

# IOOS Marine Life Progress and Planning: Monitoring Ecological Change Through Observing Systems

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IOOS Advisory Committee, Dec 2021

# Marine Life Obs Are Needed

- We know this from the Census of Marine Life!
- Marine Protected Areas (Sanctuaries, Reserves)
- Protected species and critical habitat
- Integrated Ecosystem Assessment, status reports
- Climate modeling and adaptation
- Sustainable use (fisheries, energy, recreation, etc)

# U.S. and Global Policy Relevance

- Biodiversity prominent:
  - High Level Panel for a Sustainable Ocean Economy (US joined in Nov)
  - Ocean Policy Committee high-level priorities
  - America the Beautiful, 30 x 30 voluntary goal
- Biodiversity Interagency Working Group elevated to SOST;
  - NOAA/IOOS co-chairs with NASA, BOEM
  - Will be engaged on National Ocean Plan
- Ocean Obs 19 decadal commitment to biological observing
  - Advance biology and ecosystem EOVS
  - Links to UN Ocean Decade

# Why should IOOS collect marine life obs?


- IOOS marine life observations fulfill legislative mandates:
  - ICOOS Act Reauthorization (COORA)
  - Climate Solutions Act
  - Draft language under development within:
    - Marine Mammal Research and Response Act
    - National Defense Authorization Act
- IOOS Enterprise partnership capabilities - second to none!

IOC-endorsed; proposed by:



**MBON**  
Marine Biodiversity  
Observation Network

**IOOS**  
Integrated Ocean  
Observing System

 Smithsonian



**BOEM**  
Bureau of Ocean Energy Management



**NOPP**  
National  
Oceanographic  
Partnership  
Program

**GOO BON**

**Ameri  
GOOSS**

**BLUE PLANET**  
Oceans and Society

**CONSORTIUM FOR  
Ocean Leadership**

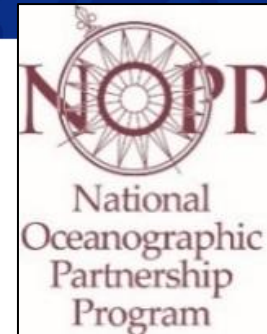
Many US and international academic  
and civil society partners

Ocean Shot 

The National  
Academies of  
SCIENCES  
ENGINEERING  
MEDICINE

# Progress to date

- Interagency investment in MBON, ATN
- MBON: NOPP success story since 2013
  - NOAA, NASA, BOEM, ONR
- 2022 NOPP call expands focus on Marine Life
- Successfully implemented foundational components in the SOST 2016-2021 ATN Implementation Plan
  - Community Alliances/Collaborations, National Data Aggregation Center, Baseline Telemetry Observations
  - Fed/non-Fed Steering Group guidance and leadership since 2017
- IOOC task teams
  - Biological Integration and Observation (BIO) 2013-2015
  - Biology Integrating Core to Essential Variables (BIO-ICE) 2021-2022



# Supporting FAC Recommendations

- Align outcomes of OceanObs'19 with emerging priorities, programs, and concepts linked to the UN Ocean Decade
- Crosswalk essential ocean, biology, climate, and other relevant variables; suggest best practices or standards to integrate the data local to global
- Use NOPP
- Enable partnerships

# IOOS Marine Life Program

WHERE IS THE MARINE  
AND AQUATIC LIFE ?



HOTSPOTS

"Microbes to Whales"

WICLODS2 10 AUGUS2

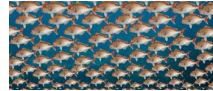
WHO'S THERE ?



BIODIVERSITY

**MBON**  
Marine Biodiversity  
Observation Network

HOW MANY?



ABUNDANCE

WHERE'D THEY COME FROM ?  
WHERE ARE THEY GOING ?



MOVEMENT

and WHY ?





# Vision and President's Budget Request

- Vision: to ensure long-term, sustained marine life observation capability
- Scope: focus on species and movement, observations of life
- FY22 President's Budget
  - \$15M for grants to external partners that expand the collection of marine life observations, support analysis of marine life data and information products, and forecast the implications of climate change on living resources and ecosystems external awards
  - \$2M for IOOS staffing and capacity (eg establishing a Marine Life Data Assembly Center)
  - \$4M Ecosystem Moorings (includes acoustics, genomics)

# Approach

Implement a sustained marine life monitoring, analysis and interpretation program by maintaining existing marine life efforts in the IOOS Regions, supporting proposed NOPP and RA Tier 2 activities and adding new activities that address regional requirements and national priorities

