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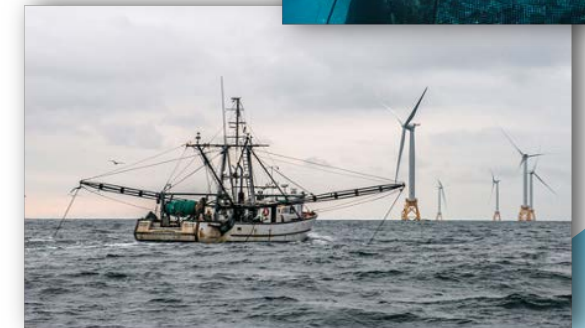
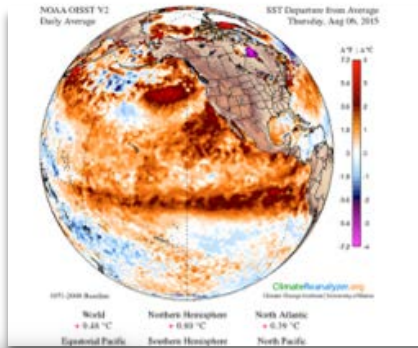
Science Enterprise Update

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Council Coordination Committee
Annapolis, MD
May 17-19, 2022

Grand Challenges to NOAA Fisheries Science

- **Climate change and marine resource management**
 - Ocean ecosystems are changing at unprecedented rates affecting all of NMFS mission
- **Offshore wind energy development** - Rapid national development needs to coexist with existing uses including fishing and conservation
- **Adapting the survey enterprise** - Surveys and other ocean observations are essential currency for scientific advice

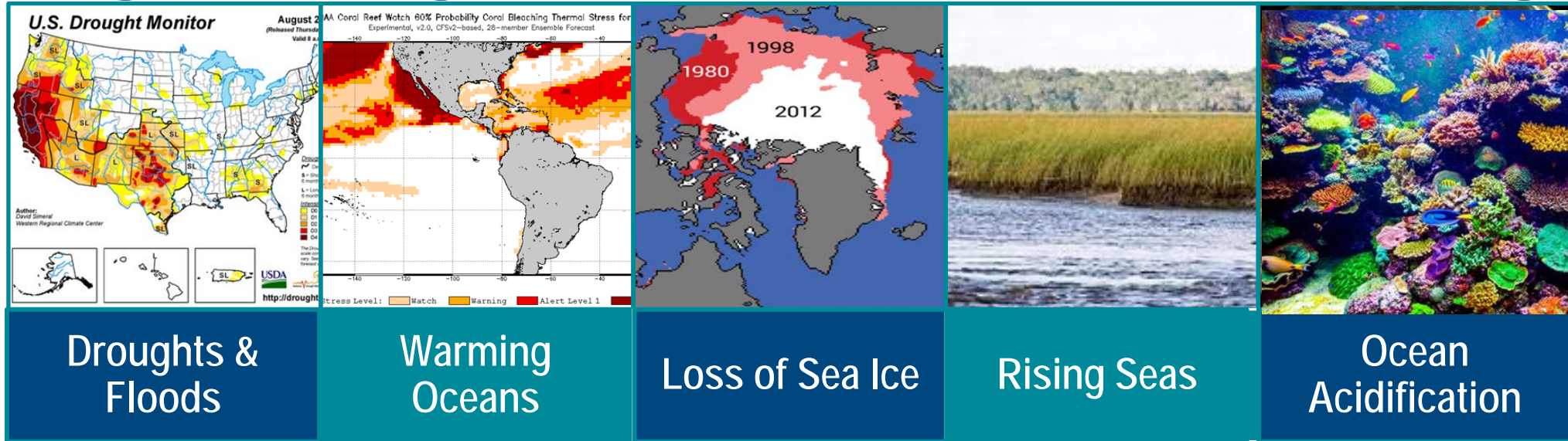


Climate Change and Marine Resource Management



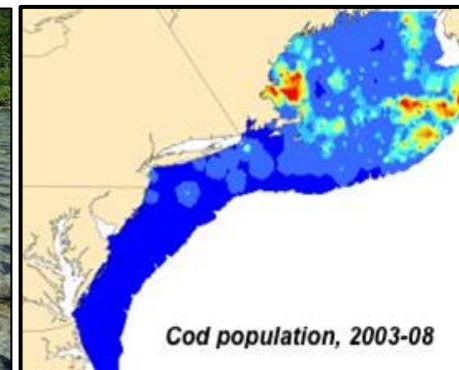
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Growing Challenges for Effective Resource Management

