Good morning!

The BOEM Oregon Intergovernmental Renewable Energy Task Force Meeting will begin at 8:30 am PT.

Please complete the poll when it appears on your screen. Select your affiliation and then select "submit." We will share the poll results later in the meeting.

For help with technical difficulties, please contact Ariella Dahlin
aDahlin@kearnswest.com or 541-659-5852

BOEM Oregon Intergovernmental Renewable Energy Task Force Meeting

October 21, 2021

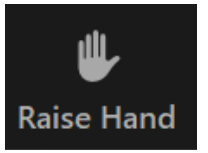
Bureau of Ocean Energy Management (BOEM) Pacific Regional Office

Facilitated by Jamie Damon, Kearns & West

For help with technical difficulties, please contact Ariella Dahlin (aDahlin@kearnswest.com, 541-659-5852) for assistance.
Webinar will be recorded.

Webinar Instructions – Task Force Members

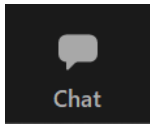
- Click the mute button at the bottom of the screen to mute yourself when not speaking.
- To enter into the discussion queue, use the "Raise your hand" button to get in the queue to speak or press *9 on your phone. Please lower your hand once you are done speaking.



- Chat function is reserved for public input.
- Task Force members are encouraged to keep their webcam on during introductions and discussion portions of the Task Force meeting.
- Closed Captioning is available. CC
- Contact Ariella Dahlin at aDahlin@kearnswest.com or 541-659-5852 if experiencing technical difficulties.

Webinar Instructions – Public Attendees

- Public attendees will be muted throughout the Task Force webinar and will not be able to unmute themselves.
- Public attendees can share verbal comments during the public input opportunities.
- Please use chat for questions and input to BOEM to be addressed during public input. Please refrain from using the chat for sidebar conversations.



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- Contact Ariella Dahlin at aDahlin@kearnswest.com or 541-659-5852 if experiencing technical difficulties.

Meeting Participation Ground Rules

- Honor the agenda.
- Participate actively and respectfully. Be mindful of your speaking time.
- Provide your name and affiliation each time you speak.
- Respect differences of opinion and perspectives.
- Please stay on mute when you're not speaking.
- Please refrain from using the chat for sidebar conversations.

Welcome and Opening Remarks

Doug Boren, BOEM Pacific Regional Office Regional Director
Amira Streeter, Oregon Governor's Office

Meeting Purpose

- Update Task Force members on offshore wind energy planning and studies since the June 2020 meeting
- Discuss next steps toward offshore wind energy leasing offshore Oregon

Agenda

Time (PT)	Topic
8:30 am	Welcome and Opening Remarks
8:50 am	Agenda Review, Meeting Purpose, Task Force Member Introductions
9:20 am	Task Force Member Updates
9:45 am	Overview of Oregon Offshore Wind Energy Planning and Engagement Activities
10:10 am	Task Force Roundtable Q&A and Discussion
10:35 am	Break
10:45 am	OROWindMap Overview and Data Sets Discussion
11:30 am	Task Force Roundtable Q&A and Discussion
	Adjourn Morning Session
12:00 pm	Public Input Opportunity I

Agenda

Time (PT)	Topic
12:30 pm	Lunch Break
1:00 pm	Floating Offshore Wind Technology and Oregon Offshore Wind Energy Studies
1:45 pm	State/Federal Studies
2:40 pm	Break
2:55 pm	Next Steps toward Offshore Wind Energy Leasing
3:10 pm	Task Force Discussion
3:45 pm	Action Items and Next Steps
3:50 pm	Closing Remarks
	Adjourn Afternoon Session
4:05 pm	Public Input Opportunity II

Introductions – BOEM Staff

Pacific Regional Office

- Doug Boren, Regional Director
- Whitney Hauer, Ph.D., Renewable Energy Specialist
- Rick Yarde, Office of Environment Regional Supervisor
- Necy Sumait, Renewable Energy Section Chief
- Sara Guiltinan, Renewable Energy Specialist
- Parker McWilliams, Tribal Liaison
- Frank Pendleton, GIS Analyst
- Dave Ball, Historic Preservation Officer
- Dave Pereksta, Avian Biologist
- John Romero, Public Affairs Officer

Task Force Member Introductions – Local Elected Officials

Organization	Name
Clatsop County Board of Commissioners	Lianne Thompson
Coos Bay City Council	Carmen Matthews
Coos County Board of Commissioners	Bob Main
Curry County Board of Commissioners	Court Boice
Douglas County Board of Commissioners	Chris Boice
Lane County Board of Commissioners	Jay Bozievich
Lincoln County Board of Commissioners	Kaety Jacobson Delegate: Onno Husing
Newport City Council	David Allen
Port of Newport Board of Commissioners	Walter Chuck
Tillamook County Board of Commissioners	David Yamamoto

Task Force Member Introductions – Tribal Representatives

Organization	Name
Confederated Tribes of Coos, Lower Umpqua and Siuslaw Indians	Julie Siestreem
Confederated Tribes of Grand Ronde	Briece Edwards
Confederated Tribes of Siletz Indians	Mike Kennedy Delegate: Andrea Sumerau
Coquille Indian Tribe	Kassandra Rippee Delegate: Mark Healy

Task Force Member Introductions – State Representatives

Organization	Name
Business Oregon	Sean Stevens
Oregon Department of Energy (ODOE)	Jason Sierman
Oregon Department of Environmental Quality (DEQ)	Marilyn Fonseca
Oregon Department of Fish and Wildlife (ODFW)	Caren Braby
Oregon Department of Geology and Mineral Industries (DOGAMI)	Robert Houston
Oregon Department of Justice (DOJ)	Steve Shipsey
Oregon Department of Land Conservation and Development (DLCD)	Andy Lanier
DLCD	Patty Snow

Task Force Member Introductions – State Representatives continued

Organization	Name
Oregon Department of State Lands (DSL)	Meliah Masiba
Oregon Governor's Office	Jason Miner Delegates: Amira Streeter, Alex Campbell
Legislative Commission on Indian Services (LCIS)	Patrick Flanagan
Oregon Parks and Recreation Department (ORPD)	Trevor Taylor
Oregon Public Utilities Commission (OPUC)	Mark Thompson
Oregon State Historic Preservation Office (SHPO)	John Pouley

Task Force Member Introductions – Federal Representatives

Organization	Name
Bonneville Power Administration (BPA)	Julie Peacock
Bureau of Indian Affairs (BIA)	Keith Hatch
Bureau of Land Management (BLM)	Tim Barnes
Bureau of Safety and Environmental Enforcement (BSEE)	Cheri Hunter
Department of Defense (DOD)	Steve Sample
Federal Aviation Administration (FAA)	Cindy Whitten
Federal Communications Commission (FCC)	Denise Coca
Federal Energy Regulatory Commission (FERC)	Jim Hastreiter
National Oceanic and Atmospheric Administration (NOAA)	Kris Wall

Task Force Member Introductions – Federal Representatives continued

Organization	Name
National Park Service (NPS)	Lara Rozzell
NOAA National Marine Fisheries Services (NMFS)	Keith Kirkendall
NMFS	Candace Nachman
U.S. Army Corps of Engineers	William Abadie
U.S. Coast Guard (USCG)	John Moriarty
U.S. Department of Energy (DOE)	Hoyt Battey
DOE	Patrick Gilman
U.S. Department of the Interior (DOI)	Allison O'Brien
U.S. Environmental Protection Agency (USEPA)	Anthony Barber
U.S. Fish and Wildlife Service (FWS)	Stefanie Stavrakas
U.S. Geological Survey (USGS)	Jill Roland

Task Force Member Updates

Key State Renewable Energy Laws for BOEM's Oregon Task Force

Jason Sierman

Sr. Energy Policy Analyst

October 21, 2021

OREGON DEPARTMENT OF ENERGY

Topics

1) **Introduction to ODOE**

2) **Oregon HB 2021**
   - **100% Clean by 2040**
   - **Nat’l & Regional Context**

3) **Oregon HB 3375**
   - **ODOE OSW Study**

OREGON DEPARTMENT OF ENERGY

Leading Oregon to a safe, equitable, clean, and sustainable energy future.

Our Mission

The Oregon Department of Energy helps Oregonians make informed decisions and maintain a resilient and affordable energy system. We advance solutions to shape an equitable clean energy transition, protect the environment and public health, and responsibly balance energy needs and impacts for current and future generations.

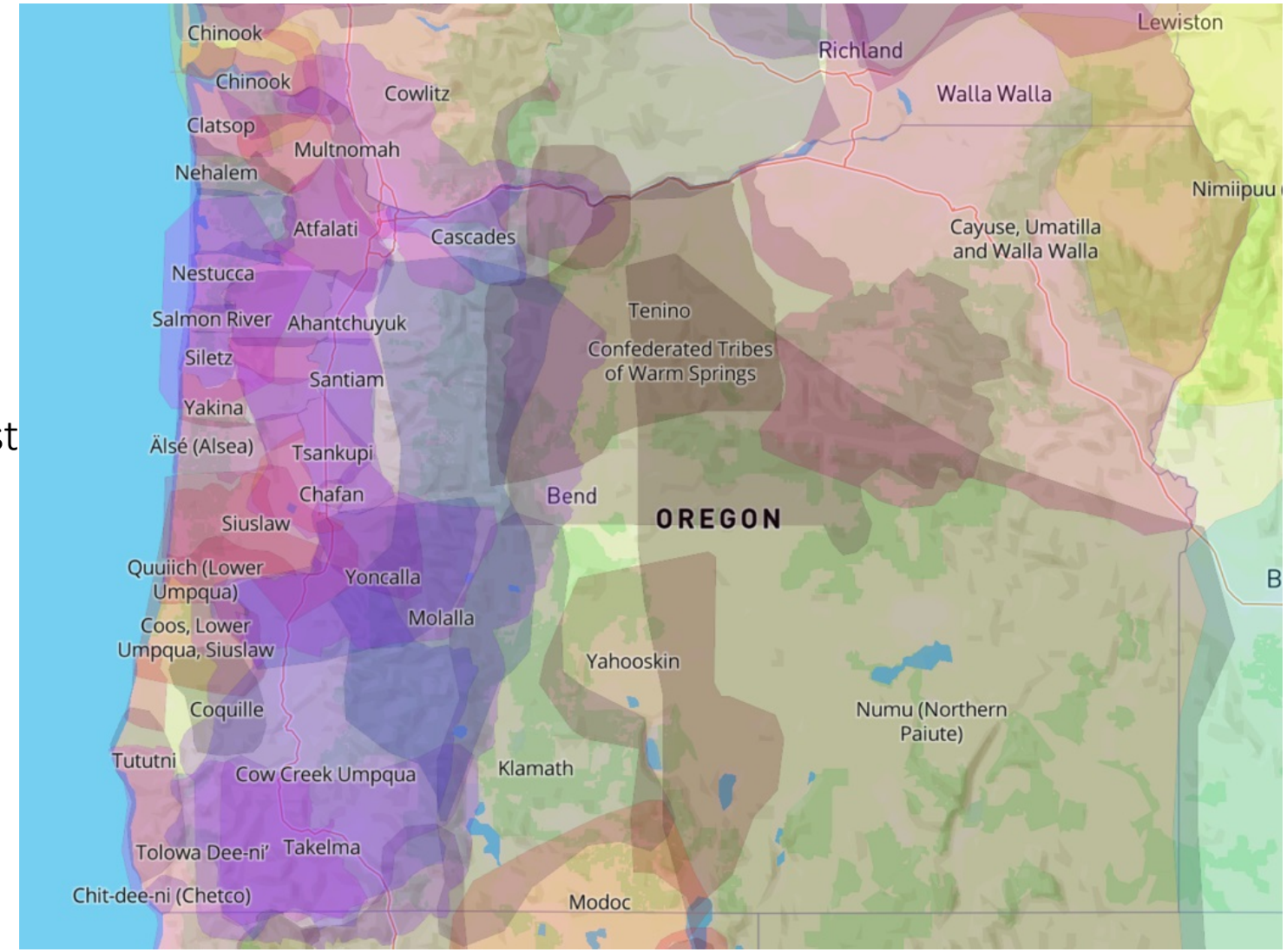
What We Do

On behalf of Oregonians across the state, the Oregon Department of Energy achieves its mission by providing:

- A Central Repository of Energy Data, Information, and Analysis
- A Venue for Problem-Solving Oregon's Energy Challenges
- Energy Education and Technical Assistance
- Regulation and Oversight
- Energy Programs and Activities

Tribal Land Acknowledgement

The Oregon Department of Energy and its staff acknowledge that indigenous tribes and bands have been with the lands that we inhabit today in the Willamette Valley and throughout Oregon and the Northwest for time immemorial. ODOE's office is in Salem, Oregon, the land of the Kalapuya, who today are represented by the Confederated Tribes of the Grand Ronde and the Confederated Tribes of the Siletz Indians, and whose relationship with this land continues to this day.



https://native-land.ca/

OREGON DEPARTMENT OF ENERGY

HB 2021 – 100% Clean Energy For All

- **Clean Electricity Targets for State's IOUs & ESSs.***
  - 80% by 2030, 90% by 2035, 100% by 2040.
- **Community Energy & Equity**
  - "Green" rates for IOU customers within boundaries of local governments with renewable or clean energy goals.
  - $50 million state fund to support planning or development of renewable projects (<20 MW) that promote resilience & provide economic or other community benefits.
  - State work group to study barriers, opportunities, and benefits of small-scale renewable projects.
- **Energy Facilities & Equity**
  - Restricts state from approving new or amended permits for GHG emitting energy facilities.
  - Construction of large renewable and storage projects (≥10 MW) must document and meet specific labor standards.

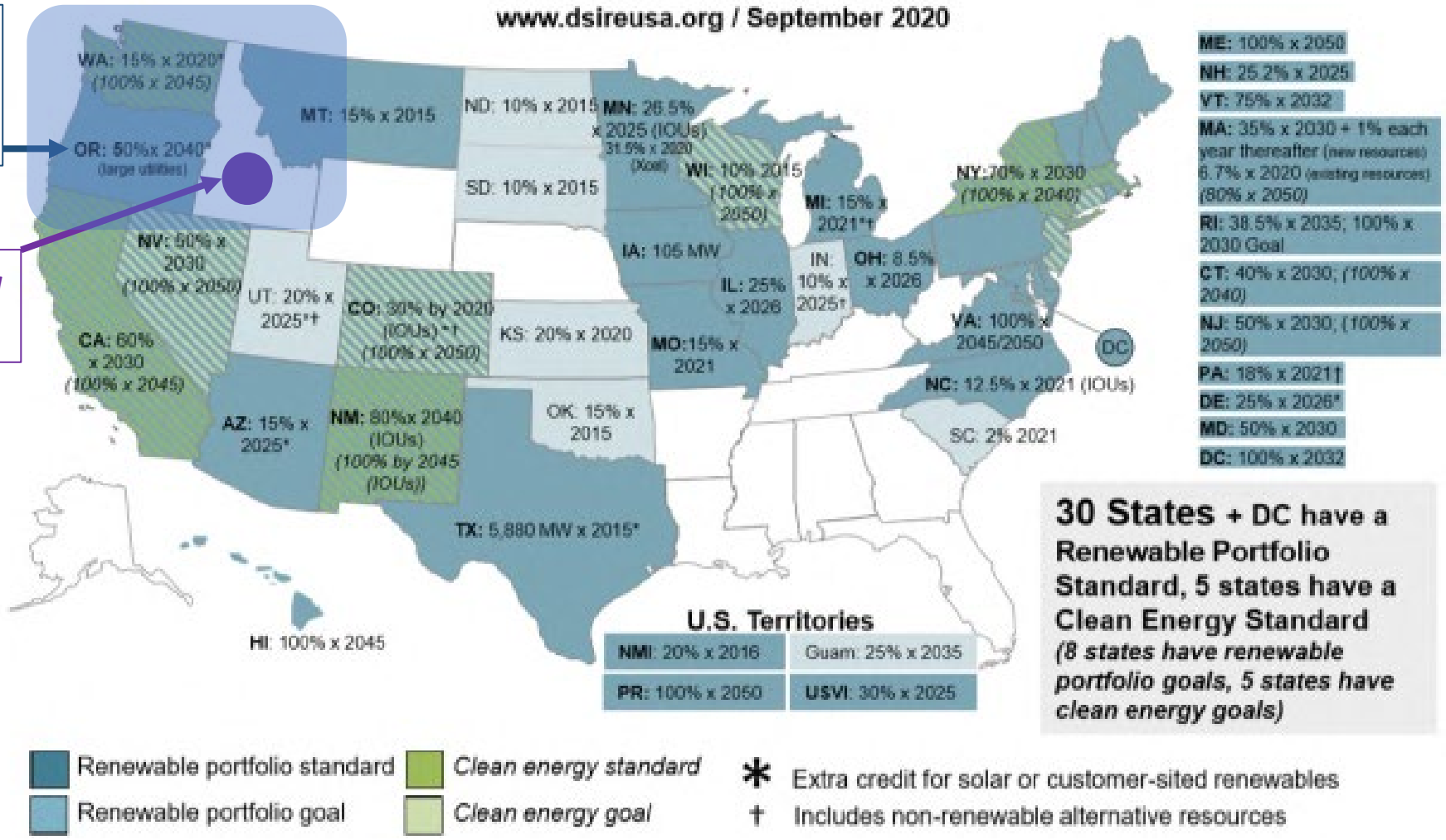
*IOUs = Investor-Owned Utilities; ESSs = Electricity Service Suppliers.

National & Regional Context

Oregon is now 100% Clean x 2040 HB 2021 (2021)

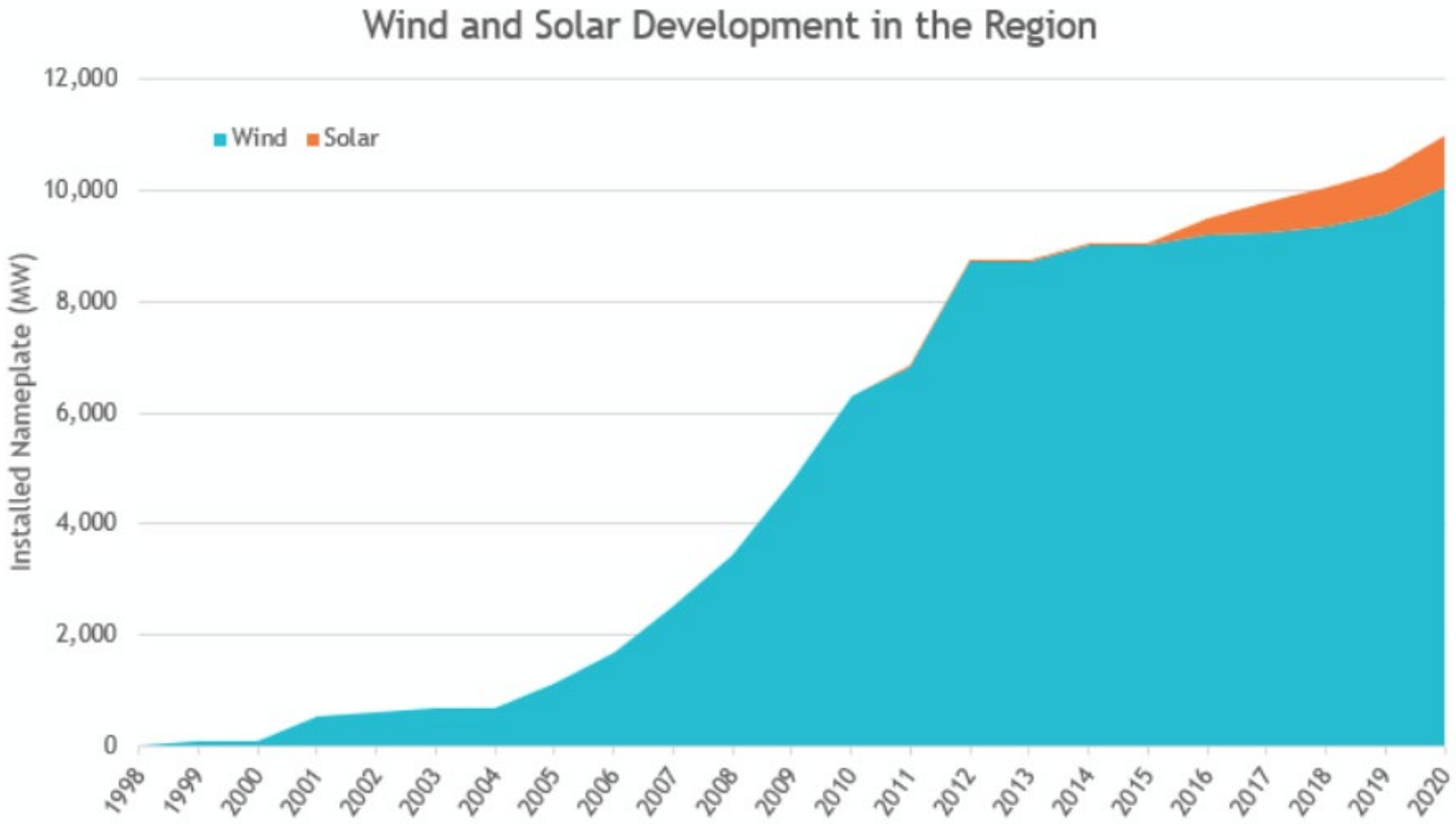
Idaho Power & Avista 100% Clean x 2045

Figure 1: Renewable and Clean Energy Standards in the United States



Oregon & Many States are Looking for Clean Energy!

Scale of Existing PNW Renewables



Source, Slide 3

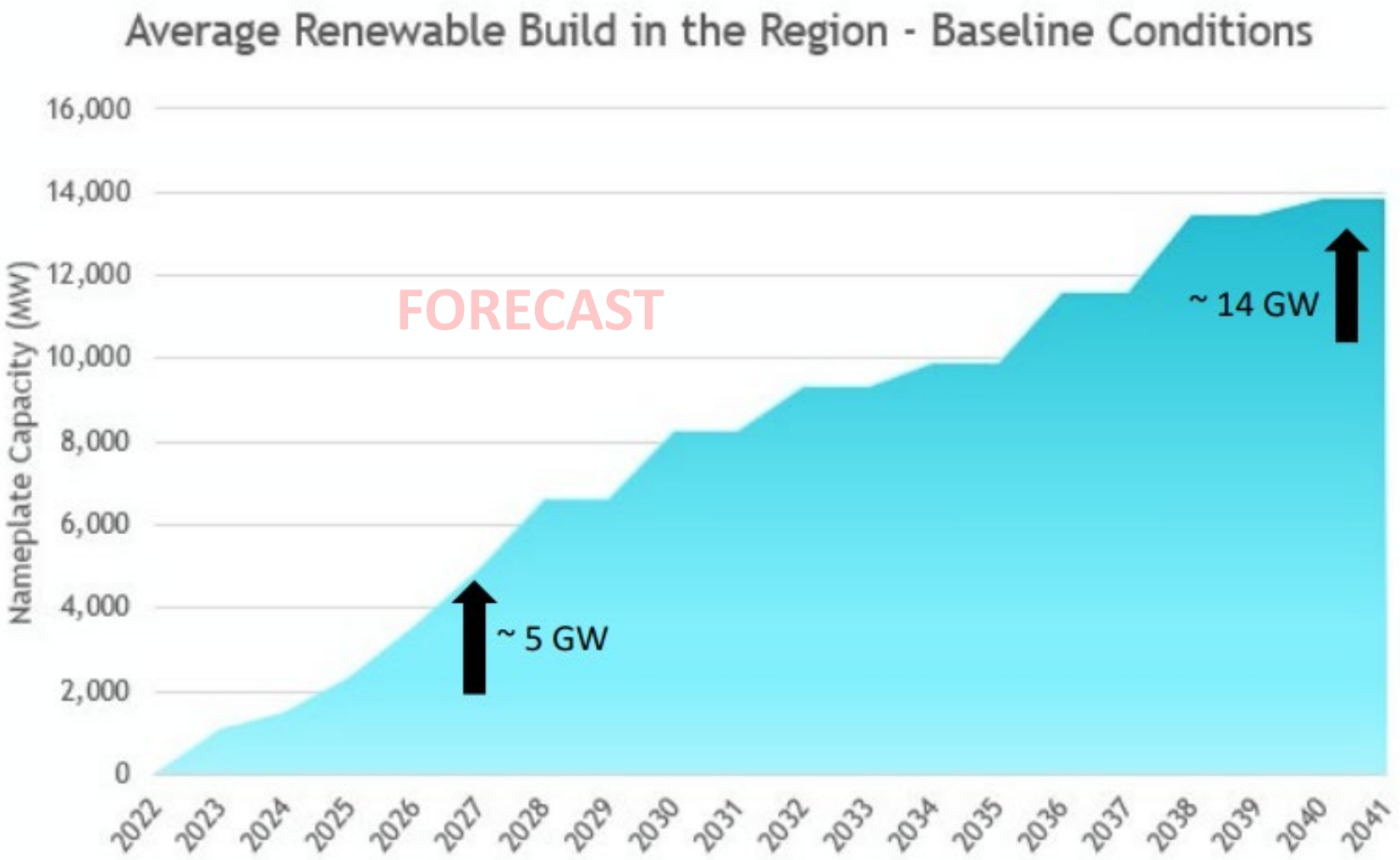
THE 2021 NORTHWEST POWER PLAN
FOR A SECURE & AFFORDABLE ENERGY FUTURE

Wind & Solar in the PNW Developed to date:

Approximately 10,000 MW of wind, with solar increasing in recent years.

Lots of Onshore Wind, How Much More?

Scale of Need for New PNW Renewables



Source, Slide 2

THE 2021 NORTHWEST POWER PLAN
FOR A SECURE & AFFORDABLE ENERGY FUTURE

Draft 2021 Power Plan: Baseline Conditions

Average build of additional new renewables in the Pacific Northwest over the next 20 years.

Can It All Get Built In Time?

What is HB 3375?

- **Recognizes the merits of studying FOSW**
  - Vast potential, BOEM activity, decarbonization, and other benefits & challenges…
- **Declares an Oregon goal to plan for up to 3 GW of FOSW by 2030**
  - **Future** → "goal to plan" is forward looking, e.g. Oregon Legislature could give further direction for state planning through future legislation.
    - ***Goal for state planning is to maximize state benefits while minimizing conflicts between FOSW, the ocean ecosystem, and ocean users.***
  - **Near-Term** → directs ODOE to inform the Oregon Legislature with a report that:
    - Identifies and summarizes key benefits & challenges, and
    - Identifies opportunities for future study and engagement.
- **Does not commit to deployment targets**
  - HB 3375 is unlike other states that have committed to specific deployment targets.

ODOE Elements of HB 3375

- **Literature Review**
  - Review relevant studies and reports on FOSW to help identify key benefits & challenges.
- **Stakeholder Engagement**
  - Several state, regional and national entities listed in the bill.
  - Many add'l stakeholders identified by ODOE, including those involved with the activities of BOEM's Oregon Task Force.
  - Develop prompting questions to help gather stakeholder feedback on key benefits & challenges.
  - Convene at least (2) public remote meetings with stakeholders.
- **Report to Legislature by 9/15/2022**
  - Summarize key findings from literature review and stakeholder feedback, including opportunities for future study and engagement.

