U.S. OFFSHORE WIND
SYNTHESIS OF ENVIRONMENTAL
EFFECTS RESEARCH

Oceanographic Responses to Offshore Wind: From First Principles to Potential Effects

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Pacific Northwest National Laboratory

NREL Transforming ENERGY

Pacific Northwest NATIONAL LABORATORY

Today's Agenda

Introduction (10 min)

Joy Page, DOE WETO

SEER Overview

Introduction to topic

Presentations (30 min)

- **Eileen Hoffman,** Old Dominion University
- **Beth Scott,** University of Aberdeen
- **Kaus Raghukumar,** Integral Consulting

Panel Discussion (20 min)

Moderated Questions

Audience Q&A

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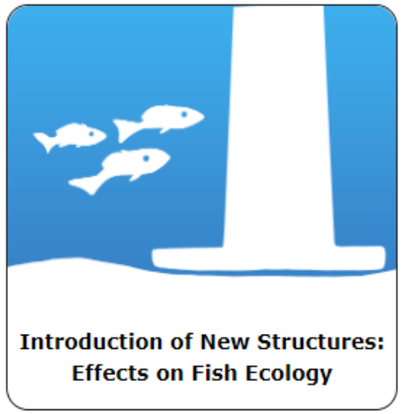
Funding for the SEER Project and this webinar come from U.S. Department of Energy, Wind Energy Technologies Office

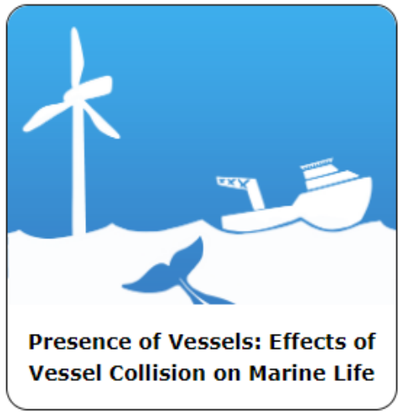
Joy Page, DOE WETO

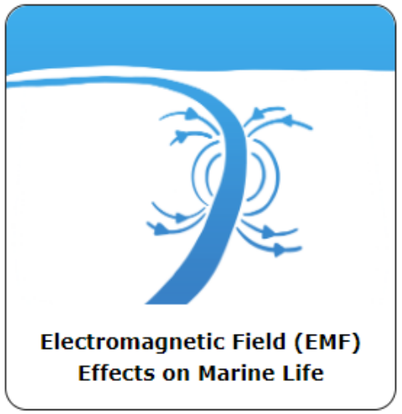
Introduction to SEER

SEER is led by the National Renewable Energy Laboratory (NREL) and the Pacific Northwest National Laboratory (PNNL) with funding from DOE WETO.

The objective of SEER is to share information on the environmental effects of offshore wind energy.

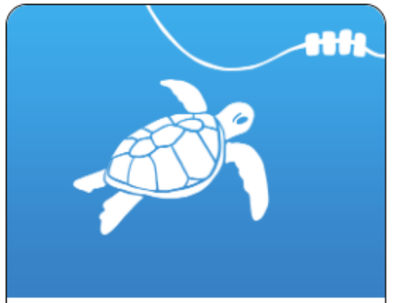

Introduction of New Structures: Effects on Fish Ecology


Presence of Vessels: Effects of Vessel Collision on Marine Life


Electromagnetic Field (EMF) Effects on Marine Life


Underwater Noise Effects on Marine Life


Bat and Bird Interactions with Offshore Wind Energy


Risk to Marine Life from Marine Debris & Floating Cable Systems


Benthic Disturbance from Foundations, Anchors, & Cables

Introduction to SEER

Research Briefs

Review state of the knowledge on stressor/receptor interactions, monitoring methods and technologies, mitigation measures, and cumulative impacts.

Webinar Series

Disseminate findings presented in Research Briefs and share latest research including minimization and monitoring strategies.

