Next Generation Aquaculture Planning

NOAA'S OCEAN SERVICE SUPPORT FOR SUSTAINABLE AQUACULTURE IN THE U.S.

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Purpose

- *To provide an overview of NOAA's integrated aquaculture program as it stands today with particular focus on NOS/NCCOS.*

- *To explore how NOAA's integrated aquaculture program partners can assist the SAB in developing their aquaculture work plan*

Key Issues for SAB

- NOS aquaculture role relative to NMFS and OAR
- Importance of science-based siting for sustainable aquaculture expansion
- Intersection with ecological forecasting (e.g. for HABs and pathogens)

NOAA Aquaculture Program

Oceanic and Atmospheric Research	National Marine Fisheries Service	National Ocean Service
		
Funding for research, extension and eduction Technical support to small businesses Great Lakes aquaculture research Legal research on permitting in state waters	Funding for research and development Coordination across regional science centers Aquaculture regulation and policy Outreach and education support	Spatial planning and siting Environmental monitoring Environmental modeling Ecosystem services

NOS Aquaculture Role

- Coastal Planning and Siting
- Environmental Interactions (modeling, monitoring, forecasting)
- Ecosystem Services (e.g. habitat, water quality, C sequestering)

Spatial Planning

Why we need spatial planning for aquaculture

- Reduces use conflicts
- Ensures environmental protection
- Streamlines permitting
- Increases investor confidence

