Atlantic States Marine Fisheries Commission

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**Committee on Economics and Social Sciences**
**2026 Spring Meeting Summary**
August 4-5, 2026

**Members in Attendance:** S. Lovell, A. Scheld, T. Scott, M. Russell, J. Walsh, J. Montañez, A. Birkenbach, R. Murphy, J. Holzer, S. Ebbin, T. Guilfoos, J. Stoll, M. Carroll, E. Frimpong, J. Hadley

**Staff:** J. Patel, P. Campfield

Striped Bass Recreational Demand Model

ASMFC contractors, S. Steinbeck and A. Carr-Harris, presented preliminary findings from a year-long project developing a bioeconomic modeling framework designed to integrate recreational angler behavior into fisheries management for Atlantic striped bass and bluefish. Emphasizing that traditional management relies primarily on fish population dynamics while omitting human behavioral responses, the framework links angler preferences—such as willingness to pay for catch, harvest opportunity, fish size, and regulatory changes—to stock assessment projections to evaluate future management strategies. Data was gathered via a coast-wide discrete choice experiment survey sent to 8,000 anglers drawn from state license frames. The survey yielded over 2,400 responses, achieving a target response rate above 30%, which was then refined into an estimation sample of 1,358 active anglers and weighted to reflect state population shares.

The econometric estimation revealed distinct patterns in angler preferences and economic value across species, fish sizes, and angler types. The model demonstrated that anglers place a substantially higher value on striped bass than on bluefish, with the estimated utility of the first harvestable striped bass reaching approximately $120 compared to just $20 for a bluefish. Striped bass utility showed a distinct non-linear pattern with respect to fish size, peaking at intermediate lengths around 28 inches and declining for trophy-sized fish, where the value of harvesting a fish dropped to match its catch-and-release value. Researchers hypothesized that this unexpected drop for trophy fish reflects a growing conservation ethic, a preference for consuming smaller fish, or concerns regarding contaminant exposure. Subgroup analyses further indicated that policy changes affecting harvest regulations primarily impact private boat anglers and consumptive anglers who prioritize harvest opportunities, whereas shore-based anglers and strict catch-and-release participants experience minimal utility loss under harvest restrictions.

To translate these preference estimates into management tools, the researchers built a trip-level bioeconomic simulation model and calibrated it to a 2023 baseline, estimating that recreational access to harvest both species generated roughly $500 million in angler welfare value, with striped bass accounting for the majority. However, attempts to project 2024 outcomes revealed a major forecasting hurdle for striped bass: while bluefish simulations tracked real-world outcomes well, the model failed to capture a massive real-world drop in striped bass catch from roughly 30 million to 21 million fish. The project team identified the root cause as the standard baseline assumption that catch-per-trip remains constant year-to-year. To fix this gap, an empirical framework was developed to forecast catch-per-trip using lagged

recruitment data from three to six years prior, aligning with the timeframe when young fish enter the targetable size classes for recreational anglers.

The project is currently in its final month and the team is finalizing a technical report that outlines the survey design, econometric estimations, and current simulation architecture. Because the model is not yet ready for direct management use and will require further funding to complete the work. If funded, immediate next steps include refining the catch-per-trip forecasting model using lagged recruitment and environmental variables, integrating recalibrated MRIP data and two upcoming benchmark stock assessments, and exploring state-level preference variations. The ultimate goal would be to construct an interactive decision-support tool, engage regional management committees and stakeholders, and publish user guides to allow decision-makers to evaluate both the biological and economic impacts of proposed harvest regulations.

Species Tasking Updates

**Menhaden**

For menhaden, A. Scheld and T. Scott reviewed existing economic literature to address questions regarding the employment impacts of potential quota changes under Amendment 2, such as reductions to the Chesapeake Bay cap. The review highlighted fundamental differences between the capital-intensive reduction sector and the more flexible bait sector. Reductions in the reduction sector, which is heavily concentrated in Reedville, Virginia, correspond to roughly 3.7 total job losses per 1,000 metric tons of quota cut. Conversely, the bait sector is lower in capital intensity and geographically dispersed across states like New Jersey and Virginia, resulting in a smaller impact of approximately 1.5 job losses per 1,000 metric tons. Because bait harvesters derive less than 10% of their annual earnings from menhaden, they possess a greater capacity to absorb management shocks by shifting to other target species. However, existing literature relies on linear models that fail to capture non-linear market thresholds, such as plant shutdowns.