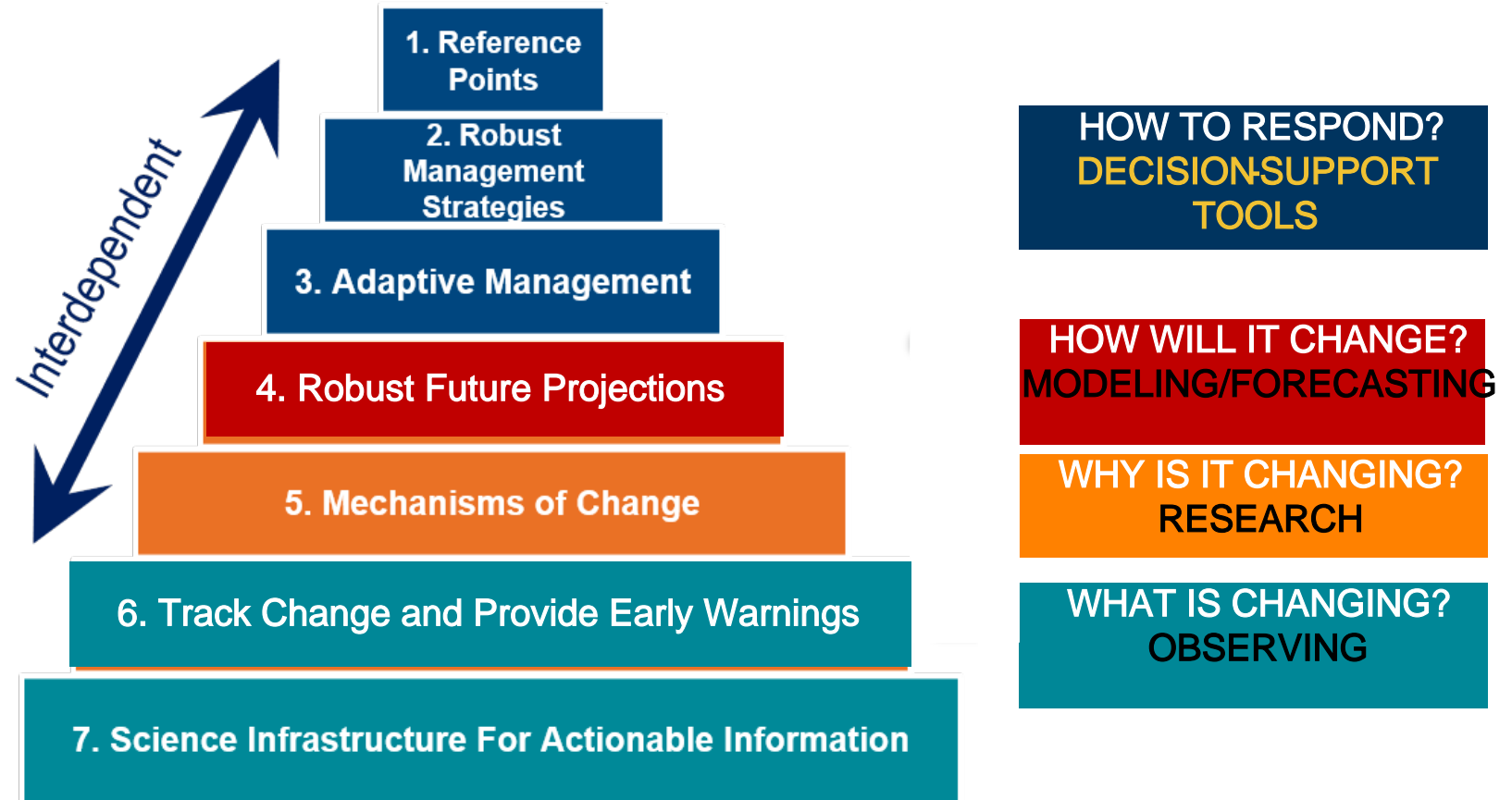
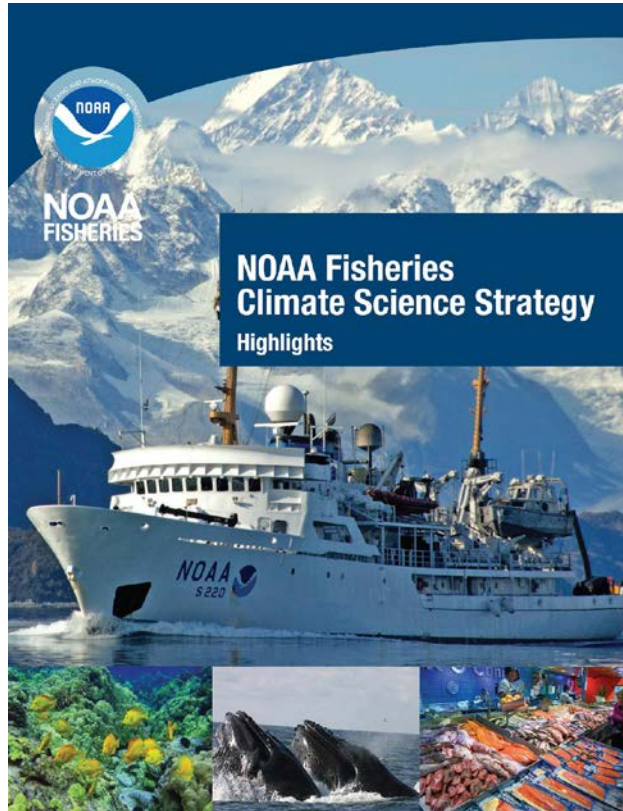


The Impacts are real

- Changing Habitats
- Changing Distributions
- Changing Abundance
- Changing Ocean Uses



NOAA Fisheries Climate Science Strategy (2015)



Increase the production, delivery and use of climate-related information to support resilience and adaptation to changing climate

Recent Accomplishments

- NMFS Climate Science Strategy: 5 Year Progress Report
- Distribution Mapping and Analysis Portal (DisMAP)
- New Forecasts of Marine Heat Waves



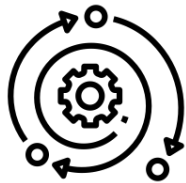
NMFS Climate Science Strategy: 5 Year Progress Report



- **Tracking change** (*Ecosystem indicators, stock distributions*)



- **Assessing vulnerability** (*Fish stocks, marine mammals, sea turtles, habitats, communities*)



- **Understanding and projecting climate impacts** (*increased research, modeling, testing applications*)



