



**NOAA**  
**FISHERIES**

# Alaska Region AOA Spatial Planning Workshop

## Welcome and Recap Day 2

*Alicia Bishop, NOAA Fisheries Alaska  
Regional Aquaculture Coordinator*



NOAA JNU AOA Spatial Planning Workshop  
March 26-27, 2024



**NCCOS**

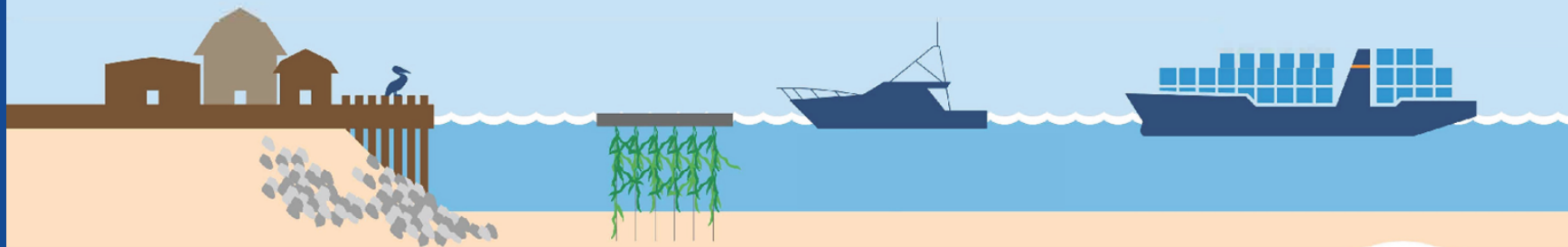
NATIONAL CENTERS FOR  
COASTAL OCEAN SCIENCE

## What is an Aquaculture Opportunity Area?

AOAs will expand economic opportunities in coastal and rural areas, and increase our nation's seafood security.

AOAs use the best available science to find appropriate spaces for sustainable aquaculture.

AOAs minimize interactions with other users, such as shipping, fishing, subsistence activities, and the military.



Aquaculture Opportunity Areas show high potential for commercial aquaculture. A science and community-based approach to identifying these areas helps minimize interference with other enterprises, account for current fishing patterns, subsistence and cultural activities, and protect the ecosystem.



# What is the Process?

- The AOA process is anticipated to take approximately four years.
  - 2 years suitability analysis
  - 2 years environmental review (NEPA)
- Some of the products of this process include: spatial analysis (Atlas) and environmental review (NEPA).
- The AOA identification process is public driven. Public input is essential in the design and location of AOAs.



NEPA: National Environmental Policy Act

# Alaska AOA Process Timeline

## 2023-2024

June 2023



Now: March 2024

2025

### Alaska Next Steps:

Announce start of process to identify Aquaculture Opportunity Areas in Alaska

Engagement and data collection. Gather feedback on study area parameters

RFI in October 2023; Nov/Dec three listening sessions

Finalize study areas based on public input

NCCOS data collection and modeling for siting analysis

### Spring 2024 Mapping Workshops

NCCOS draft Aquaculture Opportunity Atlas; peer review

\*Tasks and timeframes may shift due to resource restrictions or need

# AOA Goals

- Meet the directives of Executive Order 13921
- Utilize a science-based approach to inform marine aquaculture planning
- Find areas that could be suitable for multiple future aquaculture projects
- Address interests and concerns regarding seaweed and invertebrate aquaculture siting
- Address the increasing demand for seafood



# Key Points

- Multi-year planning process, not regulatory, no new NOAA authorities
- AOAs are *not* pre-permitted sites. Federal and state leasing and permit requirements remain the same
- In Alaska, AOAs will be sited in state waters and will support **seaweed** and **invertebrate** aquaculture (finfish farming is prohibited)
- Identification of AOA location(s) will not be made until end of NEPA process
- Aquaculture projects don't have to be located in an AOA



Credit: Mike Stekoll, University of Alaska









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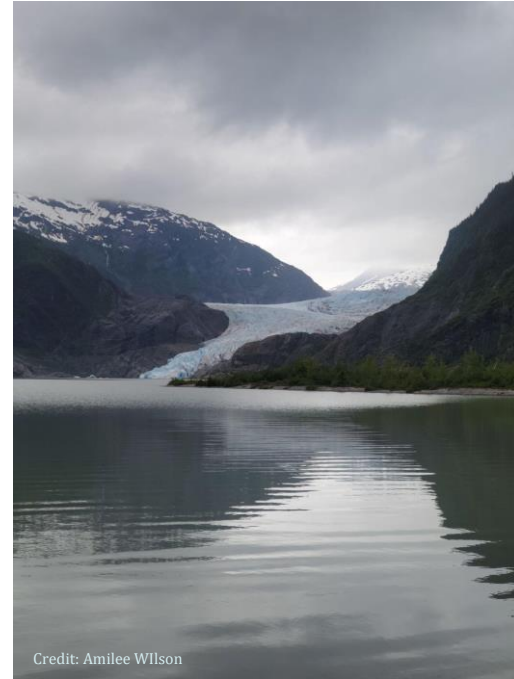
# NOAA Fisheries Tribal Responsibilities and Consultation Overview

Amilee Wilson, Alaska Regional Tribal Relations  
Coordinator  
March 27, 2024



# Importance of Tribal Voices and Consultation

- ❖ NOAA has management responsibilities for issues of importance to tribes (e.g., federal fisheries management, habitat restoration, coastal management, marine protected areas)
  - Treaty Responsibility
  - Trust Responsibility
  - Co-management
  - Co-stewardship
- ❖ Indigenous Knowledge can improve management decisions



Credit: Amilee Wilson

# What is a Tribal Consultation?

- An “accountable process ensuring meaningful and timely input from tribal officials on Department policies that have tribal implications” (DAO 218-8)
- A means of communication that may involve formal policy level ... understood by both NOAA and tribe to be a formal government-to-government meeting
- Used to exchange information, deliberate, and address Federal policies that have tribal implications
- Not a format for consensus decision-making ... a process to consider the sovereignty, rights, and resources of Indian Tribes during the development of Federal policies or actions



# What is Tribal Engagement?



## ❖ Definition in [NOAA Tribal Consultation Handbook](#):

The range of interactions with tribal governments that may be similar to (but does not rise to) the level of formal government-to-government consultation (e.g., sharing of information, data, perspectives, feedback and concerns, joint projects, education and outreach)

## ❖ Everything else

- Relationship building
- Informal meetings
- Staff level discussions
- Phone calls
- Overview or briefings of upcoming actions

Thank you for your gift of time.