Staying Informed on ODOE's Study

- **ODOE's Webpage**

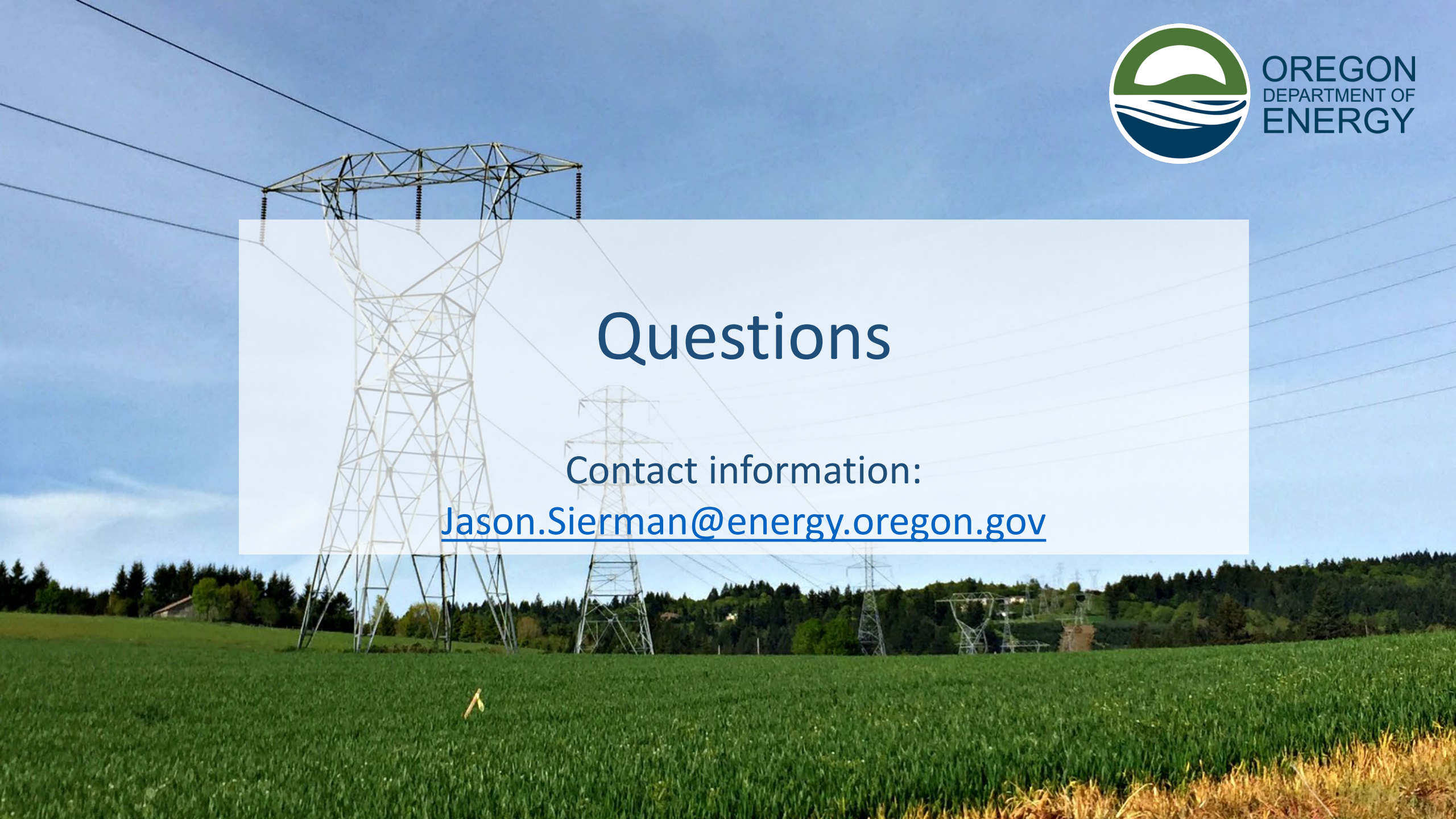
https://www.oregon.gov/energy/energy-oregon/Pages/fosw.aspx

or

https://tinyurl.com/ODOE-FOSW

- **Sign-Up for Email Updates**

http://web.energy.oregon.gov/cn/a6n53/subscribe



OREGON DEPARTMENT OF ENERGY

Questions

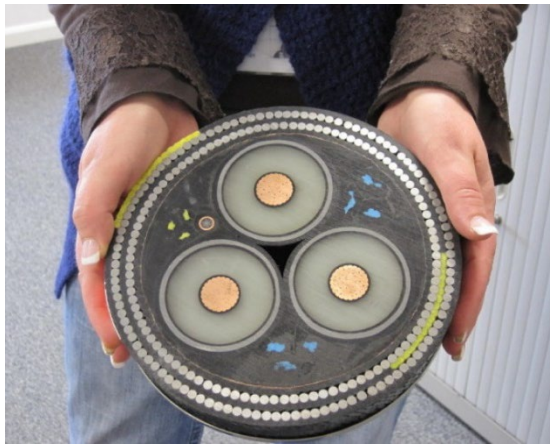
Contact information:

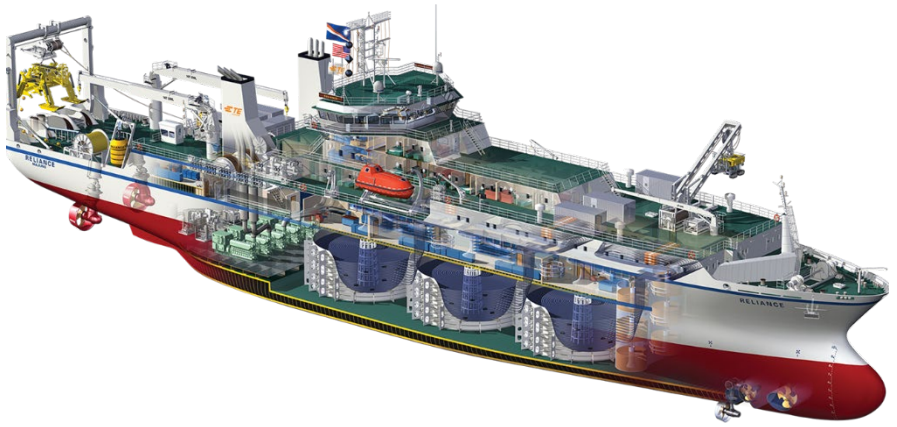
Jason.Sierman@energy.oregon.gov

HB 2603 - TSP Part Four Update

BOEM & Oregon Intergovernmental Task Force Meeting

OCMP





DLCD

10.21.2021

Andy Lanier

Marine Affairs Coordinator

Oregon Coastal Management Program

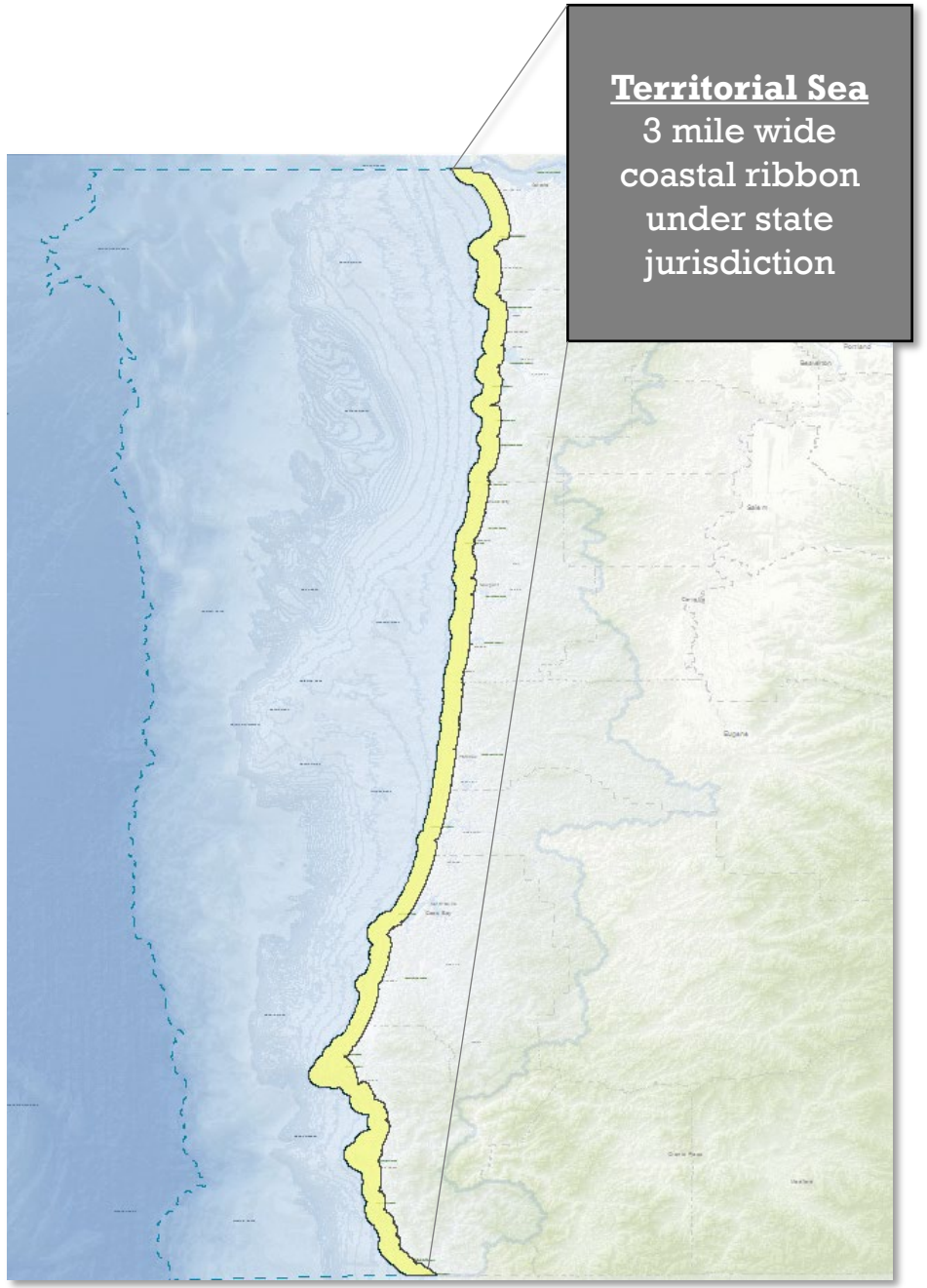
Oregon's Territorial Sea Plan (TSP)

Adopted in 1994

"To conserve marine resources and ecological functions for the purpose of providing long-term ecological, economic, and social value and benefits to future generations."

- **Provides a coordinated framework for managing Oregon's ocean resources.**
- Founded upon Statewide Land Use Planning Goal 19
- Multiple Parts (chapters)
  - Part 3 - Rocky Shore Management
  - **Part 4 - Cable's across the territorial sea**
  - Part 5 - Marine Renewable Energy

The TSP relies on a network of state authorities & programs to implement TSP policies and recommendations.



Subsea Cables in Oregon's Territorial Sea

House Bill 2603

Legislative Direction (2021)

81st OREGON LEGISLATIVE ASSEMBLY--2021 Regular Session

Enrolled

House Bill 2603

Sponsored by Representative GOMBERG (Presession filed.)

CHAPTER .....

AN ACT

Relating to undersea cables; and prescribing an effective date.

Be It Enacted by the People of the State of Oregon:

SECTION 1. (1) As used in this section, "undersea cable" includes a cable used to conduct electricity or light that is placed on state-owned submerged or submersible lands within the territorial sea and any facilities associated with the cable.

(2) An applicant for an easement to place an undersea cable within the territorial sea shall acquire and maintain, until construction of the undersea cable is completed, financial assurance to ensure that the applicant constructs the undersea cable according to the terms and conditions of the easement. The amount of financial assurance required under this subsection shall be an amount determined by the Department of State Lands to be sufficient based on the scale of the project.

(3) At least 180 days before decommissioning an undersea cable, the owner or operator of the undersea cable shall submit to the department for approval a decommissioning plan that includes:

(a) A cost estimate, prepared by a person qualified by experience and knowledge to prepare the estimate, for decommissioning the cable and restoring the area authorized by the easement to a natural condition;

(b) A detailed description of and proposed schedule for the decommissioning and restoration work, including any corrective action that may be required under the easement;

(c) A detailed description of segments of bore pipe and undersea cable proposed to be left in place to avoid or minimize impacts to aquatic resources; and

(d) A proposed form of financial assurance in an amount equal to the cost estimate under paragraph (a) of this subsection.

(4) Within 30 days of receiving a decommissioning plan under subsection (3) of this section, the department shall approve the plan or request revisions to the plan or additional information. If, after receiving revisions to the decommissioning plan or additional information, the department rejects the plan, the owner or operator of the undersea cable must within 90 days submit to the department an application for an easement for the encroachment created by the undersea cable.

(5) The owner or operator of an undersea cable may not begin decommissioning and restoration work unless:

(a) The department has approved a decommissioning plan under subsection (4) of this section;

House Bill 2603 Legislative Direction (2021)

- DLCD, in consultation with DSL and relevant local and tribal governments shall review Part Four of the Territorial Sea Plan. The review must consider:
  - Fee structures
  - State and Federal review processes (including required permits)
  - DLCD shall provide the study results to the Ocean Policy Advisory Council
- The OPAC Shall develop recommendations for amendments to Part Four. The OPAC shall consider the review study led by DLCD and evaluate:
  - (A) A coordinated permitting process for the placement of undersea cables that allows for coordination between appropriate state agencies, tribal governments and local governments
  - (B) Suitable landing sites, including a mapping analysis of opportunities, limitations and requirements for landing sites.
  - (c) The impact of other state agencies, laws, zoning requirements or statewide planning goals on potential undersea cable sites.
  - (d) Changes in fees structures and financing associated with administrative costs and the protection and management of the territorial sea and ocean shore.

House Bill 2603
Legislative Direction (2021)

- The OPAC Shall develop recommendations for amendments to Part Four. The OPAC shall consider the review study led by DLCD and evaluate (continued..):
  - (e) Requirements for public information meetings or other methods for engaging communities, tribal governments, ocean users and industries affected by the proposes undersea cable
  - (f) The impact of drilling on biological resources, including migratory species, and on resources that are of economic, aesthetic, recreational, social or historic importance to the people of this state.
  - (g) an Application process that may include:
    - A needs analysis that takes into account the socioeconomic and environmental needs of the area:
    - A geological study conducted by a registered professional geologist experienced in coastal processes
    - Consultation with Oregon seafloor experts
    - A detailed drilling, mitigation, and accident response plan
    - Requirements for interagency preapplication process meetings.
    - Standards for undersea cables in the States of California and Washington.
    - Coordination with tribal governments on potential impacts of undersea cables on cultural and traditional resources

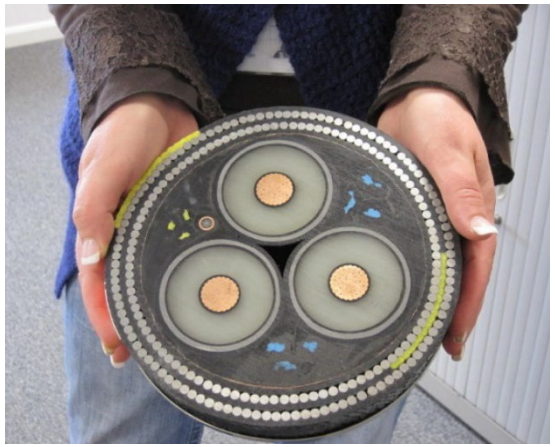
Subsea Cables in Oregon's Territorial Sea

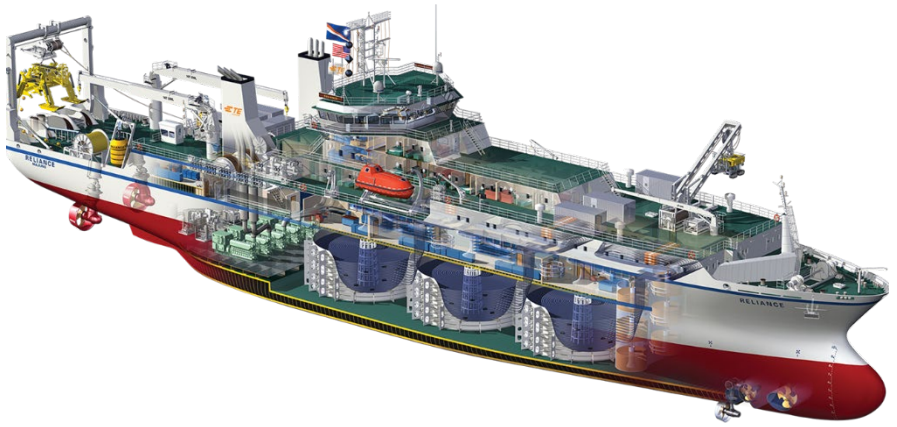
House Bill 2603 Legislative Direction (2021)

- The OPAC Shall develop recommendations for amendments to Part Four no later than two years after the effective date of the Act.
- DLCD was appropriated $497,081 for the 2021 biennium to accomplish this task.

?'s

OCMP





DLCD

Andy Lanier
Andy.Lanier@dlcd.Oregon.gov
Marine Affairs Coordinator
Oregon Coastal Management Program

Pacific Fishery Management Council engagement in West Coast offshore wind planning

Oregon-BOEM Task Force
October 21, 2021

Caren Braby, PhD
Marine Resources Program Manager, ODFW
Oregon-BOEM Task Force member
PFMC Council member and representative to MSP fora

Delia Kelly
Ocean Energy Coordinator, Marine Resources Program, ODFW
PFMC Marine Planning Committee (MPC) member

Offshore Wind Entities

BOEM
Bureau of Ocean Energy Management

3 areas
different stages

1 area
data gathering

1 area
being proposed

PFMC

NOAA FISHERIES

PFMC Marine Planning Committee (MPC)

- 2020-2021: PFMC-BOEM coordination (Exec Comm)
- 2021: 2-year ad hoc committee, 12 members
  - PFMC Advisory Subpanel representatives (6):
    - Salmon – Darus Peake
    - Groundfish – Susan Chambers (co-chair)
    - Highly Migratory – Mike Conroy (co-chair)
    - Coastal Pelagic – Mike Okoniewski
    - Ecosystem – Scott McMullen
    - Habitat – Steve Scheiblauer
  - PFMC management agencies (4):
    - WA – Corey Niles (WDFW)
    - OR – Delia Kelly (ODFW)
    - CA – Chris Potter (CDFW)
    - NMFS – Yvonne deReynier (NWFSC)
  - PFMC Conservation (1): Megan Waters
  - PFMC Tribal (1): Steve Joner
  - Staff: Kerry Griffin

PFMC Marine Planning Committee (MPC)

- Goals of the MPC
  - Regional fisheries voices input into OSW processes
  - Shape the PFMC comments on OSW, Aquaculture, other
  - Integrate state-based lessons learned, approach
- Issues of particular interest to resolve in OSW siting
  - Essential Fish Habitat and resource sustainability
  - Fisheries use, conflicts with development/closures
  - Changing ocean conditions (and resource impacts)
- Future issues for MPC
  - Cumulative effects from developments
  - Other marine spatial planning activities

PFMC Marine Planning Committee (MPC)

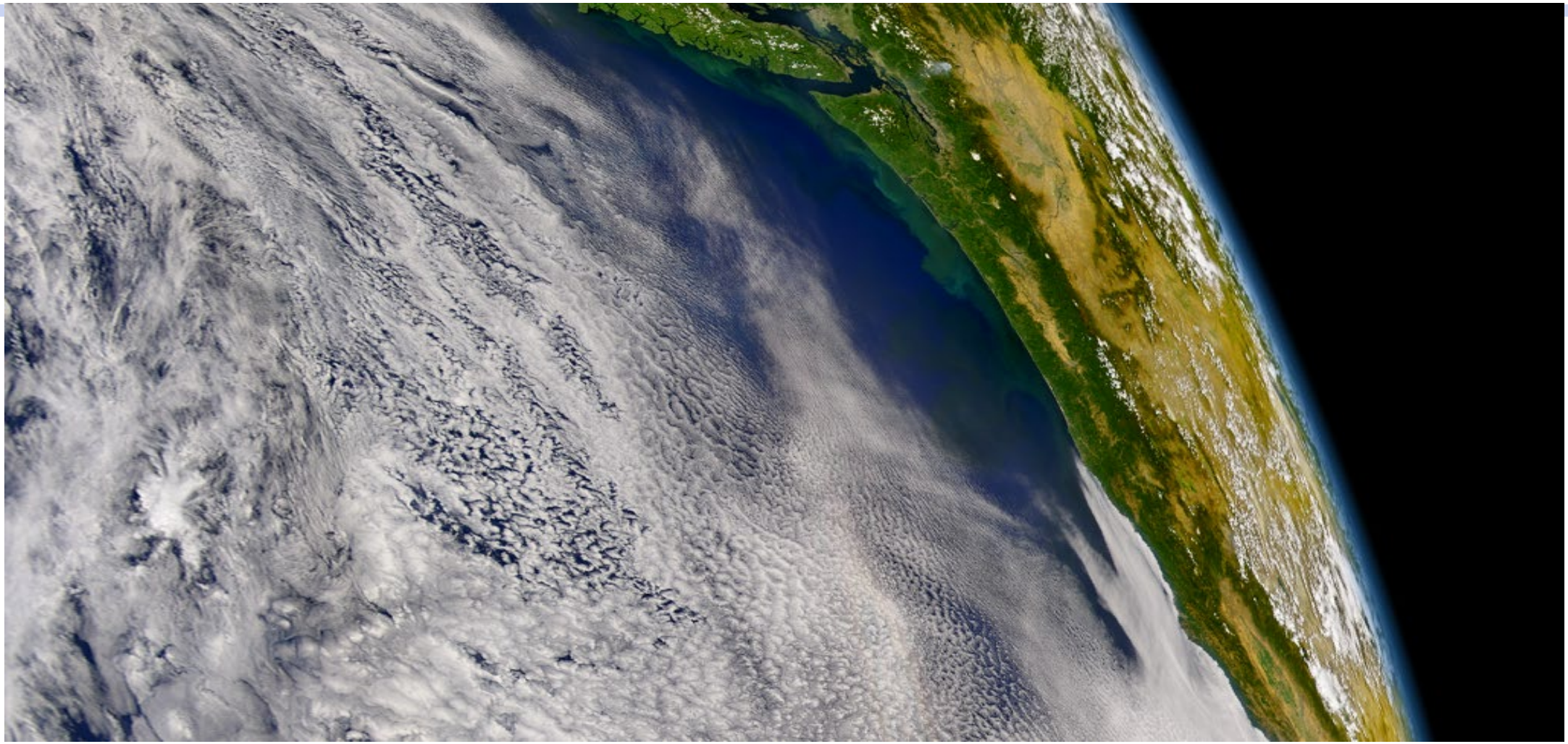
- July
  - PFMC-BOEM webinars – all PFMC "family" invited to provide comment
- September
  - MPC webinar – MPC met for first time
  - PFMC comment letters – 3 California areas (2 BOEM, 1 State Lands)
    - Morro Bay call area extensions
    - Humboldt wind energy area
    - Vandenburg projects
- November (upcoming)
  - November 10 – MPC considers USCG "PARS", Oregon OSW, other
  - November 17 – PFMC Marine Planning agenda item
- 2022
  - How will engagement continue on Oregon Call Area development?

Offshore Wind Information Resources

- Regional information resources
  - PFMC website marine planning news (roster of interest)
    - https://www.pcouncil.org/offshore-wind-news/
  - West Coast Ocean Data Portal
    - https://portal.westcoastoceans.org/
  - BOEM-Oregon task force
    - https://www.boem.gov/Oregon
- State-based portals
  - CA: California Offshore Wind Energy Gateway
    - https://caoffshorewind.databasin.org/
  - OR: OroWIND Map
    - https://offshorewind.westcoastoceans.org/
  - WA: marine spatial planning
    - https://msp.wa.gov/

OREGON Fish & Wildlife
Marine Resources

Questions?



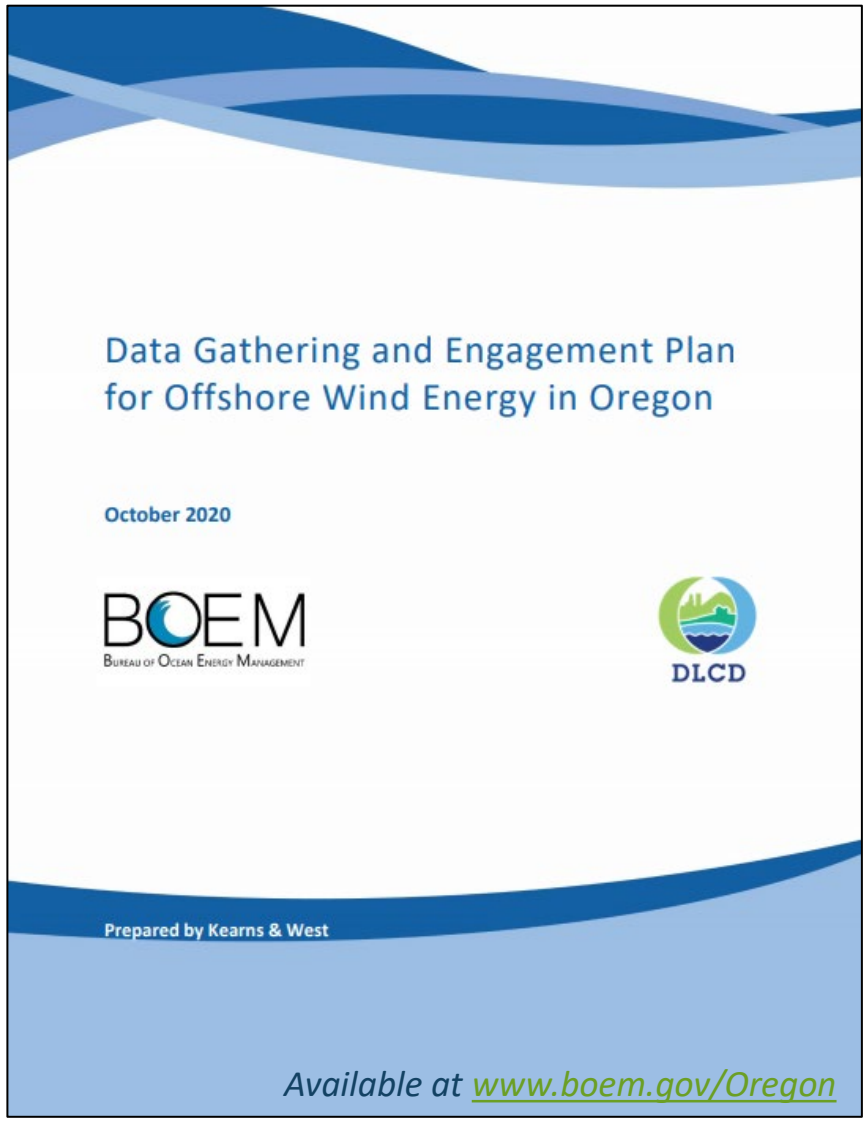
National Oceanic and Atmospheric Administration
National Marine Fisheries Service Update

Keith Kirkendall and Candace Nachman

Overview of Oregon Offshore Wind Energy Planning and Engagement Activities

Whitney Hauer, Ph.D., Renewable Energy Specialist
Sara Guiltinan, Renewable Energy Specialist
BOEM Pacific Office

BOEM Oregon Task Force: 2019 & 2020 Recap



September 2019 meeting: discussed planning approach

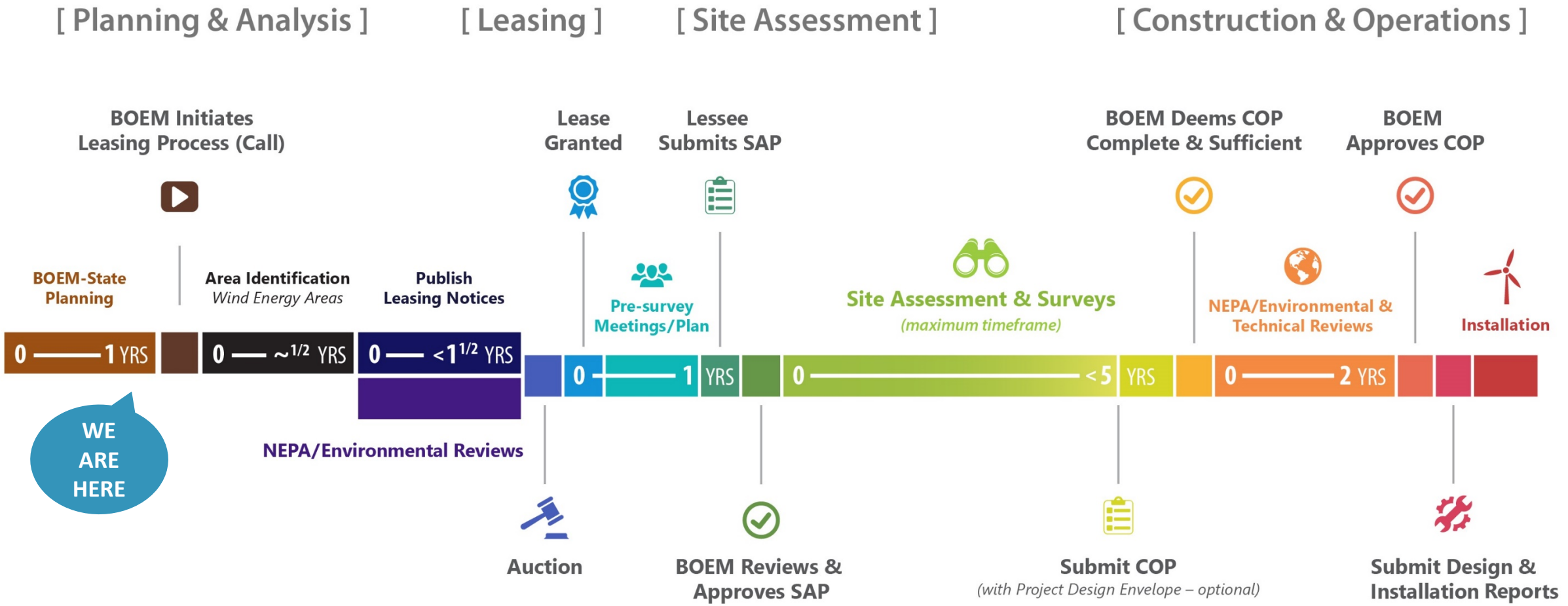
- Result: BOEM and DLCD drafted data gathering and engagement plan
- Oregon Ocean Policy Advisory Council (OPAC) letter to the Governor supports planning