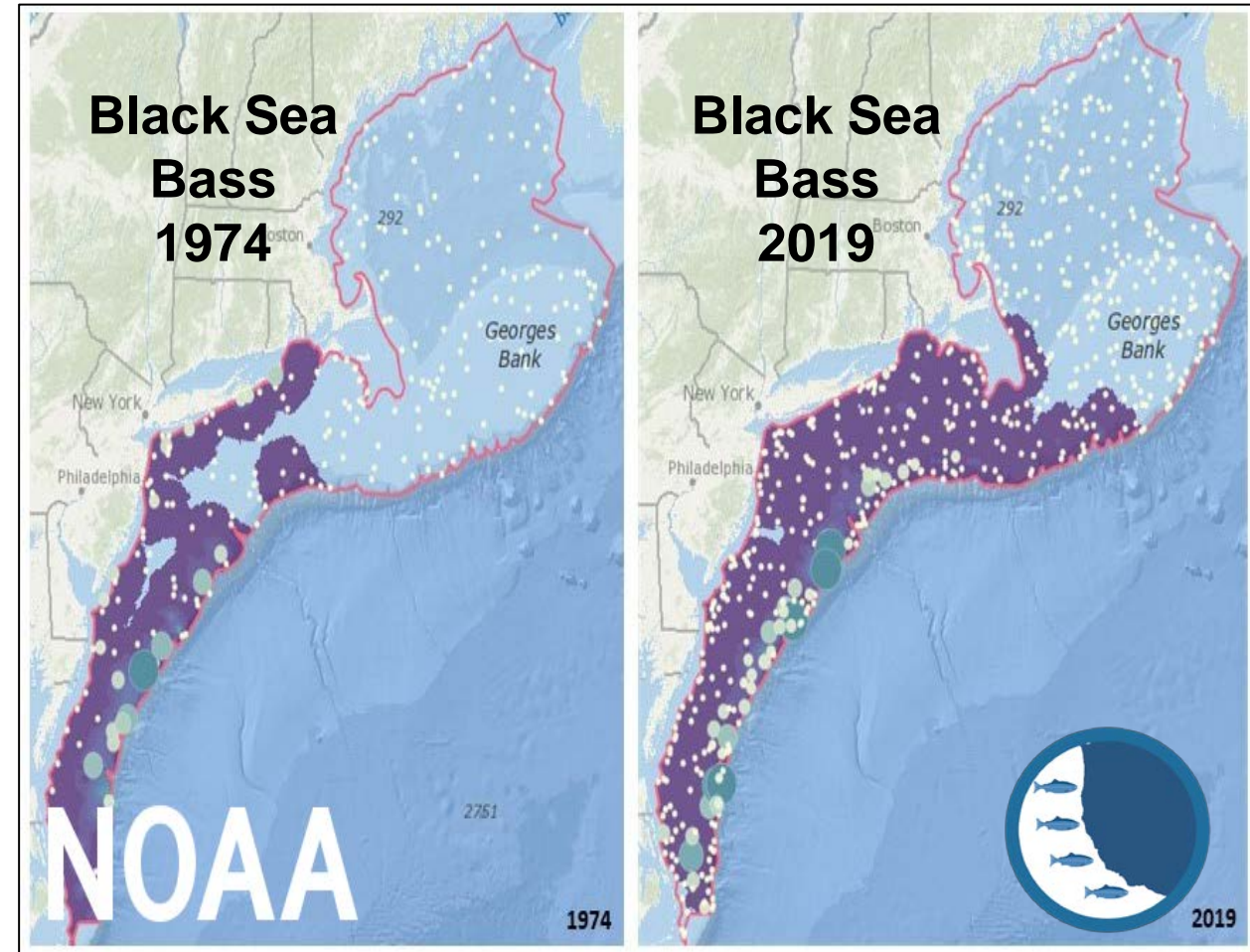
- **Building capacity to use climate information** (*information portals, toolboxes, trainings*)



- **Beginning to identify climate-ready management strategies** (*pilots in Bering Sea, West Coast, GOAlaska, Northeast*)

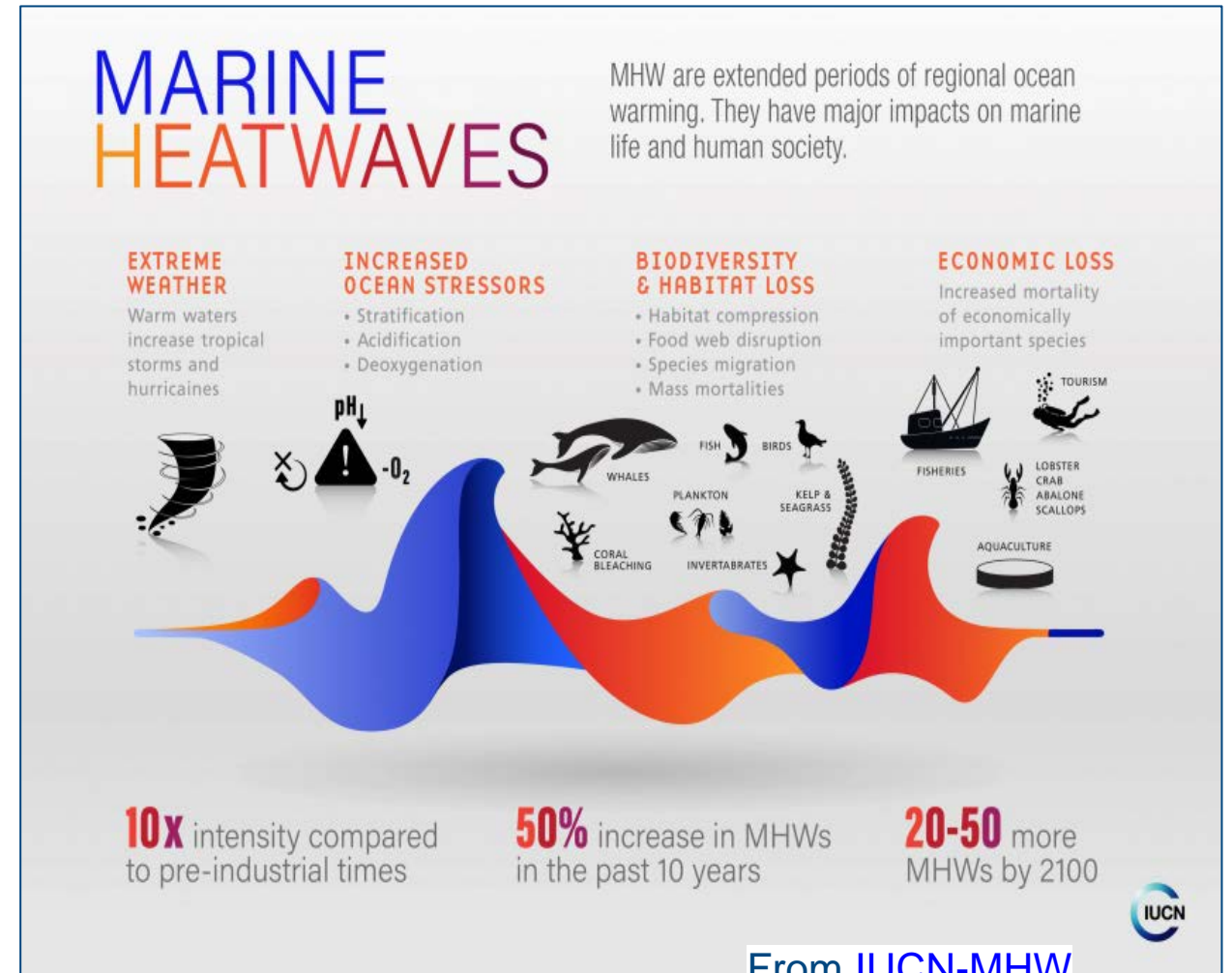
Distribution Mapping and Analysis Portal (DisMAP)

