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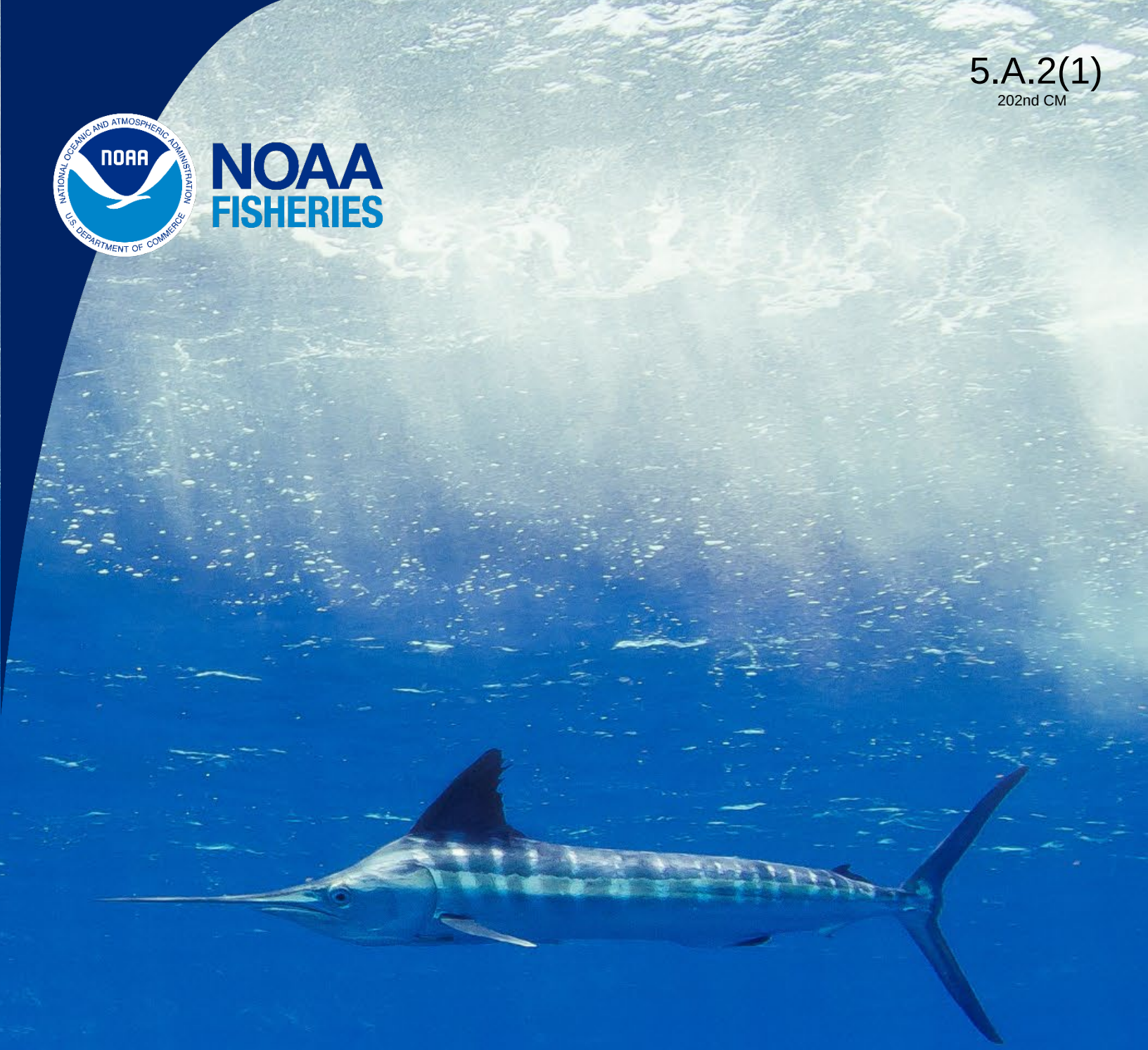

Report to the 202nd Meeting of the Western Pacific Regional Fishery Management Council

Pacific Islands Fisheries Science Center

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Pacific Islands Fisheries Science Center
National Marine Fisheries Service
1845 Wasp Boulevard
Honolulu, HI 96818

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March 2025

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Howard Lutnick, Secretary of Commerce

National Oceanic and Atmospheric Administration
Vice Admiral Nancy Hann, Deputy Under Secretary for Operations Performing the Duties of Under Secretary of Commerce for Oceans and Atmosphere and NOAA Administrator

National Marine Fisheries Service
Emily Menashes, Acting Assistant Administrator for Fisheries

About this report

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Cover photo: Striped marlin in shallow waters. Photo credit: NOAA Fisheries.