**Spiny Dogfish**

T. Scott highlighted severe market consolidation and operational bottlenecks facing the fishery. Spiny dogfish is a high-volume, low-value domestic fishery that depends heavily on foreign food-grade markets in Europe. Historical supply disruptions, combined with market shocks like COVID-19 and Brexit, caused US producers to lose market share as overseas buyers substituted dogfish from other countries or shifted to alternative whitefish. Between 2019 and 2024, US landings dropped from 17.4 million pounds to 8.4 million pounds, while active vessel participation fell by 42% down to 142 vessels, with only 13 vessels accounting for over half of all coast-wide catch. Processing capacity has consolidated dramatically, with just three buyers purchasing 67% of landings, raising monopsony concerns. In southern regions like North Carolina, the collapse of local processing infrastructure forces harvesters to pay high trucking and fuel costs to ship catch north, straining profitability against stagnant ex-vessel prices of 20 to 22 cents per pound.

**Tautog**

A. Carr-Harris conducted an econometric analysis and economic exposure assessment for inclusion in the current draft addendum for New York Bight and New Jersey. Using MRIP data from 2010 to 2025, monthly harvest numbers and weights were regressed against bag limits, size limits, season closures, and effort controls. The model indicated that daily bag limit adjustments serve as the primary driver of harvest

reductions, with minimum size limit increases providing secondary reductions. To quantify potential economic exposure, researchers evaluated scenarios where harvest restrictions lead to trip reductions between 10% and 40%. This output reflected potential direct recreational expenditure losses ranging from $7.28 million to $29 million in New Jersey and $2 million to $8 million in New York, alongside proportional drops in commercial gross revenues, though it is important to remember that these figures reflect gross exposure rather than net economic loss.

Data Management Update

The Committee held a detailed discussion regarding the administrative, technical, and operational challenges associated with accessing confidential fisheries data through the Atlantic Coastal Cooperative Statistics Program (ACCSP) and federal management systems. While ACCSP worked alongside state data managers to establish a streamlined approval process for state-level confidential data, committee members reported that obtaining federal confidential data remains exceptionally complex. A major bottleneck in the federal authorization process is the strict requirement that applicants identify a named funding source on their application forms. Because many committee tasks and species assignments are general or un-funded requests, members frequently get caught in approval loops, experience months of administrative delays, or fail to secure federal clearance altogether.

Committee members also expressed concerns regarding data consistency, architecture, and reliability across various federal and regional databases. Federal systems, such as NOAA's Catch Accounting and Monitoring System, were built primarily to support real-time, in-season quota tracking. To maintain data timeliness, these quota management systems often incorporate unvalidated state-level data that lack precise landing location details or community-level economic metrics. In contrast, state data submitted to ACCSP undergoes a rigorous, twice-yearly validation and error-checking process where missing price data is systematically input. Consequently, pulling financial or catch metrics from real-time quota tables versus validated bi-annual tables can generate vastly different economic findings, severely undermining researcher confidence in community-level valuation models, particularly for complex cross-jurisdictional species like American lobster.

The committee also highlighted a fundamental disconnect between data retrieval timelines and the Commission's management schedule. Management options and policy proposals developed between quarterly Commission meetings frequently require the committee to execute socioeconomic analyses within an abbreviated eight- to ten-week window. However, obtaining complex confidential data extracts through the ACCSP operates on a first-in, first-out queue that can take anywhere from several weeks to multiple months, making short-turnaround requests extremely difficult to fulfill without significant advance notice and coordination.

*Next steps:* J. Patel to talk to data managers, ACCSP, and GARFO (through B. Murphy) to join data access discussion at next CESS meeting.

Process on Handling Commission Requests

The Committee held an extensive discussion focused on improving the workflow between the Commission and the committee, aiming to transition historical, top-down management requests into a continuous, two-way dialogue. Committee members noted that while the committee possesses significant institutional

memory and strong quantitative modeling capabilities, Commission requests are frequently broad or vague. This disconnect stems largely from commissioners having an incomplete understanding of what socioeconomic methodologies exist, what specific data inputs are required, or how non-biological tools can inform management decisions. Conversely, committee members—who function primarily as a voluntary body—face substantial constraints when attempting to deliver complex, short-turnaround empirical models within the Commission's tight eight- to ten-week decision-making windows between quarterly meetings.