- [New portal launched April 19](#)
- Addresses decision-maker needs for information on changing species distributions
- Regular updates, robust analysis & easy access
- New features added over time (e.g., projections)
- Advancing best practices for species distribution modeling
- ***We welcome feedback to improve the new portal***



Predicting Marine Heat Waves

- [New global forecasts](#) provide up to a year's advance notice of marine heatwaves
- Forecasts will help resource managers, ocean users and coastal communities prepare and respond
- Empower decision makers and stakeholders with information to mitigate ecological and economic impacts



Future Plans

- Draft Climate Regional Action Plans for FY22-24
- NOAA Climate, Ecosystems and Fisheries Initiative (CEFI)
- FY23 Budget Request



Draft 2022-24 Climate Regional Action Plans

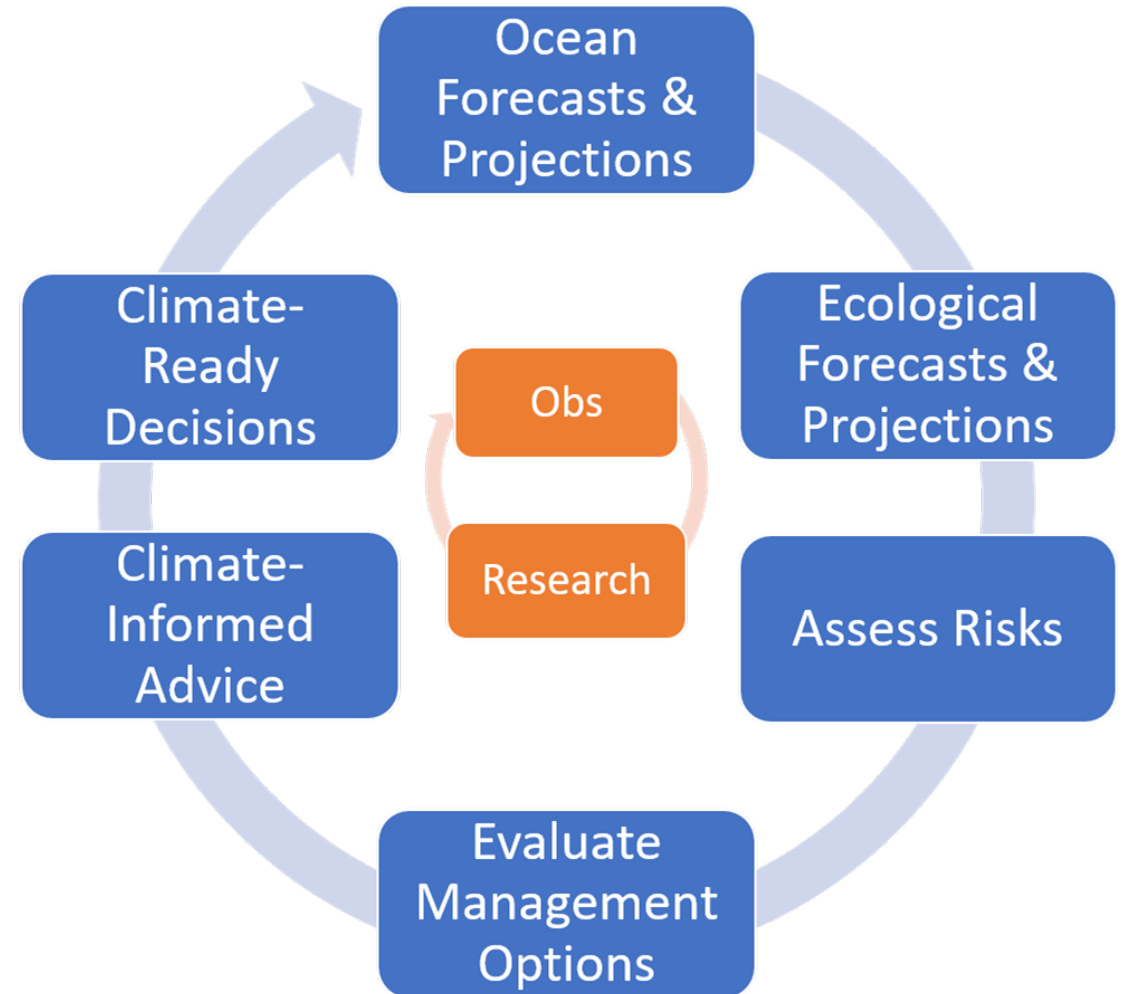
- Proposed actions over next 3 yrs
- Address key regional needs
- Coordinated cross- NMFS efforts
- Build on progress since 2016
- Informed by previous input
- ***Request for public input by June 2***
- ***More info here***