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Pacific Islands Fisheries Science Center
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
1845 Wasp Boulevard, Building #176
Honolulu, Hawai‘i 96818

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List of Acronyms

Name	Acronym
Assessment and recovery camp	ARC
Autonomous underwater vehicle	AUV
Commonwealth of the Northern Mariana Islands	CNMI
CNMI Division of Fish and Wildlife	DFW
Ecosystem Sciences Division	ESD
Environmental DNA	eDNA
Fisheries Research and Monitoring Division	FRMD
FRMD Life History Program	LHP
Guam Division of Aquatic and Wildlife Resources	DAWR
International Billfish Biological Sampling	IBBS
International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean	ISC
Operations, Management, and Information Division	OMI
Pacific Islands Fisheries Science Center	PIFSC or Center
Protected Species Division	PSD
Remotely operated vehicle	ROV
Southwest Fisheries Science Center	SWFSC
Western Pacific Regional Fishery Council	WPRFC or Council

Executive Summary

The Pacific Islands Fisheries Science Center (PIFSC or Center) administers and conducts scientific research and monitoring programs that produce science to support the conservation and management of fisheries and living marine resources. This is achieved by conducting research on fisheries and ocean ecosystems and the communities that depend on them throughout the Pacific Islands region and by dedicating efforts to the recovery and conservation of protected species. The Center is organized into four major divisions: Operations, Management, and Information Division (OMI), Fisheries Research and Monitoring Division (FRMD), Protected Species Division (PSD), and Ecosystem Sciences Division (ESD).

PIFSC continues to improve its science and operations through collaboration and integration across divisions and increased communication, cooperation, and coordination with partners and stakeholders. This report highlights research, projects, activities, and other events that are of direct interest to the Western Pacific Regional Fishery Council, including Guam bottomfish management unit species data for the Western Pacific Stock Assessment Review, a new bycatch estimate interface, survey of Makapuʻu precious coral bed, PIFSC details on the economic contributions of small boat fisheries in Guam and CNMI, and a list of our published research from this fiscal year.

Deep-sea Ecosystems of Sponges and Corals: Exploration, iNvestigation and Technology Science Planning Workshop

PIFSC hosted a two-day workshop on November 13–14, 2024, to seek input from experts around the Pacific on deep-sea coral and sponge science and management priorities. Forty-six scientists and managers came together to offer perspective, advice, and expertise in determining the priorities for the short timeframe of the Pacific Islands Deep-sea Ecosystems of Sponges and Corals: Exploration, Investigation, and Technology Initiative (2025–2028). Working in small breakout groups, participants discussed and identified deep-sea coral and sponge science and management priorities in three topic areas: (1) biology and ecology, (2) biogeographic distribution, and (3) threats (including climate change and other human impacts). The internal federal team integrated the workshop input with previous and existing strategic priorities and created four areas of research focus to provide guidance on the application of these limited resources:

1. Analyses of data from past expeditions and collections to contribute to our understanding of deep-sea coral biology and ecology, including genetics, reproductive biology, larval distribution, growth and age, and community structure.
2. Development of broad species (taxonomic) distribution and habitat suitability models to increase our understanding of connectivity between habitats, identify oxygen minimum zones and areas of vulnerability, and locate hotspots where biodiversity might occur and be targeted for further exploration.
3. Explore the key (a) physical and (b) biological factors influencing the growth, reproduction, distribution, and ecological roles of deep-sea corals and sponges across the Pacific in varying environmental conditions.
    a. Physical - impact of environmental drivers (e.g., temperature, oxygen, nutrient availability, and substrate), responses to anthropogenic impacts (fishing, deep-sea mining, and climate change).
    b. Biological - growth rates and longevity, reproductive strategies, and dispersal mechanisms, etc.
4. Use current and advanced technology (such as eDNA, ROVs, AUVs, seabed monitoring stations and landers) to facilitate our understanding of seamount / sea floor physical, chemical, and biological processes and the temporal influence of ecosystem structure, function, and resilience in deep-sea habitats.

The outcomes of this workshop perfectly align with the Council's five-year research priority IF6: the assessment of deepwater and pelagic ecosystems management unit species and exploration, including Council requests to fill information gaps, improve baseline information, develop maps of deep-water habitats, and create a list of known locations of deep coral hotspots.

Marianas Fishing Community Engagement and Jurisdictional Agencies Trainings / Workshops

Staff from FRMD convened a series of meetings, trainings, and fisheries engagement events in CNMI from January 13–18, 2025. The mission for this trip was to reconnect with the fishing communities through meetings with the Saipan fishing organizations, host a NOAA Science Night, conduct a data-limited stock assessment training, and hold the data collection improvement workshop.

Tasi to Table, Saipan Fishermen's Association, and I San Halom Laguna Angler's Association participated in the fishing association engagement meeting at the Council office. The group shared information about their program and club activities and identified potential future collaborations; Council advisers also attended this meeting.

The FRMD team convened the NOAA Science Night, and more than 50 fishery participants attended. The team informed the fishing community about the PIFSC divisions and programs, and the upcoming CNMI research cruises, including the National Coral Reef Monitoring Program and Life History Program cruise in spring and summer 2025. DFW staff also presented on fisheries projects they conduct. There were ten tables of organizations involved in the CNMI fisheries that showcased their activities and programs.