To establish a more productive working relationship, the committee evaluated its organizational framework, balancing single-species point persons with cross-cutting methodology teams. While species leads remain vital for keeping pace with individual Fishery Management Plan updates and answering quick informational inquiries, opening tasking across the entire committee allows members to deploy specialized skills—such as discrete choice experiments, econometric regressions, or qualitative community impact assessments—regardless of the specific fish species involved.

To alleviate the analytical burden on members, the Committee highlighted the need to move away from manually calculating routine accounting metrics for every new management request. Instead, the committee recommended adapting NOAA's automated performance metric dashboards to incorporate Commission-managed species. Automating periodic updates of basic participation rates, trip expenditures, landings, and gross revenues would create a consistent baseline across fisheries, freeing up researcher capacity to address higher-level policy questions.

Academic participants noted that standard institutional incentives for serving on advisory bodies are minimal, but expressed strong interest in leveraging Commission research needs as training opportunities for graduate students. The committee discussed structuring long-term analytical projects around graduate theses, Knauss Fellowships, Sea Grant partnerships, or specialized economics fellowships, creating a sustainable research pipeline that supports early-career scientists while expanding operational bandwidth.

*Next steps:* J. Patel to talk to B. Murphy about the feasibility of an economic dashboard through NOAA, J. Patel to talk to P. Campfield about the possibility of a one-day workshop to create list of analyses to present to Commissioners via a Commissioner survey.

<u>Staff Economist</u>

The Committee addressed an idea to expand the Commission’s internal analytical capacity by hiring an economist on retainer, establishing a contracted retainer, or securing an intergovernmental detail. Staff emphasized that the growing frequency and analytical complexity of socioeconomic requests coming from species management boards have strained the voluntary capacity of the committee. Because academic and federal members must balance primary professional responsibilities, executing fast-turnaround options analyses, drafting Fishery Management Plan addendums, and running quantitative models frequently creates severe operational bottlenecks. Furthermore, Commission staff noted the ongoing challenge of diagnosing complex economic questions and translating technical analytical possibilities into accessible policy language for state commissioners without having a dedicated in-house socioeconomic person.

The committee evaluated several structural approaches to address these capacity constraints. Bringing on an independent contractor or a multi-disciplinary consulting firm on retainer was highlighted as a flexible mechanism to absorb routine workloads, including updating baseline socioeconomic sections for draft amendments, assisting with risk and uncertainty scoring, and acting as a centralized state confidential data coordinator. While committee members unanimously supported the long-term ideal of a permanent, full-time staff economist, they acknowledged financial constraints and discussed intermediate options such as term-limited post-doctoral positions, graduate internships, or Intergovernmental details. Members pointed to past successful precedents where federal economists from agencies like NOAA or USDA were detailed to regional fishery commissions under shared-funding agreements, providing direct operational support without requiring permanent FTE expansion.

To build a compelling business case for Commission leadership, the Committee discussed the necessary balance of responsibilities for any new analytical position. Members cautioned that to attract and retain qualified interdisciplinary talent, the role must balance routine tasks, such as managing data pulls and updating FMP text, with opportunities for creative modeling and methodological development. Rather than immediately surveying commissioners on their data needs—a strategy previously executed in 2013—the committee recommended first hosting an informational workshop to demonstrate available socioeconomic tools and datasets to decision-makers.

*Next steps:* J. Patel will pull together a list of tasks and amount of time needed per task based on this discussion and present to ASMFC higher-ups.

AI RAG Model

The Committee on Economics and Social Sciences held a session to review a prototype Retrieval-Augmented Generation (RAG) Artificial Intelligence model developed independently by M. Carroll and a data scientist collaborator. The project aims to create a custom, transparent infrastructure capable of quickly crawling, indexing, and synthesizing information from fisheries management documents while providing precise references to primary sources. By building a dedicated system rather than relying on general commercial tools, the developers seek to eliminate source ambiguity and mitigate hallucinations in technical summaries.

The system's current architecture relies on a custom Python-based web crawler that automatically reviews publicly available web sources for relevance, downloads relevant documents, and files them into a cloud database. The proof-of-concept corpus currently holds 30 striped bass management documents extracted directly from the Commission website. To keep development costs low, the project utilizes free and open-source tools, including an open-source Facebook similarity search algorithm for semantic matching and PDF Plumber to enhance PDF text extraction. To ensure data integrity, the pipeline employs a tiered hierarchy where grounded agency reports and peer-reviewed literature are designated as Tier 1 truth, while informal reports are classified as Tier 2 data and weighed with higher skepticism. Unlike standard large language models, the custom front-end interface explicitly reports similarity scores and reveals the exact document sources and percentage contributions used to generate each response.

