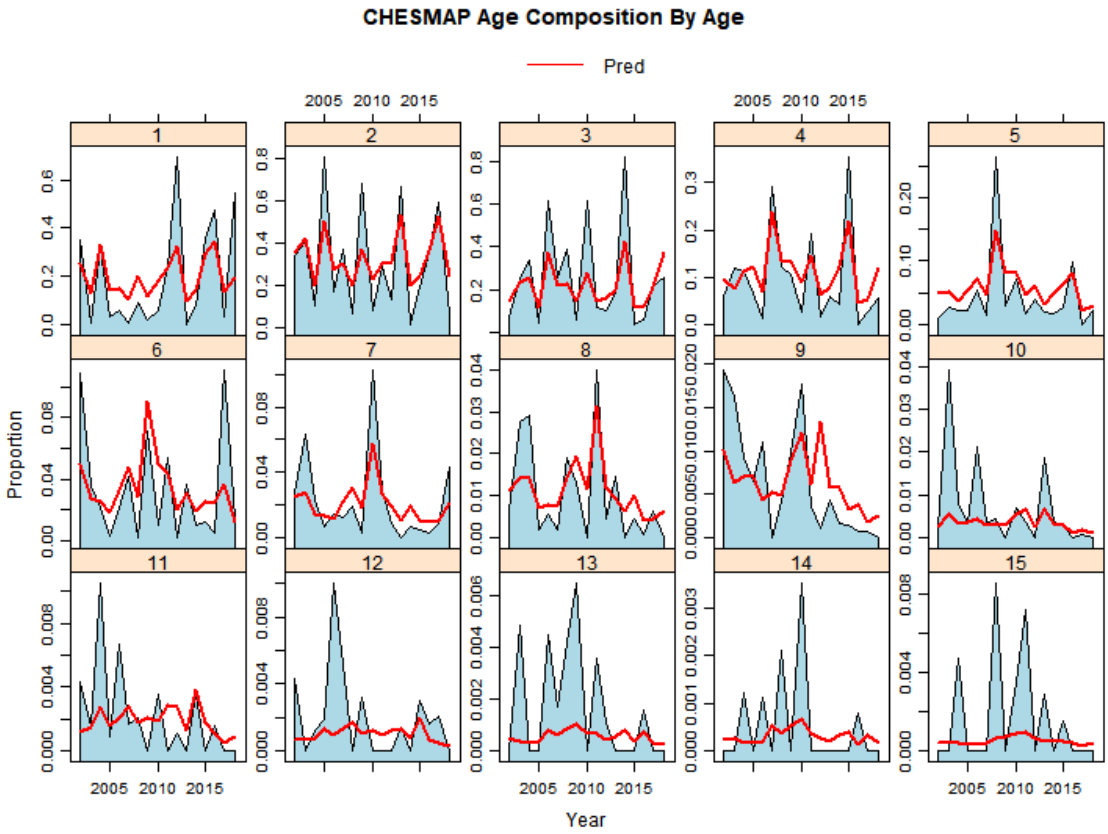
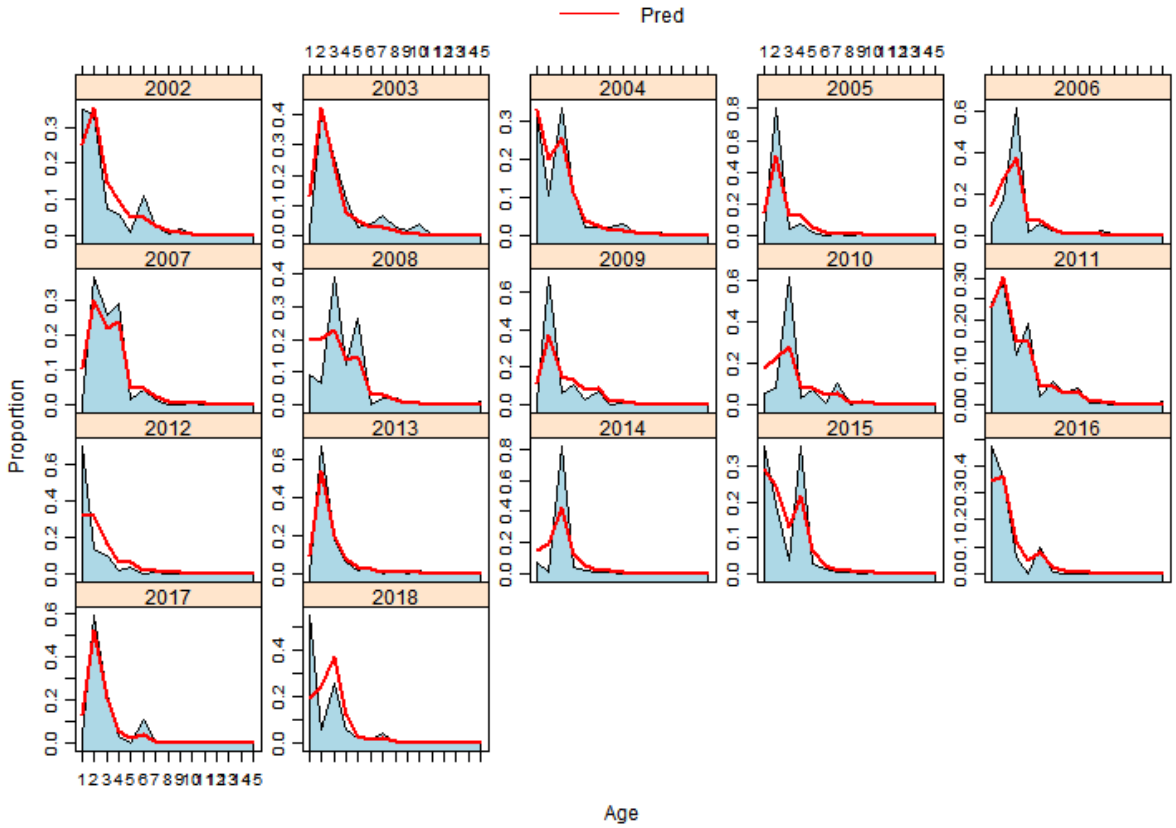
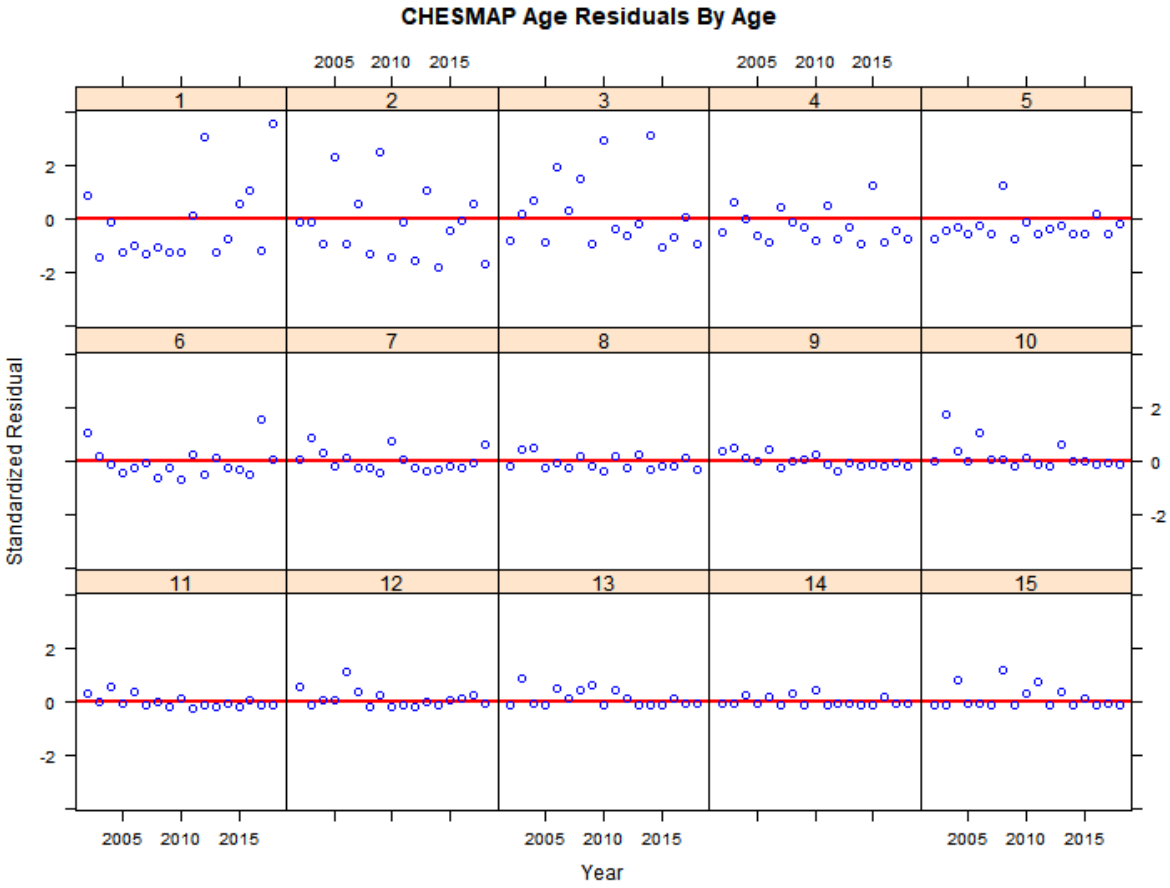
2013
2014
2015
2016
2017
2018
2019
2020
2021
Standardized Residual
Age
5 10 15