The team also held a Data Limited Stock Assessment Training on January 14, 2025, led by Rob Ahrens and supported by Toby Matthews. Staff from the Saipan Division of Fish and Wildlife, Micronesian Environmental Services, and WPRFC were trained on the length-based spawning potential ratio approach using the CNMI tataga *Naso unicornis* data set. A similar training was conducted in Guam on January 17, 2025. This was attended by biologists from DAWR and ARC Environmental Services. This training is part of the Coral Reef Conservation Program funding provided by PIRO Habitat Conservation Division to FRMD for building capacity within the local fisheries management agencies to support the development of their jurisdictional fisheries management plan.

Data Limited Stock Assessment Training in DAR (left) and DAWR (right).

The team convened the data collection improvement workshop with DFW and DAWR on January 15 and 16, 2025, respectively. The goals of these workshops were to discuss the implementation issues in the data collection system and identify tangible solutions to address these issues. Some of the solutions involved exploring the use of technology in data collection, as well as improving the relationship between the surveyors and the fishing community. Action items identified in these workshops will be tracked through the monthly coordination meetings between FRMD and the jurisdictional fisheries management agencies.

Open Science Initiatives in the International Scientific Committee

Megumi Oshima and Nicholas Ducharme-Barth from the Island Fisheries and Oceanic Fisheries Stock Assessment Programs led two multi-day training sessions on Open Science Workflows. The first training was held in Honolulu, HI, from January 13–16 in conjunction with the ISC Billfish Working Group meeting; the second was held in Yokohama, Japan, from January 27–29 in conjunction with the ISC Shark Working Group meeting. A total of 11 scientists from the U.S., Japan, and Taiwan participated in the two training sessions.

The goal of the training sessions was to teach ISC assessment scientists how they can incorporate certain tools and software into their workflows to make them more efficient, collaborative, and reproducible. Specifically, the training sessions covered material on how to use GitHub for version control and project management, creating and using containerized computing systems to ensure that coding environments are reproducible and transferable, script-based model development, and how to use the open-source publishing software, “Quarto” to create automated and reproducible reports, presentations, and websites. The training involved many hands-on activities for the participants where they worked through a typical workflow of developing an assessment, creating ways to visualize the results, and producing reports and presentations to communicate their work. The hands-on activities helped familiarize the participants with the tools and gave them the confidence to share what they learned in the training with others at their respective agencies. Because the working groups of the ISC are made up of scientists from different countries and agencies working together, it is crucial that they can effectively work together and the tools they learned in the training make working collaborative and asynchronously simple and efficient.

There was a lot of positive feedback from the participants. Not only did they learn new skills that they can begin implementing into their current workflows, but they also said one of the best things about the training was it showed them the possibilities of what they can do. This was the first time many of the participants were exposed to some or all of the software used in the training, and though they may not have mastered everything after three days, they felt inspired to continue learning and pushing themselves to incorporate this new software into their existing workflows. In addition to positive feedback, the participants also provided the leads with some constructive feedback on ways to improve the delivery of some of the material. After each training session, the leads updated the material to enhance it for future use.

Collaboration with NOAA Fisheries West Coast Regional Office to Expand Data Collection for the International Billfish Biological Sampling (IBBS) Program

The FRMD LHP is continuing to improve striped marlin, swordfish, and blue marlin stock assessments by conducting research to expand life history information through the IBBS program. The intent of the IBBS program is to collect, process, age, and assess reproductive maturity of individuals from across the Pacific Ocean using standardized sampling, specimen preparation and interpretation methodologies. LHP is working with Pacific Islands Regional Observer Program to collect samples from the Hawai‘i Longline Fleet; they are also working with international partners in Japan and Taiwan to collect samples across the North Pacific Ocean. The U.S. has collected samples from over 1,100 individuals (478 swordfish, 432 striped marlin, and 253 blue marlin). The U.S. has also begun the process of refining its sampling as the collection of small swordfish (<120 cm fork length) has met the sampling designs goals. Collectively, Japan, Taiwan, and the U.S. have sampled nearly 3,500 billfish from across the North Pacific (1,521 swordfish, 1,468 striped marlin, and 496 blue marlin). The results from this project will lead to more robust life history parameter estimates and allow for a detailed investigation of potential spatial variability in age, growth, and maturity. Ultimately, this project will expand our understanding of the fundamental biology of these federally managed pelagic predators, allowing us to more appropriately model the population in future stock assessments.

As part of this international sampling effort, LHP recently began collaborating with the West Coast Regional Observer Program to collect samples from the Eastern Pacific Ocean. These additional samples will help fill a spatial gap in the current sampling protocol. In February, LHP sent staff to SWFSC to dissect otoliths and process gonads and tissues from swordfish that were sampled during this past fishing season. Observers, Sam G. and Ivana D., who each contributed samples to this effort, stopped into the necropsy lab to observe dissections and see how these samples will be used for research. Over the course of the dissection days, at least a dozen SWFSC staff stopped by to observe and engage with the project. LHP staff traveled back to Hawai‘i with all sampled tissues for subsequent processing and analyses at PIFSC. This was the first step in adding samples from the West Coast to the larger IBBS effort across the North Pacific Ocean. Staff from LHP will endeavor to repeat this effort during the 2025 fishing season.

PIFSC, SWFSC, and observers working together to collect and process swordfish samples for the IBBS program.

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