NOAA Climate, Ecosystems and Fisheries Initiative (CEFI)

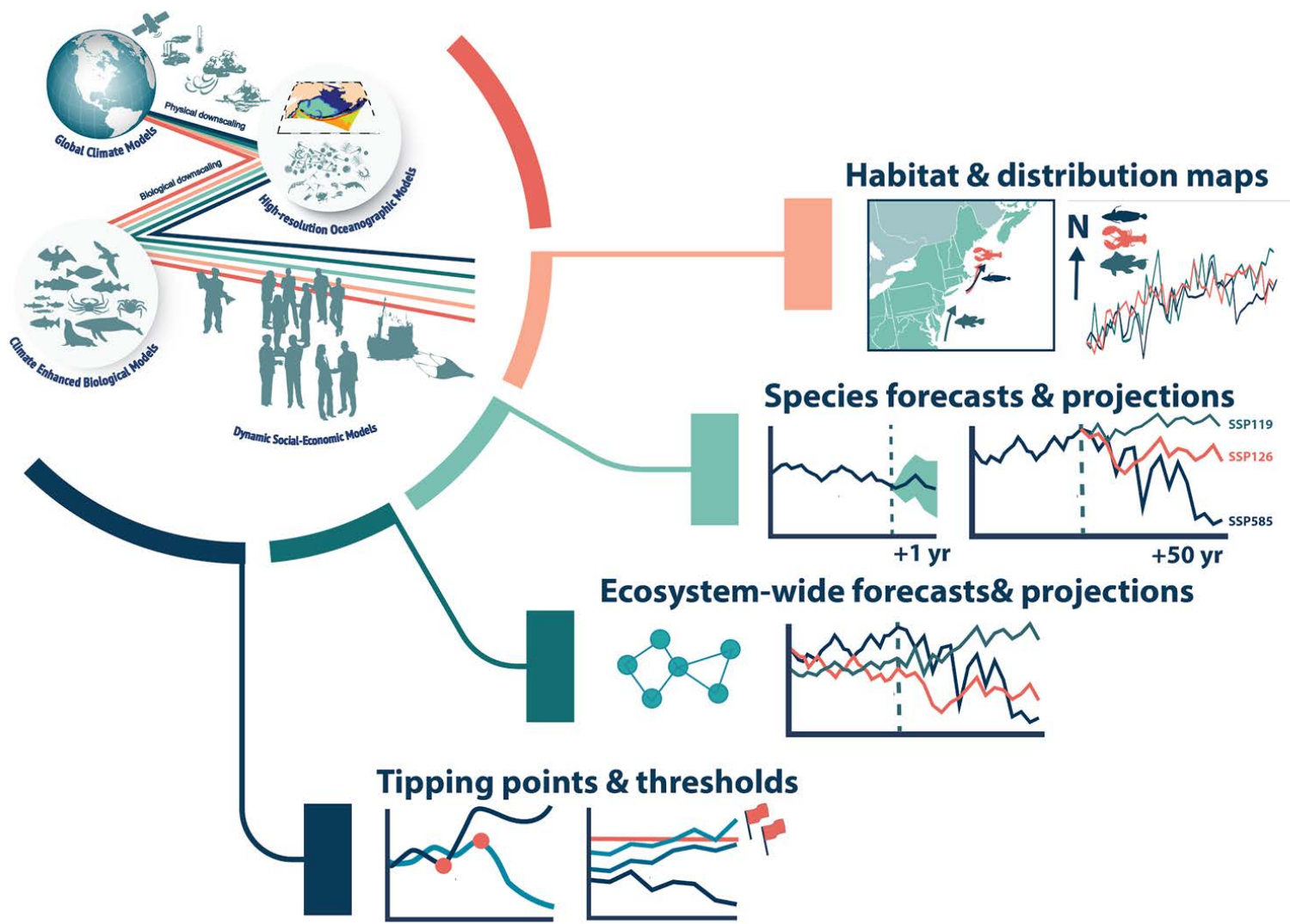
A cross-NOAA effort to provide climate-informed advice to reduce risks and increase resilience of marine resources and the people and businesses that depend on them.

- End-to-end system
- Robust forecasts and projections of future ecosystem conditions
- Operational delivery of climate informed advice
- Ongoing pilot projects (NE, West, GOAlaska, Bering Sea)



Decision Support Teams Provide Climate-Informed

A



Scenario planning



Risk Assessments



Rapid Responses



Consultations



Management Strategies



Recovery Plans

Current Status - CEFI

- Strong support from [NOAA Science Advisory Board](#)
- \$20 M requested in NOAA FY23 budget (\$10M each NMFS & OAR)
- CEFI pilot projects underway in four regions (Northeast, West Coast, Gulf of Alaska, and Bering Sea)
- Updating build-out plans for FY23-26
- Initial steps in CEFI will define additional observational and research activities needed to improve decision support
- Happy to provide more detailed information on CEFI

FY23 Budget Request

Line Item	Request
Climate-informed Fisheries Assessments & Management Strategies for Changing Oceans	\$10M (OAR has matching request)

Offshore Wind Energy Development



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Offshore Wind Energy Development - A National Issue