During the discussion, committee members raised several operational considerations regarding output consistency, data governance, and overall utility. Developers clarified that restricting the LLM to a localized,

vetted document corpus inherently produces far more consistent answers than general-purpose AI prompts, though formal benchmarking against baseline reports remains a necessary next step. Federal members noted strict agency data governance policies that prohibit feeding confidential or unvalidated raw data into non-federally hosted cloud platforms, meaning the system must remain strictly focused on public reports. Furthermore, participants emphasized that while RAG models excel at synthesizing qualitative information like meeting minutes, public testimony, or Fishery Performance Reports, they cannot replace human expert judgment for complex quantitative decisions or raw landed catch processing.

*Nest steps:* CESS to send links to species-specific socioeconomic literature and peer-reviewed publications to populate the Tier 1 pipeline. M. Carroll plans to conduct performance and hallucination testing by running identical queries across production-level LLM licenses, depending on testing funds.

Risk and Uncertainty

The Committee evaluated the ASMFC Risk and Uncertainty Decision Tool and Policy, led by J. Holzer alongside tool developers K. Drew and J. McNamee. The tool uses a weighted scoring matrix across twelve inputs—split into stock status, model and environmental uncertainty, and socioeconomic impacts—to generate an aggregated Z-score. This Z-score is processed through a logistic function to produce a success probability for achieving specific management targets, such as ending overfishing or rebuilding a stock.

During the technical and mathematical evaluation, it was noted that under current parameterization, the tool's logistic function only spans 37% of the total probability space, running from a minimum probability of 40% to a maximum of 77%. Consequently, it fails to achieve probabilities above 80% even for highly conservative management scenarios or severely depleted stocks, while a simple linear equation produces virtually identical probability outputs to the logistic function. Marginal changes in model uncertainty or biological metrics shift the final success probability by only 1% to 2%, making the tool insensitive when discriminating between species with vastly different risk profiles. Furthermore, due to raw scaling factors, socioeconomic factors carry twice the relative weight of stock assessment metrics, despite appearing equal in the explicit weight structure. In practice, short-term socioeconomic losses and long-term economic gains frequently receive equal opposing weights, causing the socioeconomic block to sum to zero and effectively eliminate economic considerations from the final decision score.

Regarding socioeconomic metrics, committee members highlighted that current scoring measures the absolute economic importance or size of a fishery rather than the incremental damage or change caused by a regulatory cut. This creates a distortion where economically vital fisheries receive less precautionary biological buffers simply because they generate high revenues or trips. Members emphasized the need to define clear objective functions and baseline reference periods, such as historical heydays, to objectively measure how proposed quota cuts impact community activity indicators, dealer networks, or recreational satisfaction. To maintain analytical transparency regarding trade-offs, participants recommended reporting success probabilities both with and without socioeconomic weighting.

On the policy governance front, committee members raised strong concerns regarding rules that allow management boards to adjust variable weights after reviewing the resulting quota implications, as post-hoc weighting adjustments undermine analytical objectivity and allow decision-makers to justify predetermined outcomes. Tool developers explained that because the Commission is not bound by federal Magnuson-

Stevens Act mandates, board members resist rigid, automated quota reductions. Allowing iterative weight adjustments was intentionally designed as a feedback feature to build board buy-in, forcing commissioners to document on the record when short-term economic gains are being prioritized over biological rebuilding.

*Next steps:* J. Patel to send summary of discussion to R&U WG, CESS to discuss new socioeconomic indicators for the tool at the fall meeting.

Knudsen AI Presentation

In this closed session, Knudsen Earth presented their AI tool for the Committee's review.

Human Mobility Research

G. DePiper from the Heart Research Institute at Texas A&M University–Corpus Christi presented preliminary research on utilizing commercial human mobility data (aggregated smartphone pings) to evaluate the economic costs of environmental shocks on recreational fishing in the Texas Coastal Bend. The study focuses on an 800-square-mile inshore bay system stretching from Port Aransas to Port Mansfield. This shallow, hypersaline environment features minimal water turnover and restricted Gulf access through only two inlets. Because the fishery consists almost exclusively of small, flat-bottomed boats operating in shallow waters, traditional tracking mechanisms such as Vessel Monitoring Systems or Automatic Identification Systems are absent.