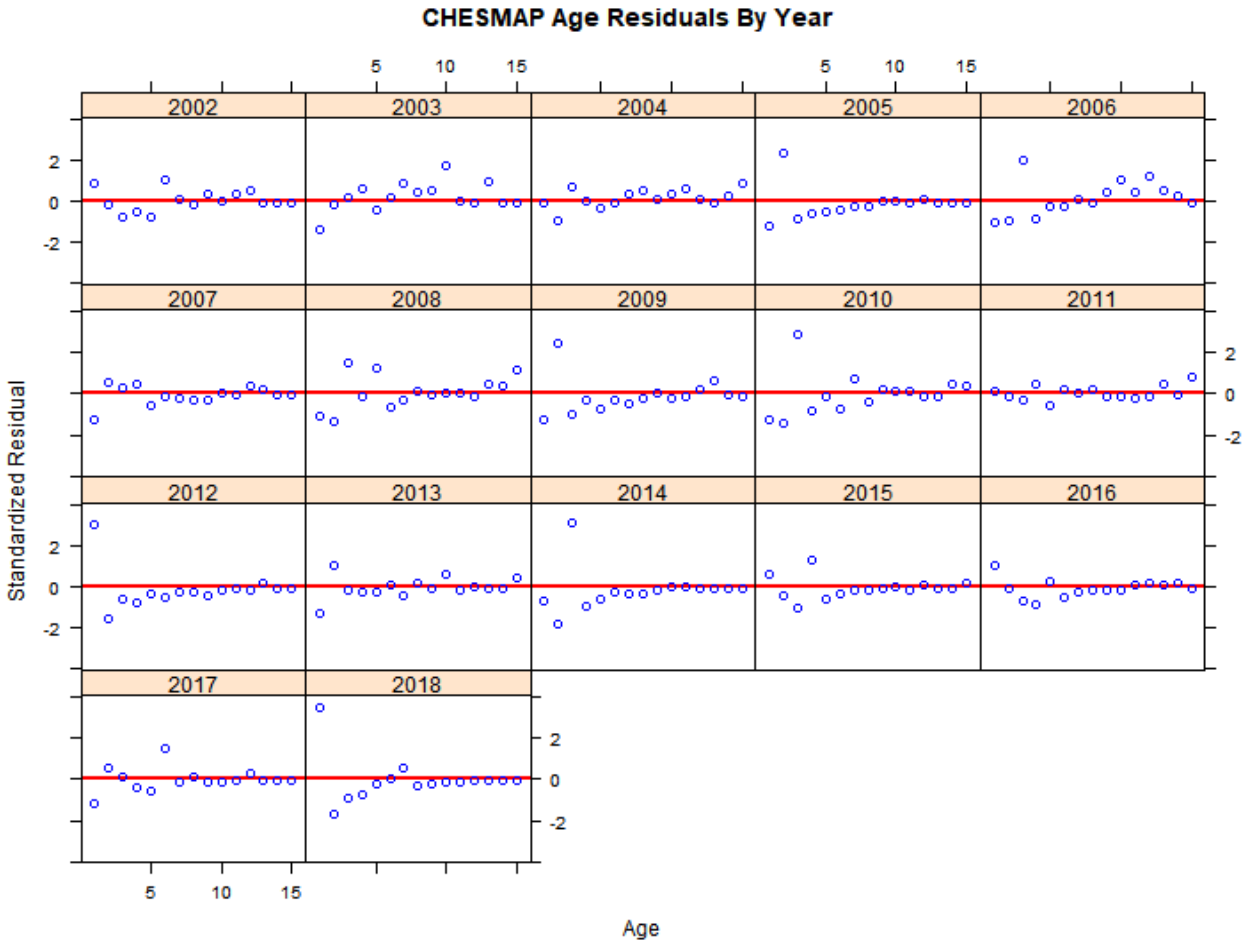

DE30FT Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)
Age
2
4
6
8
10
12
14
1999
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Year


DE30FT Selectivity
Selectivity
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Age


CHESMAP Age Composition By Age
Pred
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Proportion
Year


CHESMAP Age Composition By Year
Pred
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Proportion
Age


CHESMAP Age Residuals By Age
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
2005 2010 2015
Standardized Residual
Year