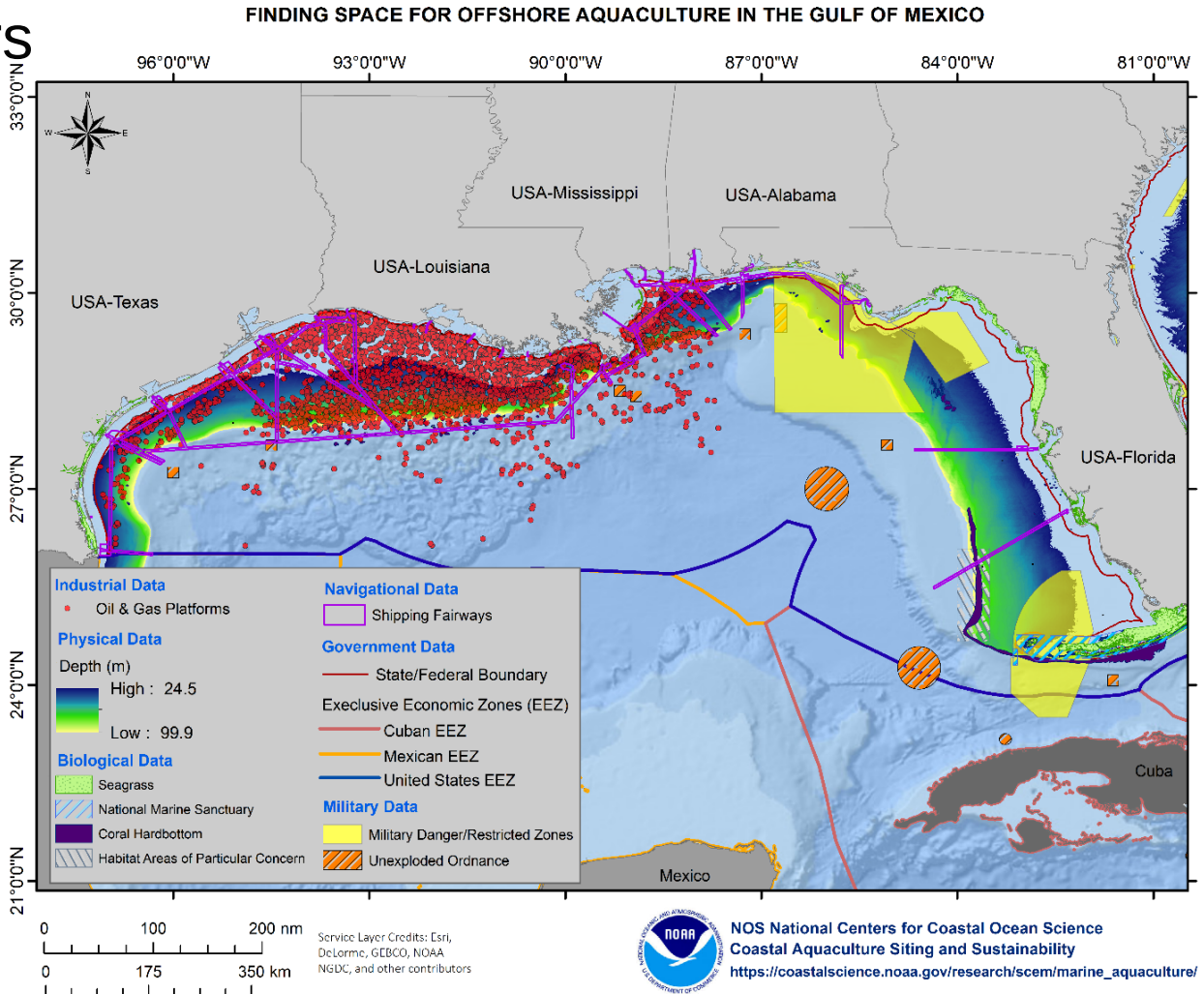
How we use spatial science

- Provide geospatial data for industry/coastal managers
- Delivers publically available map viewers
- Alternative siting analyses for commercial projects
- Regional planning (aquaculture development areas)
- National planning (economic opportunity analyses)

Spatial Planning Tools

The Gulf AquaMapper

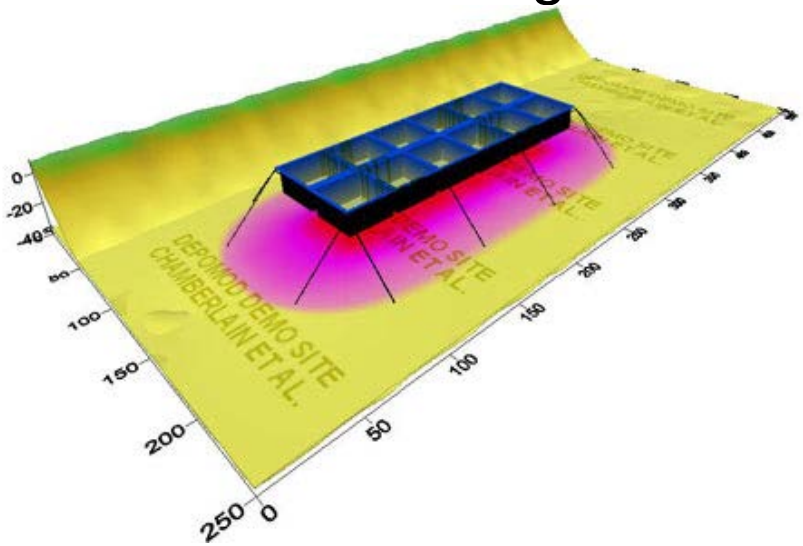
- Over 65 data layers
- Navigation
- Industries
- Natural resources
- Oceanography
- Military zones