June 2020 meeting: discussed draft plan

- Result: BOEM and the State of Oregon committed to offshore wind energy planning

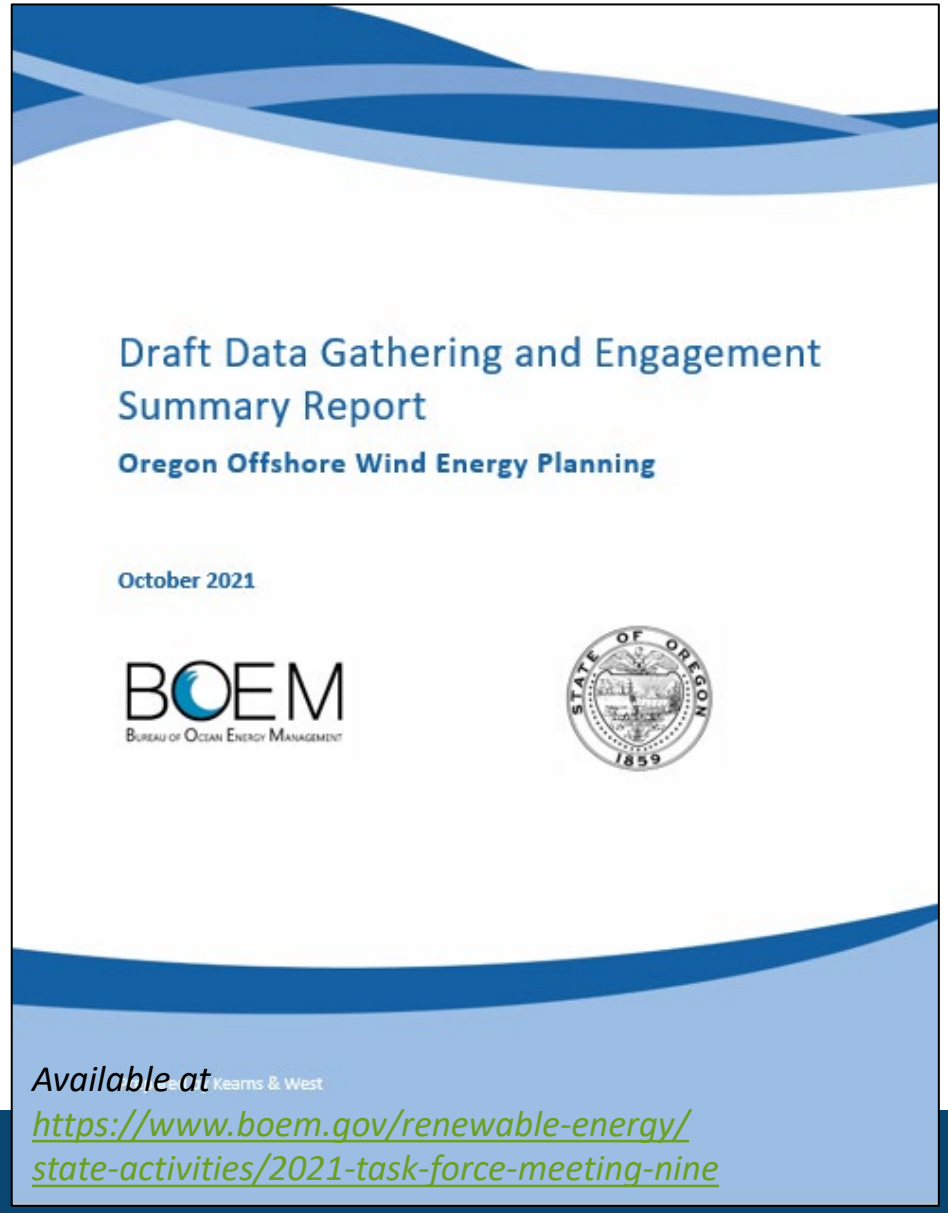
October 2020: BOEM and DLCD finalized "Data Gathering and Engagement Plan for Offshore Wind Energy in Oregon"

BOEM Offshore Wind Energy Authorization Process

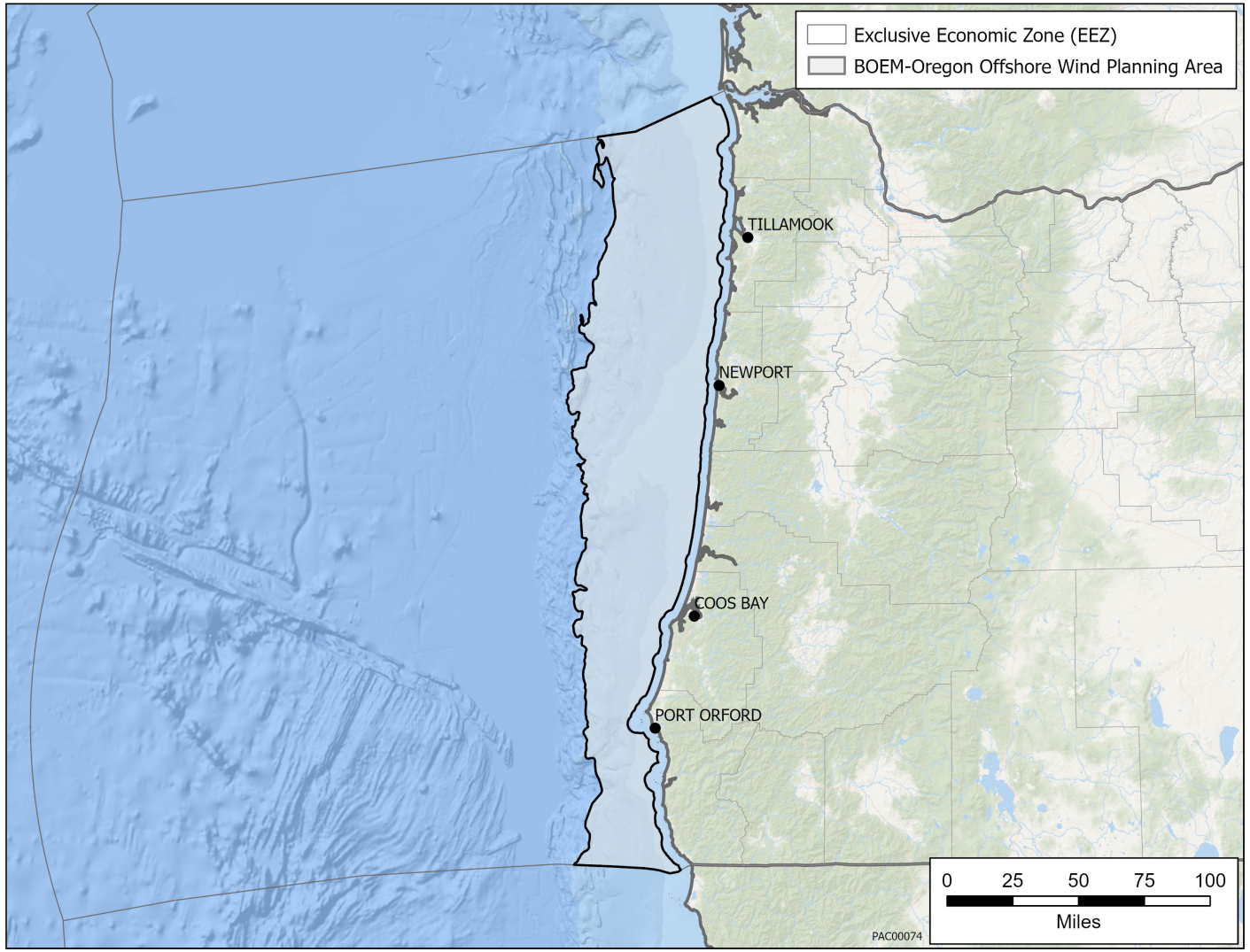


Draft Data Gathering and Engagement Summary Report

- **Outlines how BOEM and DLCD engaged over 12-month effort in data and information gathering**
- **Identifies key input and concerns received**
- **Includes feedback on data layers of the Oregon Offshore Wind Mapping (OROWindMap) Tool**
- **Target Audiences:**
  - Research organizations
  - Ocean Users
  - Coastal Communities/General Public
  - Tribes



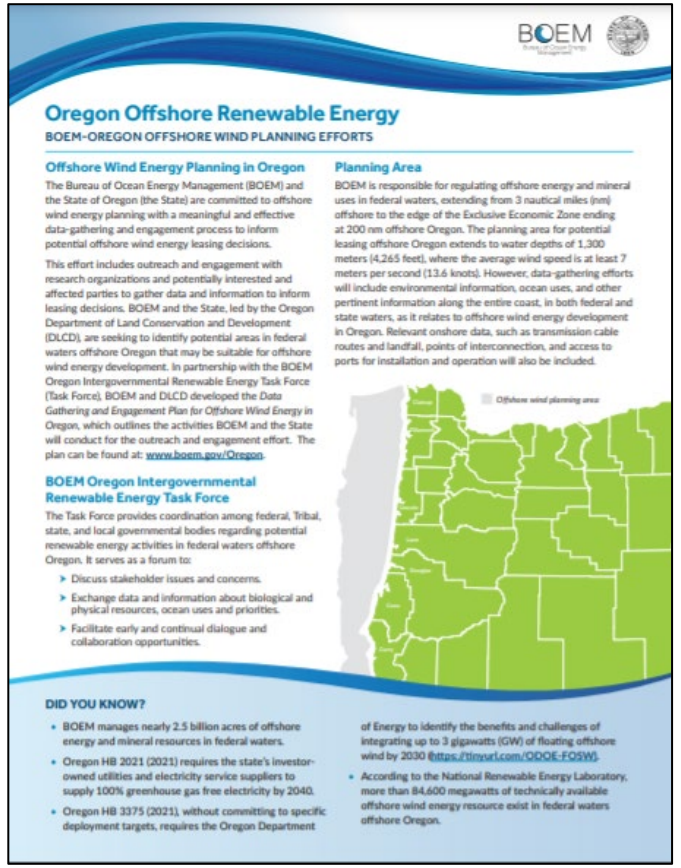
Current Planning Area for Leasing



- Federal waters offshore Oregon
- Water depths <1,300 m (4,625 ft)
- Average wind speed >7 m/s (13.6 knots)

Summary of Outreach and Engagement Efforts

- **Adjusted to a fully virtual engagement environment**
  - Hosted public webinars
  - Hosted one-on-one or small group virtual meetings
  - Participated in standing meetings
- **Developed fact sheets**
- **Updated webpage www.boem.gov/Oregon**
  - Posted standing meetings open to the public
  - Created a virtual meeting room with all public webinar recordings and materials
- **Communicated to the Task Force regularly**
- **Maintained comprehensive contact list over 1,000 contacts**



BOEM

Oregon Offshore Renewable Energy

BOEM-OREGON OFFSHORE WIND PLANNING EFFORTS

Offshore Wind Energy Planning in Oregon

The Bureau of Ocean Energy Management (BOEM) and the State of Oregon (the State) are committed to offshore wind energy planning with a meaningful and effective data-gathering and engagement process to inform potential offshore wind energy leasing decisions.

This effort includes outreach and engagement with research organizations and potentially interested and affected parties to gather data and information to inform leasing decisions. BOEM and the State, led by the Oregon Department of Land Conservation and Development (DLCD), are seeking to identify potential areas in federal waters offshore Oregon that may be suitable for offshore wind energy development. In partnership with the BOEM Oregon Intergovernmental Renewable Energy Task Force (Task Force), BOEM and DLCD developed the *Data Gathering and Engagement Plan for Offshore Wind Energy in Oregon*, which outlines the activities BOEM and the State will conduct for the outreach and engagement effort. The plan can be found at: www.boem.gov/Oregon.

BOEM Oregon Intergovernmental Renewable Energy Task Force

The Task Force provides coordination among federal, Tribal, state, and local governmental bodies regarding potential renewable energy activities in federal waters offshore Oregon. It serves as a forum to:

- Discuss stakeholder issues and concerns.
- Exchange data and information about biological and physical resources, ocean uses and priorities.
- Facilitate early and continual dialogue and collaboration opportunities.

Planning Area

BOEM is responsible for regulating offshore energy and mineral uses in federal waters, extending from 3 nautical miles (nm) offshore to the edge of the Exclusive Economic Zone ending at 200 nm offshore Oregon. The planning area for potential leasing offshore Oregon extends to water depths of 1,300 meters (4,265 feet), where the average wind speed is at least 7 meters per second (13.6 knots). However, data-gathering efforts will include environmental information, ocean uses, and other pertinent information along the entire coast, in both federal and state waters, as it relates to offshore wind energy development in Oregon. Relevant onshore data, such as transmission cable routes and landfall, points of interconnection, and access to ports for installation and operation will also be included.

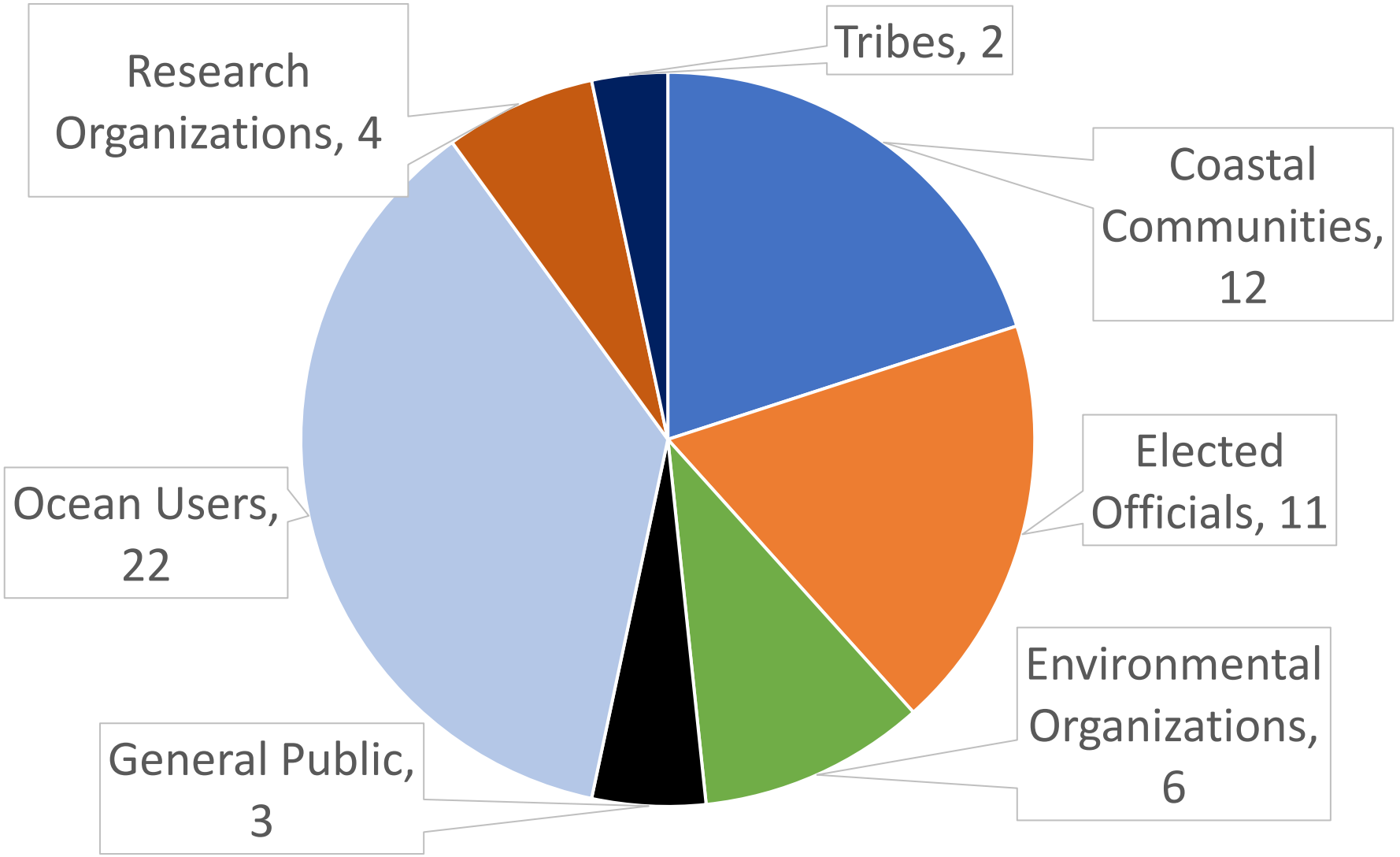
Offshore wind planning area

DID YOU KNOW?

- BOEM manages nearly 2.5 billion acres of offshore energy and mineral resources in federal waters.
- Oregon HB 2021 (2021) requires the state's investor-owned utilities and electricity service suppliers to supply 100% greenhouse gas free electricity by 2040.
- Oregon HB 3375 (2021), without committing to specific deployment targets, requires the Oregon Department of Energy to identify the benefits and challenges of integrating up to 3 gigawatts (GW) of floating offshore wind by 2030 (https://tinyurl.com/ODOE-FOSW).
- According to the National Renewable Energy Laboratory, more than 84,600 megawatts of technically available offshore wind energy resource exist in federal waters offshore Oregon.

Available at www.boem.gov/Oregon

Summary of Engagement Meetings



- **60 Meetings**
- **Over 1,200 participants**

BOEM-Oregon Offshore Wind Webinars

- **March 2021 – OROWindMap Introductory Webinar**
  - Purpose: Share the functionality of OROWindMap with key data users and data providers
  - 138 Participants
- **May 2021 – Oregon Offshore Wind Energy Planning Public Webinars**
  - Purpose: Provide an overview of and update to planning effort and gather feedback
  - 3 Webinars, 216 total participants
- **August 2021 – Data Review Virtual Workshops**
  - Purpose: Gather feedback and input on datasets
    - Physical, human-use, biological data review, 129 participants
    - Fisheries data review, 123 participants
- **Recordings and materials at www.boem.gov/renewable-energy/state-activities/2021-oregon-offshore-wind-energy-planning-public-webinars**

Tribal Engagement

- February 2021: Invited engagement with Tribes in Oregon
- March 2021: Staff-to-staff meeting with Coquille Indian Tribe, BOEM, and DLCD
- May 2021: Invited engagement with Tribes in California with ancestral lands in Oregon
- August 2021: Ocean energy staff briefing with Makah Tribe and BOEM
- Continuous: Regular updates to the West Coast Ocean Tribal Caucus
- Continuous: Periodic informal communications with Tribal representatives
- Next Steps: Continue communication, engage as requested, implement Tribal Cultural Landscapes approach
- As of September 2021, Parker McWilliams is the BOEM Pacific Tribal Liaison

Feedback Theme: Meaningful Engagement

- **Support for continued engagement throughout BOEM's authorization process for offshore wind energy leasing and development**
  - Early and often
  - Clarify level of review and analysis at each process stage in BOEM authorization
- **Fishing industry and community**
  - Expressed concern that their feedback will not be taken into consideration
  - Want BOEM and the State to consider fishing industry feedback and want decisions to be informed by input from all current users of the ocean space
- **Industry users**
  - Expressed positive support for offshore wind projects
  - Encourage maritime partnerships are developed early
  - Prioritize safety and labor standards

Feedback Theme: Fishing and Other Ocean Users

- **Siting or potential loss of fishing grounds**
  - Impacts to some fisheries more than others
  - Future change in fish behavior and migration patterns
  - Socioeconomic impacts to fishing activities, impacts to fishermen's livelihoods and other ocean users
  - Consideration of mandatory and voluntary closed fishing areas
- **Offshore wind energy installation and operations**
  - Potential impacts to fisheries operations during construction and operation
  - Safety for fishermen and their equipment
  - Interference with survey efforts important to the fishing industry
  - Potential conflicts with vessel traffic
  - Other uses within a lease area not regulated by BOEM

Feedback Theme: Impacts to Wildlife and Other Impacts

- **Concern of impacts on marine species and seabird distribution, migration, and behavior**
  - Interactions with animals and floating offshore wind turbines
  - Cumulative impacts from multiple projects
  - Impacts on marine species that could impact fishing industry
  - Impacts of climate change on marine species
- **Concern of visual impacts from shore**

Feedback Theme: Oregon's Energy Portfolio

- **Cost of offshore wind on the ratepayer**
  - Concern for projects requiring feed-in tariffs
  - Cost-effectiveness of offshore wind compared to other energy
- **Feasibility of offshore wind and hydrogen production**
- **Support for southern Oregon offshore wind development**
  - Coastal resiliency and reliability
  - Planning and process are done responsibly, with transparency, and meet environmental protection standards
- **Future analysis: job creation or displacement, economic development**

Summary Report Next Steps

- **Provide feedback to draft**
  - Use the comment tracker to provide written review and input to draft report
  - Email comments to renewableenergypocs@boem.gov by November 4, 2021
- **BOEM and DLCD will:**
  - Finalize the summary report
  - Provide report to the Task Force
  - Post report at www.boem.gov/Oregon

Task Force Roundtable Q&A and Discussion

Break

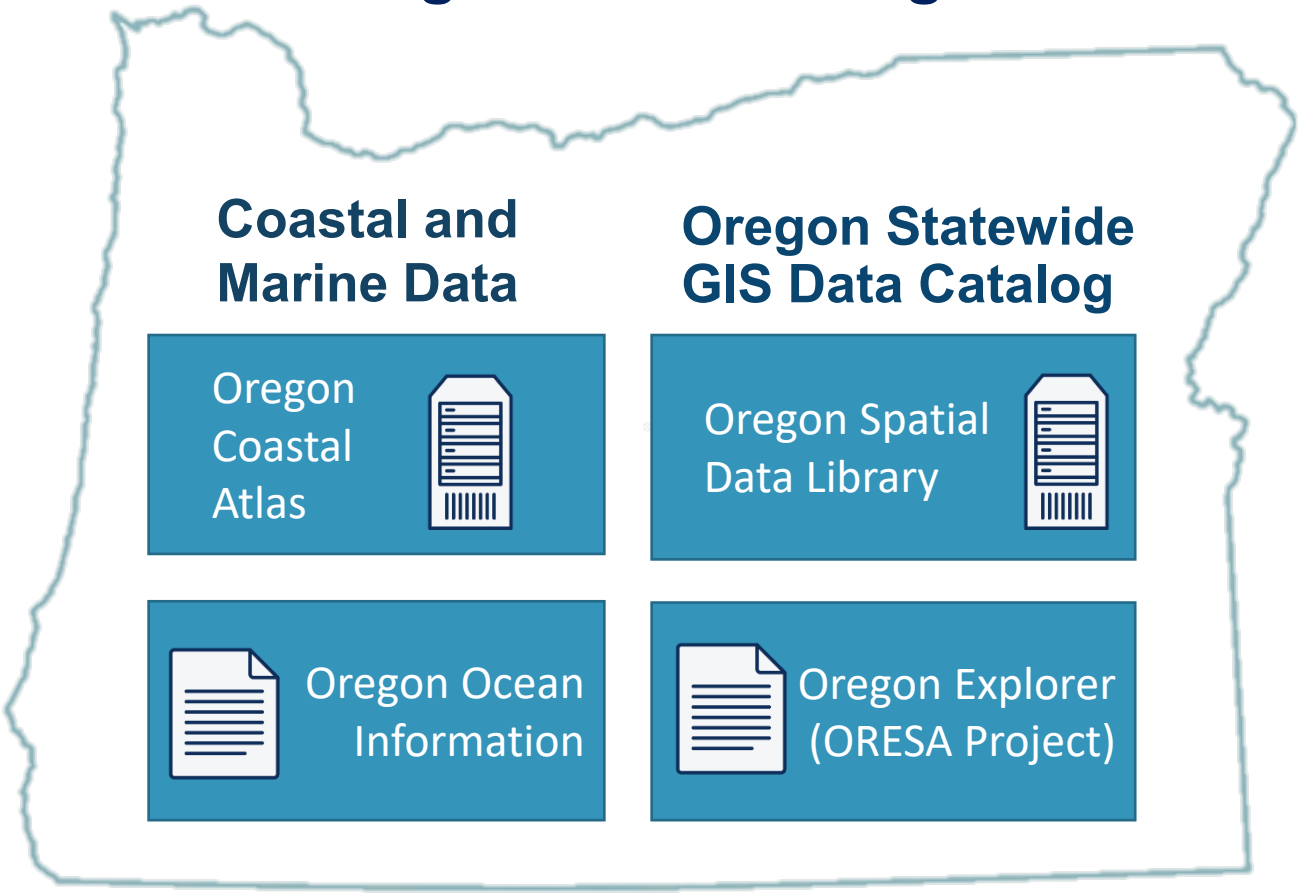
Meeting will resume at 10:45 am

OROWindMap Overview and Datasets Discussion

Andy Lanier, Oregon DLCD Marine Affairs Coordinator
Frank Pendleton, BOEM Pacific Office GIS Specialist

Offshore Wind Data Catalog Organizational Plan

Oregon Data Catalogs +



Coastal and Marine Data

- Oregon Coastal Atlas
- Oregon Ocean Information

Oregon Statewide GIS Data Catalog

- Oregon Spatial Data Library
- Oregon Explorer (ORESA Project)

Federal Data Catalogs

- Marine Cadastre
- Ocean Reporting Tool
- Digital Coast
- NOAA Fisheries (FRAM)
- NREL Data Catalog
- Ocean Observing Initiative
- USGS
- …and many more

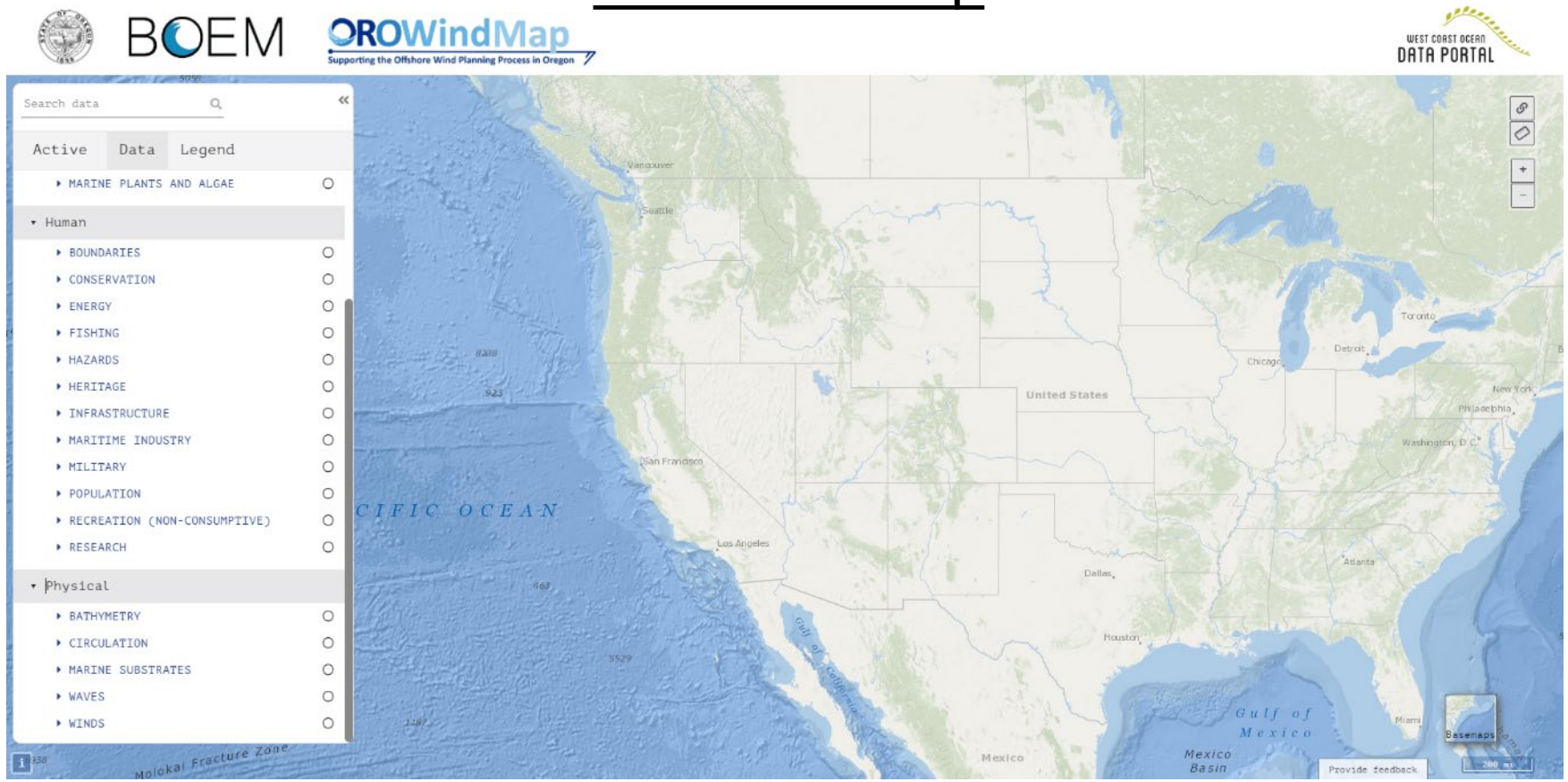
Curated Offshore Wind Catalog

WEST COAST OCEAN DATA PORTAL

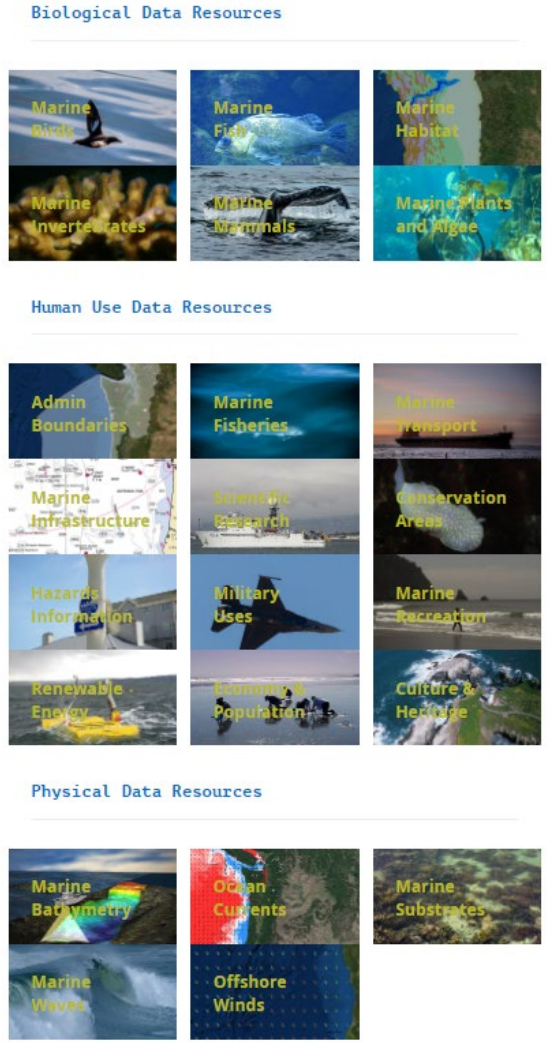
Offshore Wind Catalog (Combination of Records from Oregon and Federal Data Catalogs)