CHESMAP Age Residuals By Year
2002
2003
2004
2005
2006
2007
2008
2009
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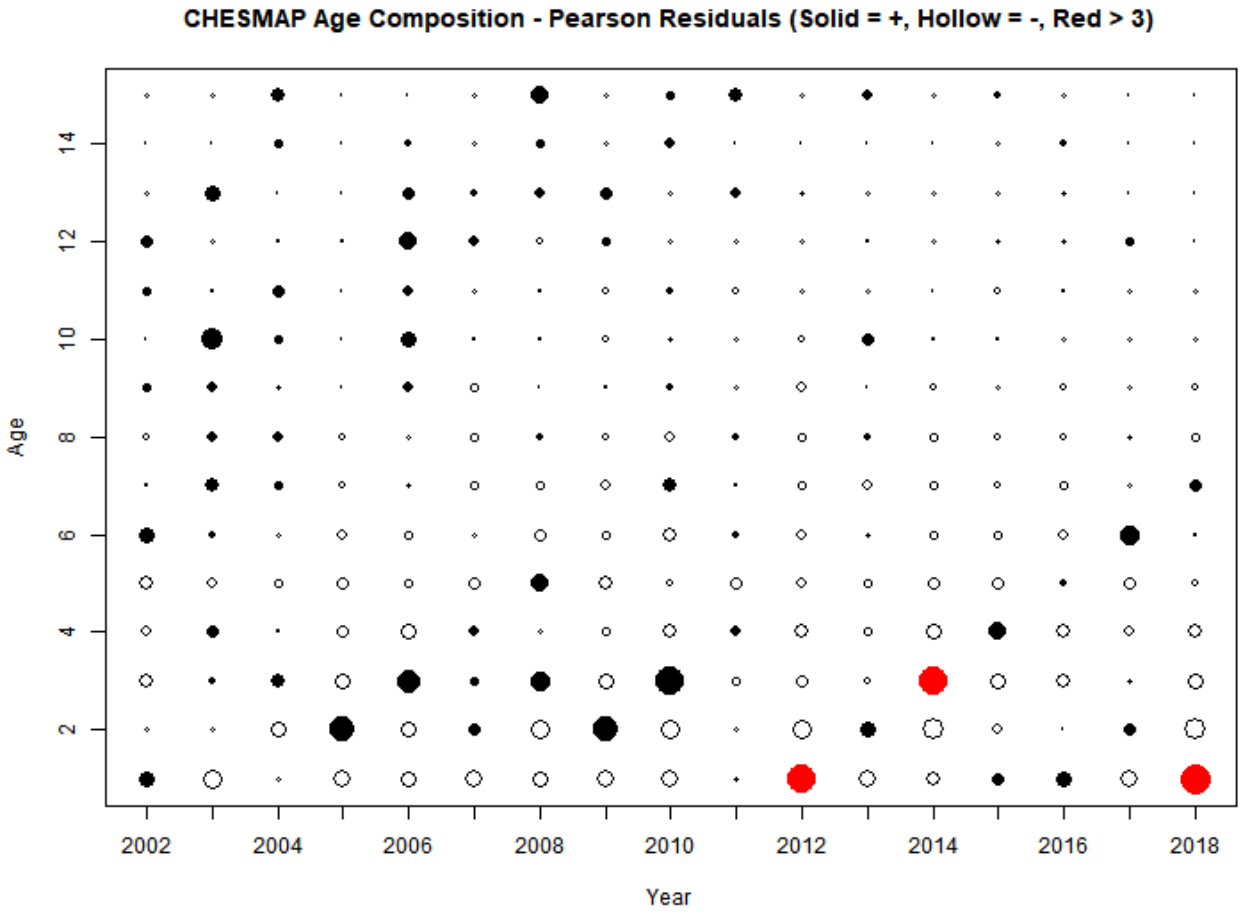
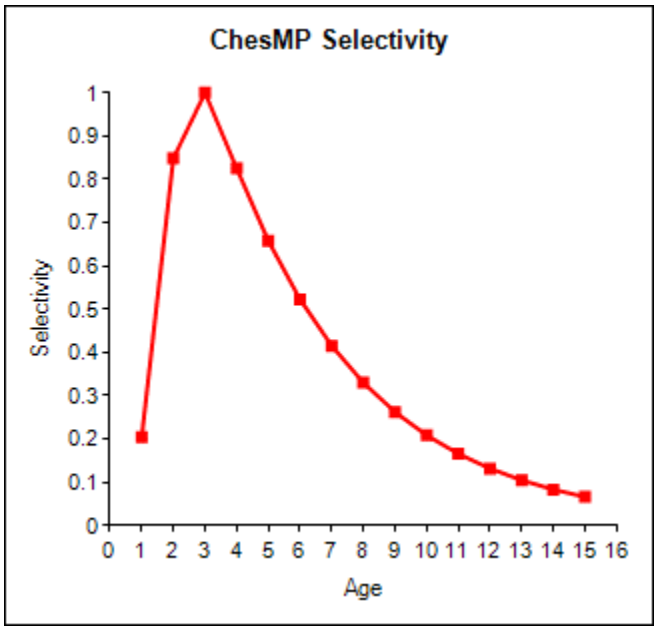
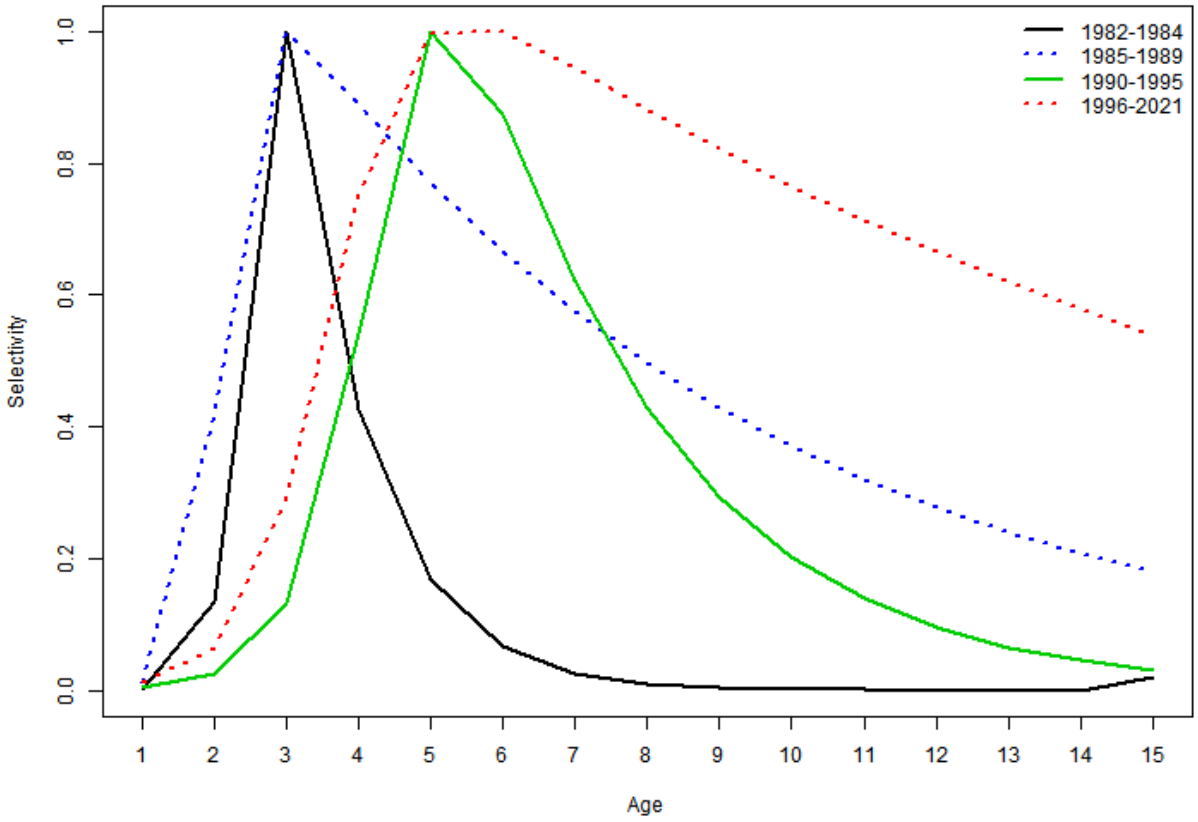
2013
2014
2015
2016
2017
2018
5 10 15
Standardized Residual
Age