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# NOAA's Spatial Planning Approach For Alaska Aquaculture Opportunity Areas



## NCCOS

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**Juneau**

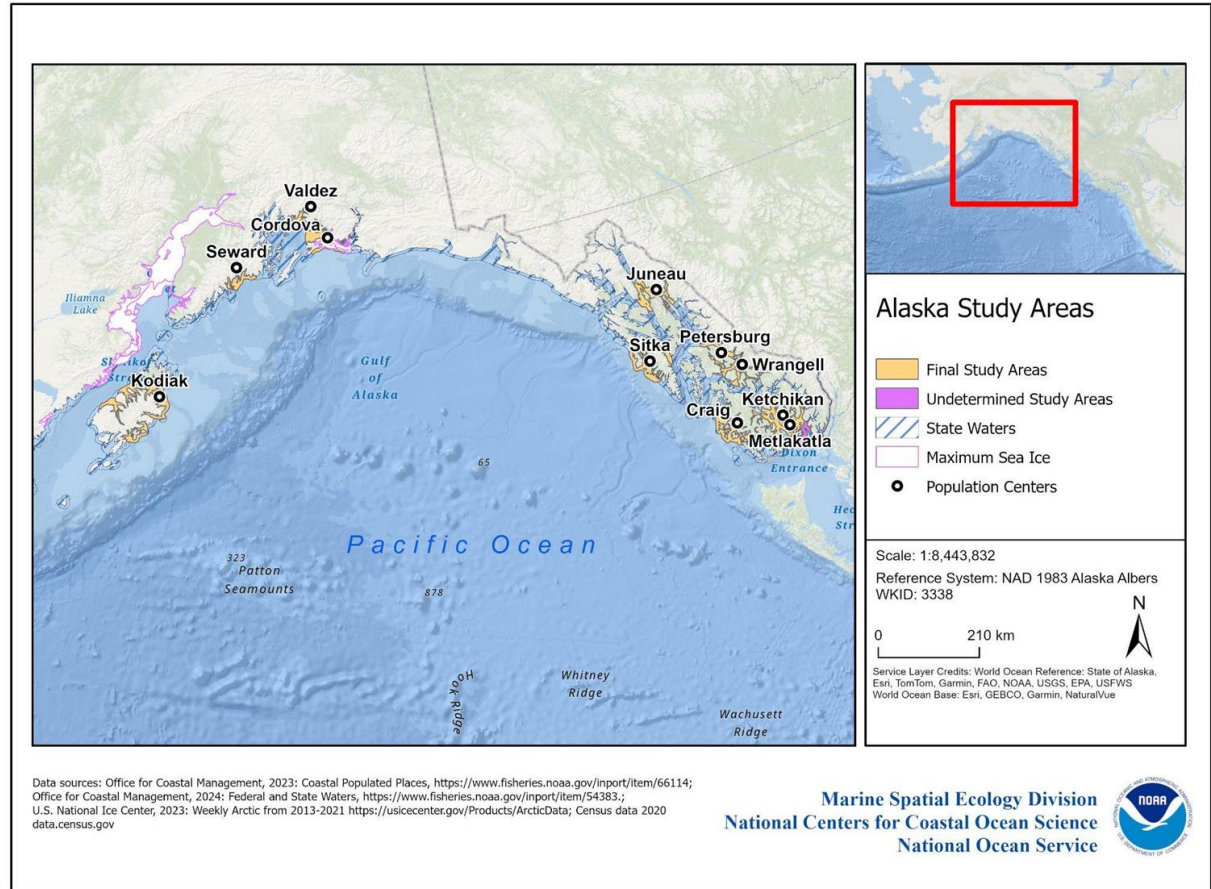
March 26, 2024

Marine Spatial Ecology Division  
National Centers for Coastal Ocean Science  
National Ocean Service  
[christopher.schillaci@noaa.gov](mailto:christopher.schillaci@noaa.gov)



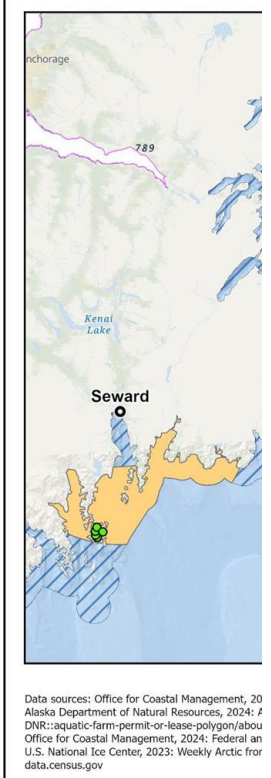
# Step 1 - Study Area Parameters

- Alaska state waters
- Use distance from coastal population centers as proxy for infrastructure
  - 25 miles from top 25 coastal communities by population (2010 census data)
- Ice cover is considered a significant constraint for aquaculture (greatest sea ice extents between 2013-2021)
- Consideration of areas in proximity to existing aquaculture that are not captured by population center and ice analysis

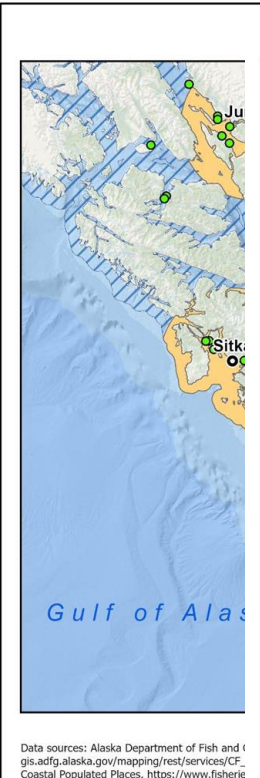




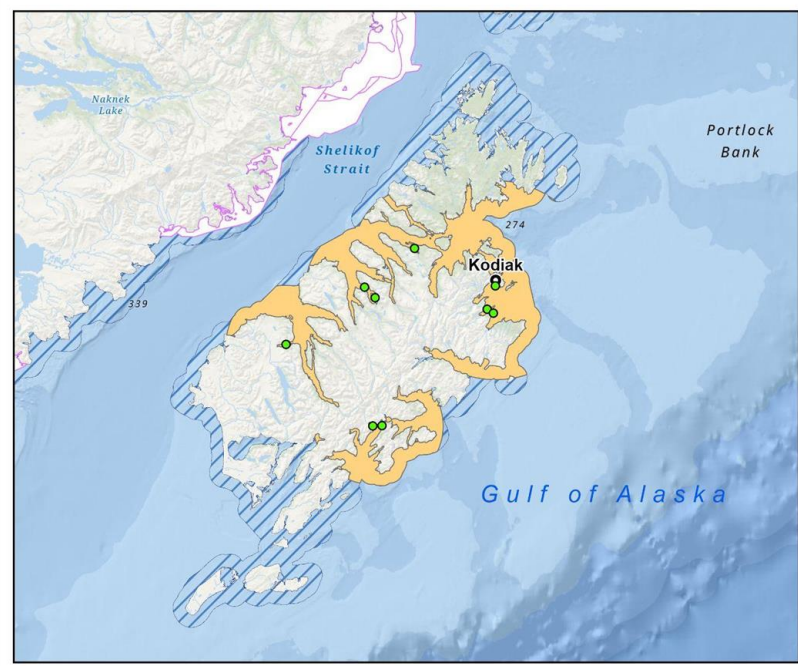
# Step 2 - Identify Study Areas



Data sources: Office for Coastal Management, 20 Alaska Department of Natural Resources, 2024; # DNR::aquatic-farm-permit-or-lease-polygon/about Office for Coastal Management, 2024; Federal and U.S. National Ice Center, 2023; Weekly Arctic from data.census.gov



Data sources: Alaska Department of Fish and Game, 2024; gis.adfg.alaska.gov/mapping/rest/services/CF\_Public/Coastal\_Populated\_Places, https://www.fisheries.noaa.gov/inport/item/66114; Office for Coastal Management, 2024; Federal and U.S. National Ice Center, 2023; Weekly Arctic from data.census.gov



Data sources: Alaska Department of Fish and Game, (2024). ADF&G Active Aquatic Farming Operation Areas. https://gis.adfg.alaska.gov/mapping/rest/services/CF\_Public/Aquatic\_Farming\_Operations/MapServer; Office for Coastal Management, 2023; Coastal Populated Places, https://www.fisheries.noaa.gov/inport/item/66114; Office for Coastal Management, 2024; Federal and State Waters, https://www.fisheries.noaa.gov/inport/item/54383; U.S. National Ice Center, 2023; Weekly Arctic from 2013-2021 https://usicecenter.gov/Products/ArcticData; Census data 2020 data.census.gov

Kodiak Study Area

- State Waters
- Maximum Sea Ice
- Final Study Areas
- Active Farm Lease Areas
- Population Centers

Scale: 1:1,812,374  
Reference System: NAD 1983 Alaska Albers  
WKID: 3338

0 40 km

Service Layer Credits: World Ocean Base: Eri, GEBCO, Garmin  
World Ocean Reference: State of Alaska, Esri, TomTom, Garmin, FAO, NOAA, USGS, EPA, NPS, USFWS  
World Ocean Base: Esri, GEBCO, Garmin, NaturalVue

# Step 3 - Compile comprehensive geodatabase

**MILITARY**



~100 layers

This card features a blue star icon in the bottom left corner and a background image of a naval ship at sea.