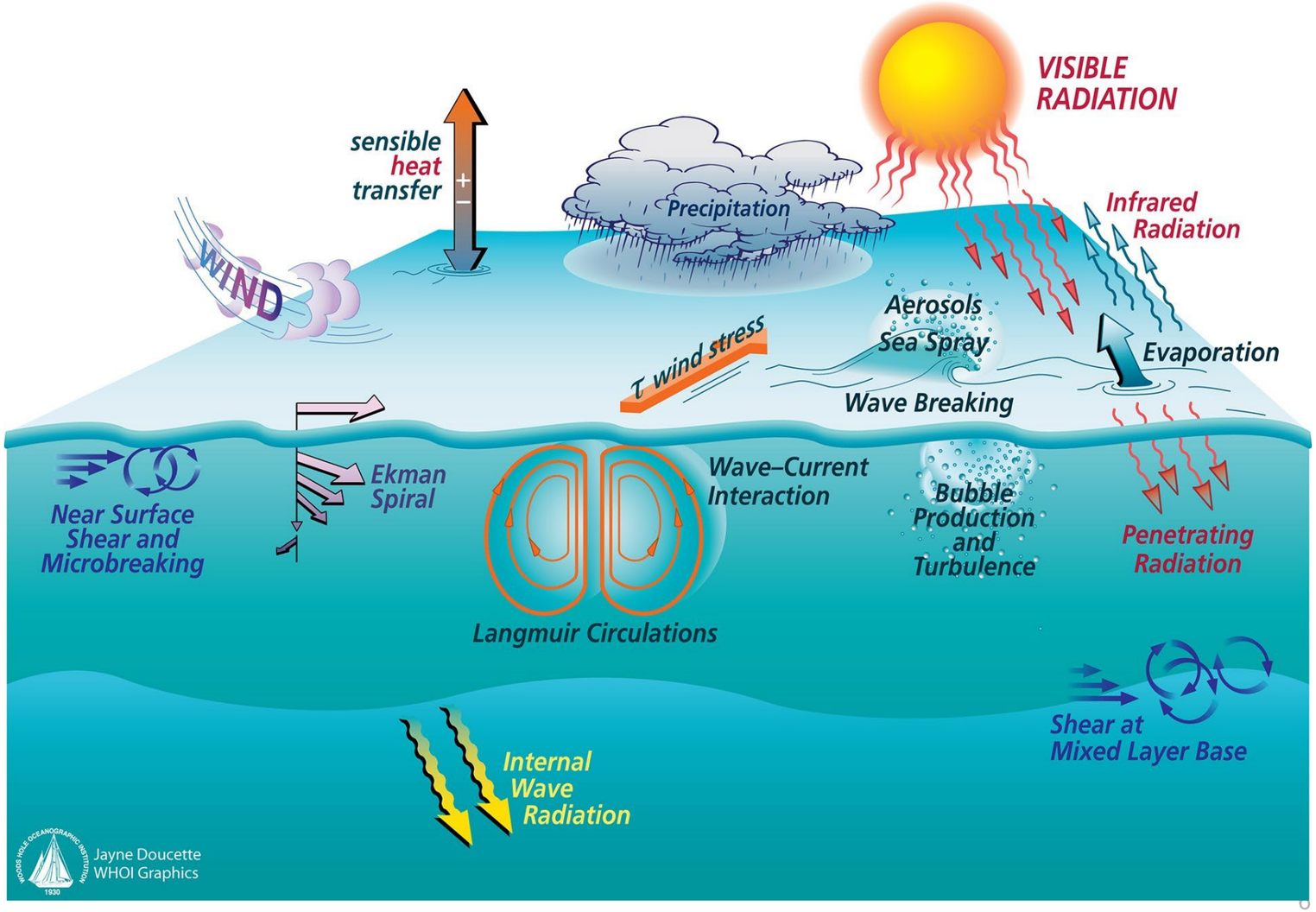
Research Recommendations

Summarize information gaps, barriers, and current challenges for U.S. Atlantic and Pacific Coasts to inform or guide future development efforts.