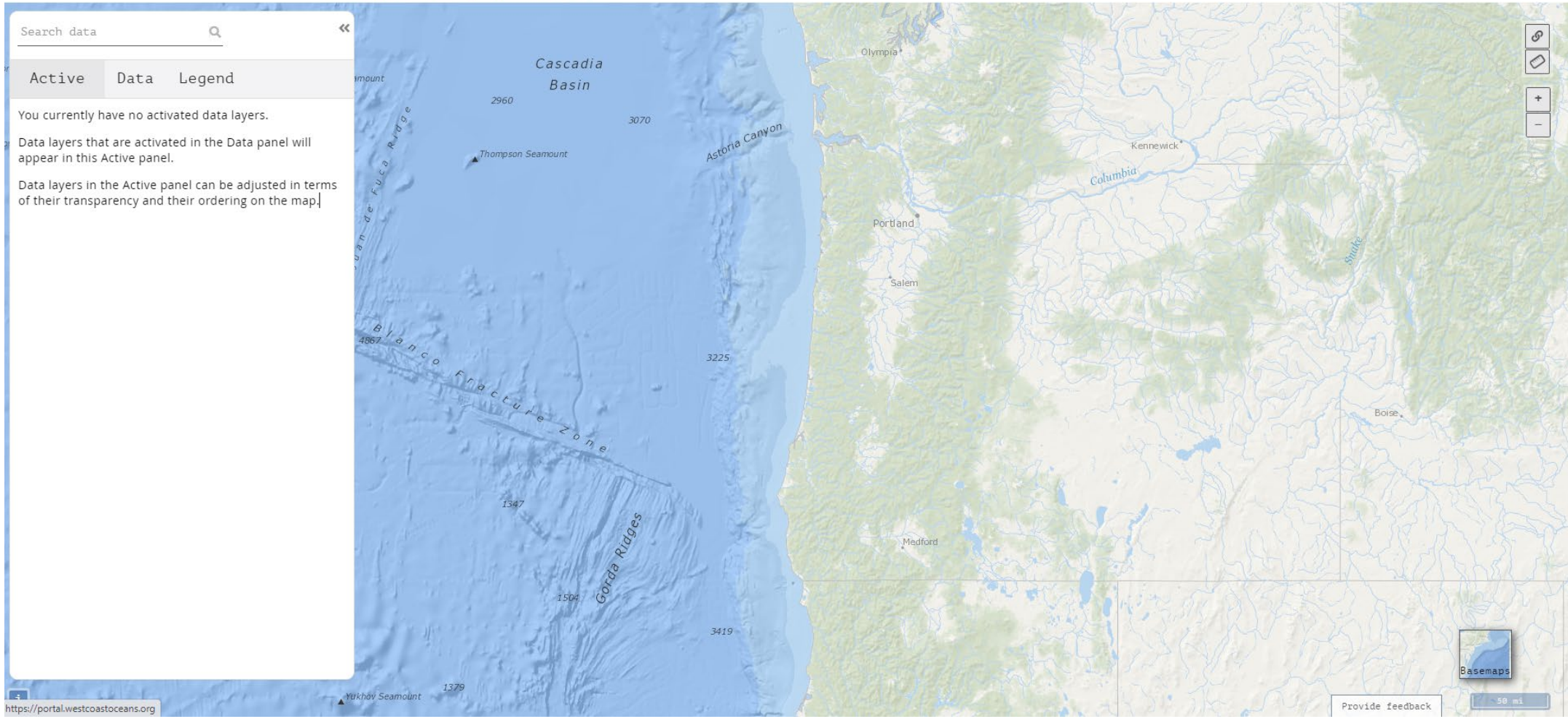
Offshore Wind Data Visualization Tool and Data Catalog

OROWindMap

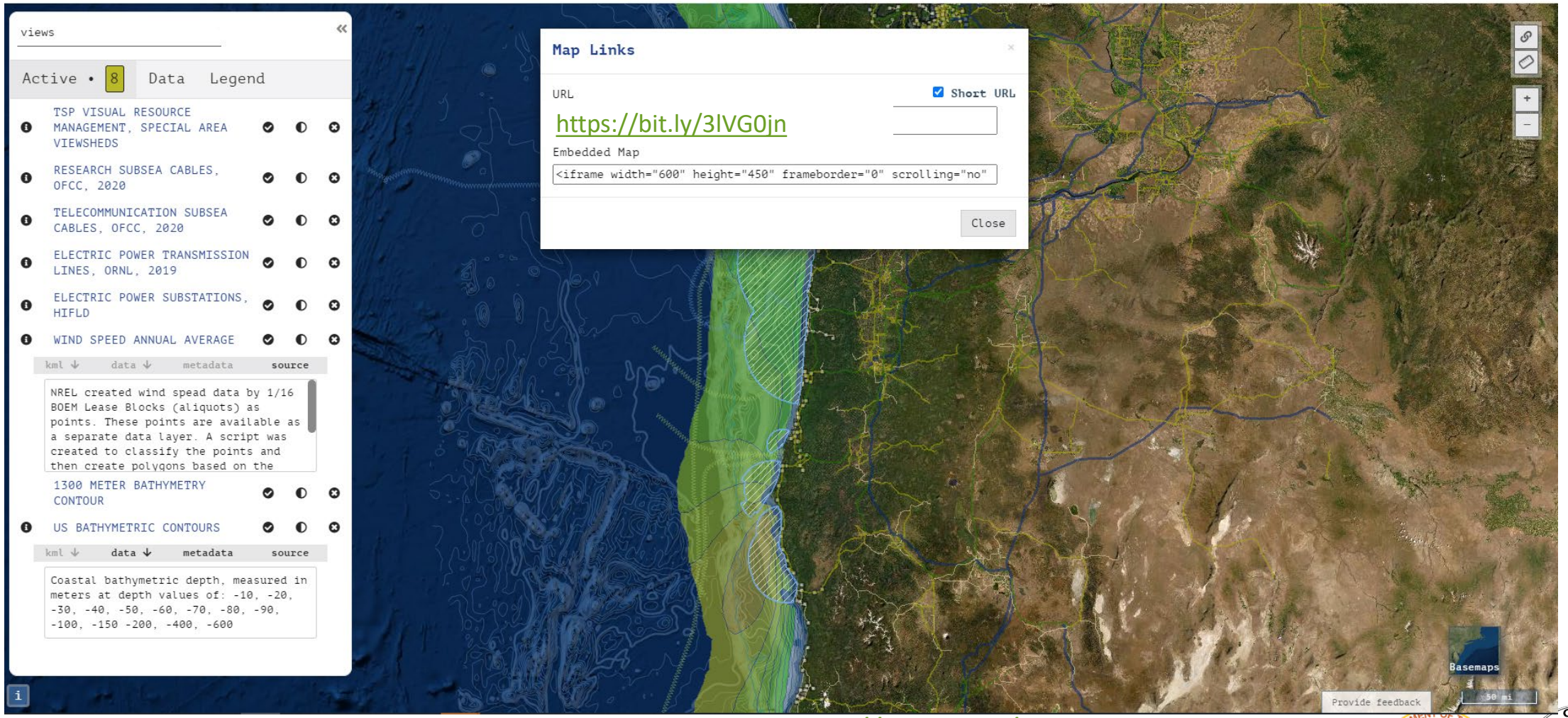


Data Catalog



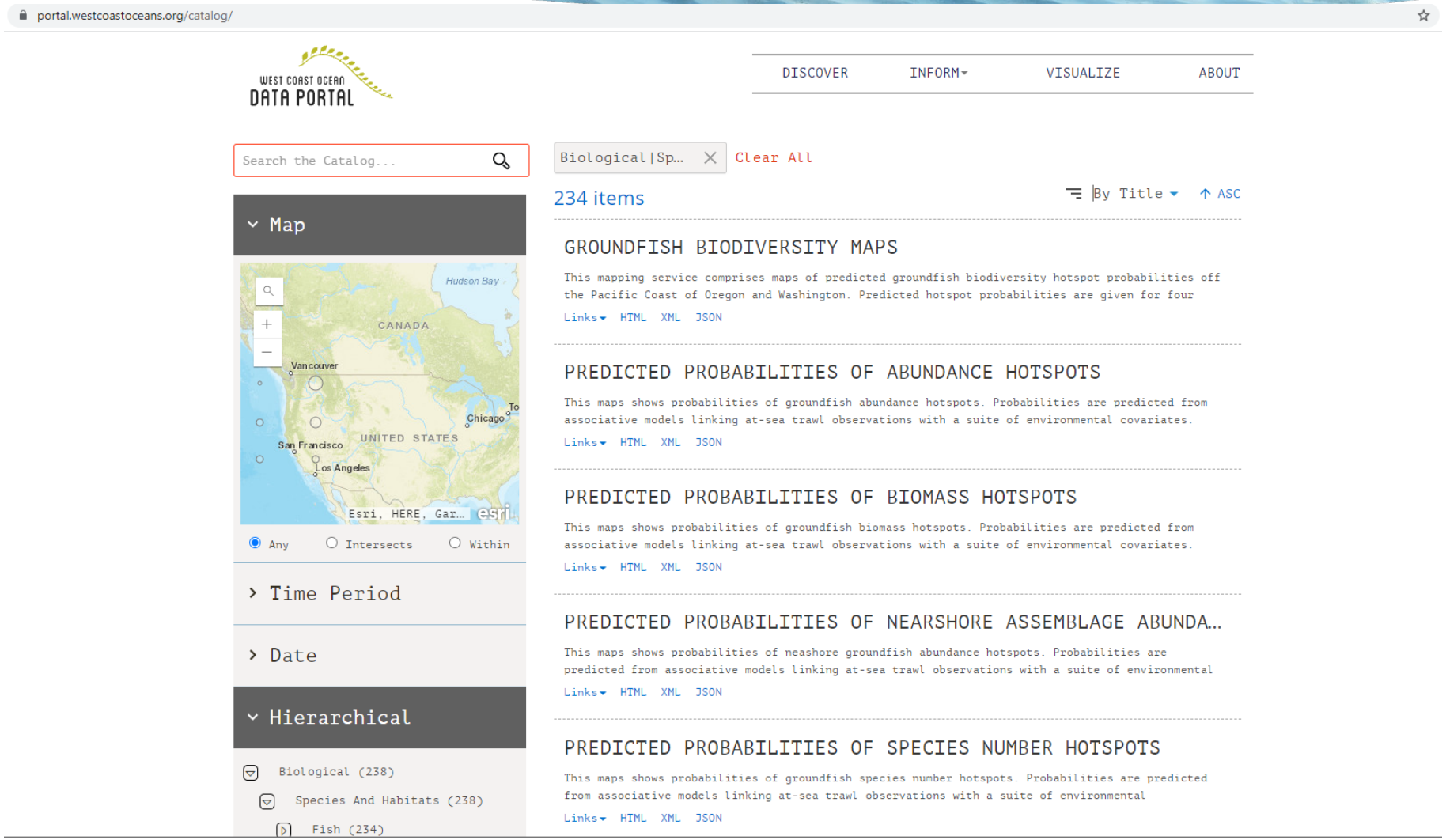


OROWindMap Introductory Webinar: https://youtu.be/d6xa3QjmdiM



OROWindMap Introductory Webinar: https://youtu.be/d6xa3QjmdiM

Discover additional data resources via the Portal



OROWindMap Data Catalog

portal.westcoastoceans.org/OROWindMap-data-themes/

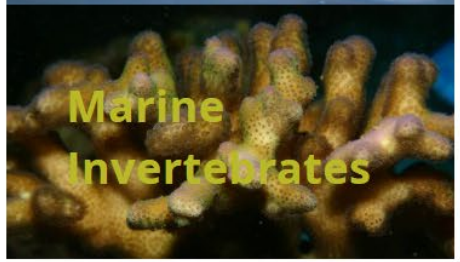
WEST COAST OCEAN DATA PORTAL

DISCOVER | INFORM | VISUALIZE | ABOUT

INFORM

OROWINDMAP CATALOG

Biological Data Resources



Human Use Data Resources

OROWindMap Data Catalog – Marine Birds

portal.westcoastoceans.org/OROWindMap-data-themes/marine-birds/

WEST COAST OCEAN DATA PORTAL

DISCOVER INFORM VISUALIZE ABOUT

Marine Birds

Marine Birds data theme includes information on avian fauna, including flying and nonflying forms.

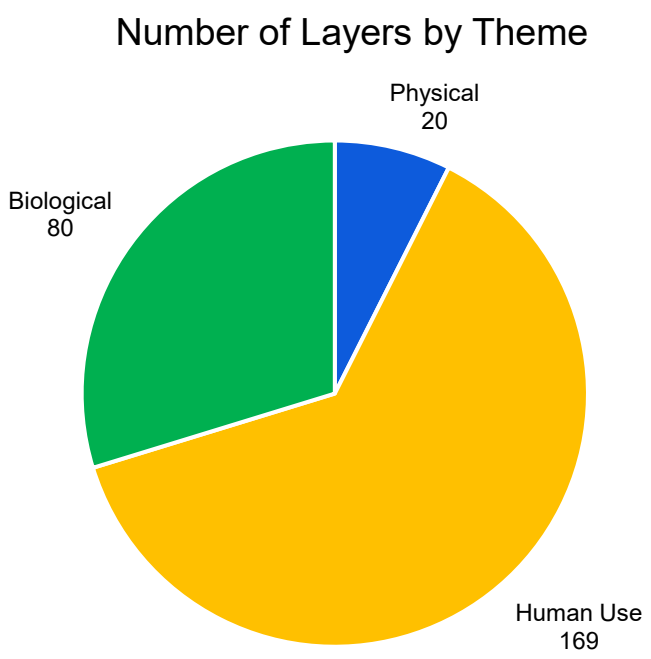
View all Marine Bird layers on OROWindMap

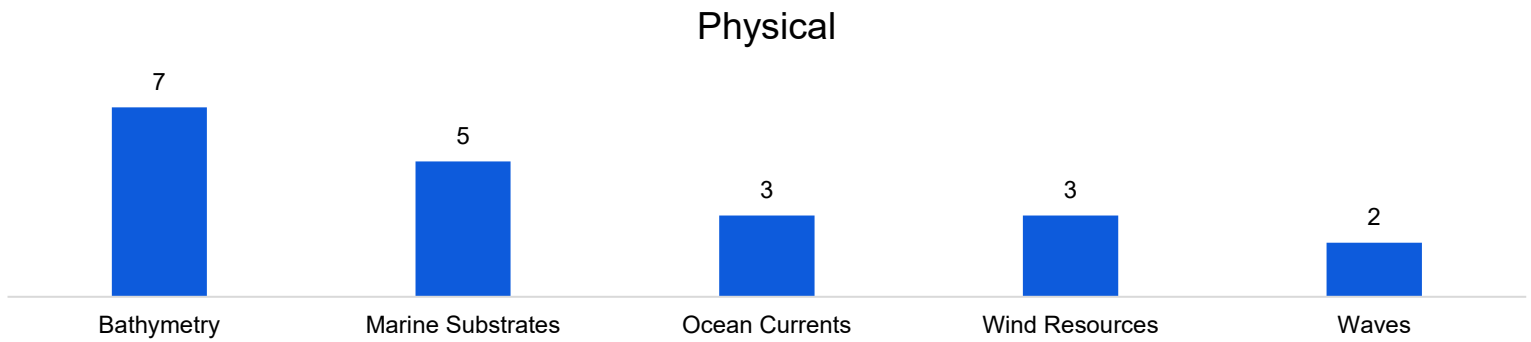
View Metadata

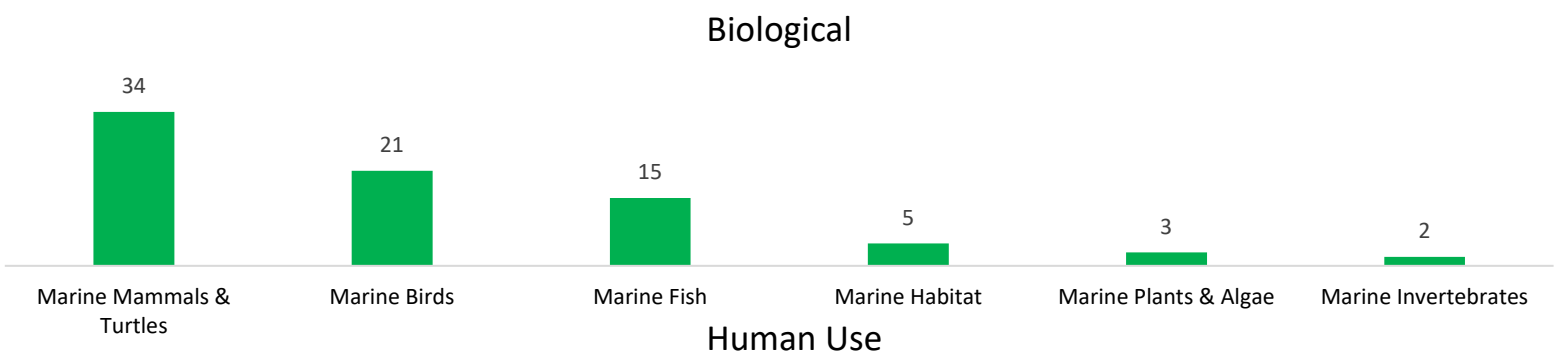
- Important Coastal Bird Areas, Audubon, 2013
  Catalog|OROWindMap
- PaCSEA All Surveys Avg 2011-2012
  Catalog|OROWindMap
  - PaCSEA Jan 2011
    Catalog|OROWindMap
  - PaCSEA June 2011
    Catalog|OROWindMap
  - PaCSEA Oct 2011
    Catalog|OROWindMap
  - PaCSEA Feb 2012
    Catalog|OROWindMap
  - PaCSEA July 2012
    Catalog|OROWindMap

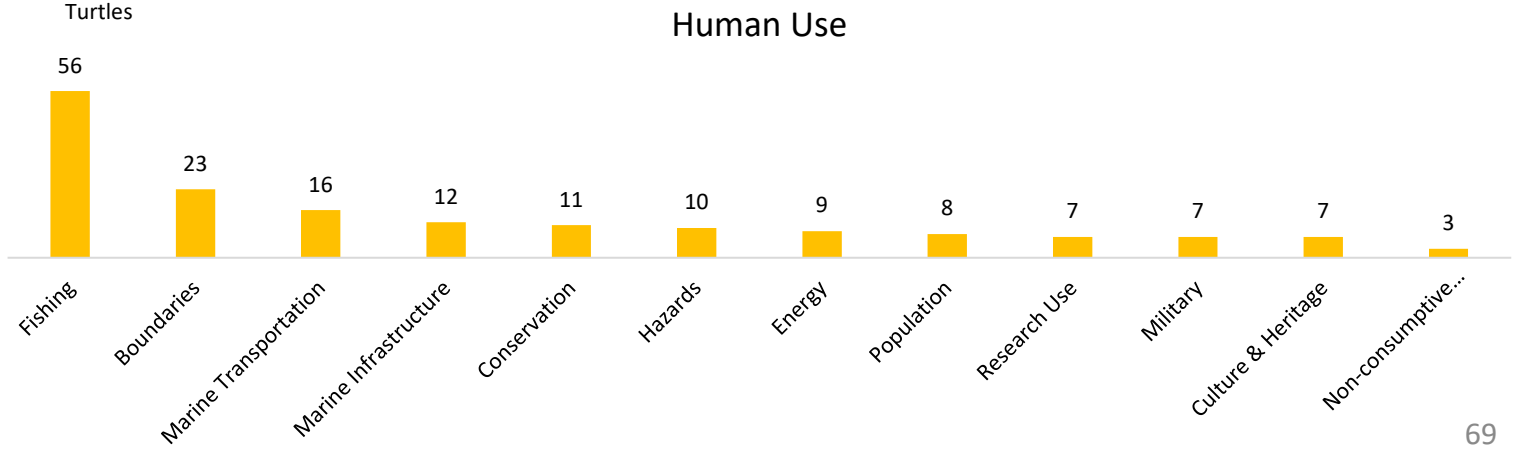
oastoceans.org

Summary of Catalog Data Records by Theme









A Big Thank You to the Data Source Providers!

Active Tectonics and Seafloor Mapping Lab (ATSML), Oregon State University
- http://bhc.coas.oregonstate.edu/geoportal/catalog/main/home.page

Bureau of Land Management (BLM)
- https://www.blm.gov/

Bureau of Ocean Energy Management (BOEM)
- https://www.boem.gov/

Bureau of Safety and Environmental Enforcement (BSEE)
- https://www.bsee.gov/

Ecotrust
- https://ecotrust.org/

Environmental Protection Agency (EPA)
- https://www.epa.gov/

Federal Aviation Administration (FAA)
https://www.faa.gov/

Georgia Institute of Technology
https://www.gatech.edu/

Marine Cadastre (A joint initiative of NOAA & BOEM)
- https://marinecadastre.gov/

Marine Mammal Institute (MMI), Oregon State University
https://mmi.oregonstate.edu/

National Audubon Society
- https://www.audubon.org/

National Park Service (NPS)
- https://www.nps.gov/

National Oceanic and Atmospheric Administration (NOAA)
- https://www.noaa.gov/

Office for Coastal Management (OCM)
- https://coast.noaa.gov/

National Centers for Coastal Ocean Science (NCCOS)
- https://coastalscience.noaa.gov/

National Centers for Environmental Prediction (NCEP)
- https://www.weather.gov/ncep/

National Geophysical Data Center (NGDC)
- https://www.ngdc.noaa.gov/

Northwest Fisheries Science Center (NWFSC)
- https://www.fisheries.noaa.gov/about/northwest-fisheries-science-center

Southwest Fisheries Science Center (SWFSC)
- https://www.fisheries.noaa.gov/about/southwest-fisheries-science-center

Oak Ridge National Laboratory (ORNL)
- https://www.ornl.gov/

Ocean Reports (A joint tool of BOEM, NOAA NCCOS & NOAA OCM)
- https://coast.noaa.gov/digitalcoast/tools/ort.html

Oregon Coastal Atlas
- https://www.coastalatlas.net/

Oregon Department of Fish and Wildlife (ODFW)
- https://www.dfw.state.or.us/

Oregon Department of Land Conservation and Development (OR DLCD)
- https://www.oregon.gov/lcd

Oregon Department of Transportation (ODOT)
- https://www.oregon.gov/odot

Oregon Fishermen's Cable Committee (OFCC)
- http://www.ofcc.com/

Oregon Geospatial Enterprise Office (GEO)
- https://www.oregon.gov/GEO

Pacific Fishery Management Council (PFMC)
- https://www.pcouncil.org/

Pacific Marine and Estuarine Fish Habitat Partnership (PMEP)
- https://www.pacificfishhabitat.org/

Pacific States Marine Fisheries Commission (PSMFC)
- https://www.psmfc.org/

Point Blue Conservation Science
- https://www.pointblue.org/

Surfrider
- https://www.surfrider.org/

The Nature Conservancy (TNC)
- https://www.nature.org

United States Department of Homeland Security
- https://www.dhs.gov/

United States Geological Survey (USGS)
- https://www.usgs.gov/

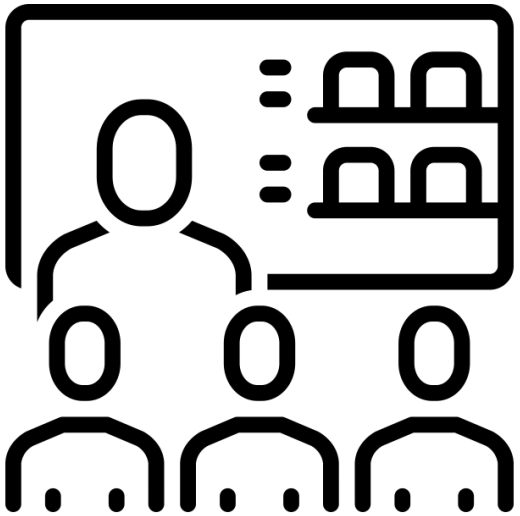
Virginia Tech
- https://vt.edu/

Washington State Department of Natural Resources (WA DNR)
- https://www.dnr.wa.gov/

West Coast Ocean Data Portal (WCODP)
- https://portal.westcoastoceans.org/

Public Data Review Workshops

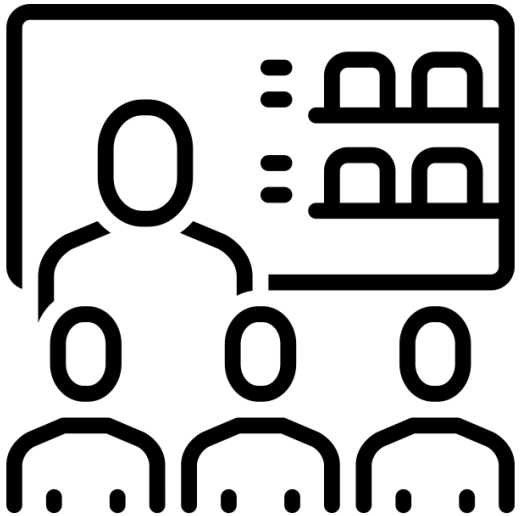
Data Review



129 Participants

Links to the Video Sessions:
Biological, Physical, Human

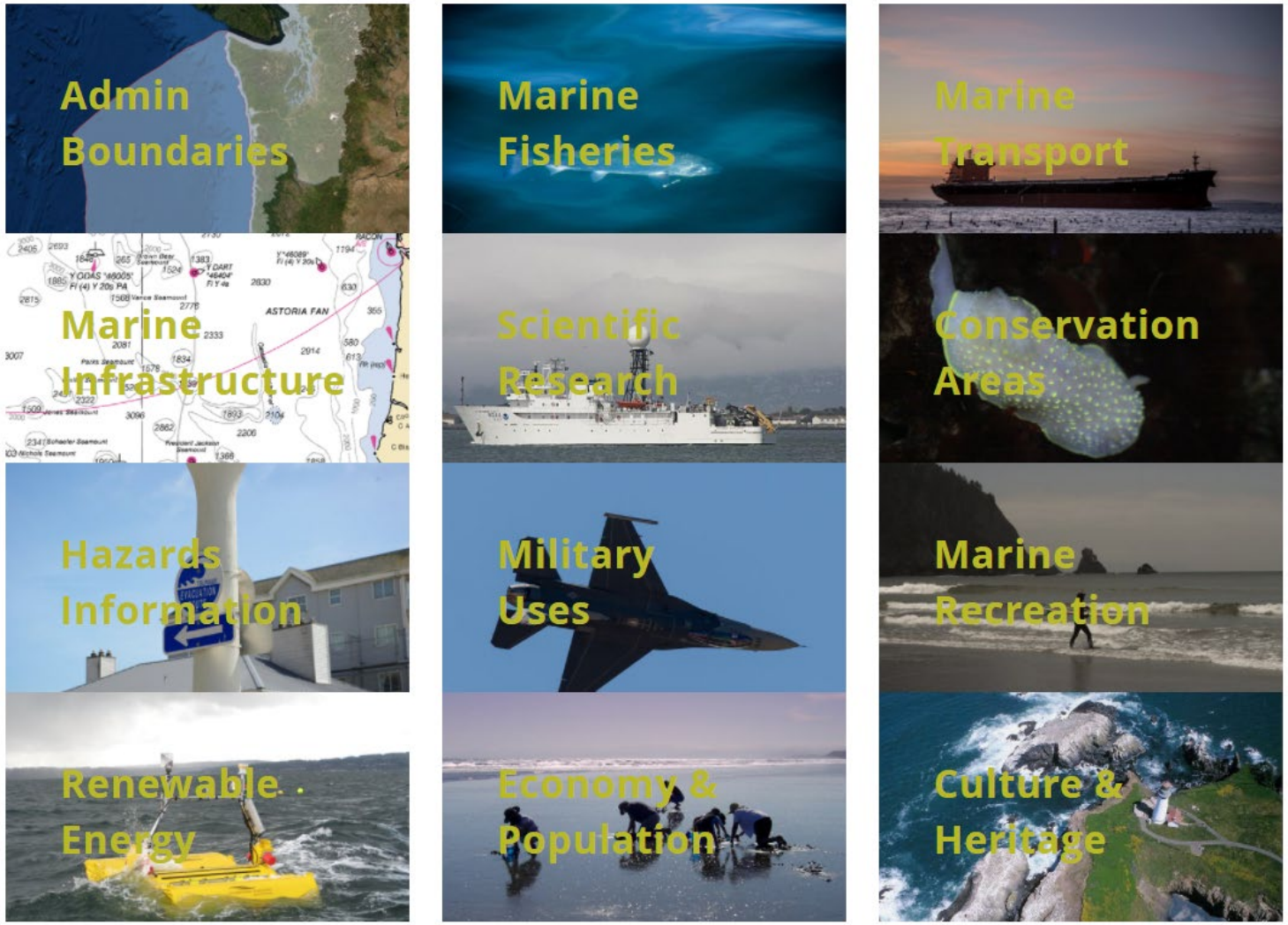
Fisheries Data Review



123 Participants

Link to the Video Sessions:
Pacific Groundfish, Crab, Shrimp, Pot or Trap
Salmon, HMS, CPS

Human Use Data



Marine Renewable Energy

Data in this theme include "Energy Resources" which refers to natural features that provide a capacity to do work through combustion, movement, radiation, or heat; these resources include oil, natural gas, coal, wind, sun, currents, tides, and natural heat gradients. Also included is information related to planning for offshore energy.