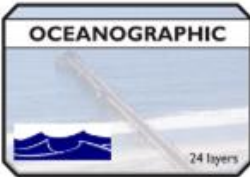
**NAVIGATION**



15 layers

This card features a compass rose icon in the bottom left corner and a background image of a ship's deck.

**OCEANOGRAPHIC**



24 layers

This card features a blue wave icon in the bottom left corner and a background image of a long pier extending into the ocean.

**BIOLOGICAL**



11 layers

This card features a blue turtle icon in the bottom left corner and a background image of a sandy beach with birds.

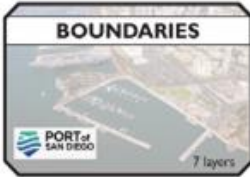
**INDUSTRIAL**



11 layers

This card features a blue ship icon in the bottom left corner and a background image of an industrial port facility.

**BOUNDARIES**



7 layers

This card features the PORT of SAN DIEGO logo in the bottom left corner and a background image of a port area with a ship.

\*Photos courtesy of the Port of San Diego



**AquaData  
Catalog**

**33 million**

The number of data  
layers we analyze to  
find the right space  
for your ocean  
industry


**UNLOCKING OCEAN  
INTELLIGENCE**

With a comprehensive database of ocean data, we can help you unlock the power of your data. Our platform provides a central hub for all your ocean data, making it easy to find, analyze, and share. The AquaData Catalog and Geospatial Information at the Port of San Diego are the industry's first and only comprehensive ocean data catalog and geospatial information platform. For more information, visit [www.aquadata.com](http://www.aquadata.com).

By Lisa C. Woodley, Kim J. Thompson, Andrew A. Lopez, Brad A. Frederick, David H. Stone, Christopher M. Taylor, Kenneth J. Wiley and James C. Moore, Jr.



# Step 4 - Build the suitability model

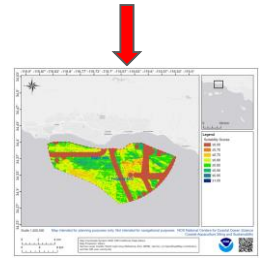
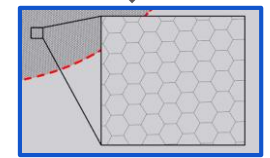
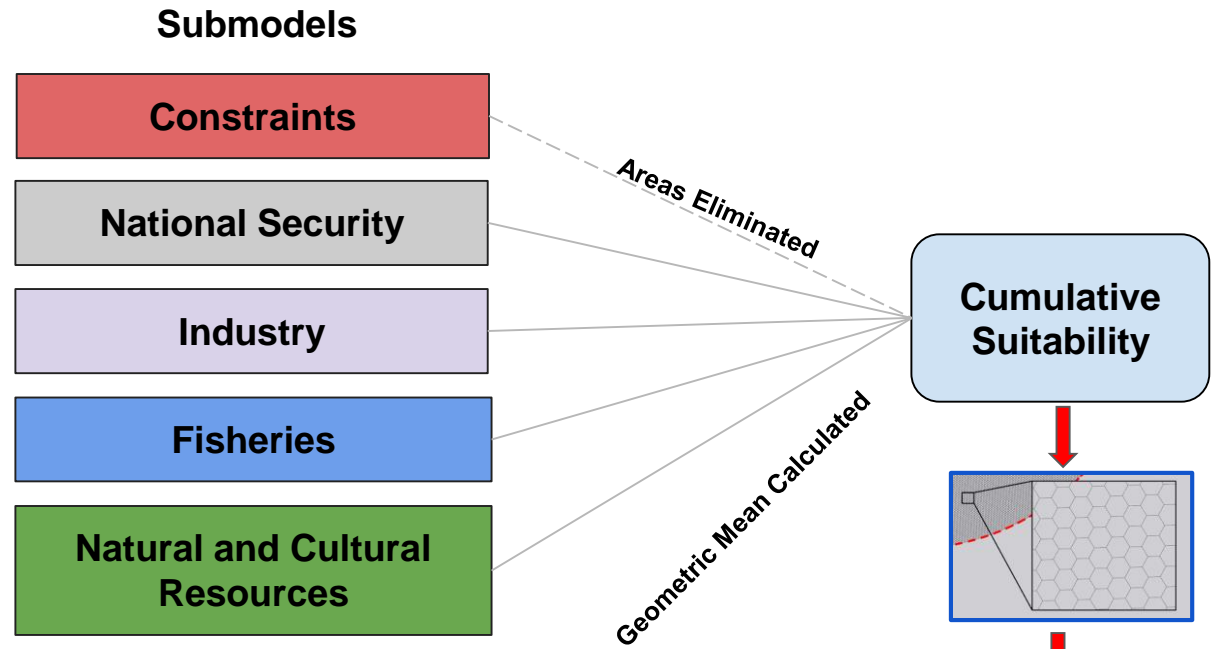


ALASKA GEOSPATIAL OFFICE

**MarineCadastre.gov**

An Ocean of Information

A joint BOEM and NOAA initiative providing authoritative data to meet the needs of the offshore energy and marine planning communities.



# Data Categories

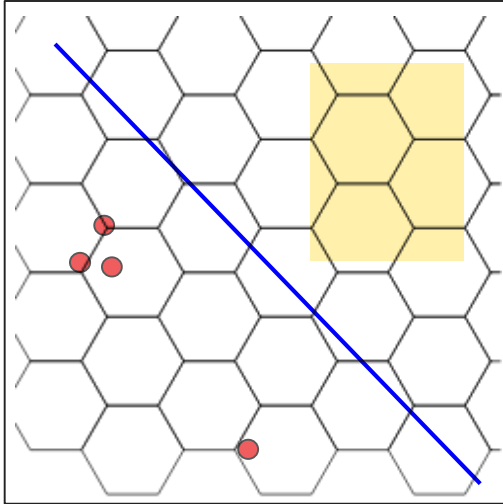
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1. **Boundaries:** state and federal boundaries, locations for existing military activities, area management plans, and designated parks and refuges, etc.
2. **Oceanographic Data:** meteorological and oceanographic conditions, water depth and slope (bathymetry), buoys and weather forecasting stations, etc.
3. **Natural Resources:** information about protected species and sensitive habitats
4. **Cultural and Social Resources:** cultural, subsistence, personal and traditional/historical uses of the environment, demographic data, shipwrecks, etc.
5. **Fisheries:** areas where both commercial and sport fisheries are active
6. **Industries and Navigation:** locations of vessel traffic, key industrial considerations (shipping lanes, pipelines, submarine cables), and outfalls, etc..