For more information, visit: https://tethys.pnnl.gov/seer

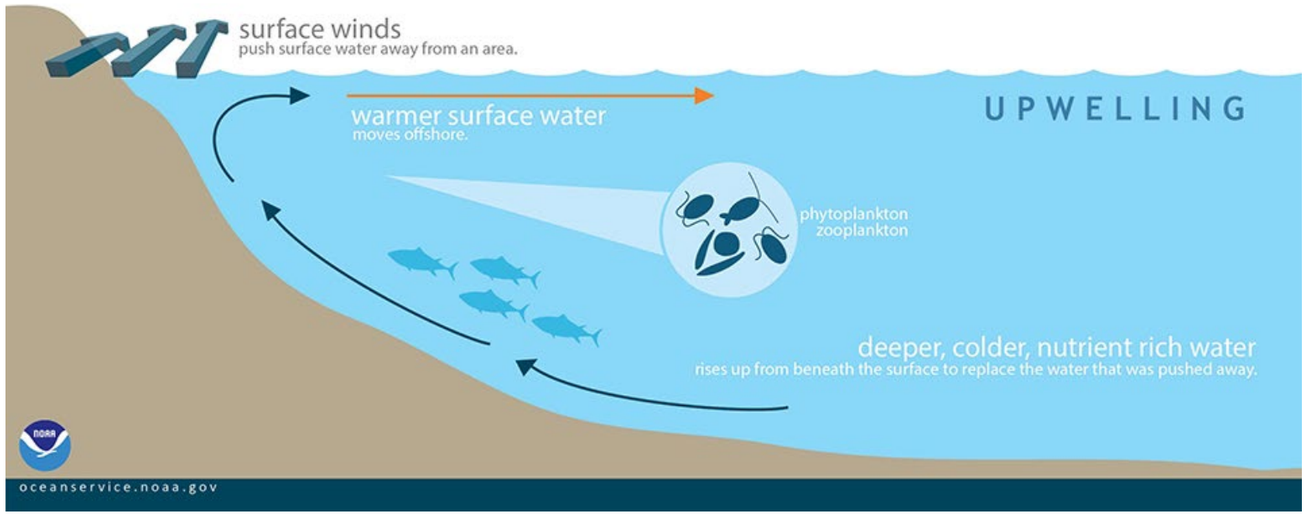
Oceanography - Physical Processes

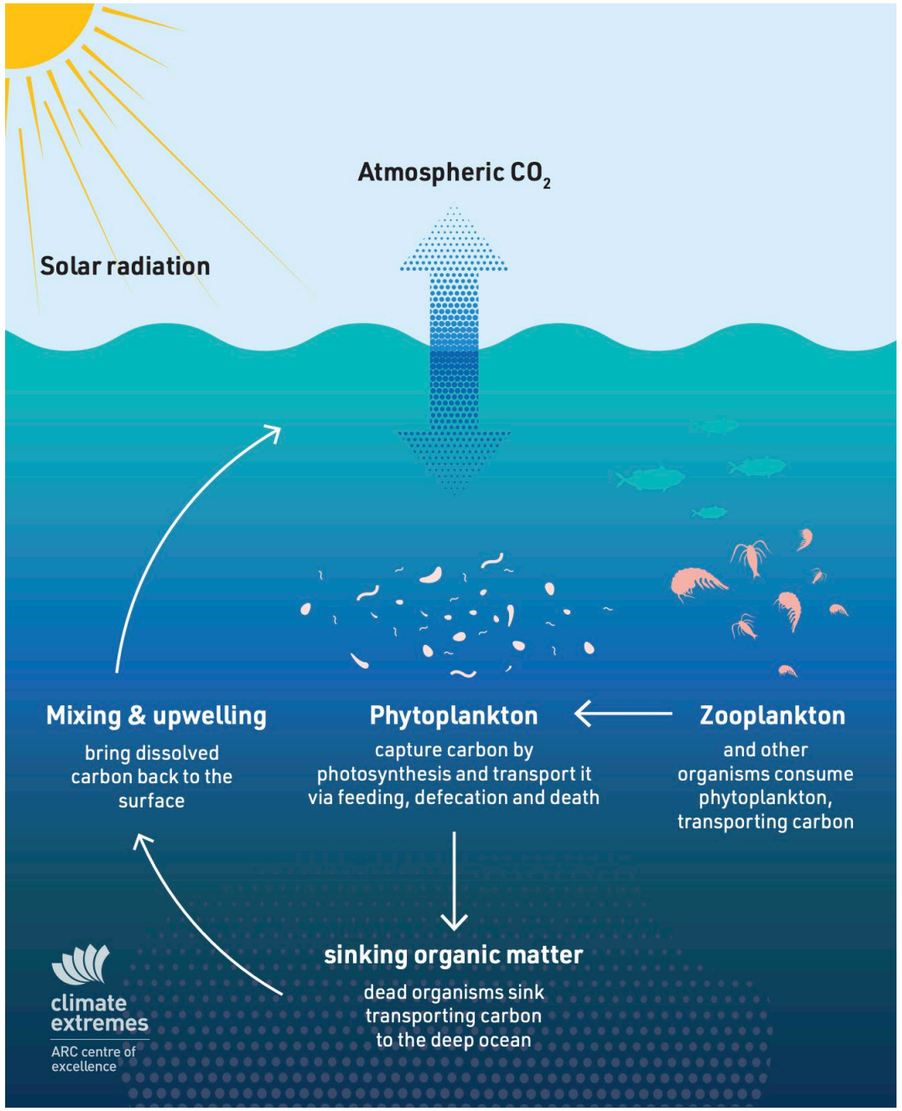
- Dynamics between the ocean and atmosphere and solar energy drive processes in the ocean's surface layer
- Ocean plays a key role in regulating the climate