The primary research objective is quantifying how environmental disturbances, specifically anthropogenic nutrient loading that triggers brown tide blooms, impact recreational fishing behavior and angler welfare. In addition to potential fish kills, low dissolved oxygen levels during brown tide events cause jelly flesh in black drum, degrading the meat and ruining catch quality. To model angler site choice and participation, researchers are leveraging commercially available geolocation data containing date-time stamps, geographic coordinates, unique device identifiers, and home ZIP codes, paired with Texas Parks and Wildlife Department creel intercept surveys and state fishing license records.

The methodology utilizes Baffin Bay as an isolated natural laboratory. Because 90% of Baffin Bay's shoreline is privately owned by large cattle ranches, public shore access is non-existent, and the bay lacks recreational beaches. Consequently, virtually all boat traffic entering through the mouth of Baffin Bay represents recreational fishing trips. Researchers are applying a one-class classification model to isolate recreational fishing trips, identify launch ramps, calculate travel distances, and establish individual choice sets. These inputs feed into a Random Utility Model, structured as a conditional or nested logit, to estimate willingness to pay and quantify welfare losses resulting from brown tide blooms, extreme heat events, or regulatory modifications.

During the discussion, Committee members and researchers explored operational challenges, data quality limitations, and potential broader applications for human mobility data:

Data validation and filtering require extensive effort because commercial vendors clean and process mobility data for onshore marketing rather than marine environments. Researchers encountered significant data anomalies, including missing offshore coverage due to vendor settings, geo-hash buffering

obfuscations from state privacy laws, and heavy data density around military installations or urban estuaries like the Chesapeake Bay.

Differentiating recreational fishing from general marine activity requires deep local ecological knowledge and spatial geofencing rather than relying solely on automated algorithms, as pings can originate from non-fishing vessels or passive devices.

Evaluating sample representativeness remains a central focus. Researchers are comparing smartphone coverage rates against state fishing license censuses, paid beach access counts, and stadium crowd benchmarks, while cross-validating overlapping mobility datasets from multiple commercial vendors.

Despite high initial learning curves and data processing hurdles, mobility data offers a cost-effective supplementary tool to traditional survey methods, enabling researchers to track seasonal effort shifts and evaluate policy interventions, such as cross-state red snapper effort in the Gulf of Mexico.

Upcoming Tasks/Species Assignments

The Committee addressed upcoming species management tasks, species lead assignments, and strategies to remedy representation gaps across state and federal agencies.

Staff provided a preview of potential upcoming tasks from Commission management boards. While current ongoing tasks include evaluating menhaden employment impacts, spiny dogfish market dynamics, and American lobster management strategy evaluations, several potential actions are emerging on the horizon. A striped bass future management workgroup is discussing post-stocking measures and recreational release mortality, which may require socioeconomic input or an updated application of the recreational demand model, alongside a request to develop a high-level infographic summarizing the coast-wide economic baseline of the striped bass fishery. Simultaneously, a joint amendment under development by the Mid-Atlantic Fishery Management Council and the Commission is evaluating sector separation options for summer flounder, scup, black sea bass, and bluefish, specifically considering separate management, permitting, and reporting rules for the for-hire fleet.

Regarding committee composition and species assignments, members discussed the historical framework aiming for one economist and one social scientist per species. Several members questioned the strict separation of these roles, arguing that economists and social scientists share interdisciplinary analytical approaches and that deep species-specific familiarity or local knowledge is often more valuable than disciplinary background alone. Members prioritized ensuring every managed species has at least one assigned primary contact rather than enforcing dual-disciplinary coverage across all boards.

The committee addressed ongoing membership shortages across state and federal jurisdictions. While Commission operating guidelines historically specify one designated representative per state or agency, the committee noted gaps from missing state appointments and dwindling active participants. To build long-term analytical capacity, members supported expanding federal participation from NOAA regional science centers and exploring creative proxy mechanisms.

*Next steps:* J. Patel to reach out to CESS as needed for upcoming tasks, starting with the Striped Bass economics infographic. J. Patel to draft CESS charter for review by chairs.

Other Business

The Committee discussed funding avenues for committee-aligned research, highlighting the Atlantic Coastal Cooperative Statistics Program Annual Request for Proposals, which funds socioeconomic data collection and database consolidation projects with recent rubric updates that weight social and economic proposals more favorably.