# Step 4 - Build the suitability model

## Categorical data

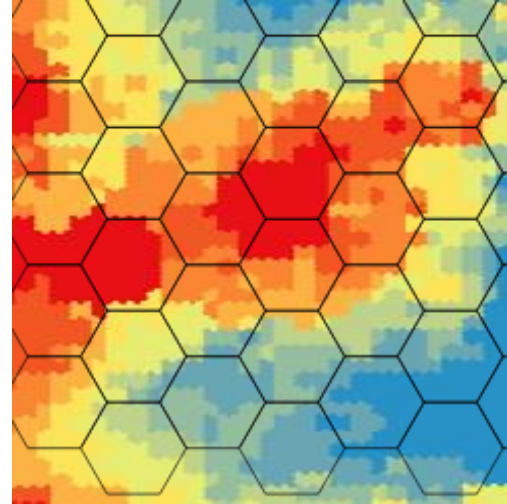


### **Presence/Absence Data**

0 - 1 score is assigned to grid cell if that data layer is present inside of cell or overlaps the cell

Examples: Deep-sea corals, Cables, Pipelines, Wrecks, Military restriction areas, Hardbottom

## Continuous data



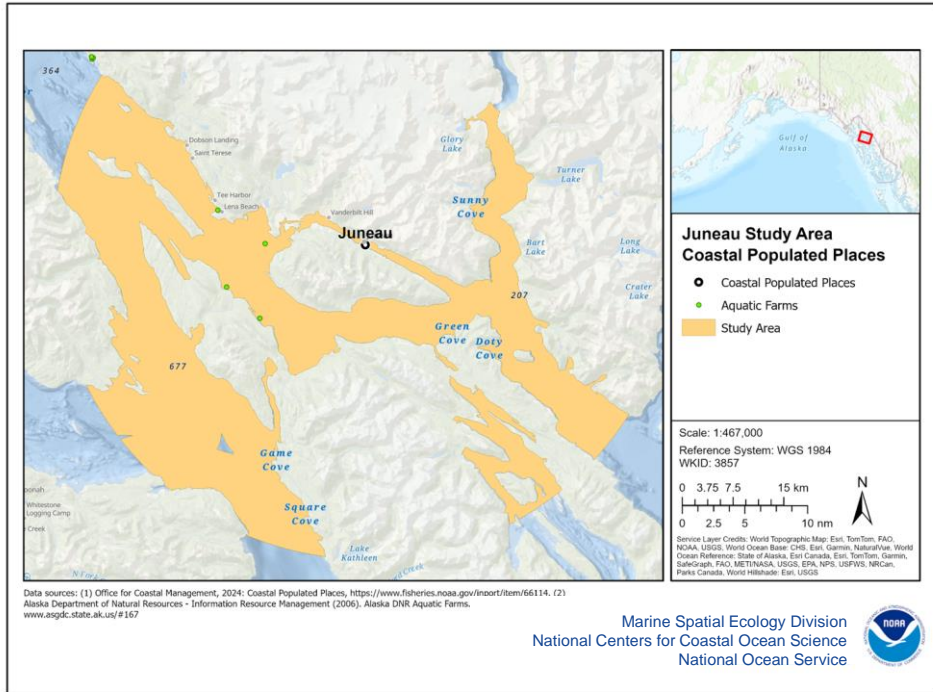
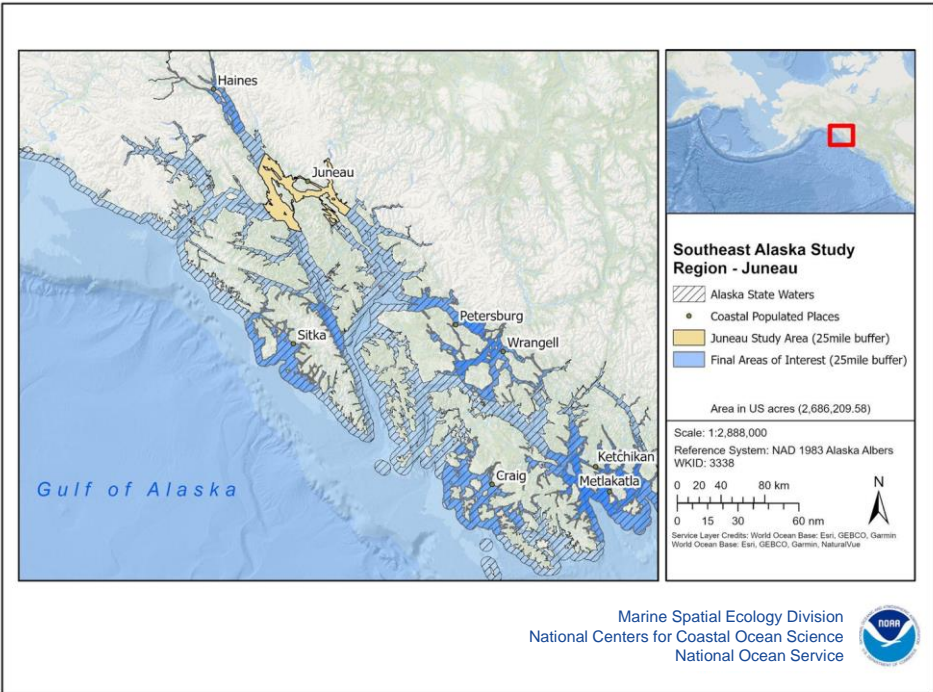
### **Raster Data - Changes over space and time**

Data are rescaled 0 - 1 using a z-membership function (ZMF)

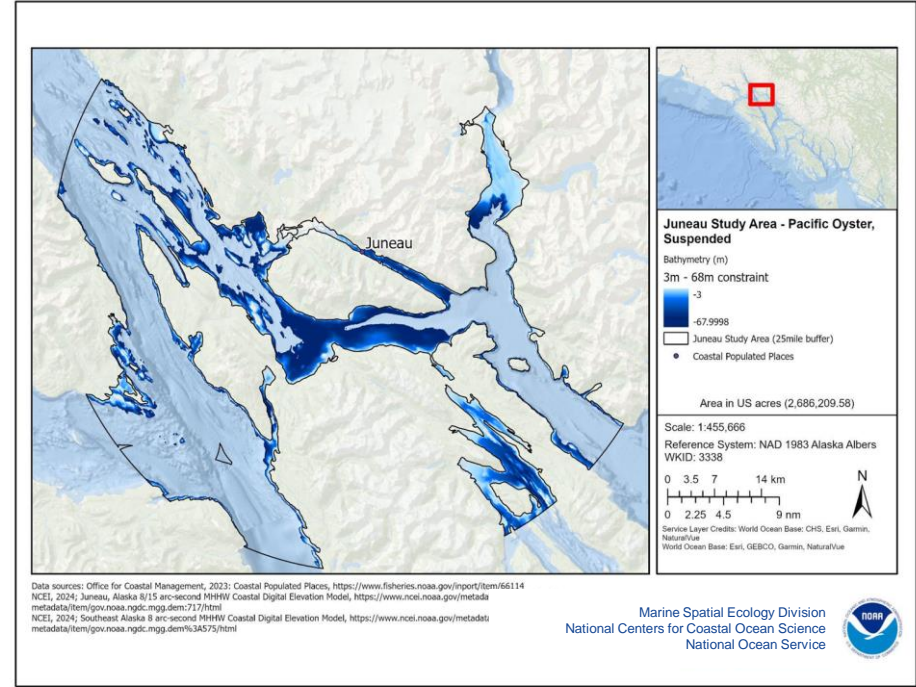
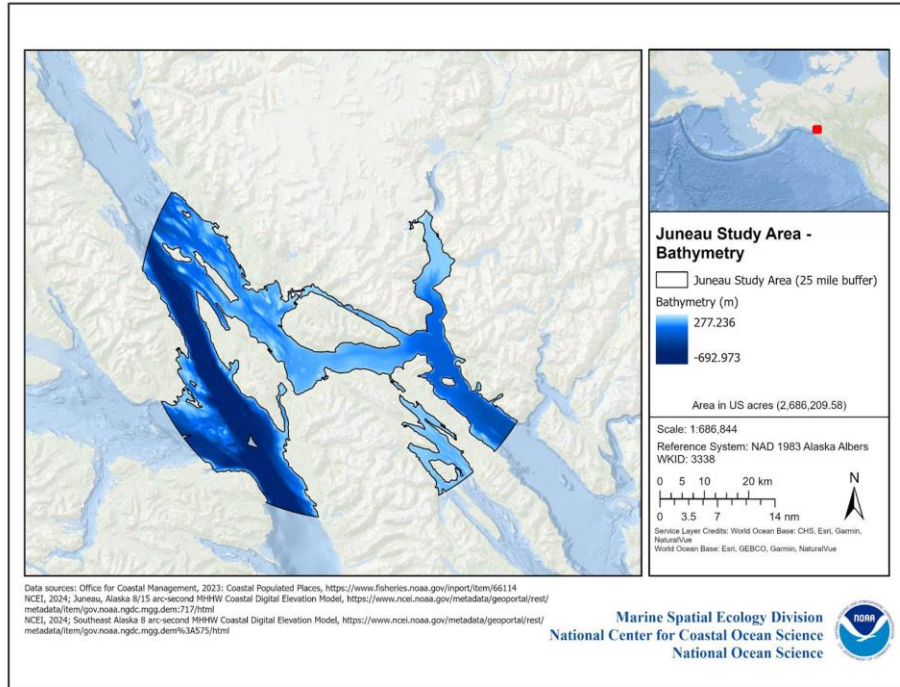
Examples: Fishing effort, Vessel traffic, Protected resources