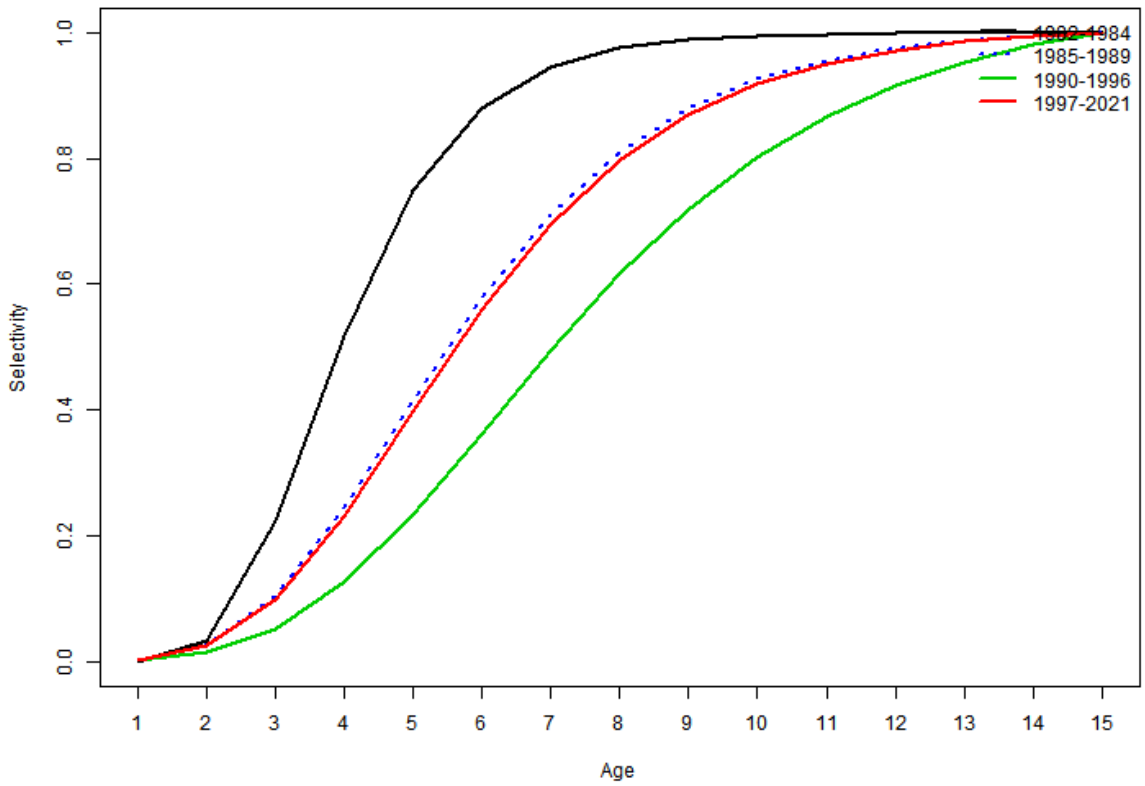

CHESMAP Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)
Age
2
4
6
8
10
12
14
2002
2004
2006
2008
2010
2012
2014
2016
2018
Year


ChesMP Selectivity
Selectivity
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Age

Bay

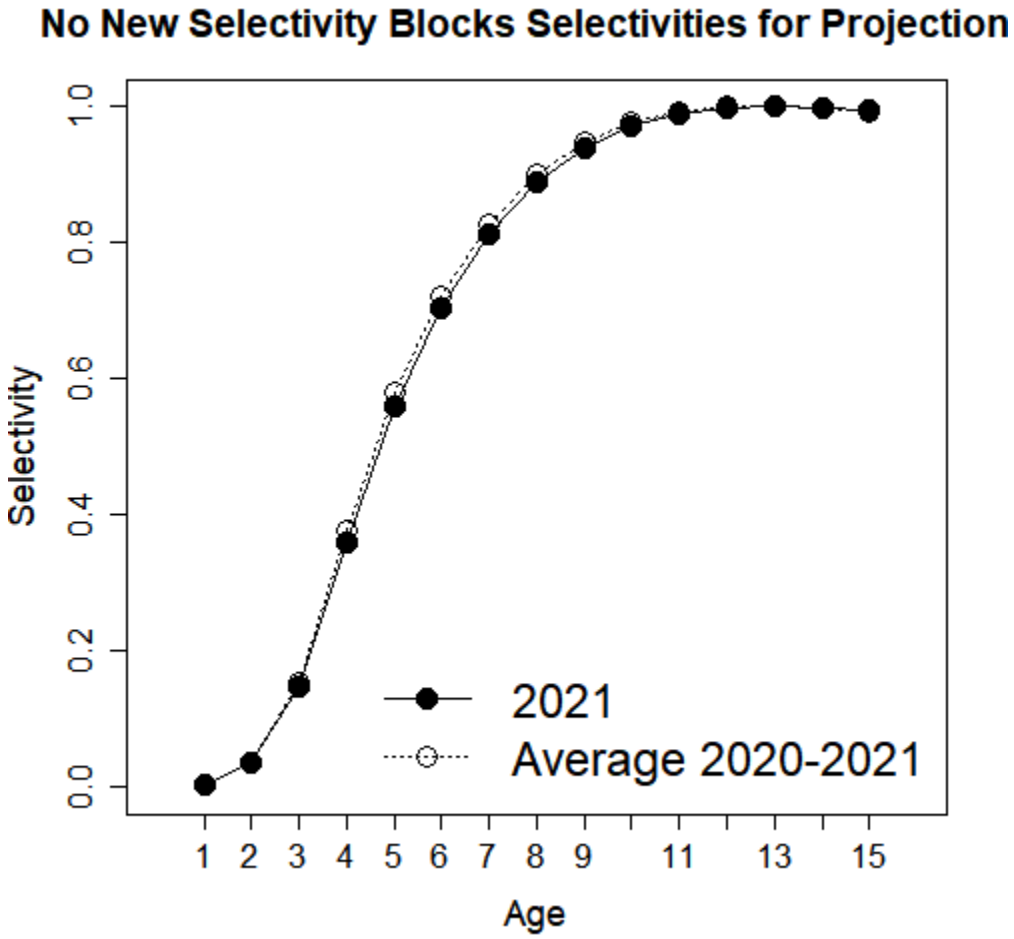

1982-1984
1985-1989
1990-1995
1996-2021
Selectivity
0.0
0.2
0.4
0.6
0.8
1.0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Age

Ocean


1982-1984
1985-1989
1990-1996
1997-2021
Selectivity
0.0
0.2
0.4
0.6
0.8
1.0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Age

	Likelihood Weight	RSS
Fleet 1 Total Catch:	2	0.222509
Fleet 2 Total Catch:	2	1.69769
Aggregate Abundance Indices		
NYYOY	1	28.2264
NJYOY	1	30.1896
MDYOY	1	10.0705
Compos	1	37.511
NYAge1	1	31.7116
MDAge1	1	24.2042
Age Comp Abundance Indices		
NYOHS	1	18.6369
NJTRAWL	1	20.626
MDSSN	1	30.6333
DESSN	1	21.6587
MRIP	1	35.7363
CTLIST	1	27.5067
DE30FT	1	17.2643
ChesMap	1	14.889
Total RSS		350.785
No. of Obs		517
Conc. Likel.		-100.264
Age Composition Data Likelihood		
Fleet 1 Age Comp:	1	4929.84
Fleet 2 Age Comp:	1	6138.57
NYOHS	1	728.002
NJTRAWL	1	310.785
MDSSN	1	1084.42
DESSN	1	984.378
MRIP	1	2625.57
CTLIST	1	819.882
DE30FT	1	240.59
ChesMap	1	401.496
Recr Devs :	1	41.7836
Total Likelihood :		18136
AIC :		36644

Index	n	RMSE	CV Weight	Effective Sample Size
NYYOY	36	0.993619	2.95	
NJYOY	38	1.00437	1.75	
MDYOY	12	0.99145	2.09	
compos	40	0.992974	0.99	
NYAge1	37	0.99486	1.21	
MDAge1	52	0.992657	3.22	
NYOHS	20	0.990824	2.60	21.88
NJTRAWL	29	1.00158	2.95	5.70
MDSSN	37	0.990333	2.50	14.33
DESSN	24	0.995435	1.16	17.81
MRIP	40	1.00725	2.31	30.68
CTLIST	34	1.00434	3.00	12.99
DE30FT	21	1.00074	0.85	6.09
ChesMP	17	1.00582	2.47	15.26

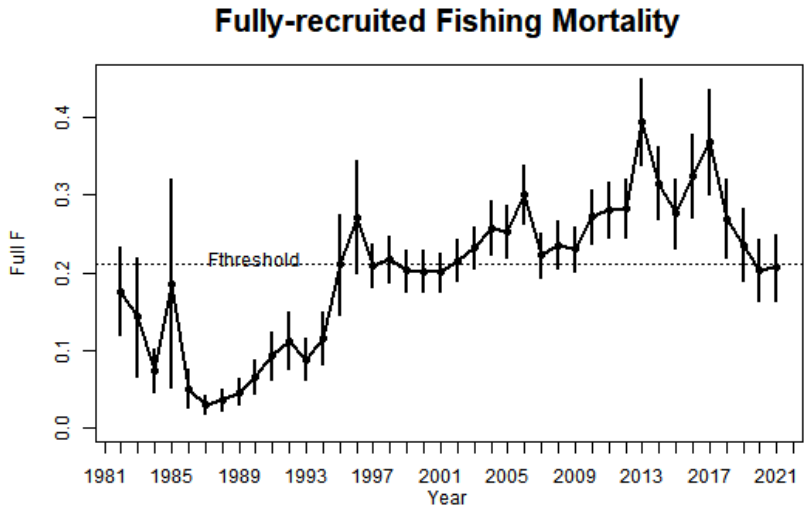

No New Selectivity Blocks Selectivities for Projection
Selectivity
0.0
0.2
0.4
0.6
0.8
1.0
1 2 3 4 5 6 7 8 9 11 13 15
Age
2021
Average 2020-2021