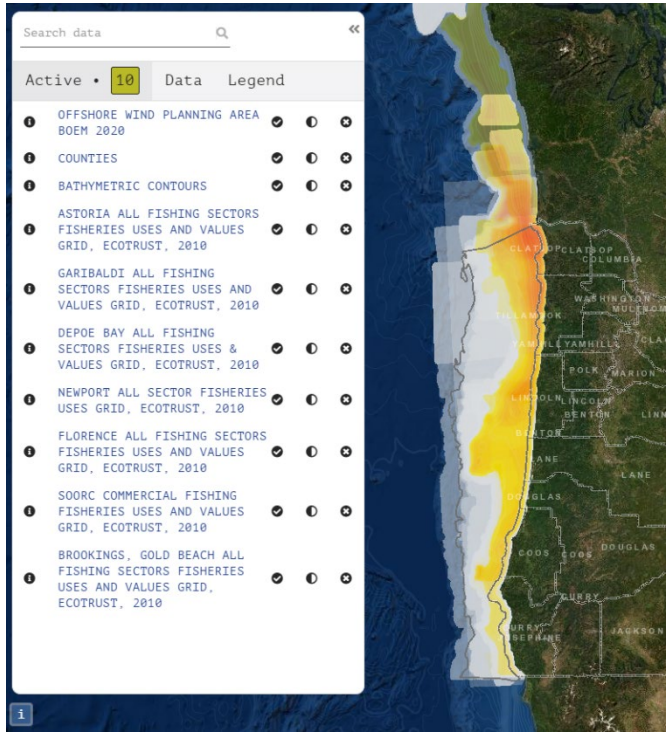
Data Layers in the Catalog

- BOEM Block Aliquots, BOEM, 2020
- BOEM Limit of OCSLA 8(g) zone, BOEM, 2020
- BOEM OCS Lease Blocks, BOEM, 2020
- DoD Offshore Wind Mission Compatibility Assessments, NOAA, 2021
- Offshore Wind Technology Depth Zones, NOAA, 2021
- Distance to Shore, BOEM, 2021
- Permitted Marine Hydrokinetic Projects, NOAA, 2018
- Oregon Offshore Wind Planning Area, BOEM, 2020
- Territorial Sea Plan Part V, DLCD, 2019

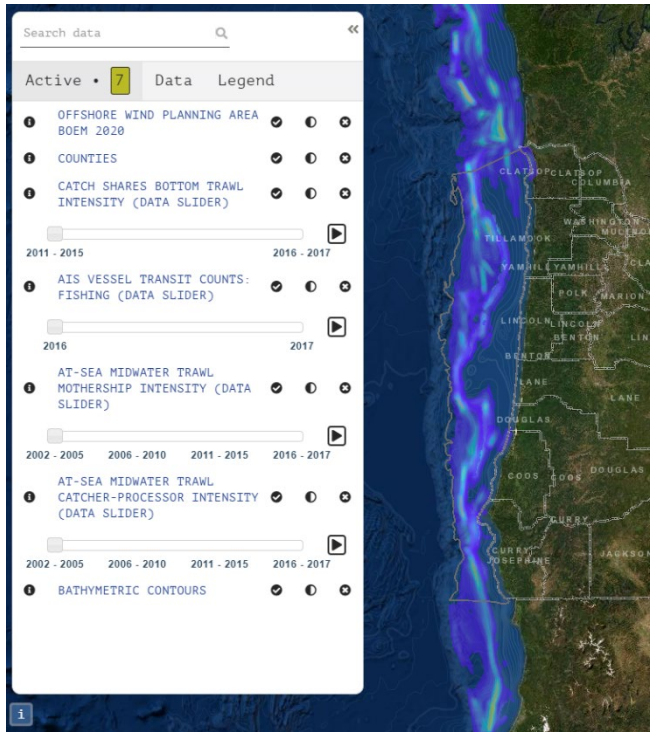
View in OROWindMap

Marine Fisheries Data Catalog

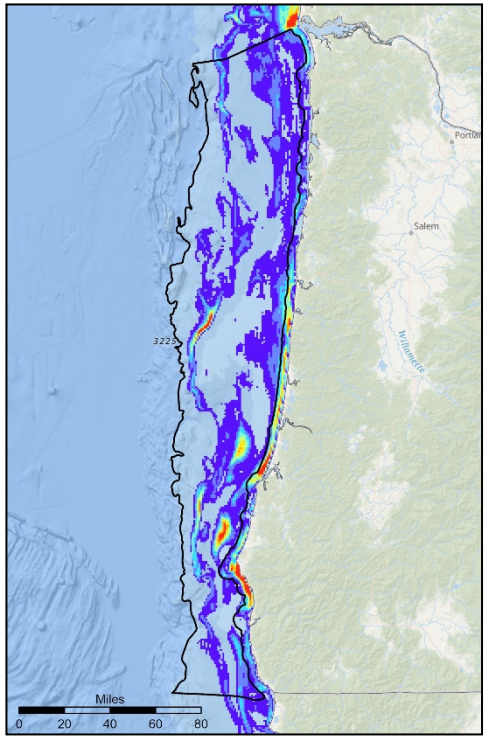
TSP Part Five



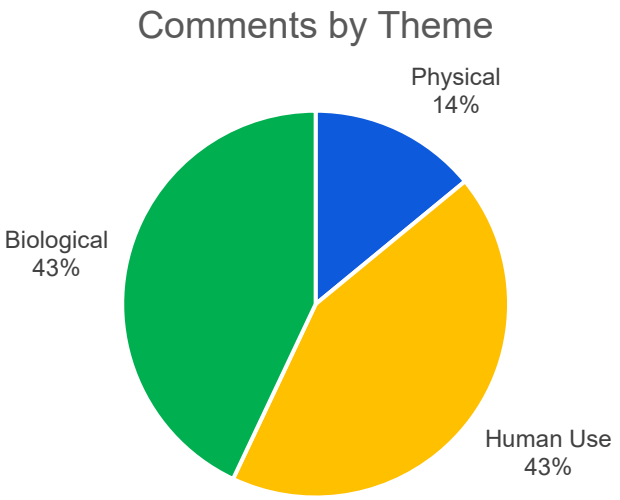
NOAA Fisheries (FRAM)

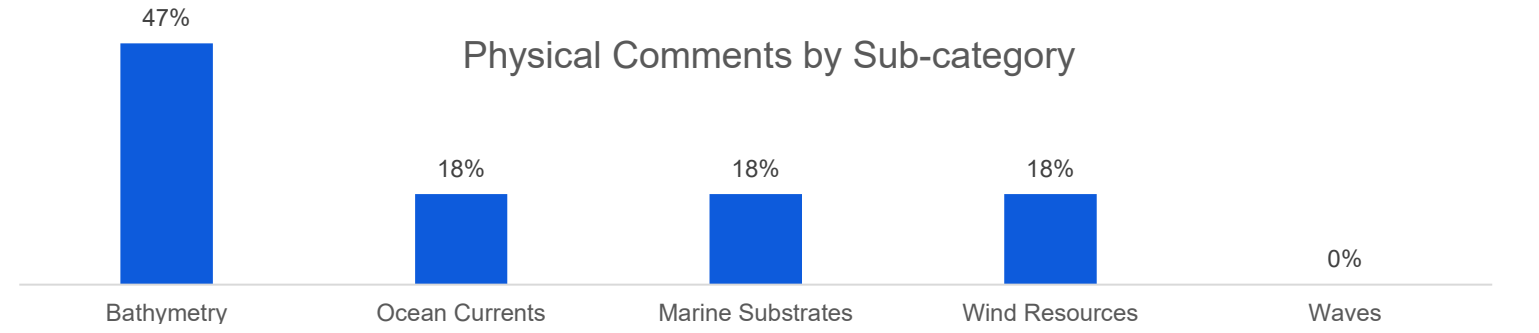


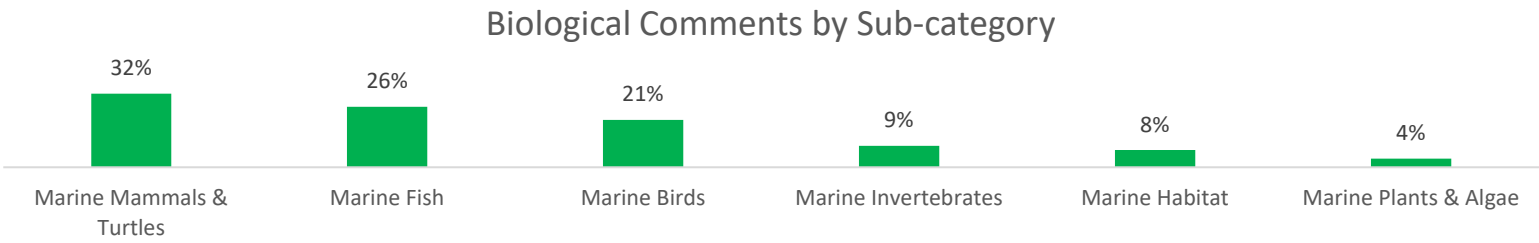
BOEM VMS Analysis (Draft Products)

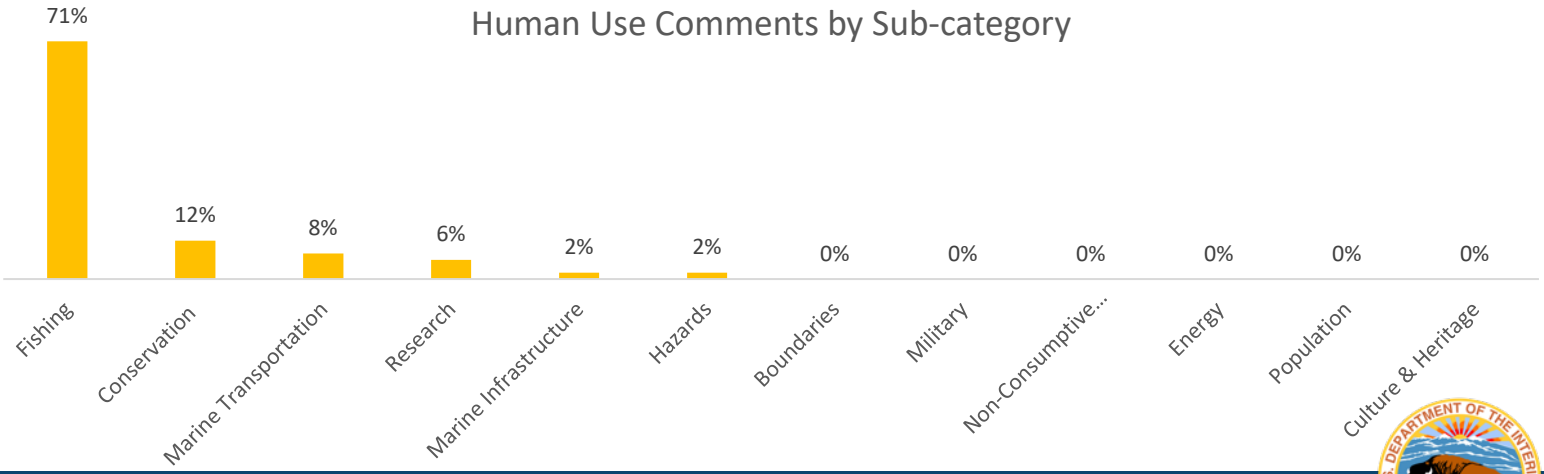


Public Data Review Comments by Theme

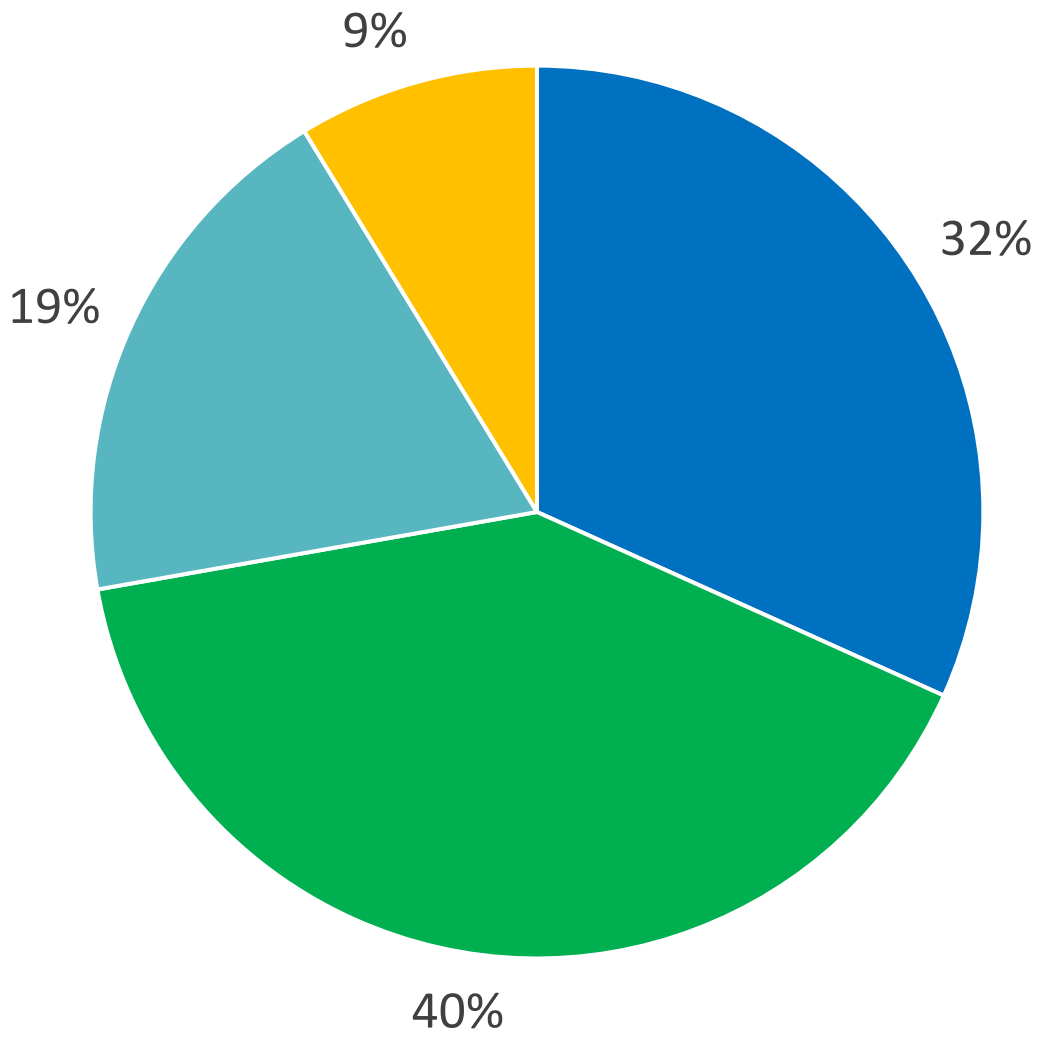








Public Data Review Comments by Type

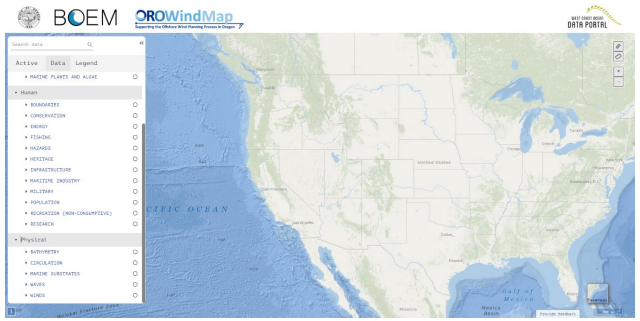


A total of 189 comments were received (includes written and verbal)

- Identified additional existing spatial data layers to include
- Identified desired changes to representation or metadata of spatial data layer in tool
- Identified data gap that would require creation of new spatial data layers
- Identified concern with limitations / accuracy of data layers

OROWindMap Data To-Go!~

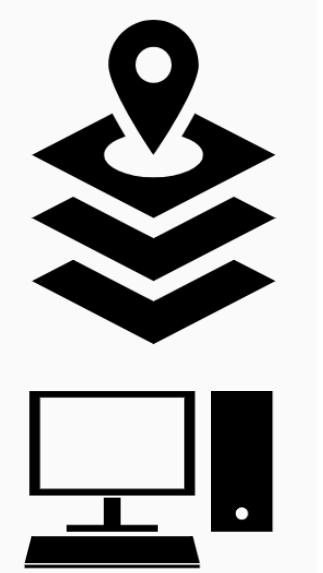
OROWindMap



Data Catalog

OROWindMap GIS Data Catalog Files

(Coming Soon!)



Got Data?

What?

Ocean Characteristics

Biological, Physical, Human Use

Where?

Oregon, West Coast

Geospatial

Ideal, but not required

Geospatial Service

Metadata

How was it made?

Where does it live?

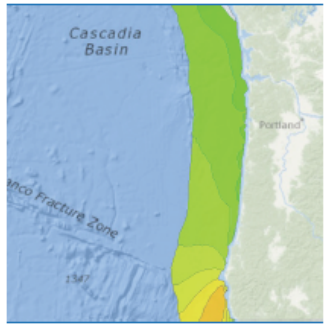
www.boem.gov/OROWindMapInfo

Data Sharing for Oregon Offshore Wind Planning

The Bureau of Ocean Energy Management (BOEM) and the State of Oregon (the State), led by the Oregon Department of Land Conservation and Development (DLCD), are committed to offshore wind energy planning with a data gathering process to inform potential leasing decisions. In partnership with the BOEM Oregon Intergovernmental Renewable Energy Task Force (Task Force), BOEM and DLCD developed the *Data Gathering and Engagement Plan for Offshore Wind Energy in Oregon*, which outlines the activities BOEM and the State will conduct to gather information to inform the Task Force and offshore wind energy leasing decisions. The plan can be found at: www.boem.gov/Oregon.

The DLCD, in partnership with BOEM, is developing a data catalog and map viewer within the West Coast Ocean Data Portal to provide public access to the best available data throughout the planning process. The Oregon Offshore Wind Mapping Tool (OROWindMap), which can be found at https://offshorewind.westcoastoceans.org, has been developed to compile the collected data and information. This powerful planning tool accesses relevant datasets and provides visualization capabilities to inform the planning process for offshore wind energy leasing in federal waters offshore Oregon. The inclusion of new data sets will help inform the public, the State, and the Bureau of Ocean Energy Management during the planning process. Below are the criteria for inclusion of new data sets in OROWindMap.

- Data sets depict coastal and ocean characteristics (e.g., biological, physical) or human uses that are relevant to planning for offshore wind energy development in federal waters offshore Oregon.
- Data sets include the State (and its Territorial Sea) or federal waters offshore Oregon; however, data that encompasses the entire West Coast are ideal.
- Data sets are geospatial, ideally in a GIS format, but may be in a tabular format with coordinates.
- Data sets include standards-compliant metadata. The basic information required for metadata is outlined below, and more information can be found at http://wcodp.readthedocs.io/.



If there is an information product that is relevant to this process but is not geospatial or tabular, please contact the West Coast Ocean Data Portal (WCODP) Administrator at portal.westcoastoceans@sccwrp.org.

Metadata help document the details of data sets, including who created it, when it was created, and why it was created. All data in OROWindMap have, at a minimum, the following metadata associated with them:

- Title
- Abstract / Description
- Use Limitations / Constraints
- Bounding Box Coordinates in Latitude/Longitude (decimal degrees)
- Keywords
- Date Published
- Contacts
  - Originator
  - Publisher
  - Distributor
- URLs for data download, web services, kml, web application, documentation

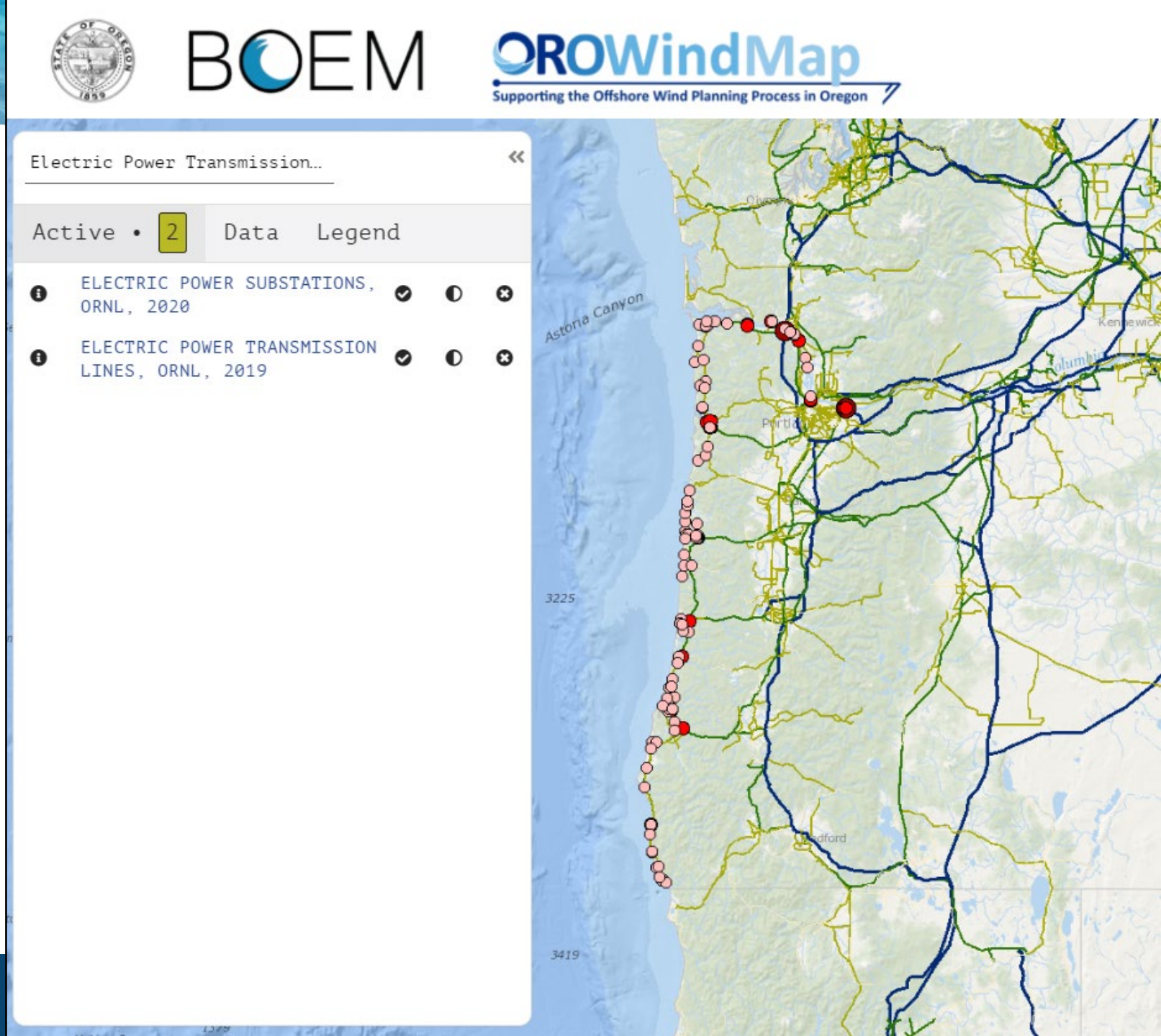
If the metadata meet the requirements of the Federal Geographic Data Committee (FGDC) endorsed standards (https://www.fgdc.gov/metadata/geospatial-metadata-standards), then it will meet the WCODP requirements.