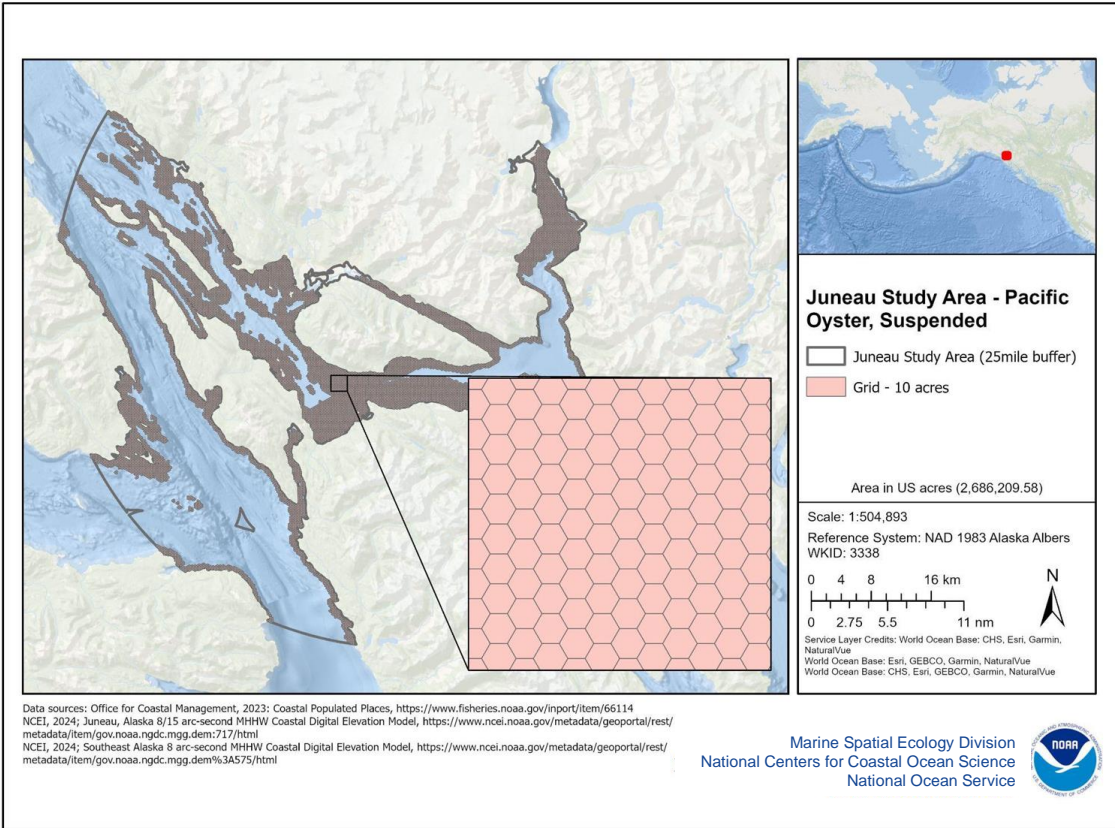
# Step 4 - Build the suitability model



# Step 4 - Build the suitability model



# Step 4 - Build the suitability model



10 acre  
grid cell size

Within 25 miles of  
Coastal Populated  
Town

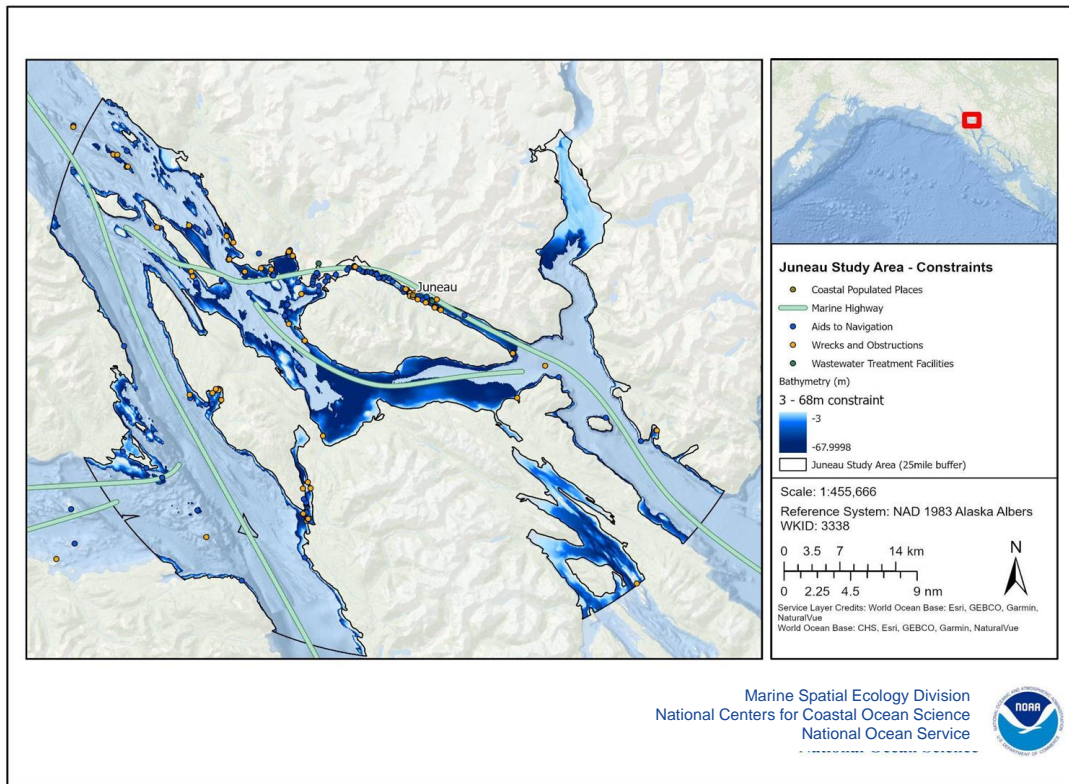
9-220' depth



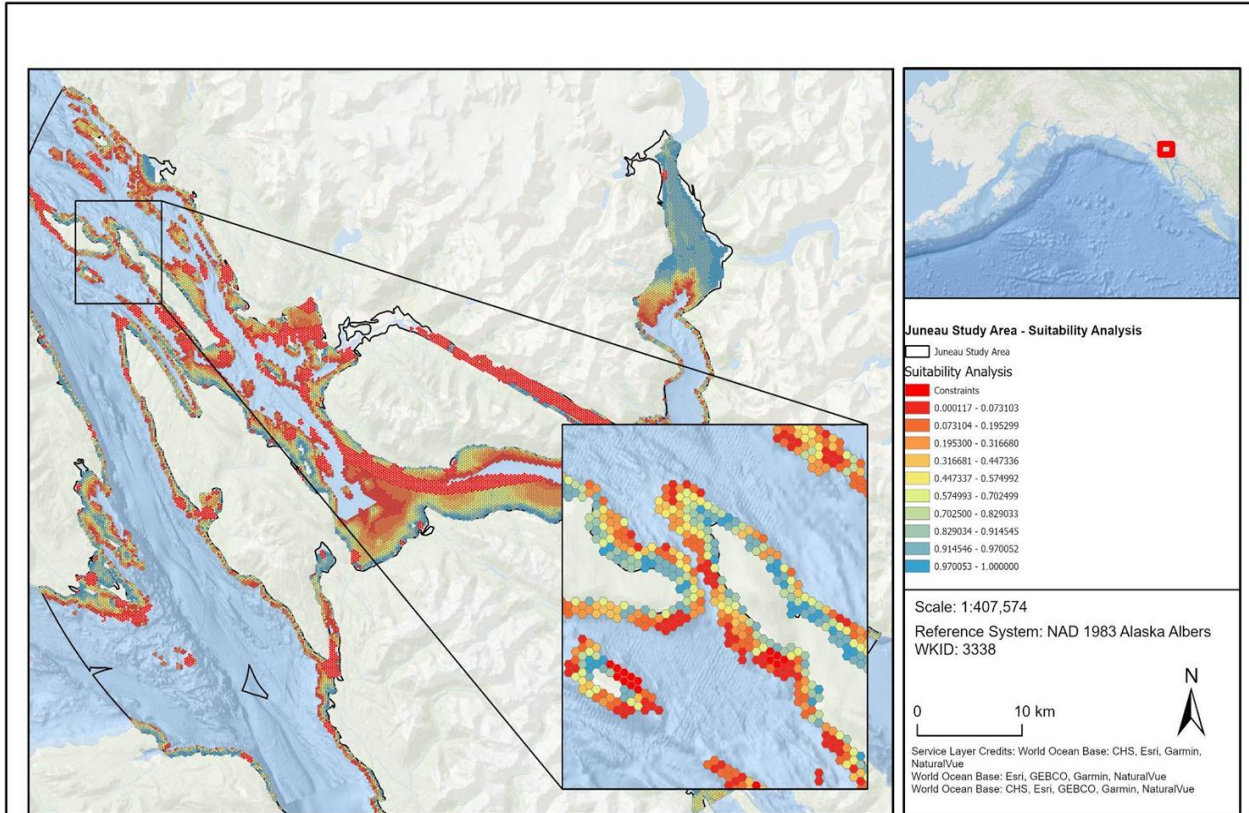
# Step 4 - Build a suitability model

Datasets	Scoring
Wrecks and obstructions - 152.4 m setback	0
Aids to navigation - 500 m setback	0
Ocean disposal sites - 500 m setback	0