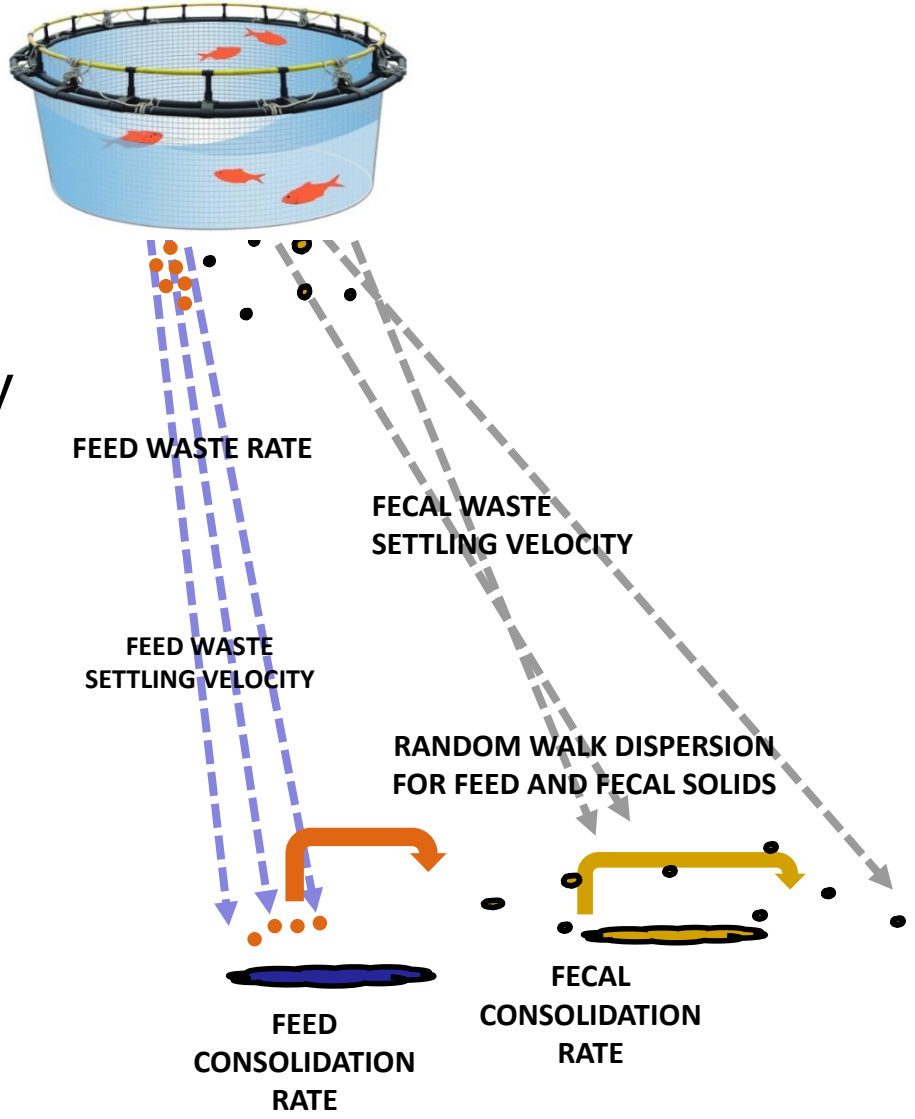


Environmental Modeling

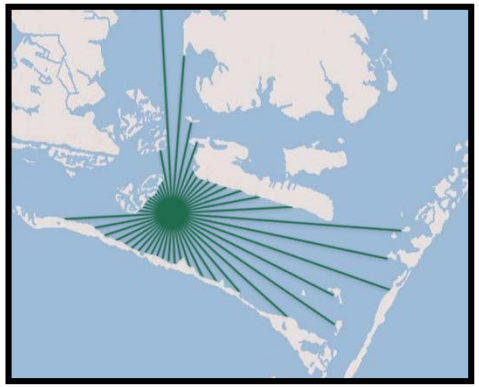
What models do…

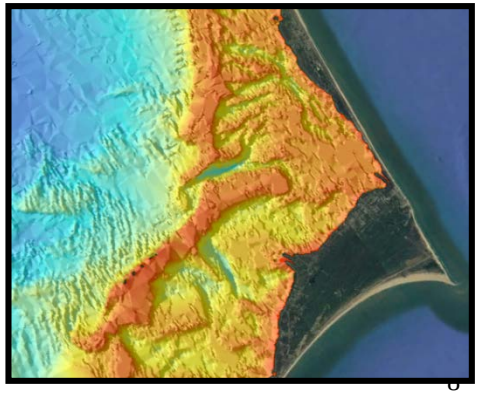
- Allow precision siting
- Predict impacts
- Inform farm planning
- Alert regulatory community
- Reduce concerns
- Provide due diligence