Offshore Wind Energy Development - 6 Buckets of Need

6 Buckets of Need	Status
1. Policy and Legislation	Providing Technical Drafting Assistance on various bills
2. Regulatory process	Overwhelmed in the Northeast; trying to set conditions in the Southeast and West Coast to learn from Northeast lessons
3. Science to support the regulatory process	
4. Surveys to assessment to advice	Have a Draft Implementation Strategy ; will finalize in June
5. Science for understanding	Need national and regional science plans - effect of offshore wind energy development on coastal and marine ecosystems, including human communities
6. Fishing Industry Mitigation	Working to co-develop fishing industry mitigation with BOEM and the states



NOAA and BOEM Survey Mitigation Strategy

- Implementation of a draft Federal Survey Mitigation Strategy
- The strategy identifies the essential components of mitigating the impacts of offshore wind energy development on the surveys, as well as actions to accomplish the goals and objectives of mitigation
- Share experiences and lessons-learned with other regions where offshore wind energy development is being planned and occurring



FY23 Budget Request

Line Item	Request
Wind Energy: Fisheries Science & Technical Review (Bucket 3)	\$8.7M
Wind Energy: Scientific Survey Mitigation (Bucket 4)	\$17.4M
Wind Energy: Protected Species Environmental Reviews and Science (Bucket 2 and 3)	\$4.5M
Wind Energy: Fisheries Management (Bucket 3)	\$6.2M

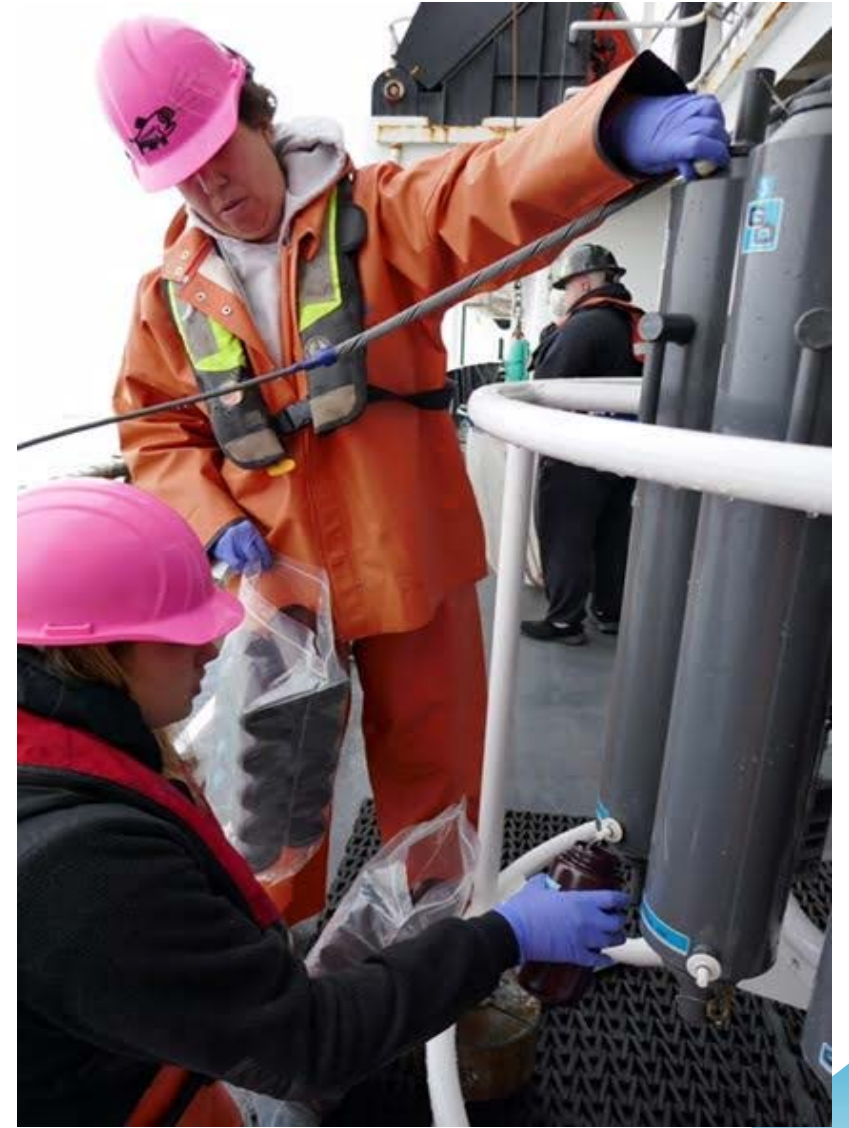
Adapting the Survey Enterprise



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NOAA Fisheries Surveys

- NOAA Fisheries' surveys are essential for:
 - the sustainable management of our nation's fisheries,
 - recovery of protected resources, conservation of habitats and ecosystems,
 - and understanding the impacts of climate change
- This data forms the scientific foundation for our management and conservation work



Fishery-Independent Surveys FY2022

	Quarter 1	Quarter 2
Completed (NOAA/Charter/Small boat)	6 / 9 / 1	2 / 1 / 1
Cancelled (NOAA/Charter/Small boat)	1	2
Underway (NOAA/Charter/Small boat)		1