Marine Highways - 500 m setback	0
Anadromous streams	0
Bathymetry (3 m to 68 m)	linear
AIS Vessel Traffic 2021	continuous

EXAMPLE



# Step 4 - Build a suitability model

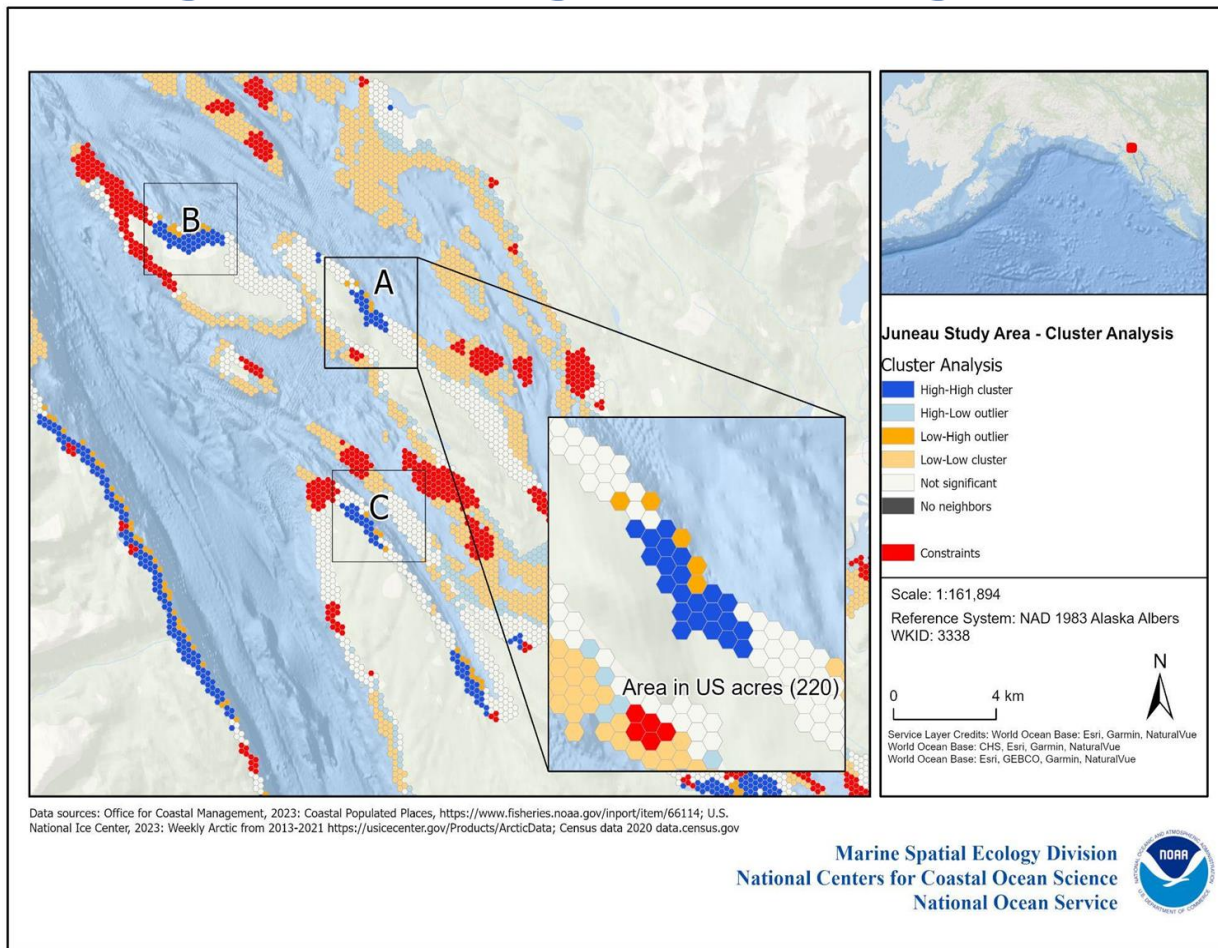


Data sources: Office for Coastal Management, 2023: Coastal Populated Places, <https://www.fisheries.noaa.gov/inport/item/66114>; U.S. National Ice Center, 2023: Weekly Arctic from 2013-2021 <https://usicecenter.gov/Products/ArcticData>; Census data 2020 [data.census.gov](https://data.census.gov)