*National level priorities include:*

*Sustained biodiversity/tagging operations*

*Passive & active acoustics/soundscapes*

*National-level assessments, status & trends*

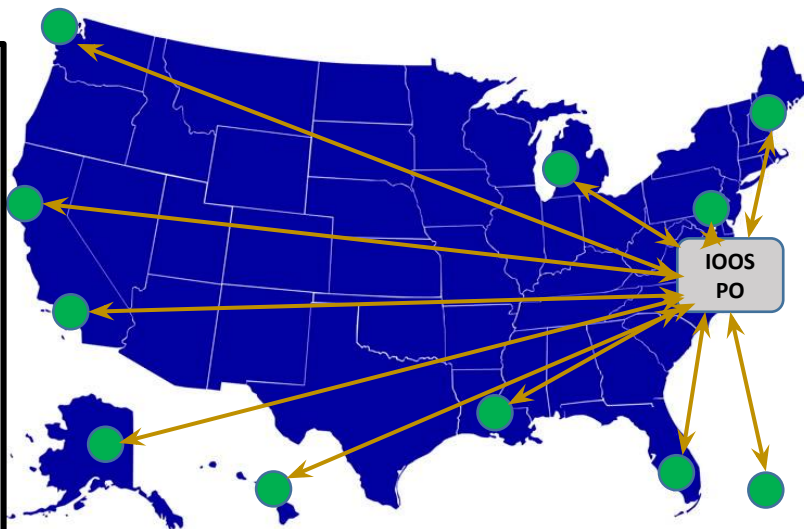
*Data analysis, interpretation & information*

*Sentinel science & indicators*

*Vulnerability & adaptation*

*Catching the coastal climate signal*

*Advancing global efforts (GOOS, GEO BON/MBON, Marine Life 2030, AniBOS)*



# FY22 Funding Categories

Regional data wranglers

New deployments, O&M (via RAs)

NOPP Marine Life NOFO - new projects

Marine Life DAC

NCEI archival support

Development of data products with partners

Argos fees

Global activities

# Critical Components

1. Support existing and new base level observational efforts
2. Expand existing national cyber infrastructure; create, integrate and serve national and regional data, analyses and information products
3. Add management and dedicated data handling positions
4. Continue the successful interagency competitive NOPP process to award new and innovative observing capabilities while building upon and leveraging the IOOS regional observing, data, and prediction systems.

# Requests

- Elevating the marine life message
- Ensuring advocacy, resources
- What's the message?
  - IOOS niche: sustained marine life obs and data
  - Critical role for IOOS and always part of our mission
  - Currently a gap in our national observing capability
  - Multiple policy, legislative, global drivers
  - Cross-NOAA, interagency and stakeholder needs
  - Local to global relevance

# Thank you!

Time for discussion...



# Background Materials



# MBON and ATN Successes

- Producing MBON Seascapes at NOAA CoastWatch to map dynamic ocean habitats (<https://coastwatch.noaa.gov/cw/satellite-data-products/multi-parameter-models/seascape-peglogic-habitat-classification.html#:~:text=MBON%20Seascapes%20identifies%20spatially%20explicit,at%205%20km%20spatial%20resolution>)
- Advancing use of new technologies and approaches - eDNA, passive acoustics, animal telemetry, satellite remote sensing imagery, artificial intelligence
- Ensuring data and information availability for resource managers, scientists, educators, and the public
- Partnering with the Ocean Biodiversity Information System (OBIS) to advance best practices and standards for biological data management
- Sharing data via the MBON Data Portal (<http://mbon.ioos.us>) and ATN Data Assembly Center (<https://atn.ioos.us/>)
- Innovative modeling approaches contextualize and extend organismal and ecosystem-wide observations to enable regional understanding of dynamic biogeographic patterns and underlying oceanographic processes, sustainable marine biological surveys, enhanced monitoring methodology, and real-time synoptic ecosystem assessments
- Addressing priority themes and recommendations from the ATN/MBON Regional Stakeholder Workshops (<https://cdn.ioos.noaa.gov/media/2021/08/ATN-Regional-Workshops-Summary.pdf>)
- Supporting education and research to build a diverse, equitable, and inclusive blue workforce



# Stakeholder expressed needs

Marine Life observations are needed to:

- Assess ecological change
- Identify hotspots, species aggregations
- Document impact of climate driven oceanographic processes on living resources
- Inform adaptation strategies and management
- Prioritize areas for conservation and restoration
- Track ecosystem sentinel species for insight into ecosystem function, human health risks and future change

# IOOS Marine Life Goals

- Stakeholders want information, not data
- Move beyond just proxy measurements
- Expand collection of marine life observations in the ocean and Great Lakes
- Support analysis of marine life data; co-develop products with users to ensure relevance for management and decision making
- Forecast implications of climate change on living resources and ecosystems
- Integrate with physical, chemical, biogeochemical obs
- Advance new technologies