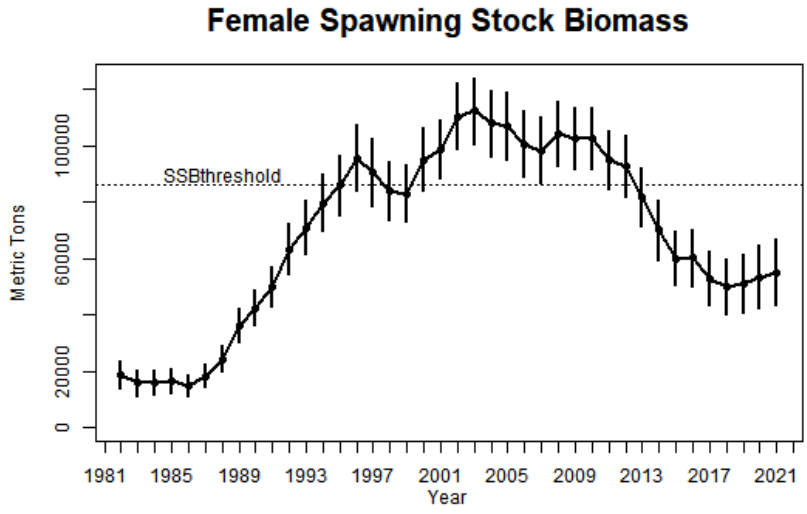
SSBthreshold=86016.6’Fthreshold=0.2120

SSBtarget=107520.7;Ftarget=0.1727

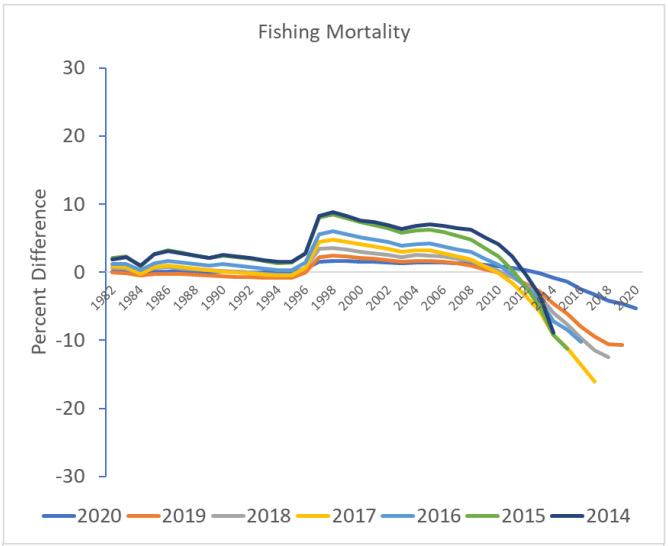
Fcurrent=0.2069

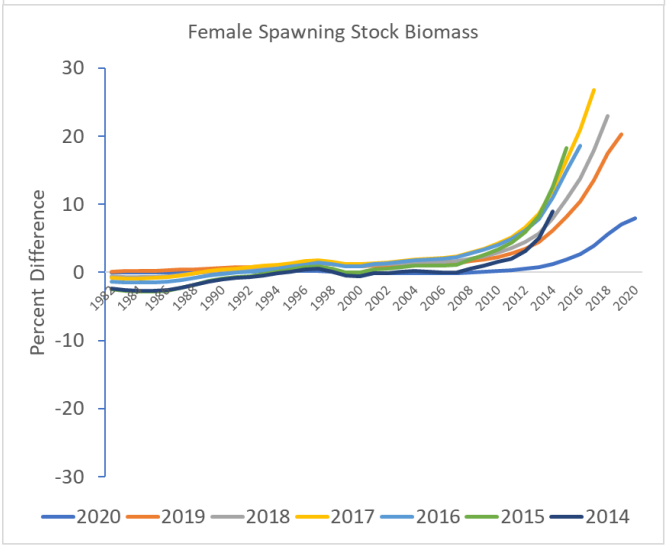
Estimates with 95% Confidence Intervals

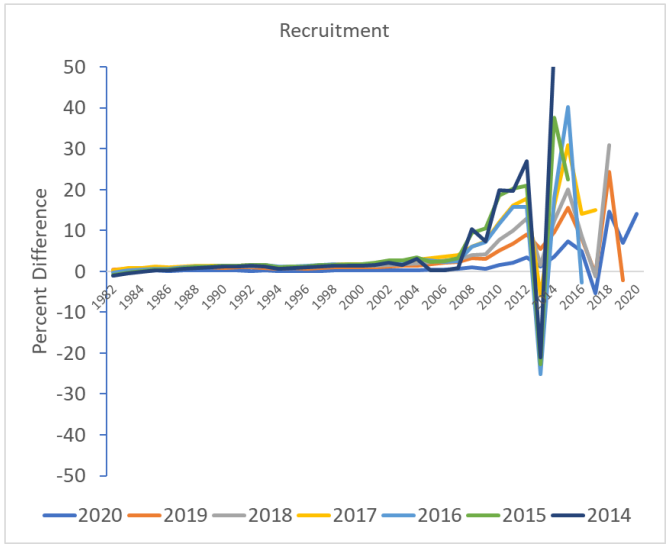




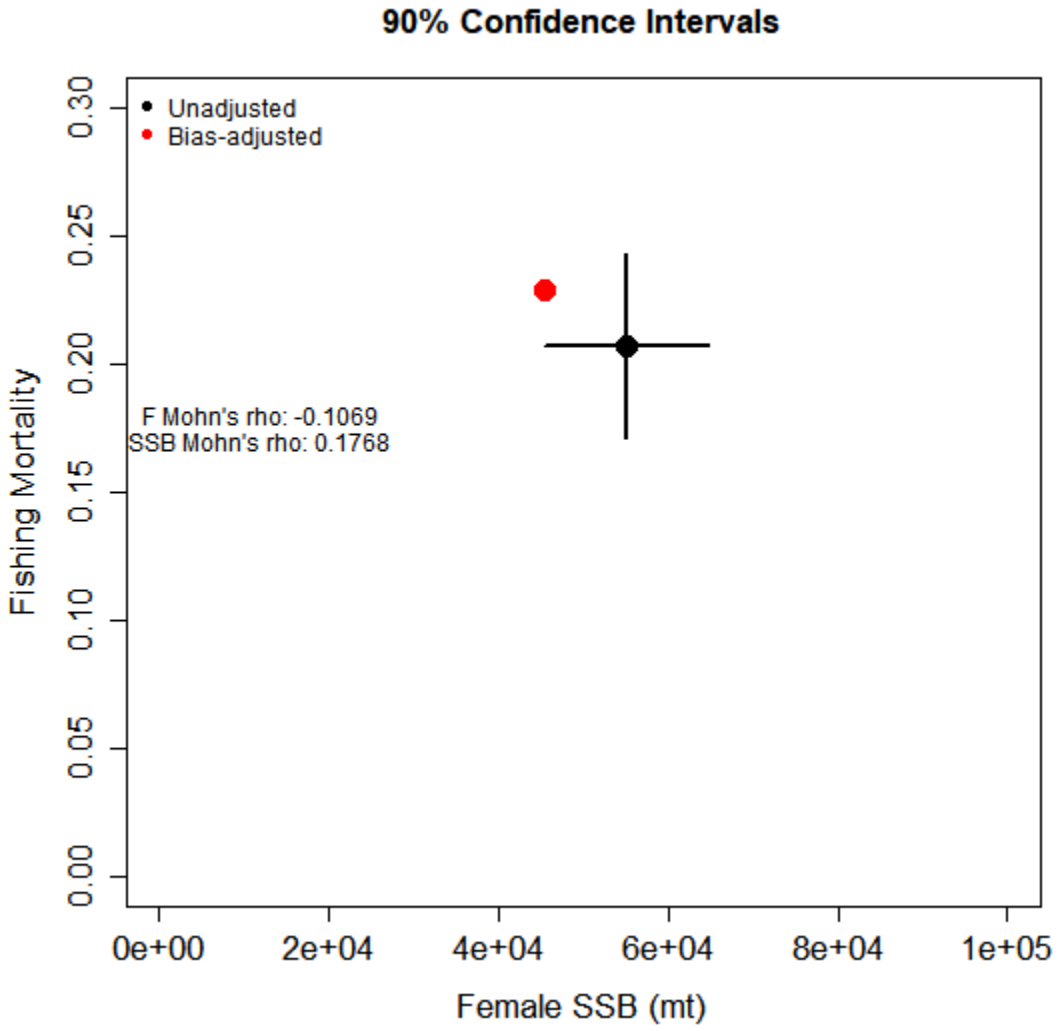
Number of peels = 7 (NMFS standard)