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National Ocean Service

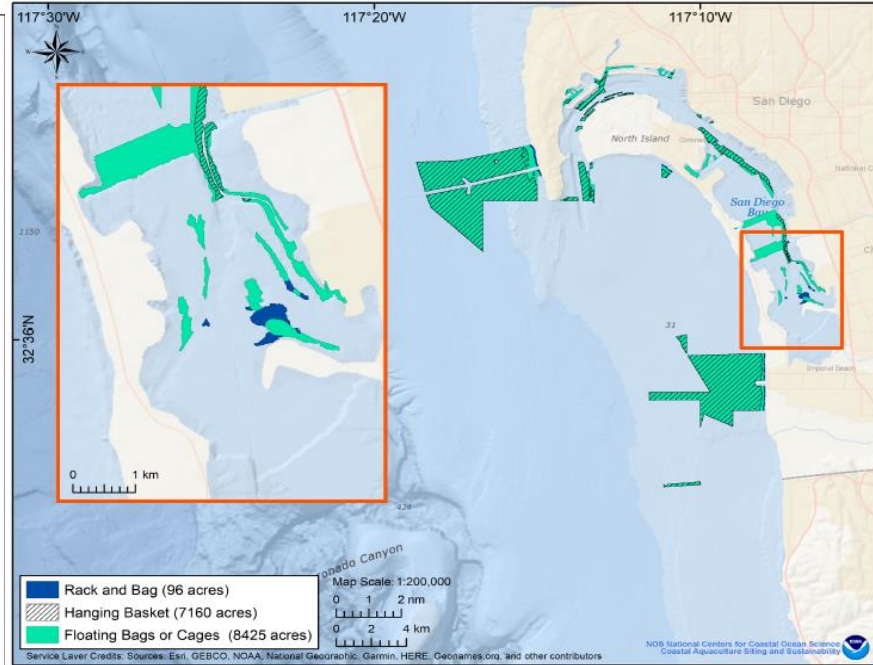
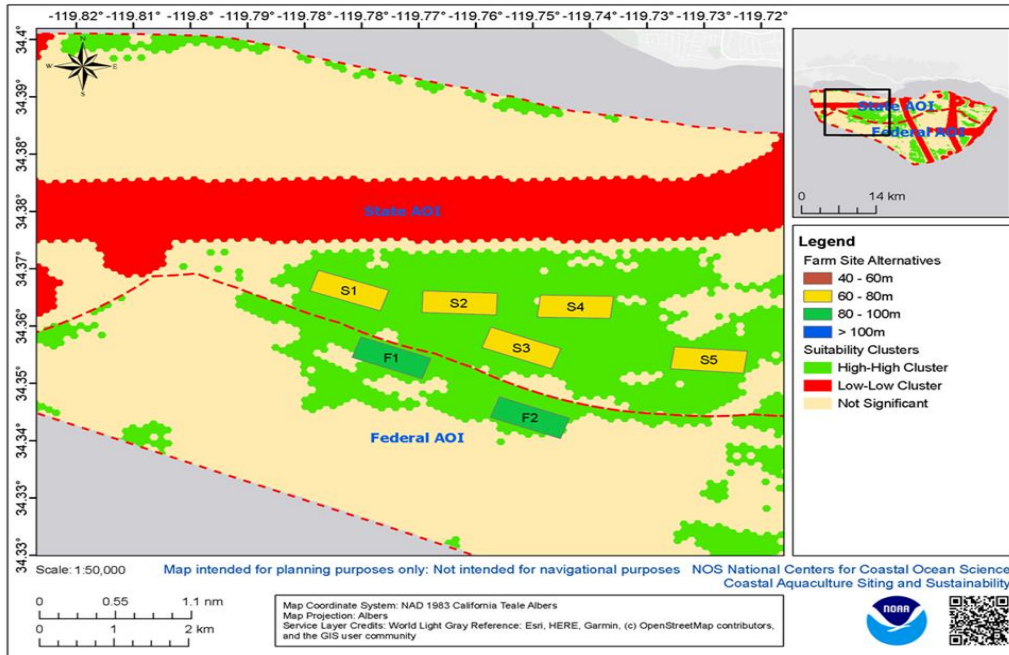


# Step 5 - Cluster groups of highest scoring cells within study area

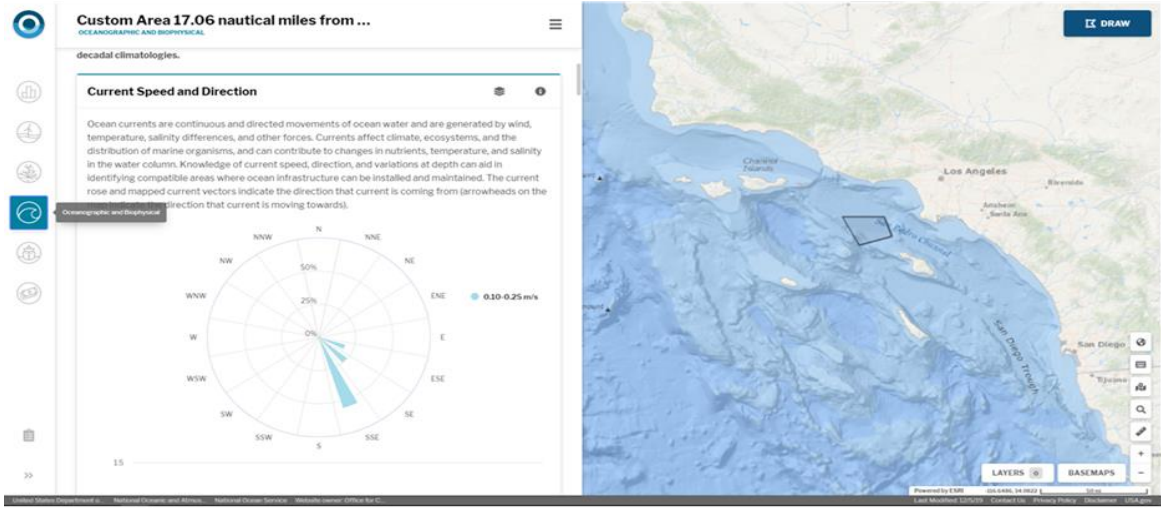




# Step 6 - Identify best options within study areas



# Step 7 - Characterize options



Parameter	Location A	Location B	Location C	Location D
Area (Acres)	390	1630	2640	840
Mean Suitability Score	0.86	0.86	0.84	0.86
Mean Bathymetry	44	39	37	33
Mean Slope	0.30	0.43	0.71	0.47
Mean Sediment grain size	0.29	0.68	0.43	0.32
Wave Height hours	50	54	68	58
Temperature hours	3933	3924	3908	3904
Mean VMS Traffic (2009-2019)	23	24	17	12
AIS 2017 Other vessel transits per 1 ha	1.66	2.34	1.90	2.84
AIS 2017 Tug/Tow vessel transits per 1 ha	0.24	0.13	0.33	0.45
AIS 2017 Tanker vessel transits per 1 ha	0	0	0	0
AIS 2017 Pleasure vessel transits per 1 ha	3.66	1.37	1.43	4.04
AIS 2017 Passenger vessel transits per 1 ha	1.03	5.50	3.66	0.57
AIS 2017 Cargo vessel transits per 1 ha	0	0	0	0
AIS 2017 Fishing vessel transits per 1 ha	0.43	1.21	2.38	0.50
Closest Port	Rye Harbor	Hampton Harbor	Newburyport	Newburyport
EPA Region	1	1	1	1
Coast Guard District	1	1	1	1
US Army Corps of Engineers District	New England	New England	New England	New England
Unexploded Ordnance	Yes	No	No	No