Datasets

Frank Pendleton, GIS Analyst
BOEM Pacific Office

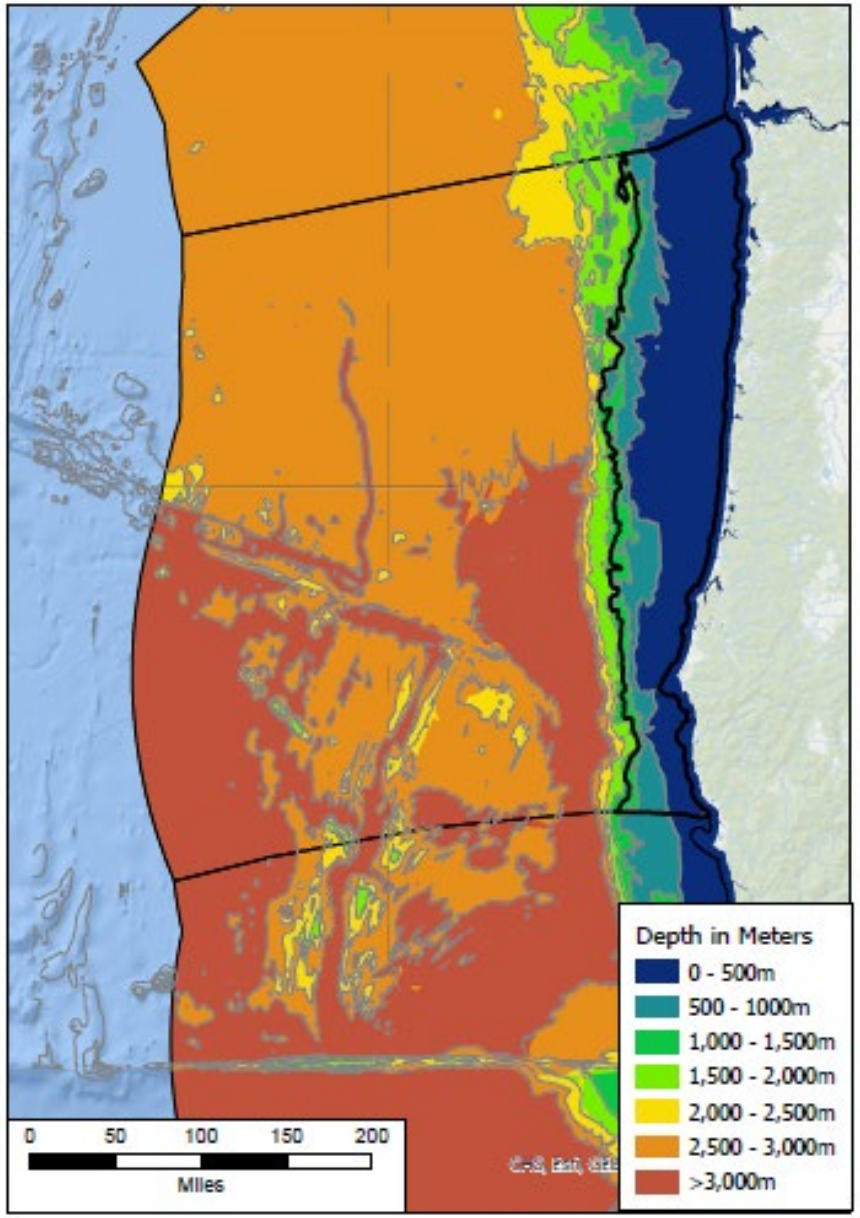
Grid Connection

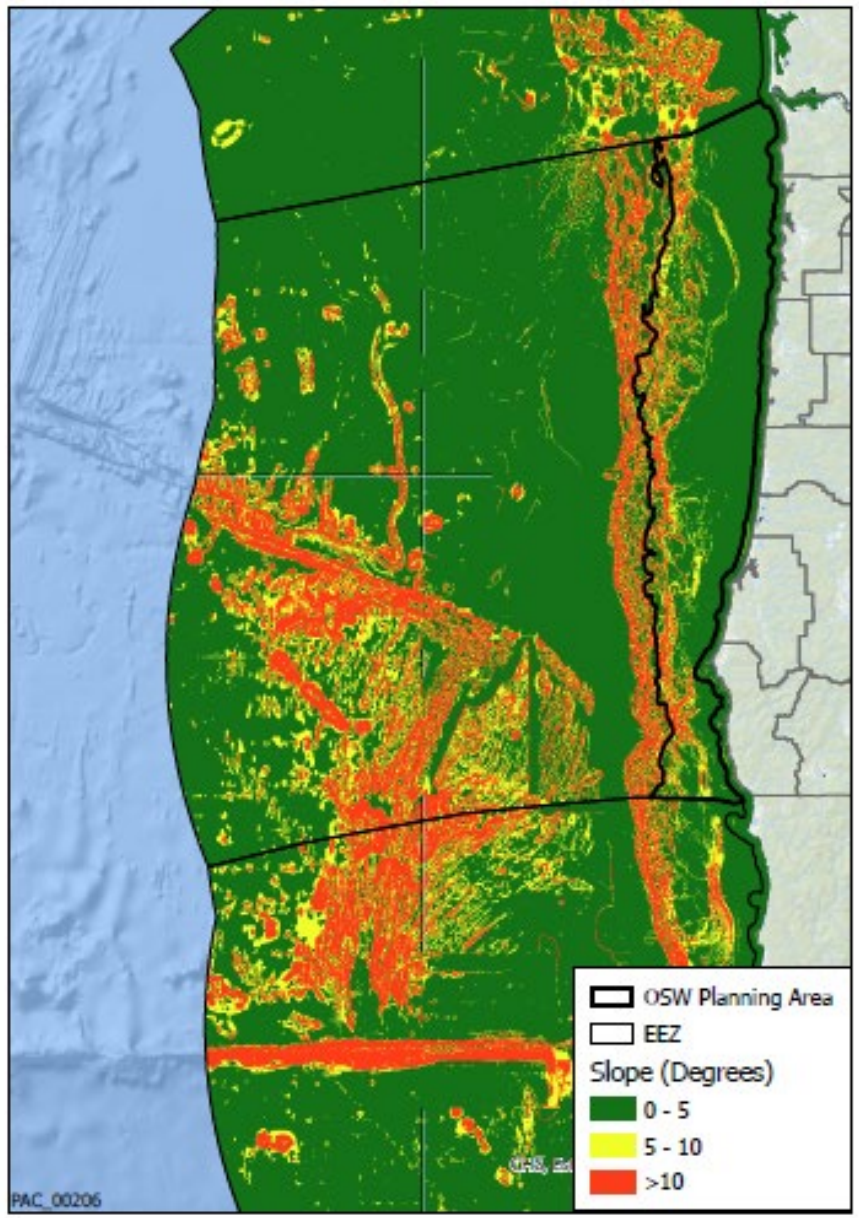
- **Electric substations and transmission lines**
- **Homeland Infrastructure Foundation Level Data (HIFLD)**
  - Department of Defense
  - Department of Homeland Security
  - National Geospatial Intelligence Agency
  - Department of the Interior



Water Depth and Slope

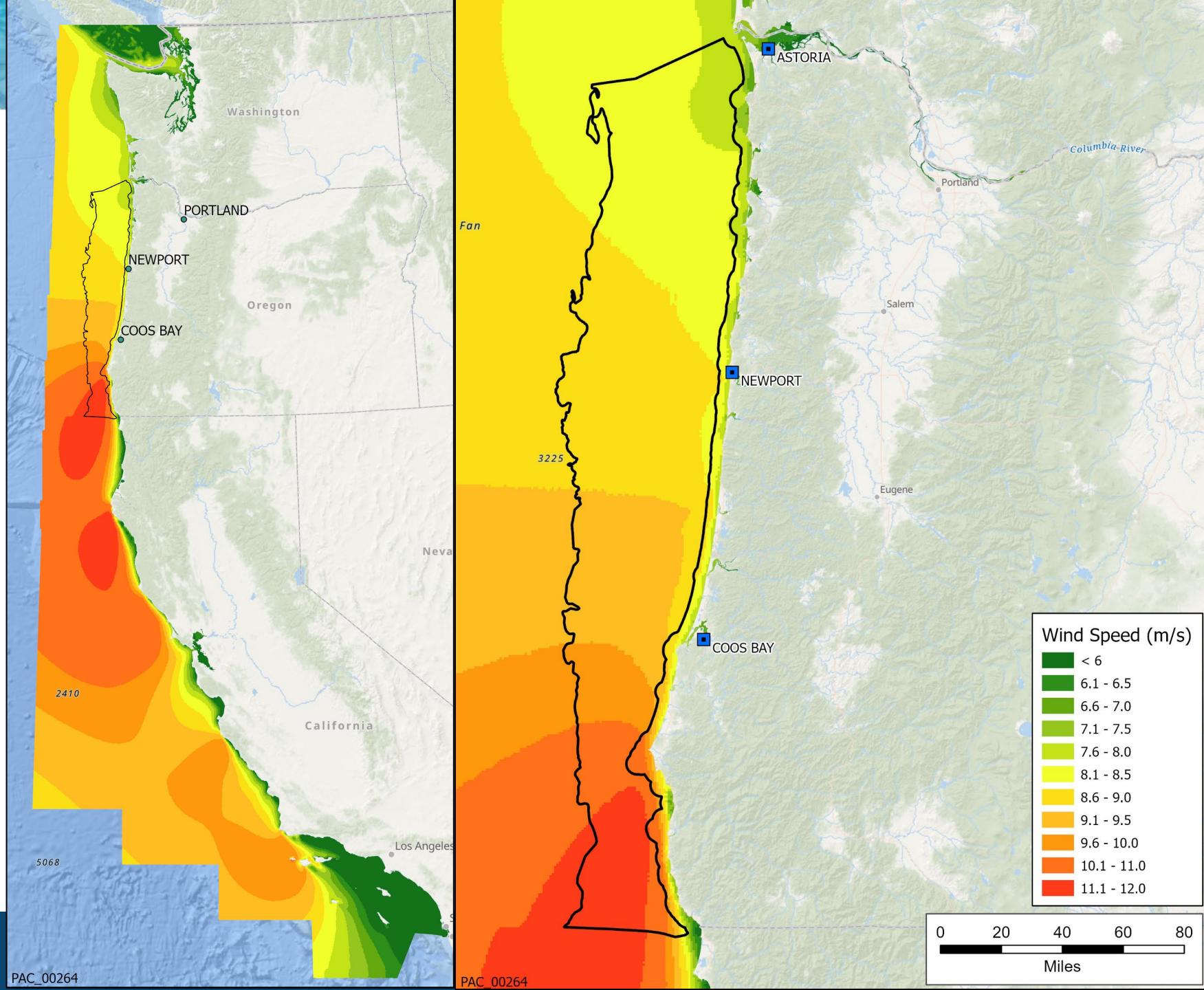
- Bathymetry data from NOAA
- Slope derived from bathymetry





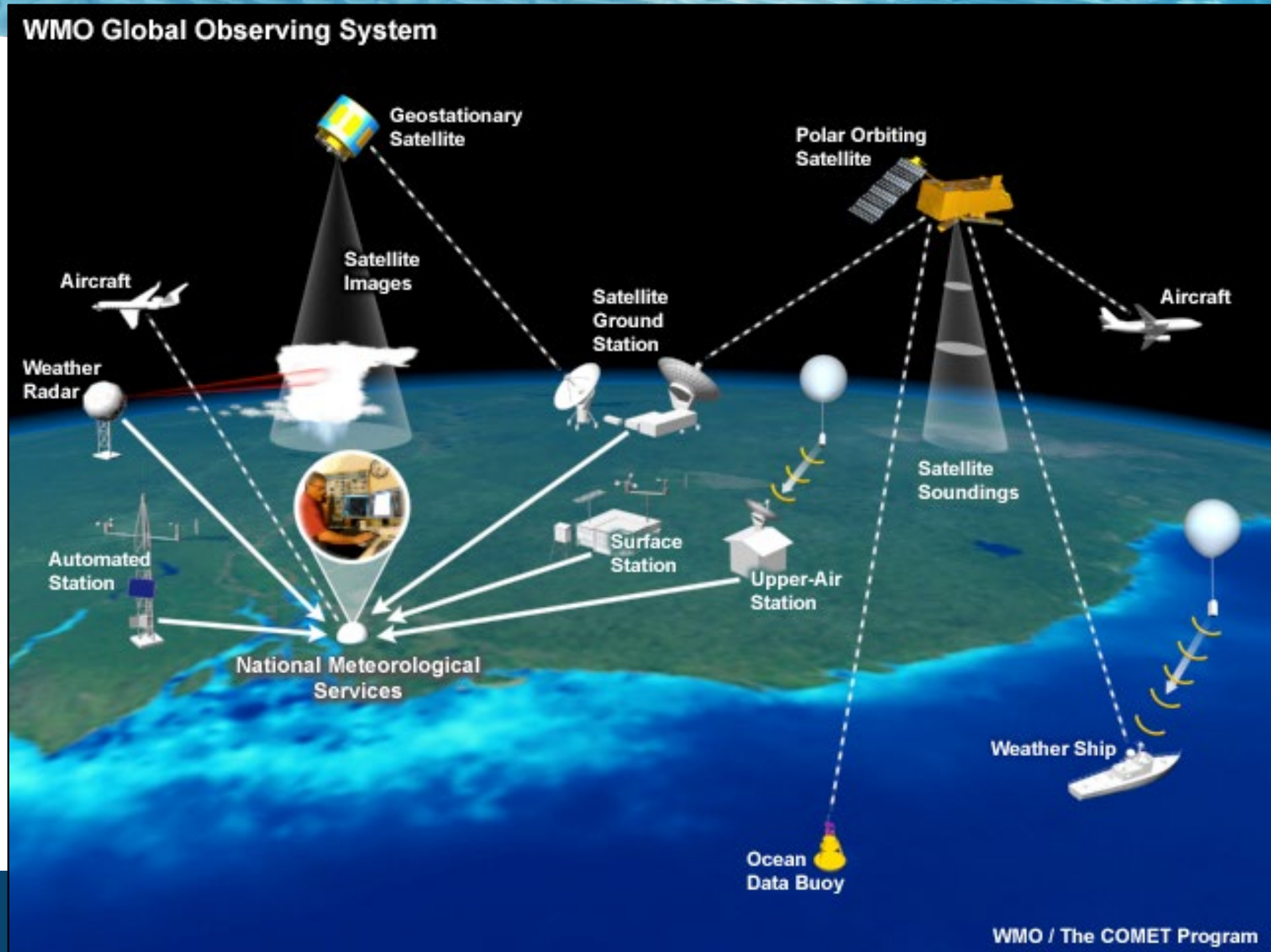
Wind Speed Data

- **National Renewable Energy Laboratory (NREL)**
- **2020 Dataset**



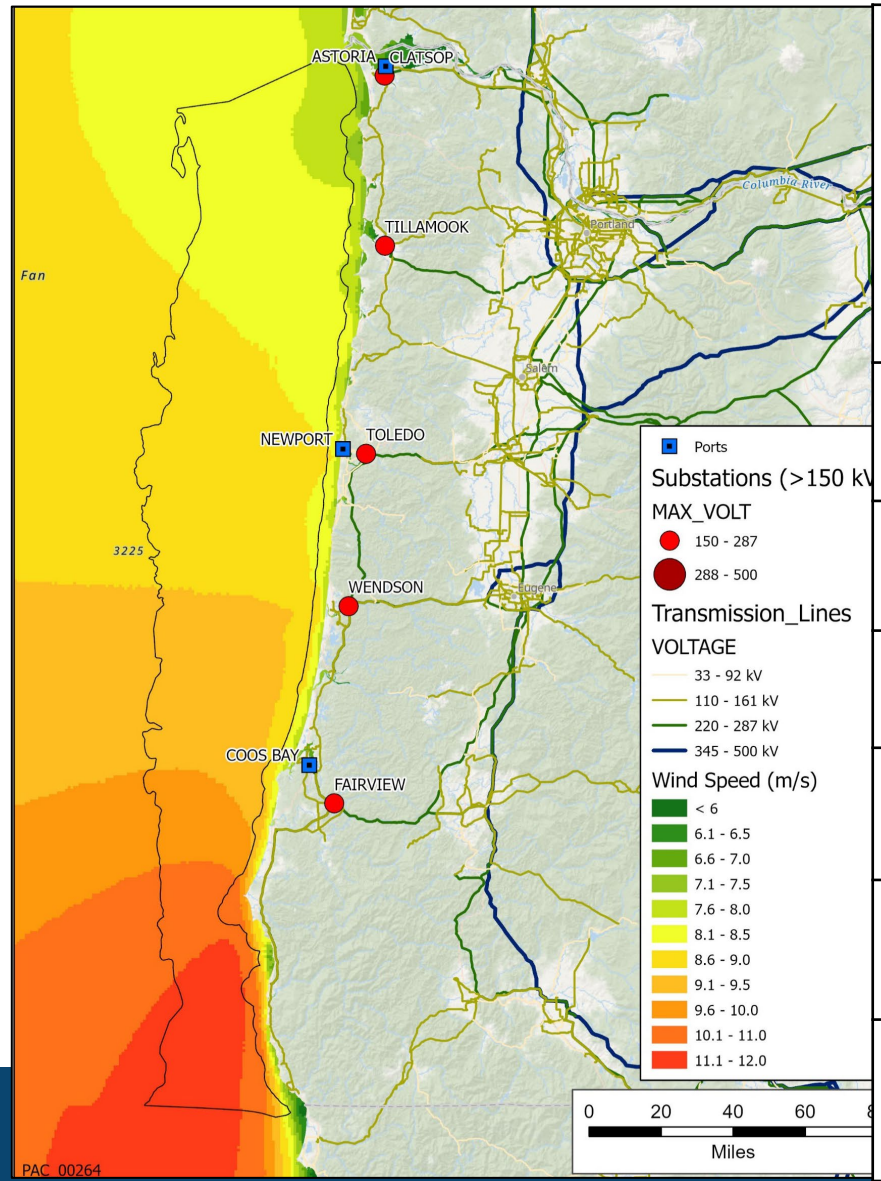
Wind Speed Data

- Many data sources
- Modeled to provide consistent dataset for USA



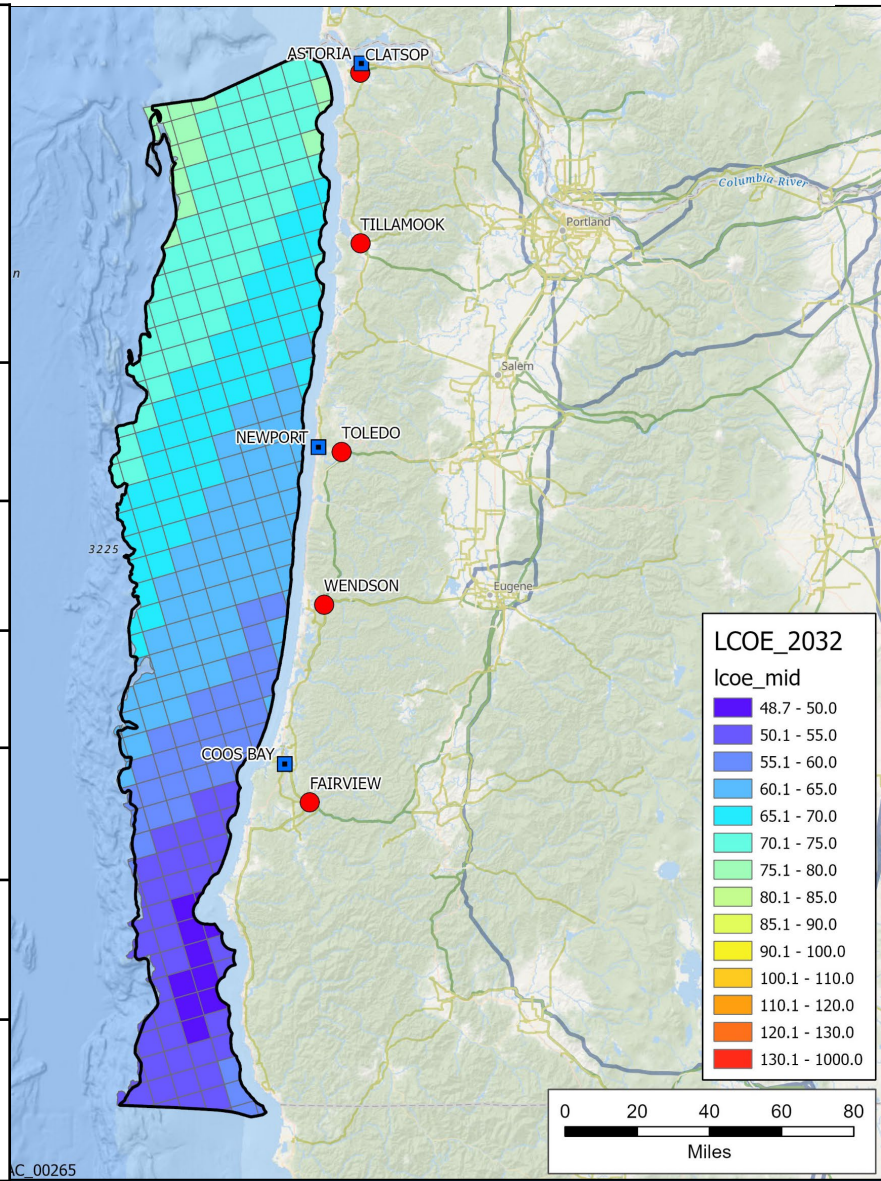
NREL Studies

Wind, Transmission, Ports



Offshore Wind Point of Interconnection	Max Capacity (MW)
Clatsop	361
Tillamook	553
Toledo	156
Wendson	613
Fairview	941
Total	**2,625**

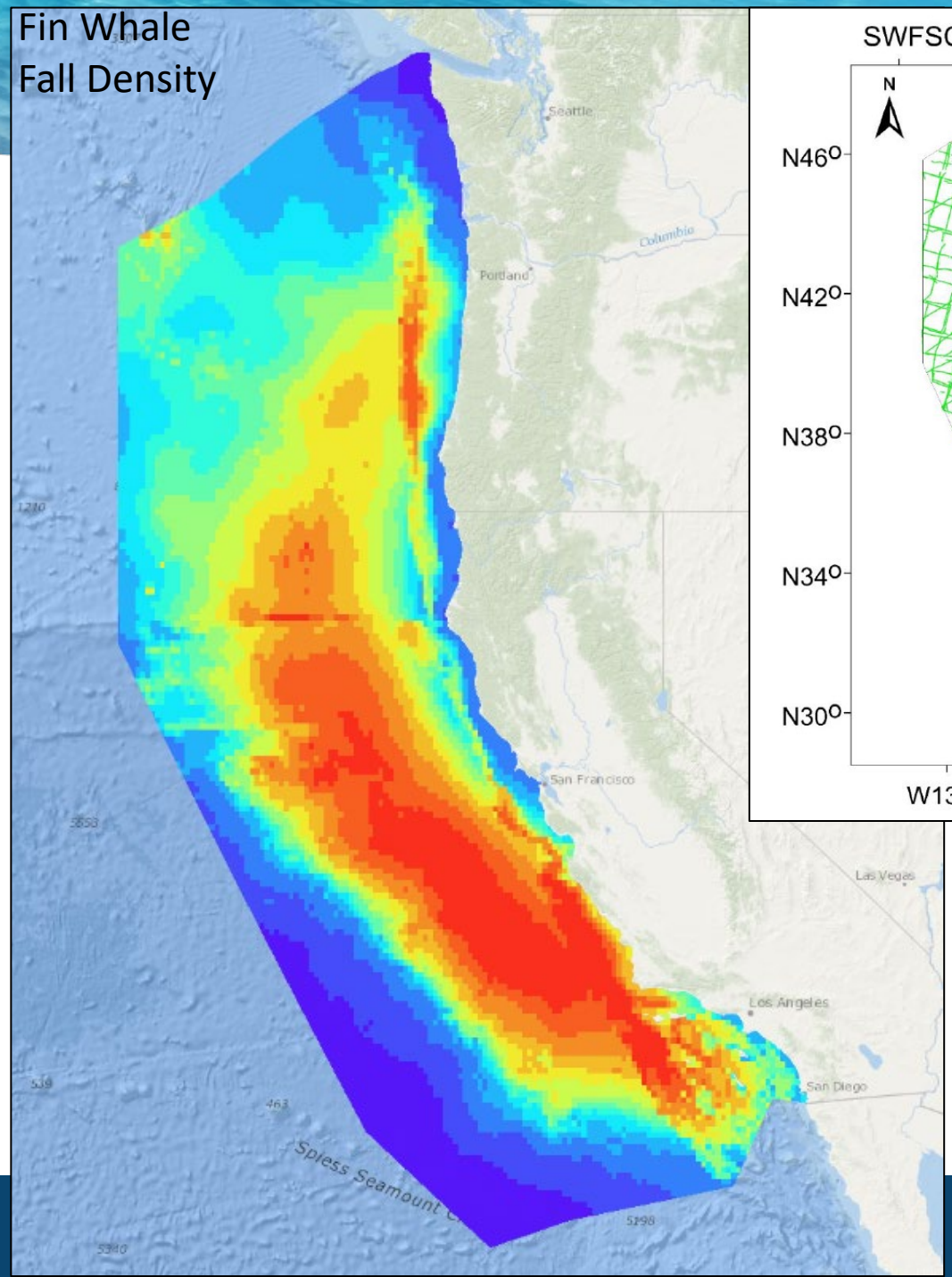
Levelized Cost of Energy

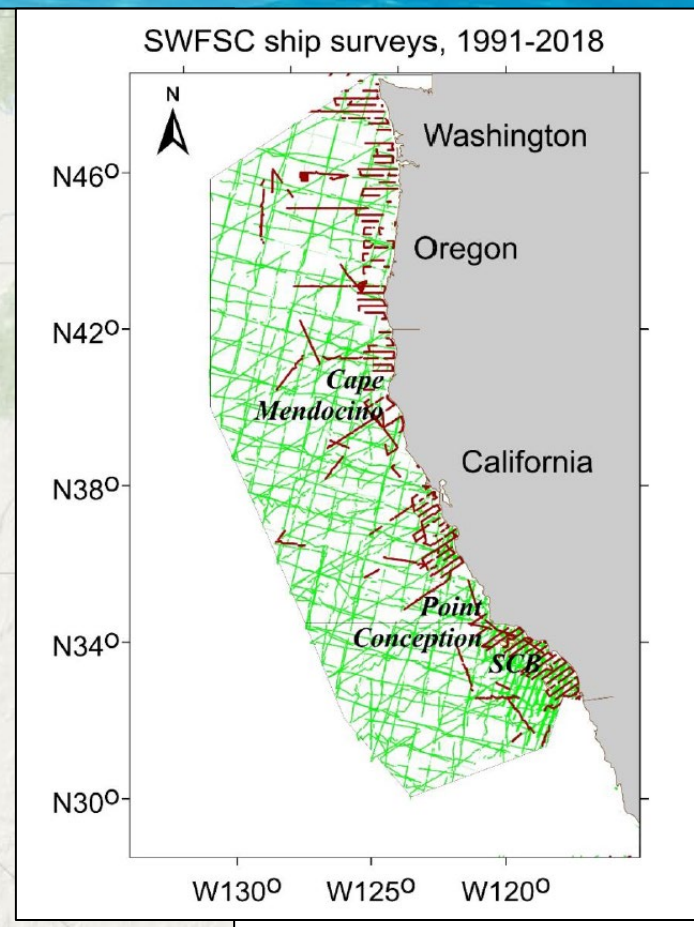


BOEM

Biological Data

- **Whales and Dolphins**
  - NOAA NMFS
  - Jul – Dec
  - 1991 – 2018
- **Variables for Predictive Models**
  - Time of year
  - Latitude
  - Depth / Slope / Dist to Shore
  - Chlorophyll / Temperature
  - Etc, etc, etc





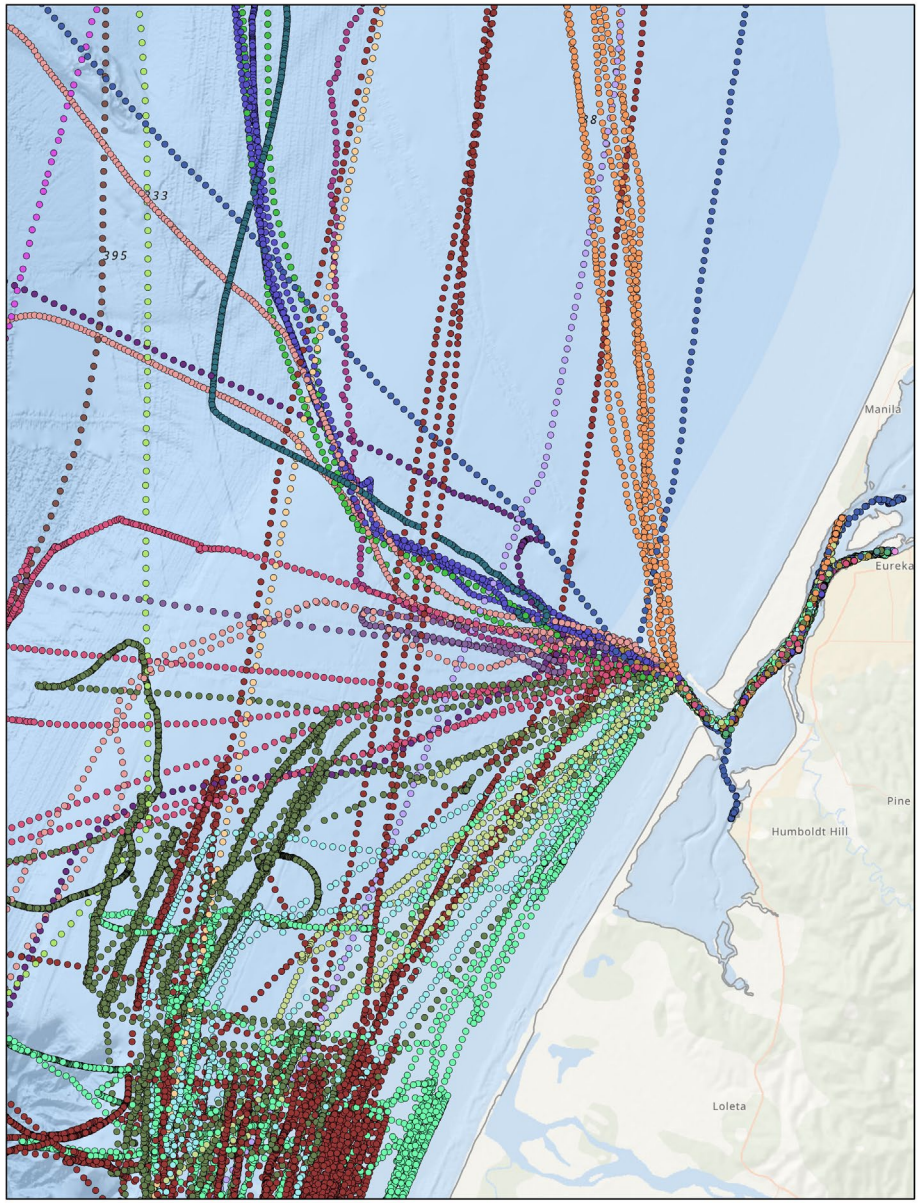
Becker, et al. 2020. Habitat-based density estimates for cetaceans in the California Current Ecosystem based on 1991-2018 survey data,
U.S. Department of Commerce, NOAA Technical Memorandum NMFS-SWFSC-638
https://www.fisheries.noaa.gov/about/southwest-fisheries-science-center.