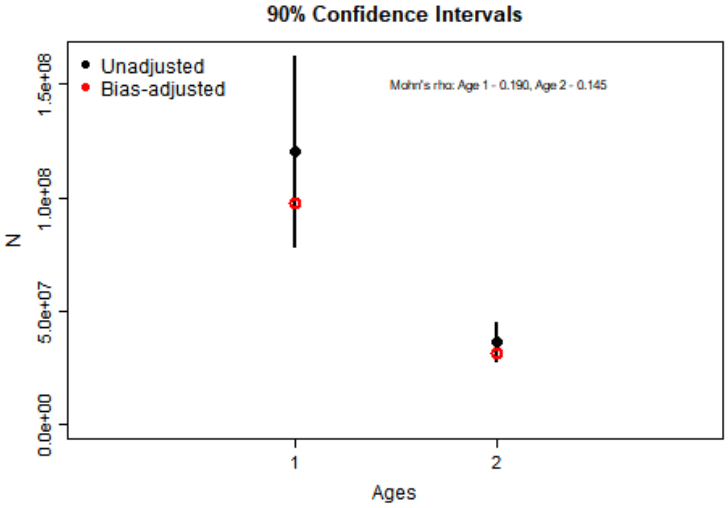


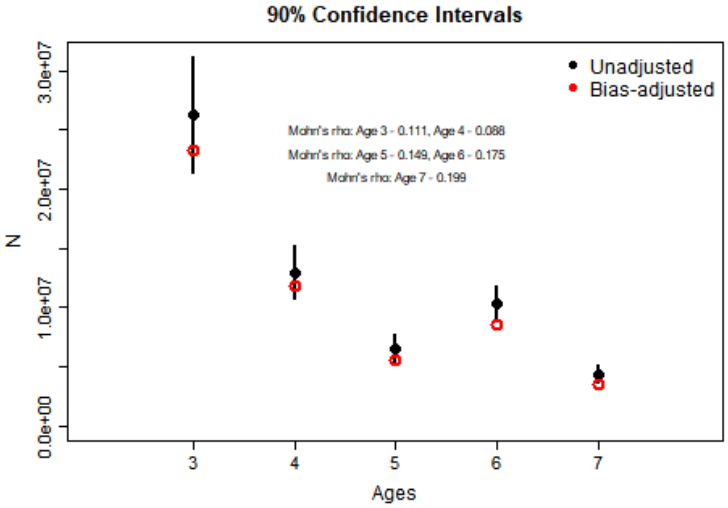


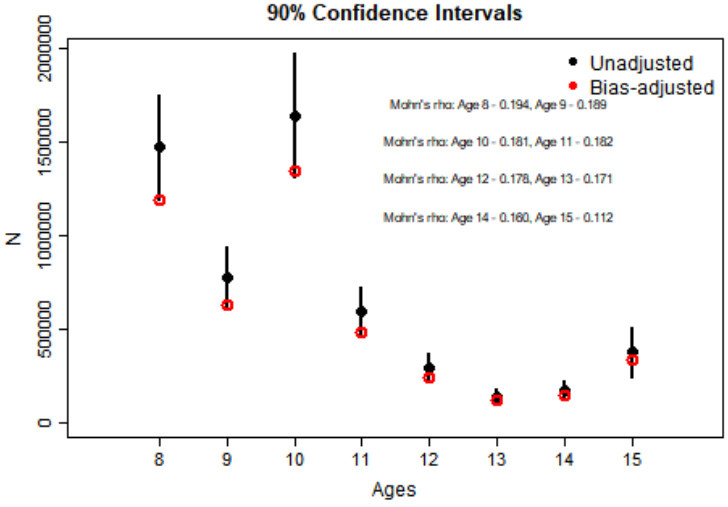
Retrospective Bias corrected values just barely within 90% confidence intervals of original values; no bias-correction required.



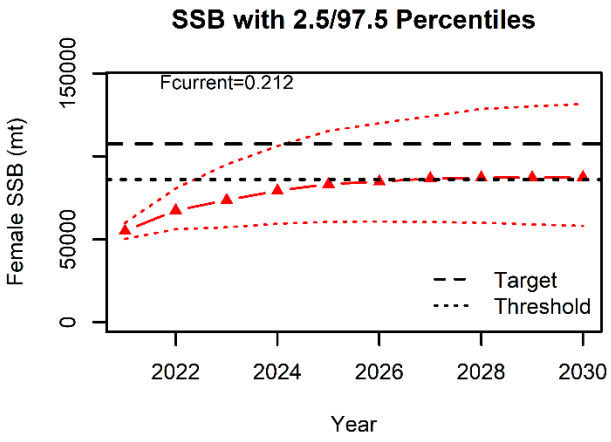
Only 2 retrospective values outside 90% Cis of original values