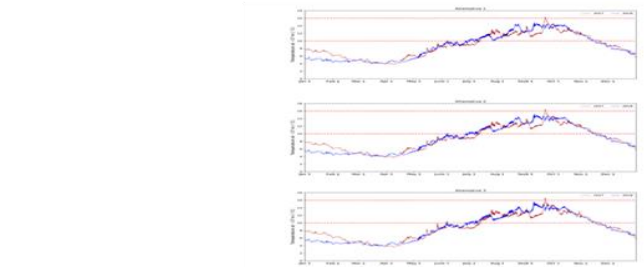
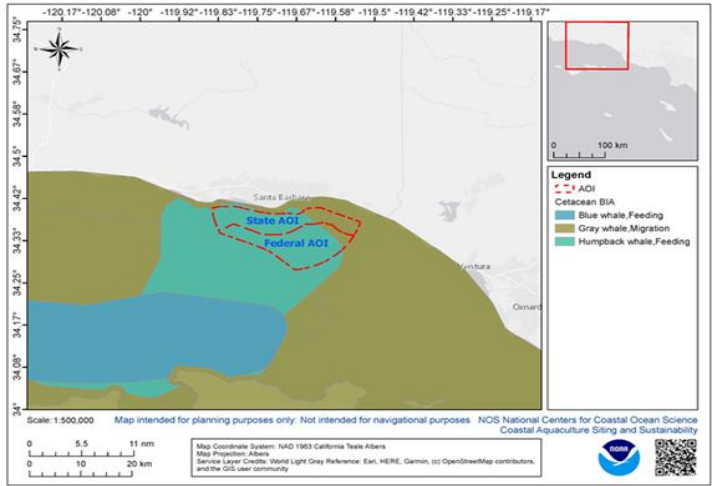
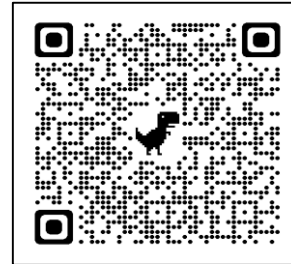
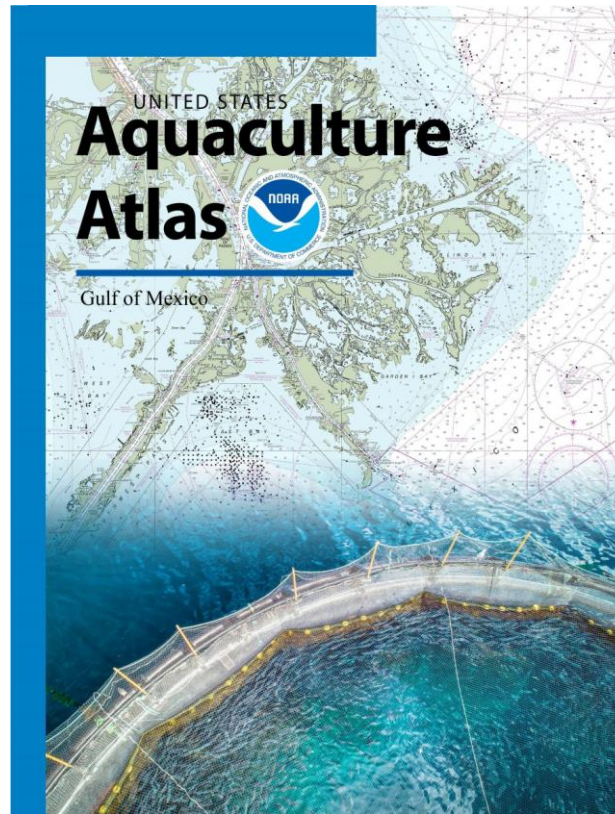
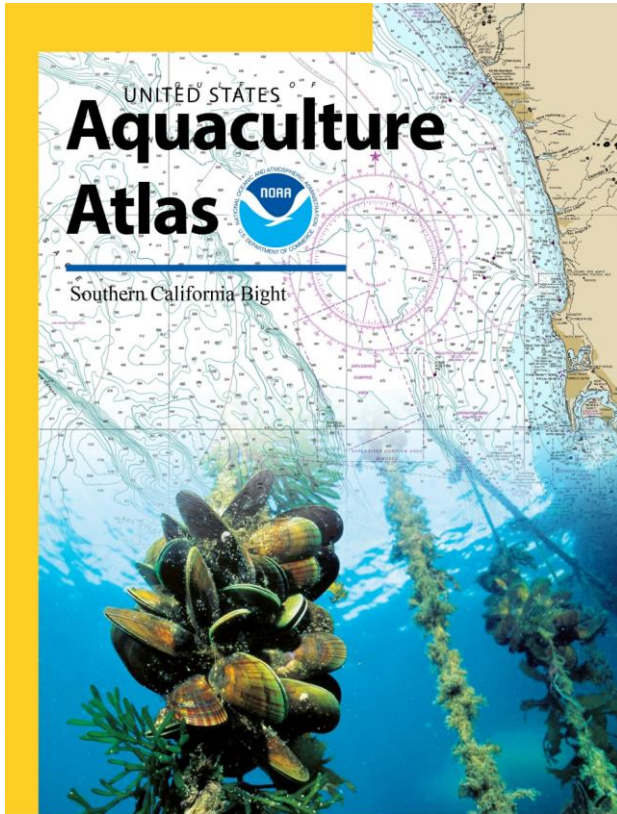


Figure 20. Monthly water temperature at 17 m for alternative areas 1, 2, and 3 for 2017-2018. Wind-dotted lines indicate annual temperature range.



Maps for demonstration only

# Step 8 - Develop report/atlas





# Cultural and Social Resources

- Coastal infrastructure/working waterfronts
- \*Personal use and Subsistence fisheries
- \*Traditional/ceremonial or important recreational uses of marine or coastal areas (dive sites, sandbars, transit routes to those areas, etc)
- \*Underwater and/or coastal actual or possible archeological sites

**\*Limited current spatially explicit public information**

# Partnerships for participatory mapping and engagement

## Bring on project partners to:

- Help NOAA address subsistence and tribal data scarcity
- Identify methods to support integration of indigenous and traditional knowledge into analysis
- Identify data sharing protocols that do not compromise data sensitivity and sovereignty
- Identify tribal resources need for participation
- Identify existing spatial data sets

## Use participatory mapping opportunities to:

- Develop new datasets to support spatial analysis

## Stakeholder Engagement Strategies for Participatory Mapping



### NOAA Guidance and Best Practices for Engaging and Incorporating Indigenous Knowledge in Decision-Making

#### Introduction

Indigenous Peoples across the United States have been stewards and part of their environments for thousands of years. Throughout this time they have amassed an immense amount of knowledge informed by unique ways of knowing and being. This knowledge continues to grow today, built upon a living process over a millennia<sup>1</sup>. To truly understand the environment and to have adaptive and holistic decision-making, we need to bring together Indigenous Knowledge and science. Bringing forward equitable engagement practices for the involvement of Indigenous Knowledge will inform and enrich

many aspects of NOAA's work, allowing us to better understand Earth and ocean systems and fulfill our management responsibilities. As a continuation of our commitment to engage meaningfully with federally recognized Tribes, non-recognized Tribes and other Indigenous Peoples, NOAA is building upon the "NOAA Procedures for Government-to-Government Consultation with Federally Recognized Indian Tribes and Alaska Native Corporations" (Consultation Handbook) to provide guidance on including IK in