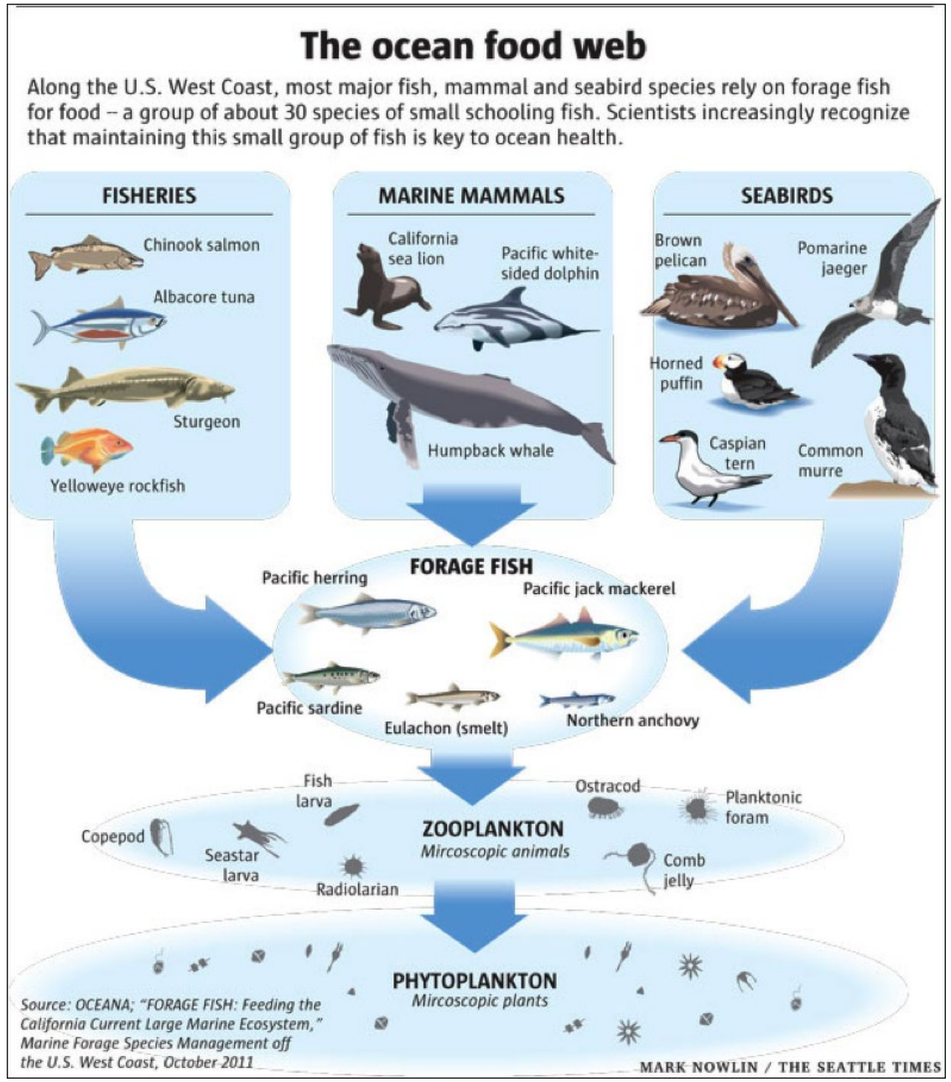
Drivers of Biological Productivity

- Physical processes affect nutrient availability
- Nutrients are critical to phytoplankton that are the foundation to marine food webs