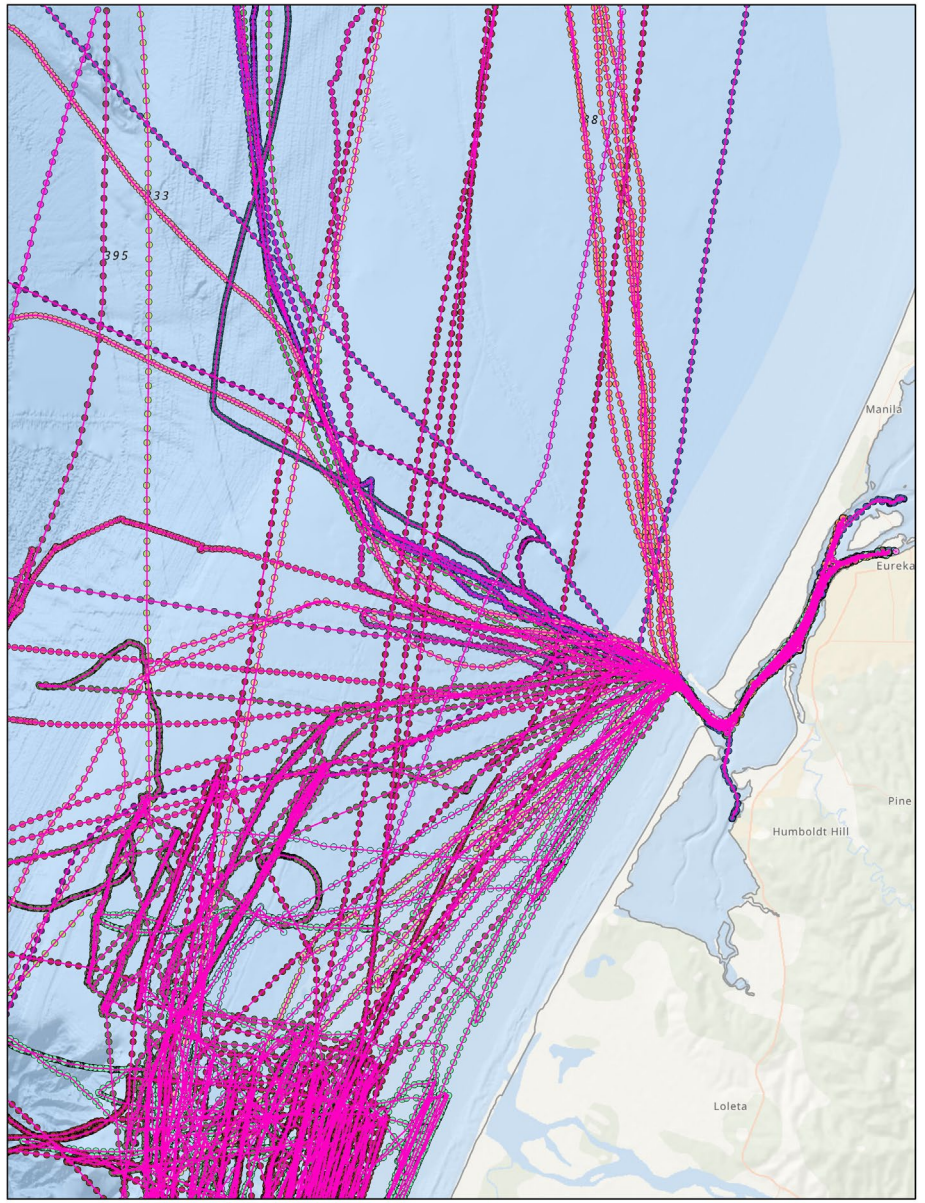
Vessel Traffic / Fishing

	Automatic Identification System (AIS)	Vessel Monitoring System (VMS)
Source	U.S. Coast Guard	National Oceanic and Atmospheric Administration (NOAA) Office of Law Enforcement
Purpose	Collision avoidance	Fisheries management
Required Vessels	>300 gross tonnage (~65 feet)	Federally managed fishery
Confidential?	N/A Data available at https://marinecadastre.gov/ais/	Non-Disclosure Agreement At least 3 vessels in any block
Years	2009-2020 (2017 shown)	2010-2018
Analysis	All speeds	Fishing speed only/all speeds

Point Data to Density Grids

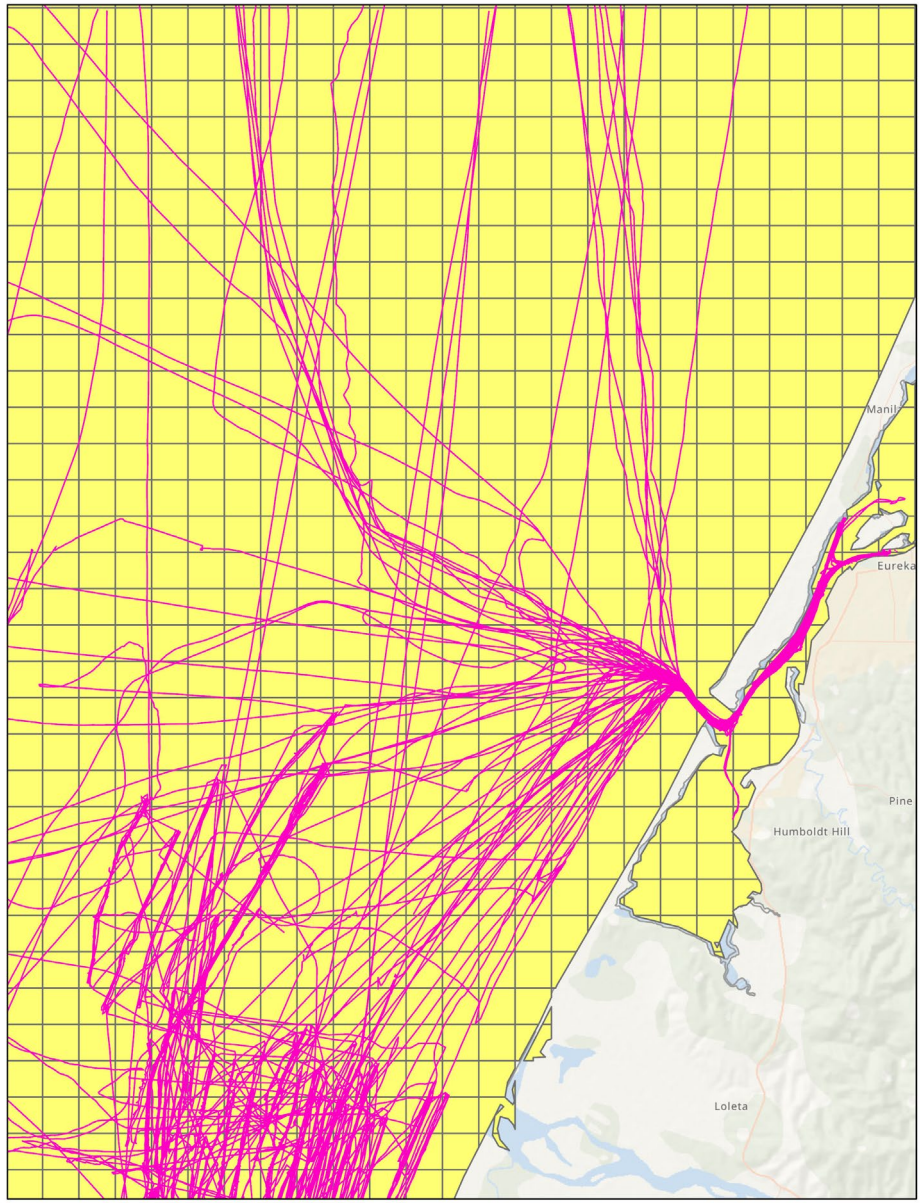
- **AIS Vessel Traffic**
- **Same process for VMS**

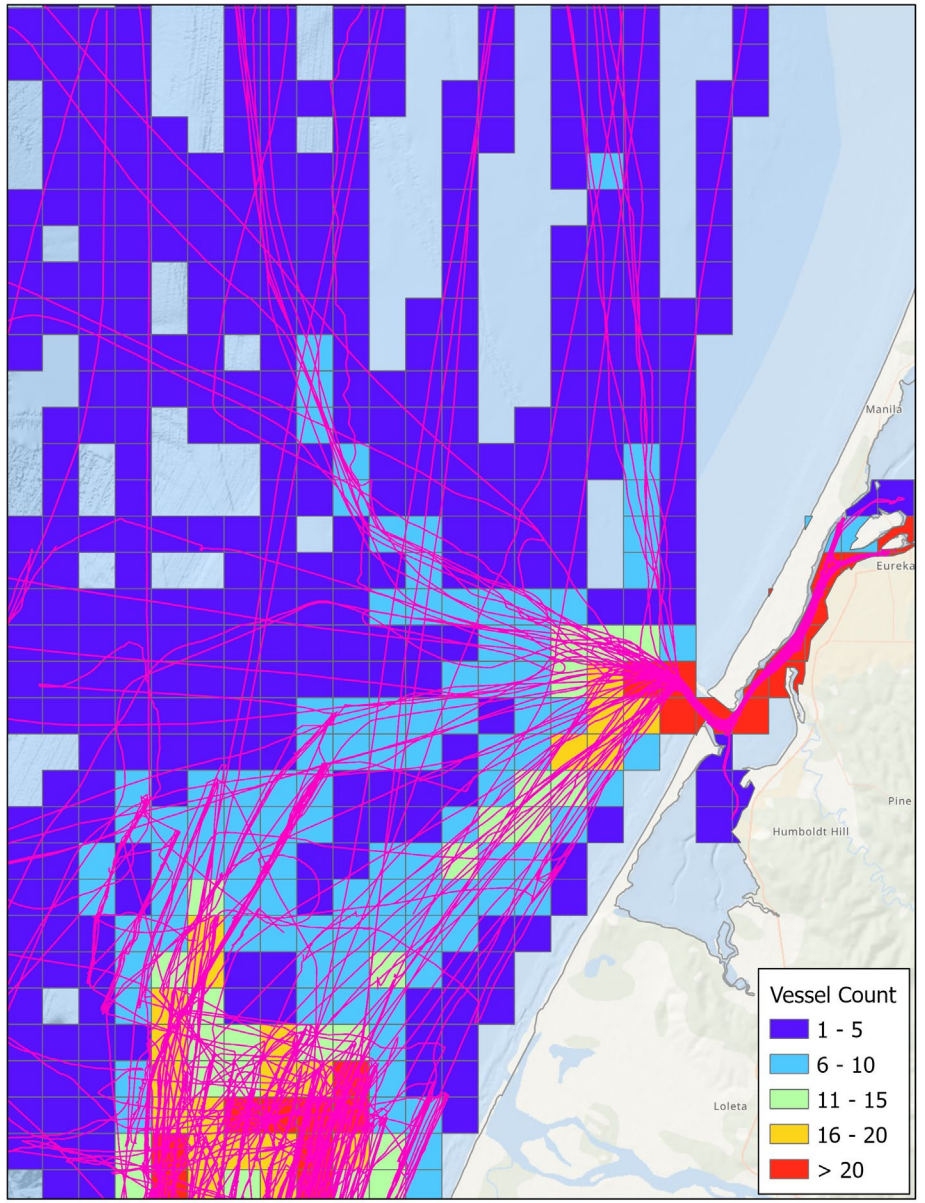




Point Data to Density Grids

- AIS Vessel Traffic
- Same process for VMS





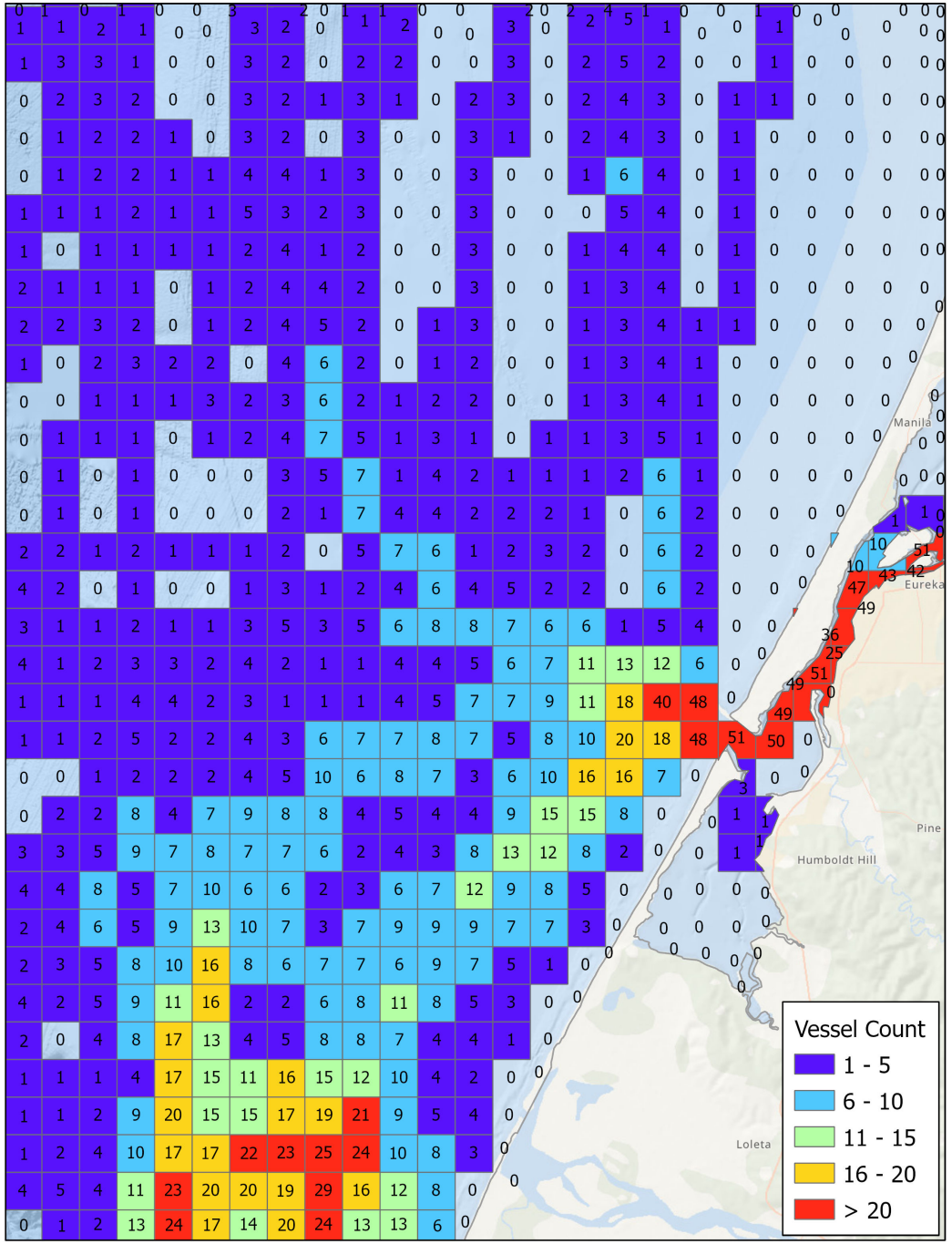
Point Data to Density Grids

What's in the boxes

- # Vessels (AIS)
- # Fishing Events for VMS fisheries

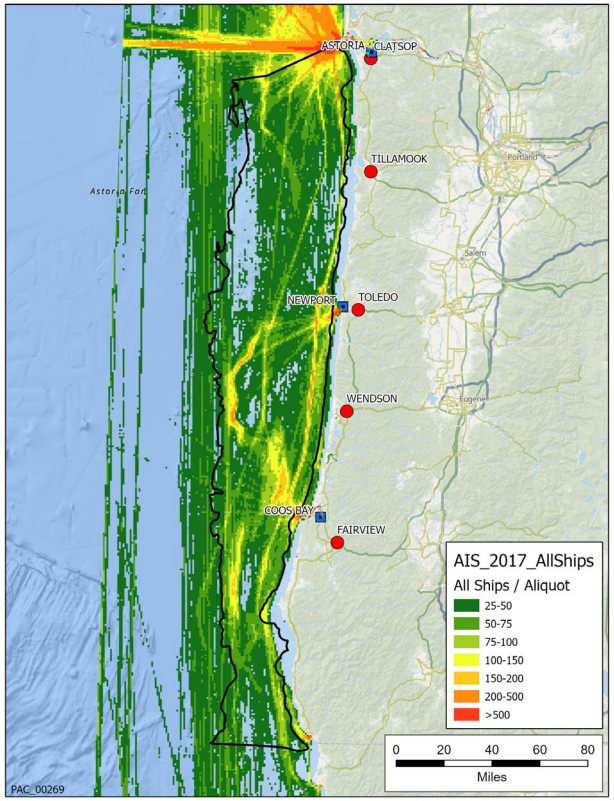
But it could be

- # Fishing Events for non-VMS fisheries
- Km fished / Square km
- Ex-Vessel Value

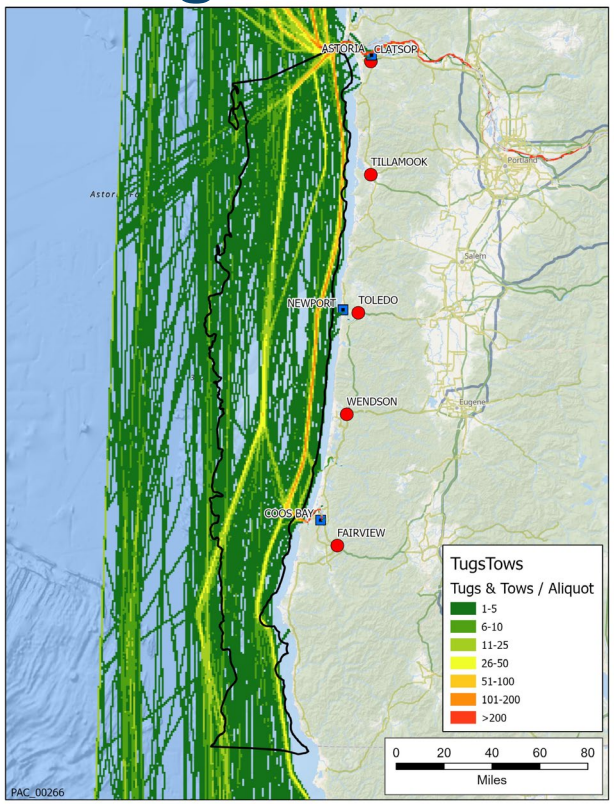


Existing Uses – Vessel Traffic

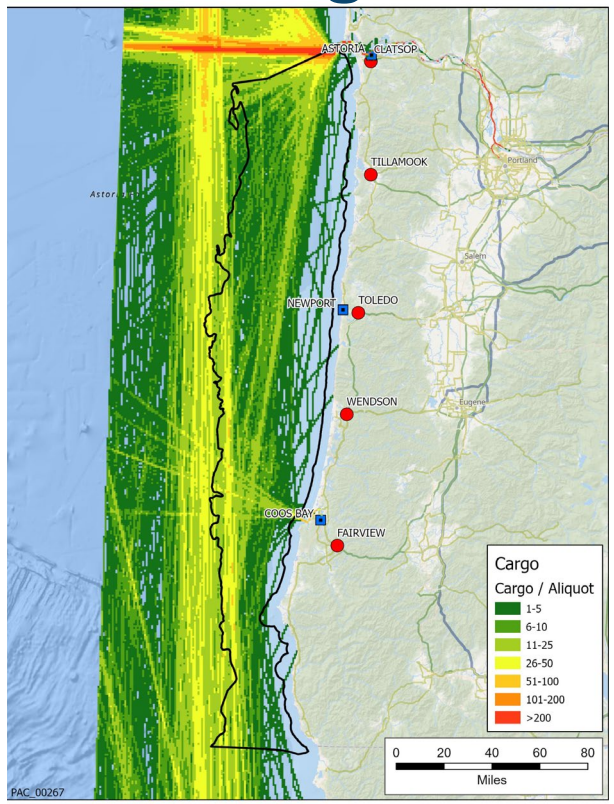
All Ships



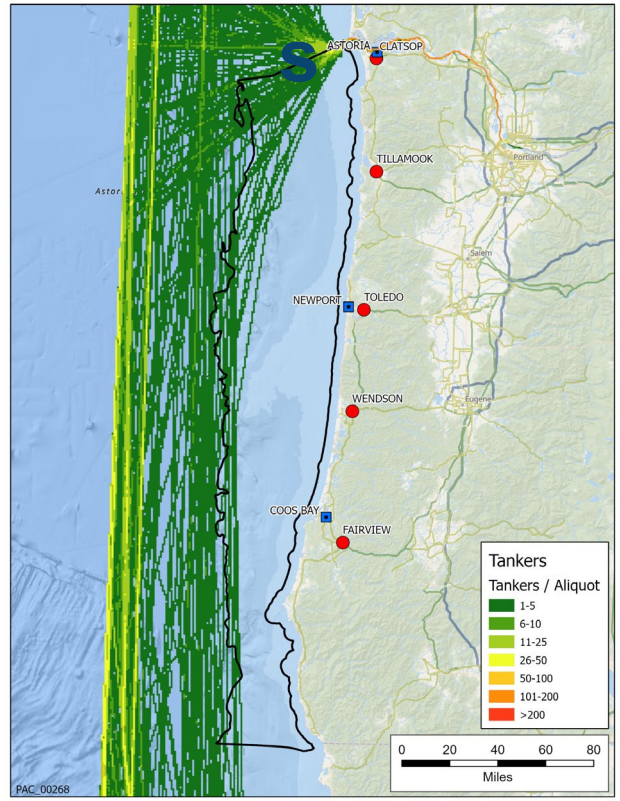
Tugs & Tows



Cargo

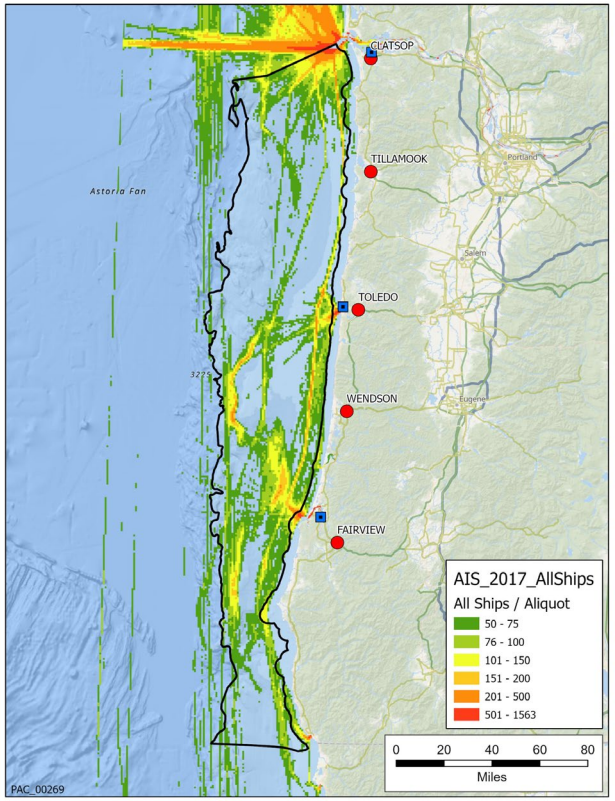


Tanker

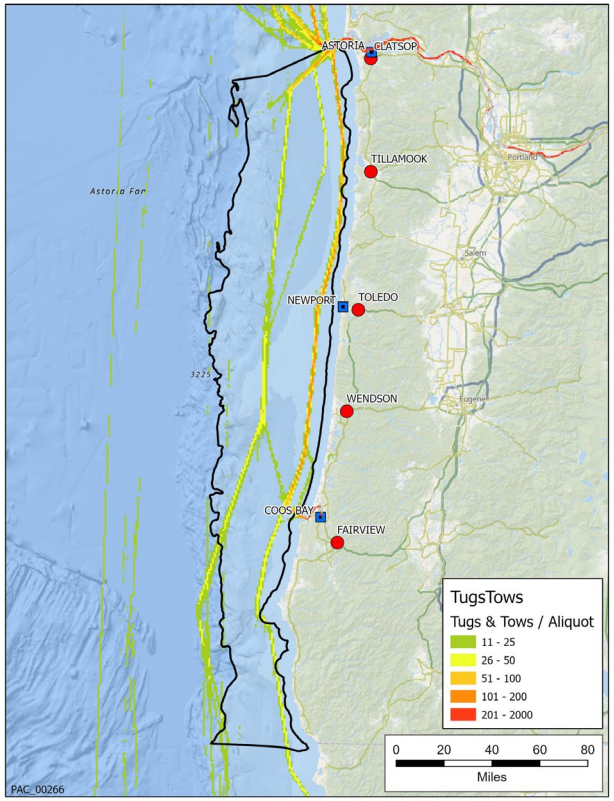


Existing Uses – Vessel Traffic (Busy Areas)

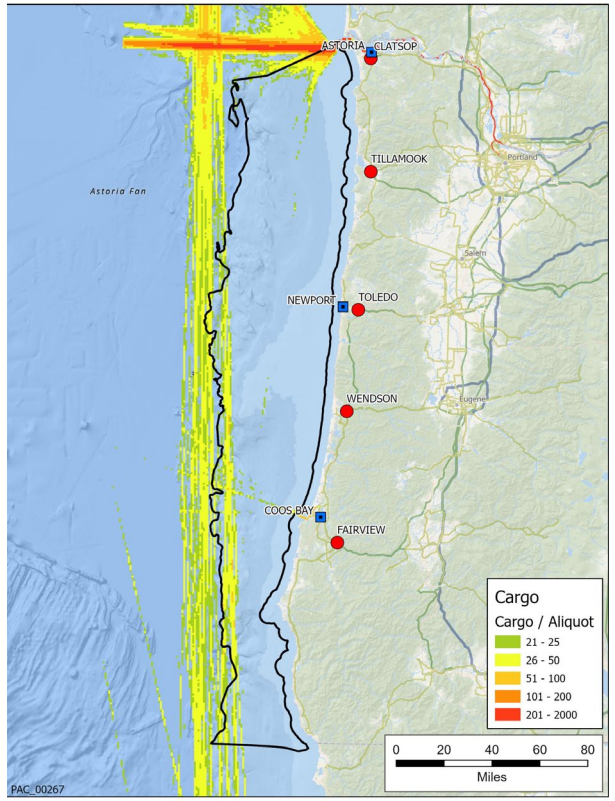
All Ships >50



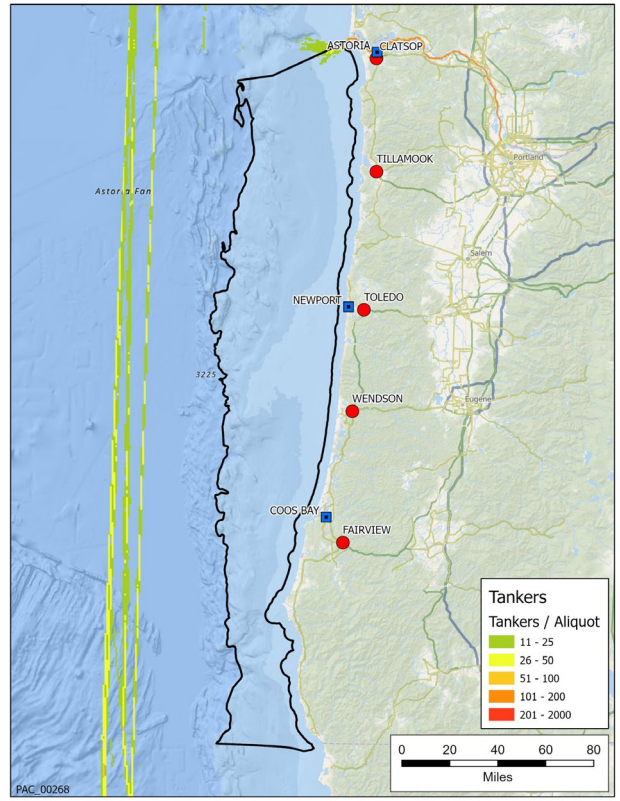
Tugs & Tows >10



Cargo >20



Tankers >10



Vessel Monitoring System (VMS)