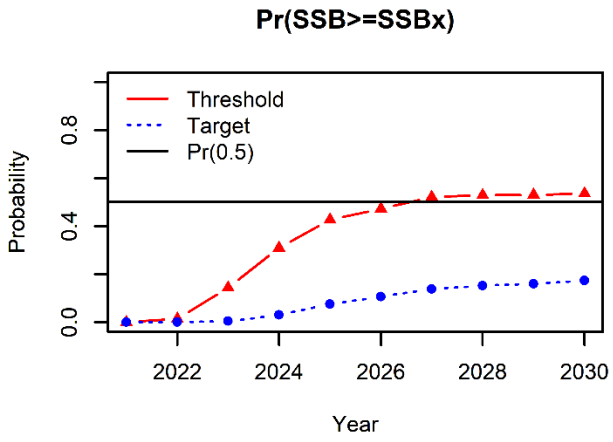


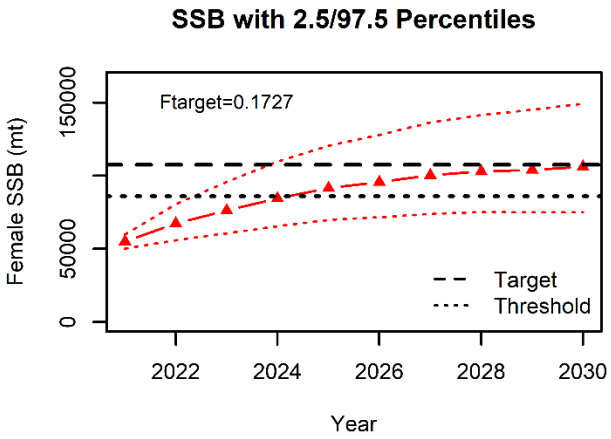


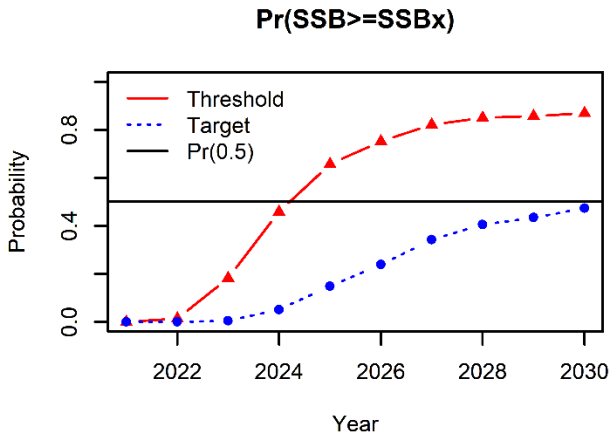


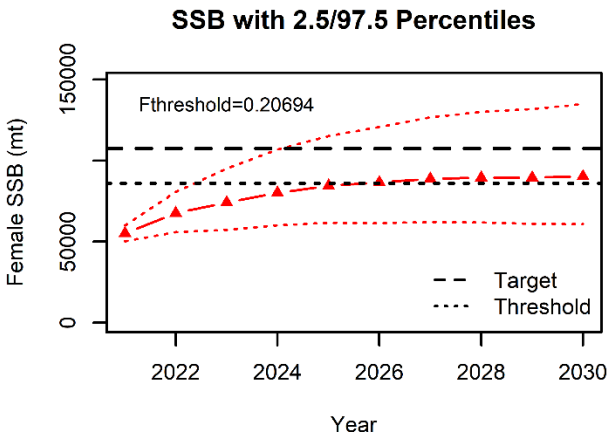
SSBtarget not reached by 2029 under current fishing mortality but it is reached by 2030 under Ftarget

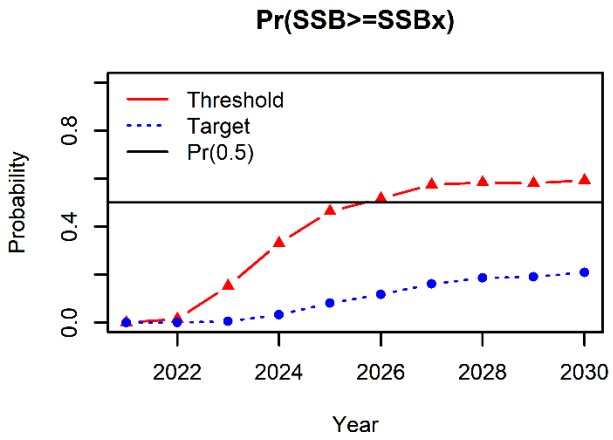












Because SSBtarget will not be reached by 2029 under current F, how much should removals be reduced.

Not Bias-Corrected

Catch = 4700757; F_{2029}=0.162

%Reduction from current:

(4,700,757-5,144534)/5,144,534*100 = -8.6%

Atlantic States Marine Fisheries Commission

1050 N. Highland Street • Suite 200A-N • Arlington, VA 22201
703.842.0740 • 703.842.0741 (fax) • www.asmfc.org

MEMORANDUM

October 12, 2022

To: **Atlantic Striped Bass Management Board**

From: **Tina Berger, Director of Communications**

RE: **Advisory Panel Nomination**

Please find attached a nomination to the Atlantic Striped Bass Advisory Panel – Craig Poosikian, a commercial rod and reel fishermen from Massachusetts. Please review this nomination for action at the next Board meeting.

If you have any questions, please feel free to contact me at (703) 842-0749 or tberger@asmfc.org.

Enc.

cc: Emilie Franke

Atlantic Striped Bass Advisory Panel

Maine
David Pecci (rec)
144 Whiskeag Road
Bath, ME 04530

Phone (o): (207) 442-8581
Phone (c): (207) 841-1444
FAX: (207) 442-8581
dave@obsessioncharters.com
Appt. Confirmed 5/23/02
Appt Reconfirmed 5/10

Bob Humphrey (comm. rod and reel/for-hire)
727 Poland Range Road
Pownal, ME 04069
Phone (day): 207.688.4966
Phone (eve): 207.688.4854
bob@bobhumphrey.com
Appt. Confirmed 2/18/20

New Hampshire
Peter Whelan (rec)
100 Gates Street
Portsmouth, NH 03801
Phone (o): (603) 205-5318
Phone (h): (603) 427-0401
pawhelan@comcast.net
Appt. Confirmed 2/24/03
Appt Reconfirmed 5/10

Massachusetts
Douglas M. Amorello (comm. rod & reel)
68 Standish Street
Pembroke, MA 02359
Cell: (774)766-8781
sashamysportfishing@gmail.com
Appt. Confirmed 3/23/11
Appt. Reconfirmed 8/18

Patrick Paquette (rec/for-hire/comm)
61 Maple Street
Hyannis, MA 02601
Phone: (781)771.8374
Email: basicpatrick@aol.com
Appt. Confirmed 8/16

Rhode Island
Andrew J. Dangelo (for-hire)
1035 Liberty Lane
West Kingston, RI 02892
Phone: 401.788.6012
Maridee2@gmail.com
Appt. Confirmed 2/3/21

Michael Plaia (comm/rec/for-hire)
119 Currituck Road
Newtown, CT 06470
Phone: 203.512.4280
Makomike3333@yahoo.com
Appt. Confirmed 2/3/21

Craig Poosikian (comm. rod & reel)
19 Giddah Hill Road
PO Box 1878
Orleans, MA 02653
Phone: 508.240.2345
bhge@gmail.com

Connecticut
Kyle Douton (rec/tackle shop owner)
5 Rockwell Street
Niantic, CT 06357
Phone (day): (860)739-7419
Phone (eve): (860)739-8899
FAX: (860)739-9208
kyle@jbtackle.com
Appt. Confirmed 5/13/14

Vacancy (rec)

New York
Bob Danielson (rec)
86 Balin Avenue
South Setauket, NY 11720
Phone: 631.974.8774
Bdan93@optonline.net
Appt. Confirmed 10/22/20

Vacancy (comm)

New Jersey
C. Louis Bassano, Chair
1725 West Central Avenue
Ortley Beach, New Jersey 08751

Atlantic Striped Bass Advisory Panel

Phone (c): (908) 241-4852
FAX: (908) 241-6628
lbassano@comcast.net
Appt. Confirmed 10/15/01
Appt. Reconfirmed 2/9/06; 5/17/10; 4/14/14

Eleanor A. Bochenek (retired fisheries scientists with experience in Mid-Atlantic rec. and comm fisheries)
117 Alexander Avenue
Villas, NJ 08251
Phone: (609) 425.0686
eboch@hsrl.rutgers.edu
Appt. Confirmed 11/5/21

Pennsylvania
Vacancy (rec)

Delaware
Leonard Voss, Jr. (com)
2854 Big Oak Road
Smyrna, DE 19977
Phone: (302) 653-7999
Appt. Confirmed 4/21/94
Appt. Reconfirmed 7/27/99; 7/03 and 7/07

Steven Smith (rec)
59 Burnham Lane
Dover, DE 19901
Phone (day): (302)744-9140
Phone (eve): (302)674-5186
smithbait@verizon.net
Appt. Confirmed 10/23/18

Maryland
Chris Dollar (outdoor columnist and fishing guide)
PO Box 367
Queenstown, MD 21658
Phone: 410.991.8486
cdollarchesapeake@gmail.com
Appt. Confirmed 8/3/21

Charles E. Green Jr. (for –hire)
7327 Woodshire Avenue
Chesapeake Beach, MD 20732
Phone: 301.233.0377
greeneddie@verizon.net
Appt. Confirmed 8/3/21

Virginia
Vice-Chair - Kelly Place (comm; reappted chair 10/2010)
213 Waller Mill Road
Williamsburg, VA 23185
Phone (h): (757) 220-8801
Phone (c): (757) 897-1009
FAX: (757) 259-9669
kelltron@aol.com
Appt. Confirmed 5/23/02
Appt Reconfirmed 5/06 and 5/10

William Edward Hall Jr. (rec)
PO Box 235
26367 Shoremain Drive
Bloxom, VA 23308
Phone (day): (757)854-1519
Phone (eve): (757)894-0416
FAX: (757)854-0698
esangler@verizon.net
Appt. Confirmed 5/13/14