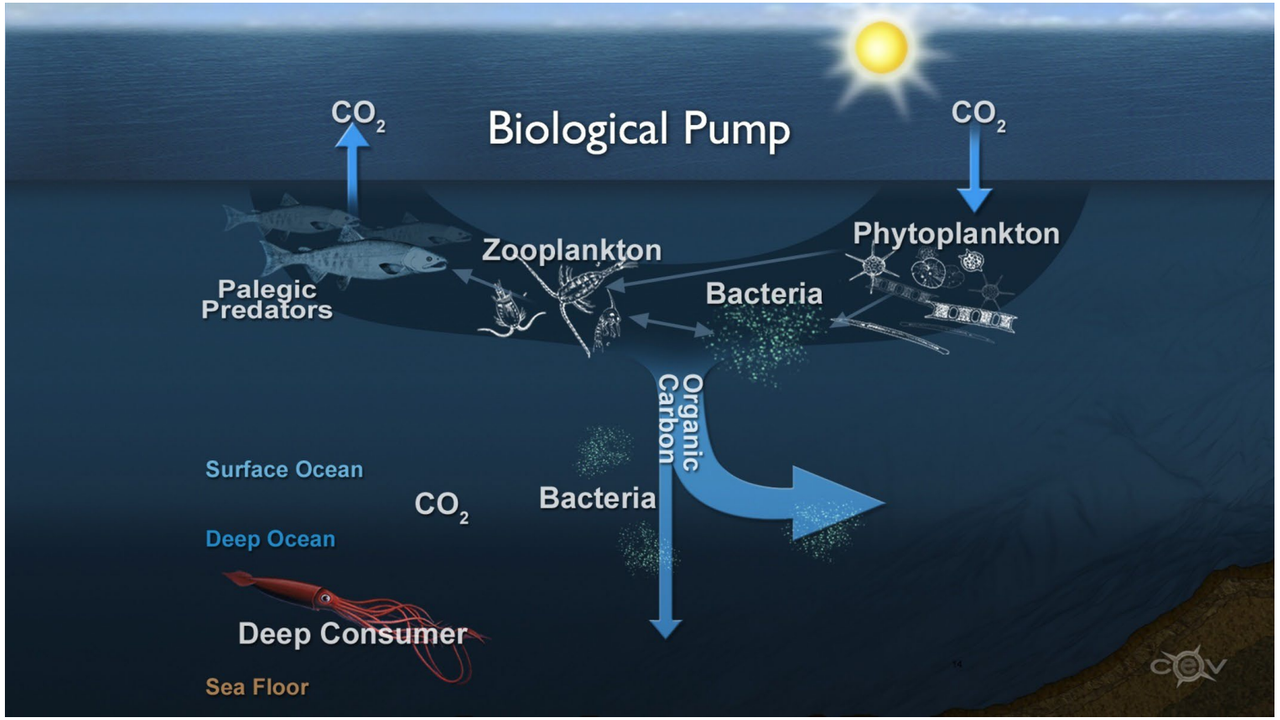




Ocean Food Web and Biological Pump

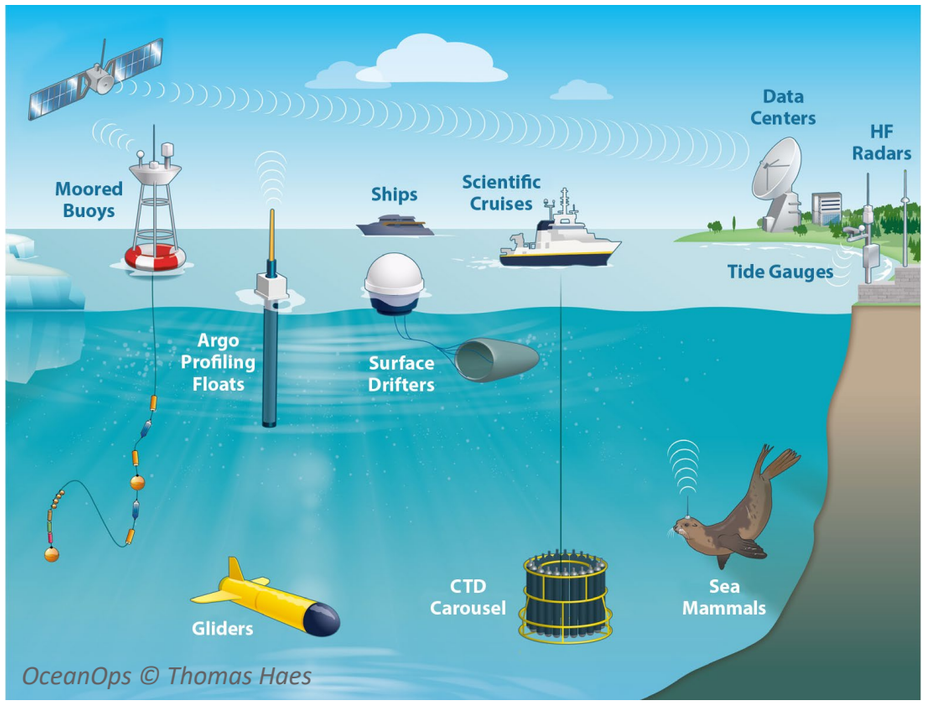


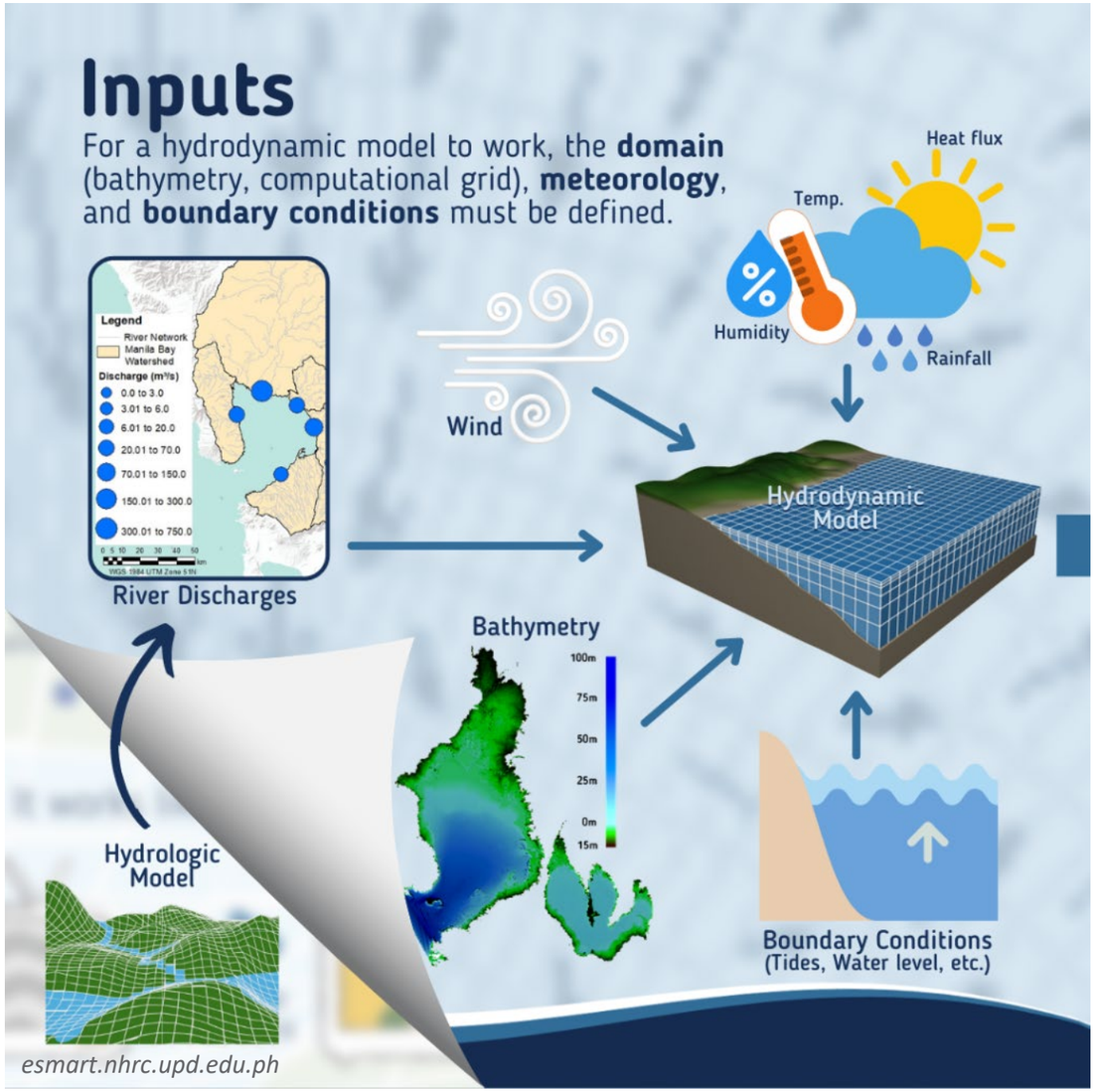
- Productivity fuels life in the ocean
- Biological pump sequesters carbon



Ocean Observing and Modeling

- Ocean observing and modeling are critical to understanding oceanographic dynamics and understanding baseline conditions
- Tools to evaluate potential effects of offshore wind





Speakers

Oceanographic Responses to Offshore Wind: From First Principles to Potential Effects

Eileen Hoffman
Professor and Eminent Scholar
Old Dominion University

Beth Scott
Professor
University of Aberdeen

Kaus Raghukumar
Senior Consultant
Integral Consulting

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Discussion

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Thank you for joining today

For more information about offshore wind and environmental effects, visit

https://tethys.pnnl.gov/seer

The SEER webpage includes

- **Educational research briefs**
- **Scientific literature**
- **Webinar recordings**
- **Research recommendations**

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