Survey Vision for the Future

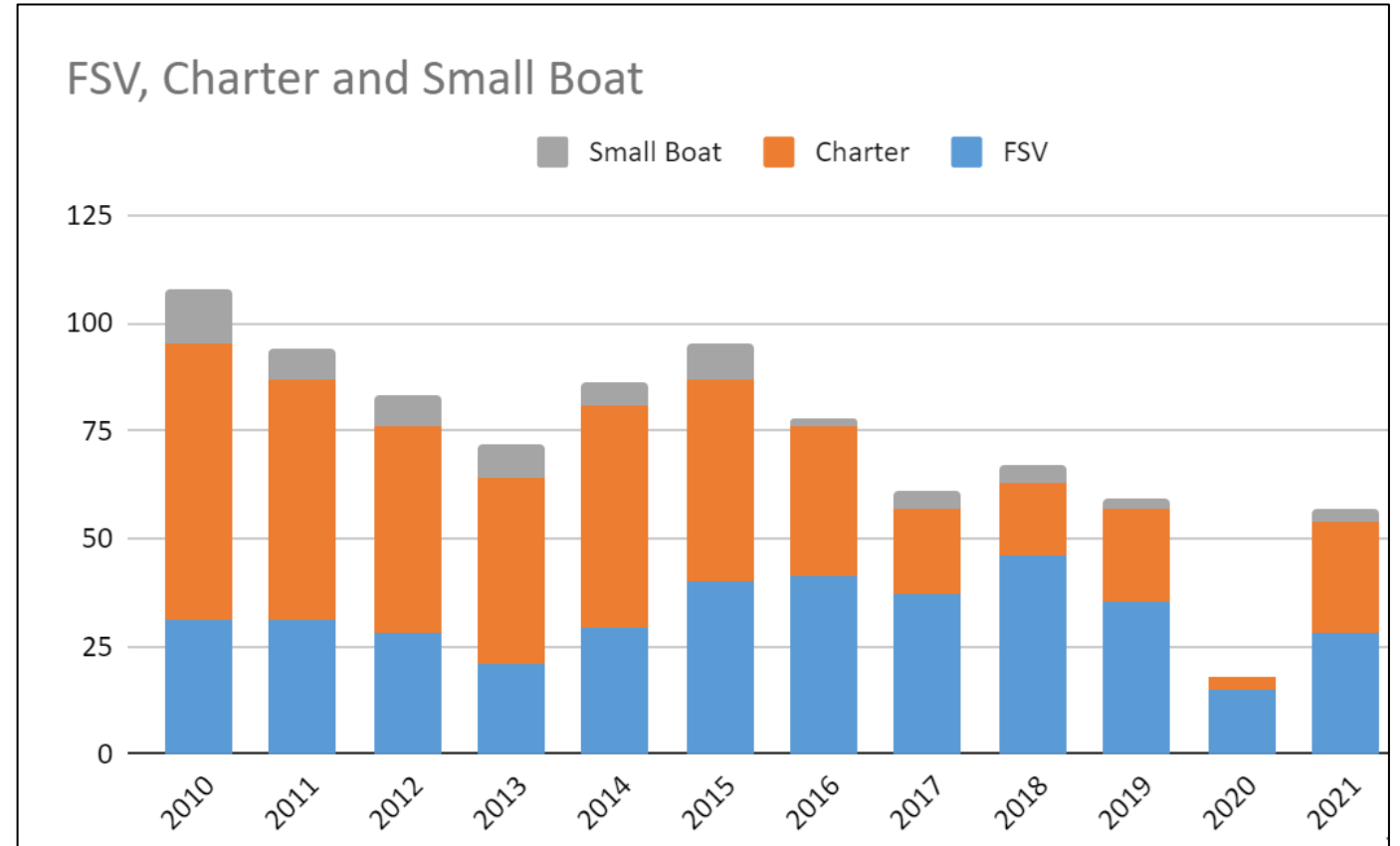
- **Sustain** core strength while we build the **additional capacity** needed to face the ever-growing challenges of climate change
- **Modernize** - Evaluate and implement **new technology platforms** for collecting data and enhancing workforce proficiency
- **Strengthen** survey **planning, prioritization, and management** of survey resources to optimize return on investment



Sustaining Current Survey Enterprise

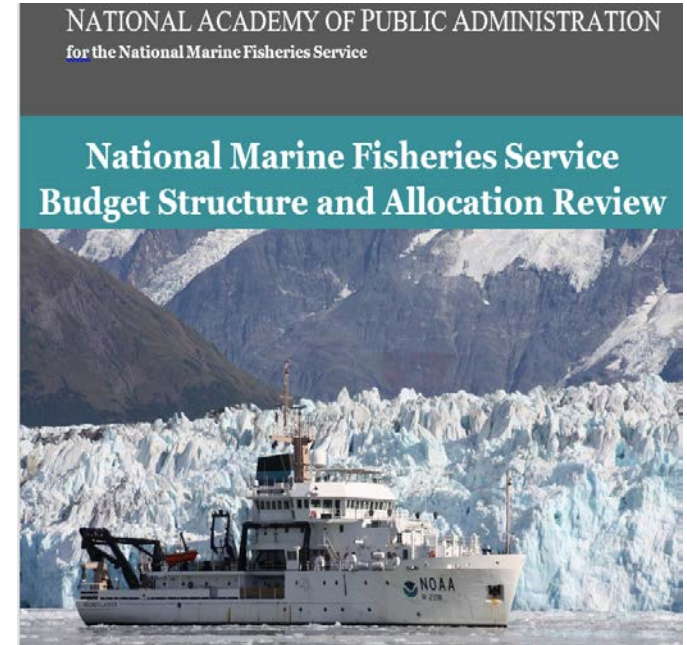
Goals to sustain our survey enterprise:

- Restore capacity
- Expand regional coverage
- Increase data collection
- Continue advanced technology initiatives
- Increase staff proficiency