North Carolina
Jon Worthington (rec)
405 Japonica Drive
Camden, NC 27921
Phone: (252) 562-2914
ncpierrat@gmail.com
Appt Confirmed 5/5/21

Jamie Lane (estuarine and ocean gillnetter)
602 South Main Street
Robersonville, NC 27871
Phone: (252) 312-6832
Jlwinsl3@ncsu.edu
Appt Confirmed 5/4/22

District of Columbia
Joe Fletcher (rec)
1445 Pathfinder Lane
McLean, VA 22101
Phone: (703) 356-9106
Email: jmfletcher@verizon.net
Appt. Confirmed 10/30/95
Appt. Reconfirmed 9/15/99; 9/03 and 9/07

Atlantic Striped Bass Advisory Panel

Potomac Fisheries River Comm.
Dennis Fleming (fishing guide; seafood processor/dealer)
P.O. Box 283
Newburg, MD 20664
Phone: 240.538.1260
captaindennisf@gmail.com
Appt. Confirmed 2/3/21

ATLANTIC STATES MARINE FISHERIES COMMISSION

Advisory Panel Nomination Form

This form is designed to help nominate Advisors to the Commission's Species Advisory Panels. The information on the returned form will be provided to the Commission's relevant species management board or section. Please answer the questions in the categories (All Nominees, Commercial Fisherman, Charter/Headboat Captain, Recreational Fisherman, Dealer/Processor, or Other Interested Parties) that pertain to the nominee's experience. If the nominee fits into more than one category, answer the questions for all categories that fit the situation. **Also, please fill in the sections which pertain to All Nominees (pages 1 and 2). In addition, nominee signatures are required to verify the provided information (page 4), and Commissioner signatures are requested to verify Commissioner consensus (page 4). Please print and use a black pen.**

Form submitted by: Raymond Kane (your name) State: MA

Name of Nominee: Craig Poosikian

Address: 19 Giddiah Hill Rd. PO Box 1878

City, State, Zip: Orleans, Ma. 02653

Please provide the appropriate numbers where the nominee can be reached:

Phone (day): 508-240-2345 Phone (evening): same

FAX: _____ Email: bhge@ymail.com

FOR ALL NOMINEES:

1. Please list, in order of preference, the Advisory Panel for which you are nominating the above person.
   1. Striped Bass
   2. _____
   3. _____
   4. _____

2. Has the nominee been found in violation of criminal or civil federal fishery law or regulation or convicted of any felony or crime over the last three years?

   yes_____ no X

3. Is the nominee a member of any fishermen's organizations or clubs?

yes X no_____

If "yes," please list them below by name.

Nauset Rod & Gun Club

4. What kinds (species) of fish and/or shellfish has the nominee fished for during the past year?

striped bass, bluefish

sea bass, fluke

bonito, false albacore

oyster, quahog, razor clam

sea worm, squid

5. What kinds (species) of fish and/or shellfish has the nominee fished for in the past?

all of the above, plus

tautog, flounders, and more

(if it crawls or swims, I have spent time catching it)

FOR COMMERCIAL FISHERMEN:

1. How many years has the nominee been the commercial fishing business? 41 years
2. Is the nominee employed only in commercial fishing? yes_____ no X
3. What is the predominant gear type used by the nominee? rod & reel, hand rakes
4. What is the predominant geographic area fished by the nominee (i.e., inshore, offshore)? inshore

FOR CHARTER/HEADBOAT CAPTAINS:

1. How long has the nominee been employed in the charter/headboat business? _____ years

2. Is the nominee employed only in the charter/headboat industry? yes _____ no_____

   If "no," please list other type(s)of business(es) and/occupation(s):_____

   _____

3. How many years has the nominee lived in the home port community? _____ years

   If less than five years, please indicate the nominee's previous home port community.

   _____

FOR RECREATIONAL FISHERMEN:

1. How long has the nominee engaged in recreational fishing? 60 years

2. Is the nominee working, or has the nominee ever worked in any area related to the fishing industry? yes x no _____

   If "yes," please explain.

commercial harvester, aquaculturist (primarily oyster), reel repair for local tackle shop

SHELLFISH, FINFISH, CHARTER (MATE), CATERING (RAW BAR/ CLAMBAKE), DIG SEAWEEDS

FOR SEAFOOD PROCESSORS & DEALERS:

1. How long has the nominee been employed in the business of seafood processing/dealing? _____years

2. Is the nominee employed only in the business of seafood processing/dealing?

   yes _____ no _____ If "no," please list other type(s) of business(es) and/or occupation(s):

   _____

   _____

   _____

3. How many years has the nominee lived in the home port community? _____ years

If less than five years, please indicate the nominee's previous home port community.

_____

FOR OTHER INTERESTED PARTIES:

1. How long has the nominee been interested in fishing and/or fisheries management? _____ years

2. Is the nominee employed in the fishing business or the field of fisheries management?
yes _____ no _____

If "no," please list other type(s) of business(es) and/or occupation(s):

_____

_____

_____

FOR ALL NOMINEES:

In the space provided below, please provide the Commission with any additional information which you feel would assist us in making choosing new Advisors. You may use as many pages as needed.

I started fishing when I was three years old. I have been fully immersed in the sport since then to the point that I build rods, repair reels and build my own terminal tackle. I sold my first striped bass in 1981 and I was hooked! I'm not a high liner by any means and I don't want to be; I enjoy fishing for stripers and if they are commercially viable I take them to market. I blew up the engine on my boat two years ago but I still fish from shore looking to make my sales.

I sat on the Board of Directors of the Cape Cod Commercial Hook Fishermen's Assoc. for five years. I am the Executive Officer (board position) of Nauset Rod and Gun Club in Eastham and have held that position for approximately 10 years. For the past seven years, I have sat on the Orleans Shellfish and Waterways Advisory Committee (Secretary for past two years).

For work I do home construction, bend sheet metal (primarily copper), reel repair at the local tackle shop and I have an aquaculture site (one acre) in Eastham where I focus on growing oysters, though other species have come and gone.

Nominee Signature: Craig Poosikian Date: ~~7/27/22~~ 10/4/22

Name: Craig Poosikian
(please print)

COMMISSIONERS SIGN-OFF (not required for non-traditional stakeholders)

Daniel J McKiernan
State Director

Sarah N. Peake
State Legislator

Raymond W. Kane
Governor's Appointee

From: Robert Beal
Sent: Wednesday, October 12, 2022 9:23 AM
To: Emilie Franke
Subject: FW: [External] Striped Bass fishery currently worse than it was in 1985

Good Morning Emilie,

I received the following comments this morning. Please add to the public comment for the November meeting.

Thanks,
Bob

From: tim johnson <ballalldaysports@gmail.com>
Sent: Wednesday, October 12, 2022 12:48 AM
To: Robert Beal <Rbeal@asmfc.org>
Subject: [External] Striped Bass fishery currently worse than it was in 1985

Hello Mr.Beal I have been on the water a lot this year all over new england and have now ended my season and going back to my home in Delaware now and have spoken to many other recreational and commercial fisherman who are very experienced and we are all coming to the same conclusion, the striped bass fishery has come to a collapse that is worse than the early 80s.

I honestly believe sir that it is time to shut down this fishery and give these fish game fish status and recommend that Congress invest money in environmental police to combat poaching as well.

To put it bluntly this fishery is absolutely screwed at this time and commercial and recreational stress along with many other factors such as large seal colonies, poachers and low spawn rates I fear that this fishery could collapse at any given year very soon. Also I cannot believe how many poachers I saw killing small fish this year guys having trash bags filled with 16-25" fish it is disgusting what is going on out on the ground. Never have I seen so much bait with no big bass slamming on them during the fall migration we are concerned very concerned even 1985 was better than what we saw this year it is bad hope you guys recover this fishery it would be a shamme if these kids cant have the experiences we had in the 70s wow those were good times God bless