Wave Modeling to Inform Aquaculture Siting



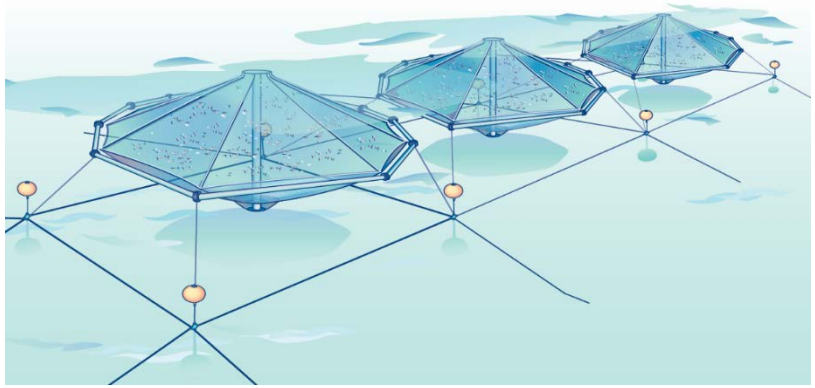


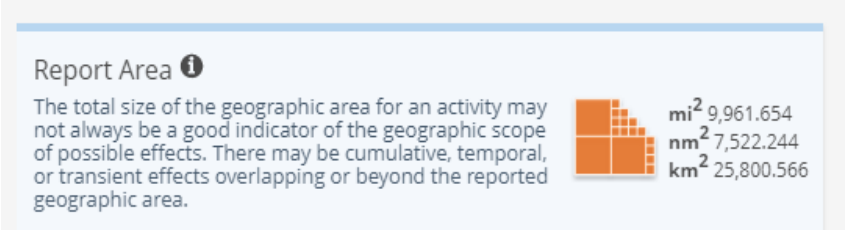
On Demand Spatial Planning

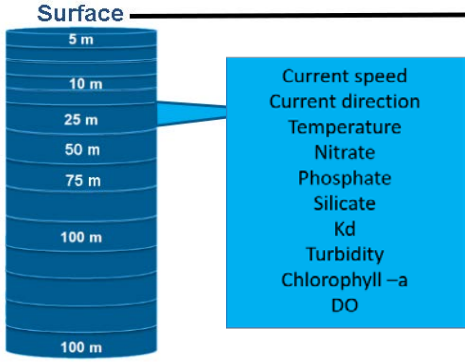
COMING SOON

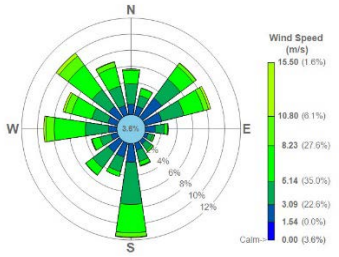
Ocean Reporting Tool

- General profile
- Energy and Minerals
- Natural Resources and Conservation
- Transportation and Infrastructure
- Biophysical and Oceanographic









Ecosystem Services

Ecosystem

- Habitat for finfish & shellfish
- Increased production
- Stabilize shorelines
- Eutrophication reduction
- Improved water clarity

Economic/Social

- Harvestable $eafood
- Jobs
- Working waterfronts
- Food security
- Cultural resource

Ecoforecasting & Aquaculture

Puget Sound Temperature Warnings

Shellfish Growing Areas

Click on the Growing Area below to see the Air Temperature forecast and corresponding Time to Cooling.

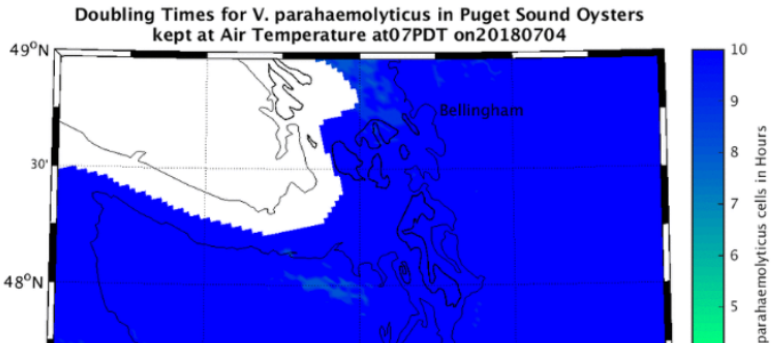
Growing Areas	2018 Risk Category
Alden Bank	1
Anderson Island	1
Annas Bay	
Bainbridge South	
Bay Center	
Birch Bay	
Blake Island	
Bruceport	

Pacific Northwest Forecasts

Doubling Time of *Vp* in Puget Sound Oysters

Vp Doubling Times | Air Temperature Forecasts | NCOM Salinity Forecasts

stop | |< | < | > | >| | rock | slower | faster



NOAA Coordination

Coordination with:

- DOE ARPA-e program
- NMFS Office of Aquaculture
- OAR Sea Grant
- NOS Office for Coastal Management
- Bureau of Ocean Energy Management
- The Nature Conservancy

Major Customers:

US Army Corps of Engineers

Desired Outcome

A fully integrated and effective NOAA Aquaculture Program that builds on the strengths of current multi-line office efforts to advance domestic aquaculture production.

This requires:

- *Engaging the external research and technology development community on aquaculture.*
- *Ensuring a robust NOAA laboratory backbone.*
- *Initiating regional pilot projects with university, federal and industry scientists to address critical science gaps.*
- *Enriching workforce training and education.*

Desired Outcome

Specific Requests of the SAB:

- *Review and input on 1st draft of SASP in January 2019*
- *Assistance in defining the most impactful investments of federal aquaculture funds and efforts to develop the most useful partnerships with industry.*
- *Assistance in communicating the role of NOS in aquaculture:*
  - *Coastal Planning and Siting*
  - *Environmental Interactions (monitoring, modeling, forecasting)*
  - *Ecosystem Services (e.g. water filtration, carbon sequestering.*