Strengthen National Survey Program Management

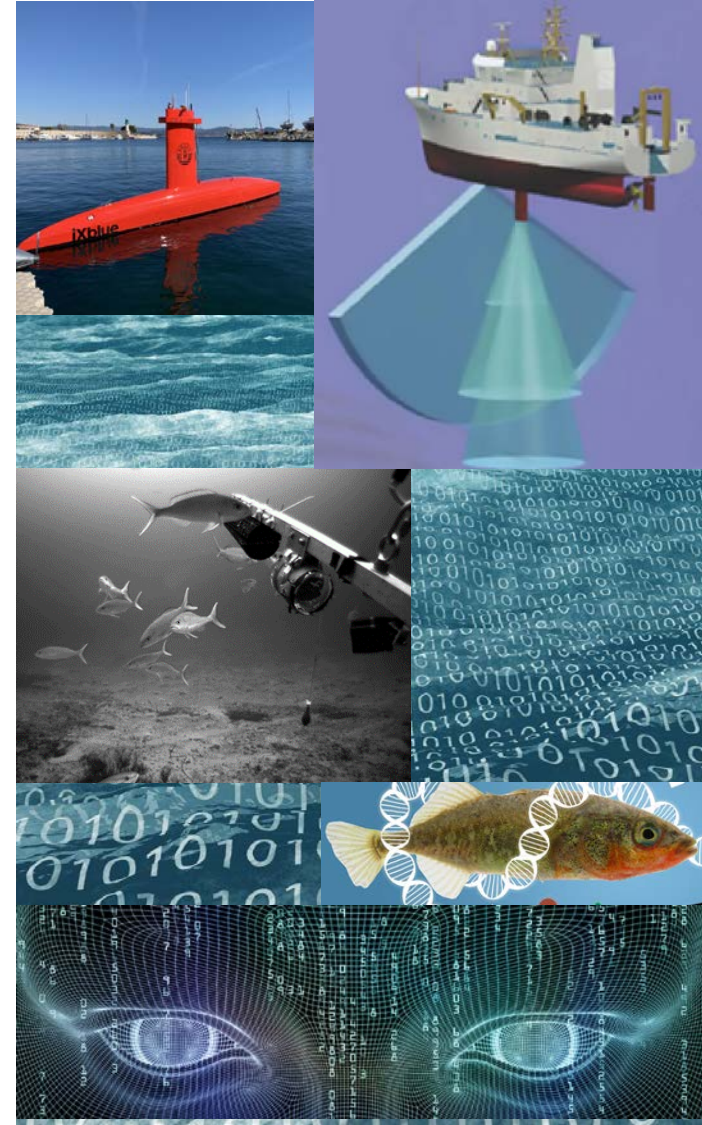
- Elevate the **national program management model** (e.g., produce annual survey and stock assessment priority list)
- Continue national survey program **cost analysis**
- Improvement of national survey **prioritization**, budget formulation, and execution
- Continual attention to emerging **gaps** in NMFS' survey vision



Modernize the enterprise

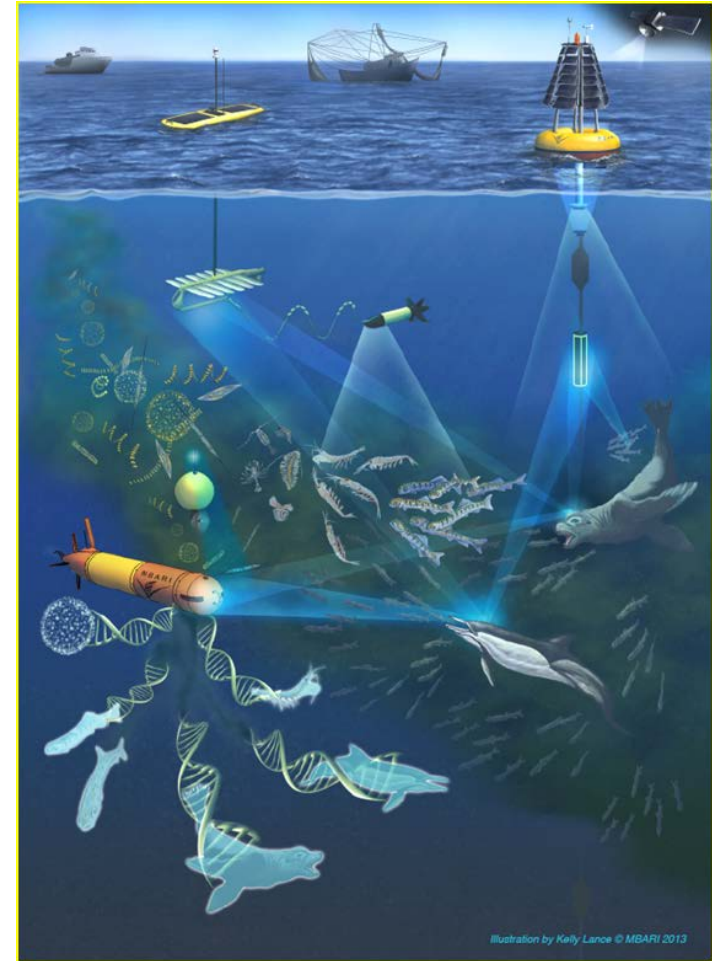
Surveys will need to expand to collect essential data about our “new ocean”

- This requires a suite of new operational approaches: Next-Generation Data Acquisition Plan (**NG-DAP**), **Fleet Recap**
- Exponential increase in acquired data volume will require modernized data management and analysis: **FIMM, NMFS Data Vision 2022**
- Survey enterprise supports assessments, as well as ecosystem forecasts and societal needs: **CEFI, HPC, EJ**
- Advance workforce proficiency (training and new hires)



Data Acquisition and our Future Science Enterprise

- Targeting the use of **innovative technologies** (e.g., UxS, 'Omics)
- **Modernizing fishery information** collection, management, and dissemination systems
- Optimizing Artificial Intelligence and Machine Learning (**AI/ML**) capabilities
- Developing **next generation analytical and modeling tools**



Next Gen-Data Acquisition Planning Feedback

- Identify current and future data needs and priorities relevant to NOAA Fisheries and NOAA missions in a changing ocean environment
 - Internal questionnaire capturing feedback from NOAA Fisheries headquarters, regional offices, and science centers
 - Five public listening sessions to capture information from external stakeholders (> 300 attendees)



What are the biggest challenges
you see for NOAA Fisheries
Science?



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