Collaboration between

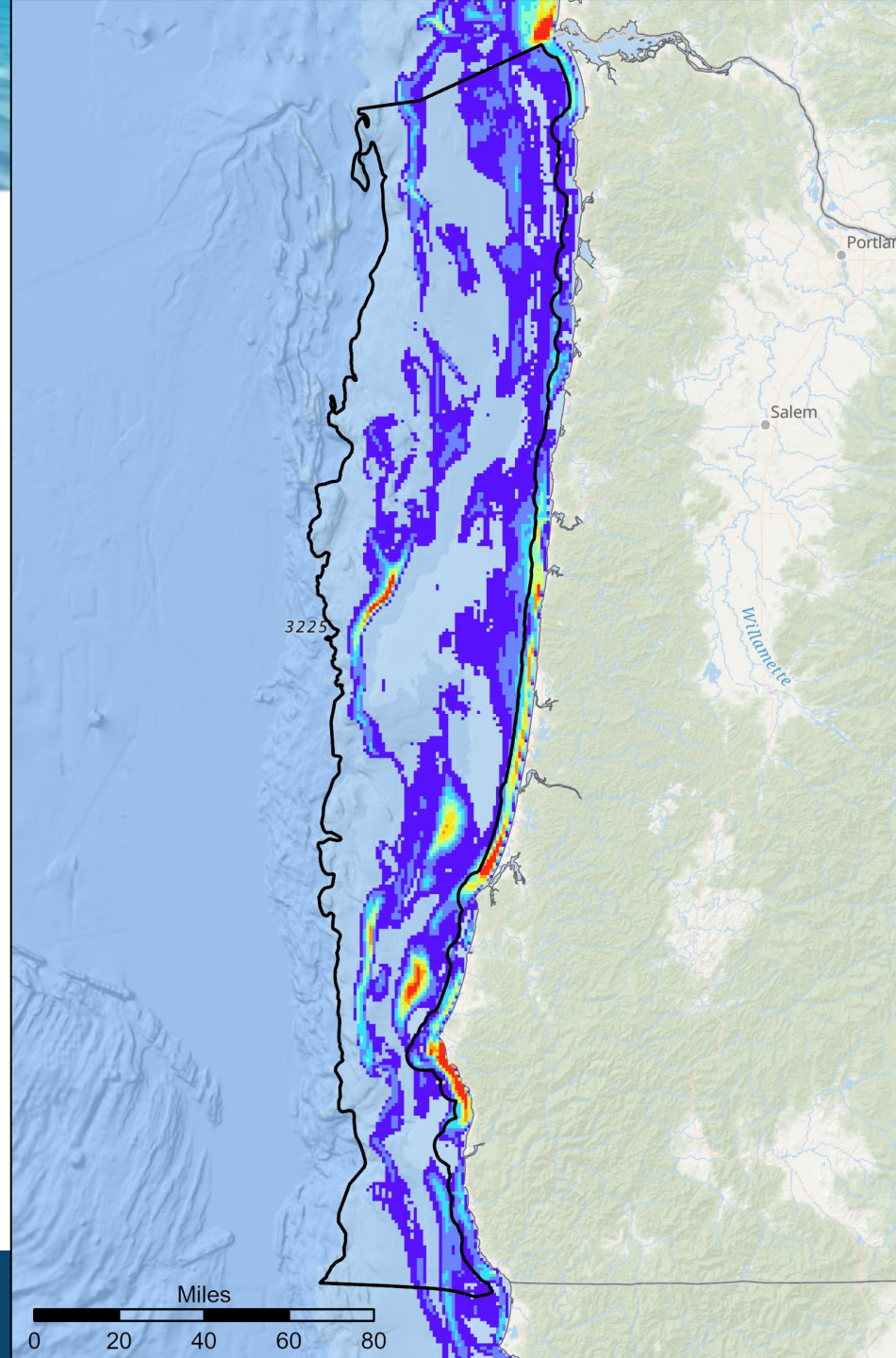
- California Polytechnic State University
- BOEM

NOAA Office of Law Enforcement Data

- Non-Disclosure Agreement
- Rule of 3

Our Dataset = 2010 – 2017

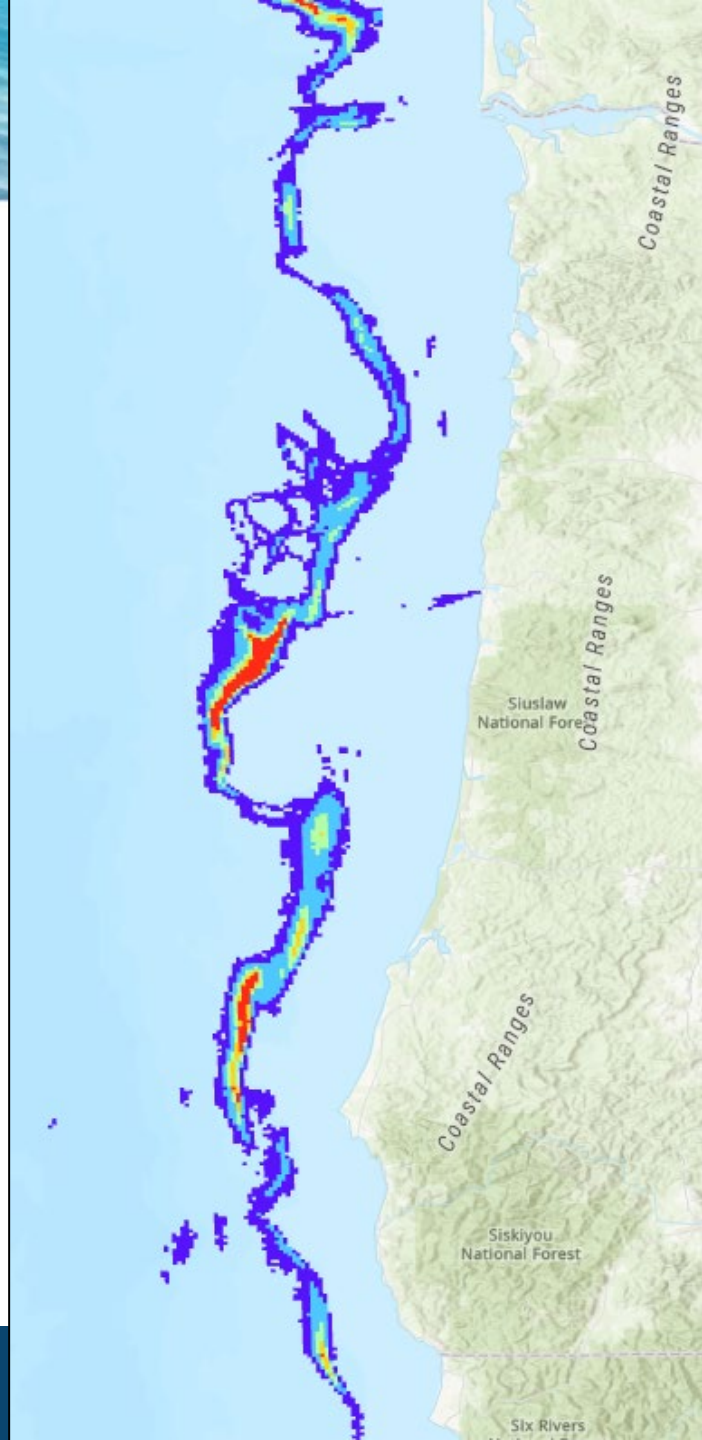
Dynamic dataset



Fisheries Outreach & Datasets

Outreach and discussions with:

- California Dept of Fish and Wildlife
- Oregon Dept of Fish and Wildlife
- NOAA Aquaculture Team
- NOAA NMFS Offshore Wind Team
- NOAA Office of Law Enforcement
- Pacific Fishery Management Council (PFMC)
- Pacific States Marine Fisheries Commission (PSMFC)
- Fishery Commissions / Organizations
- Oregon Fisheries Data Review



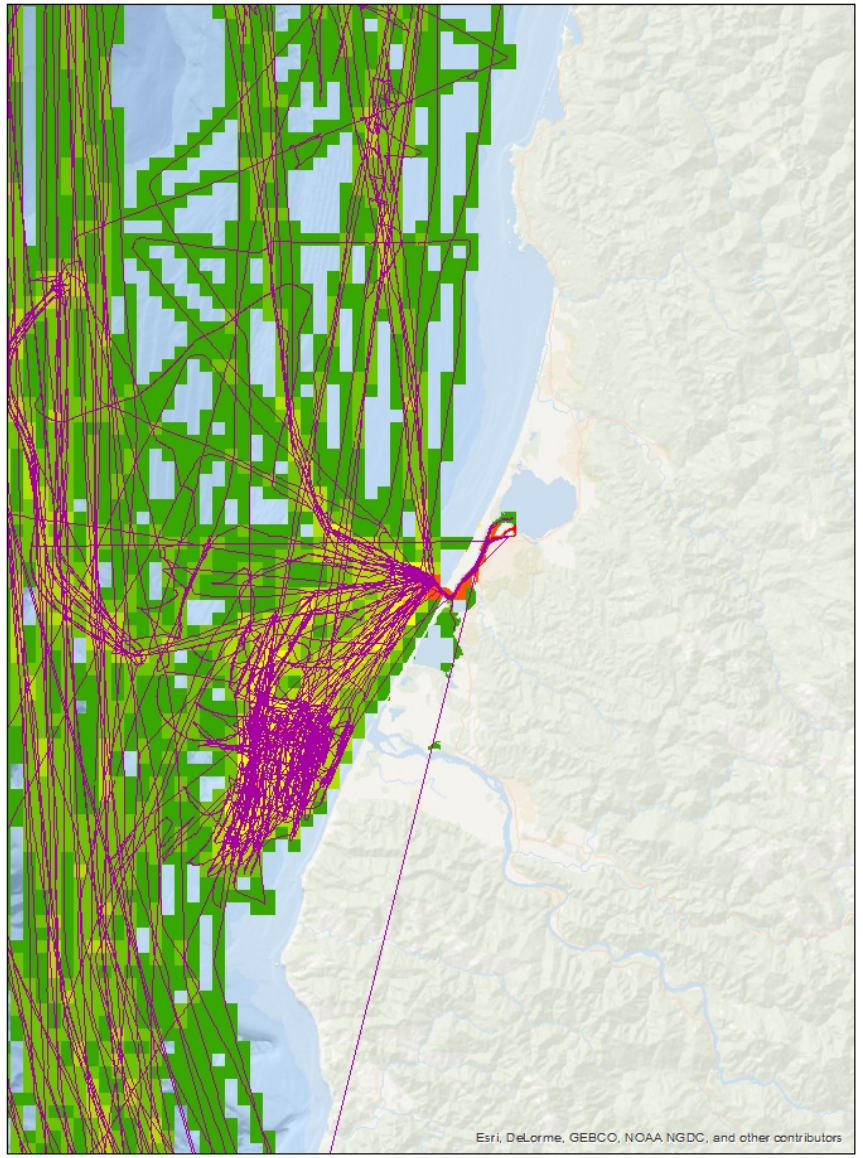
VMS Processing

Fishing Trip

- Begins when a vessel leaves port
- Ends when it enters port

Fishing Event

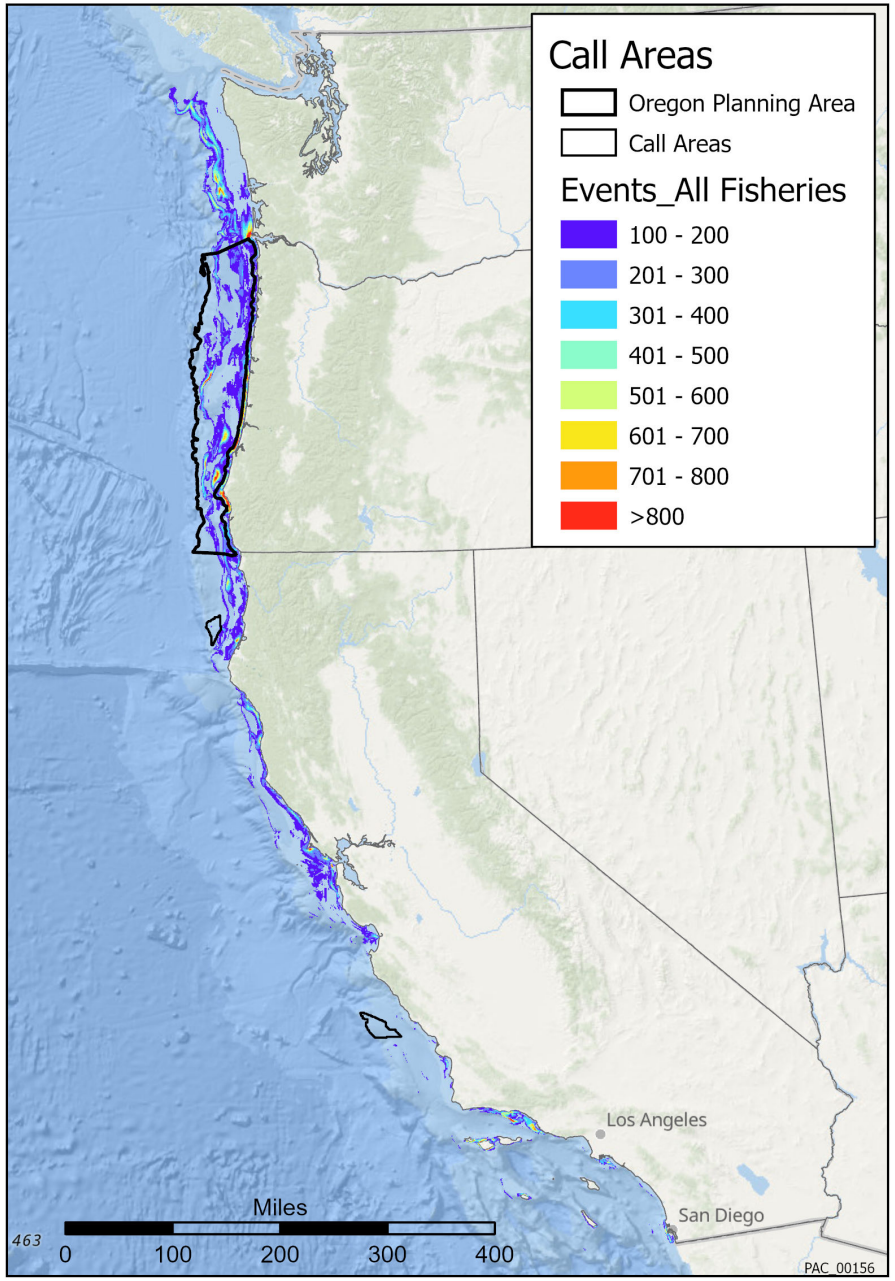
- Begins when a vessel slows below cutoff speed
- Ends when it speed up above cutoff speed
- Speed varies by Fishery (~5 kts)

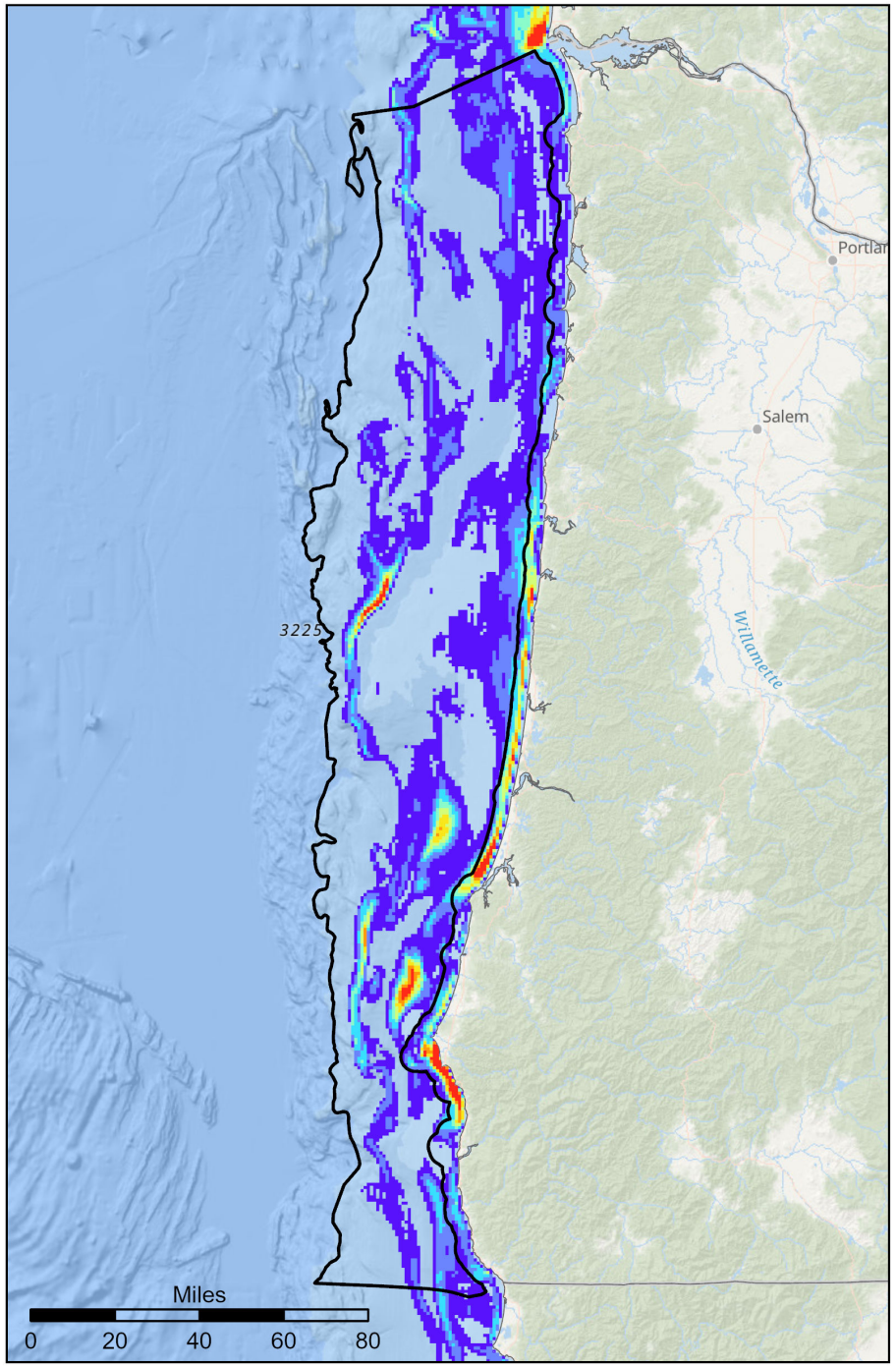


VMS Draft

VMS All Fisheries

VMS All Fisheries (>100 events / aliquot)
2010-2018

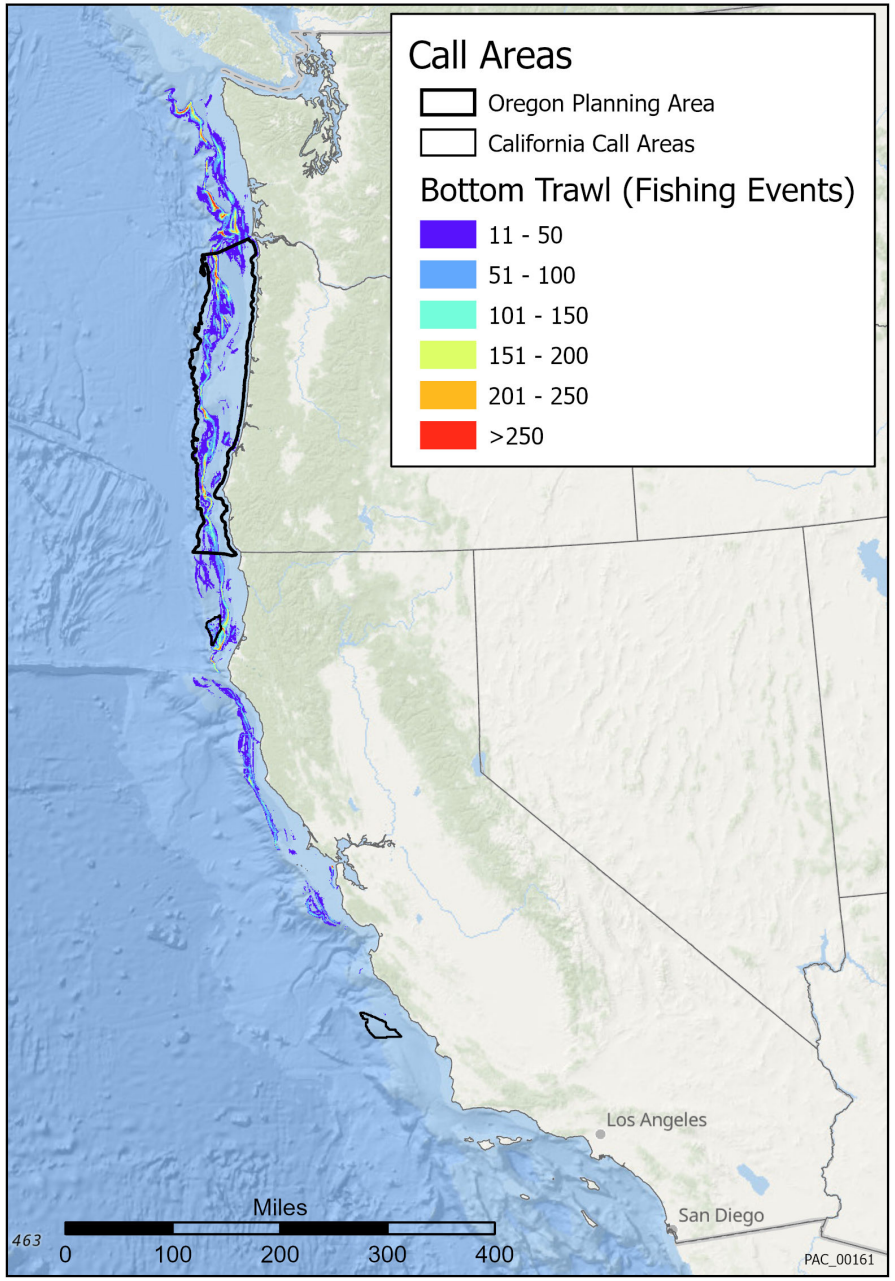


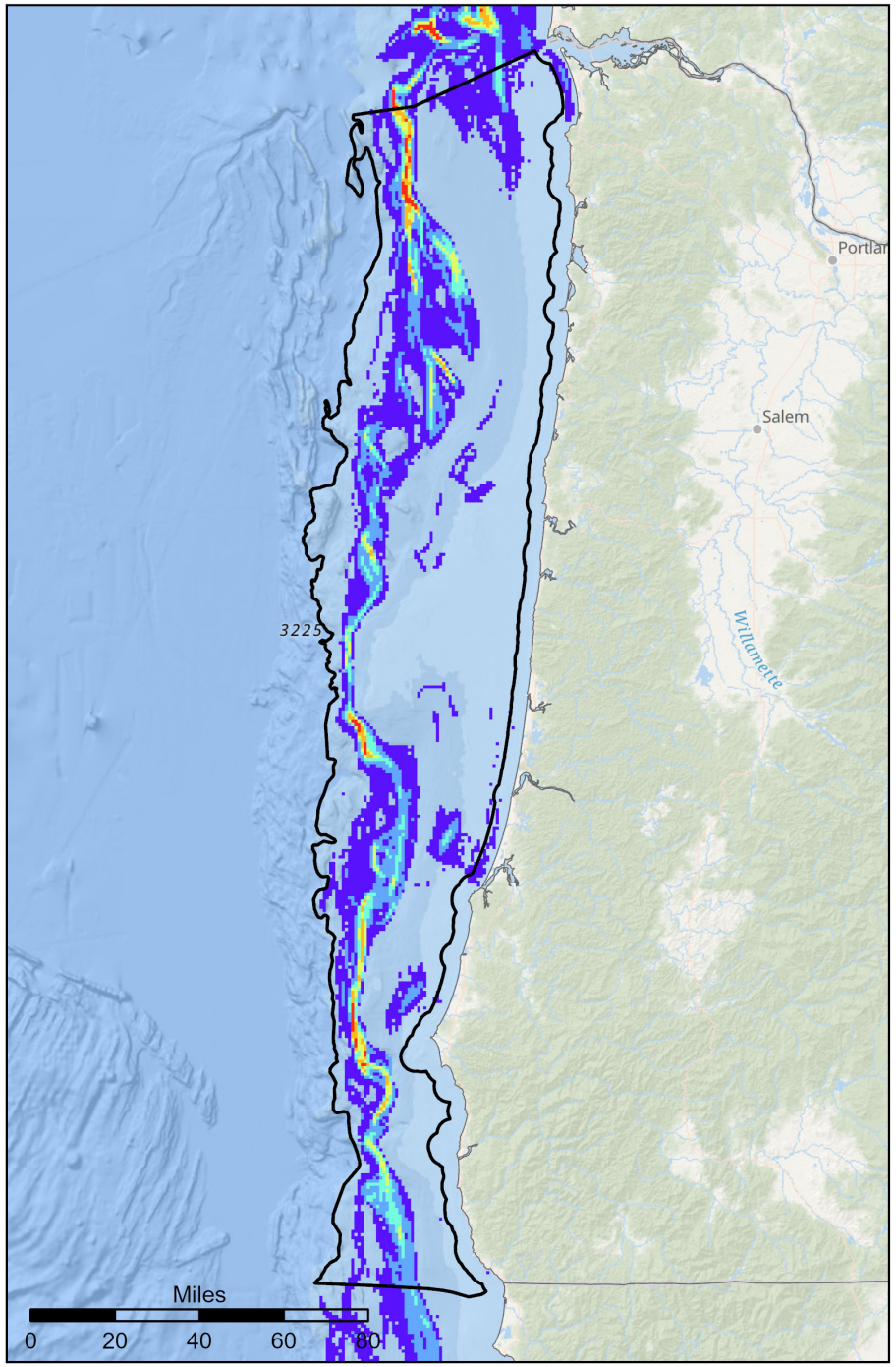


VMS Draft

Bottom Trawl 2010-2017

Bottom Trawl 230-231

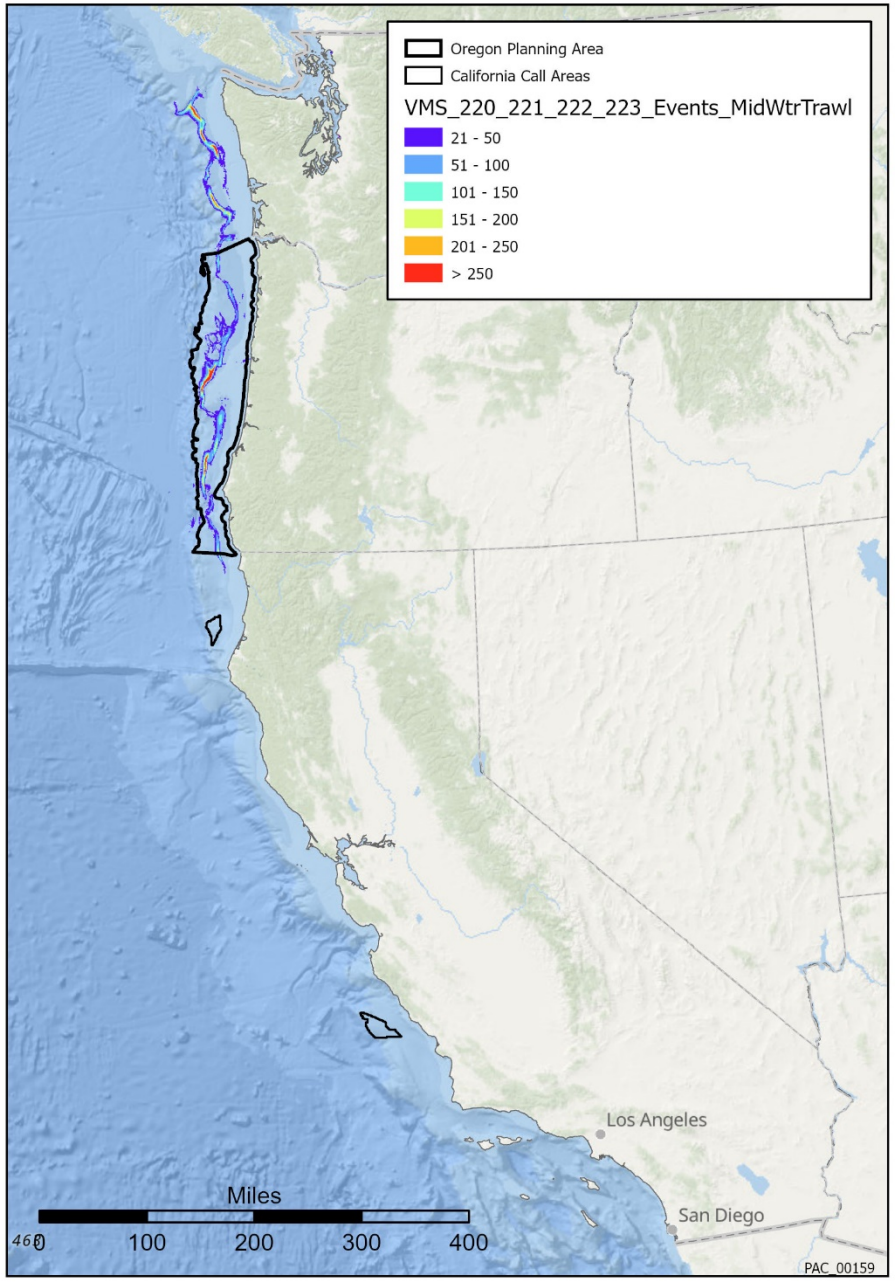


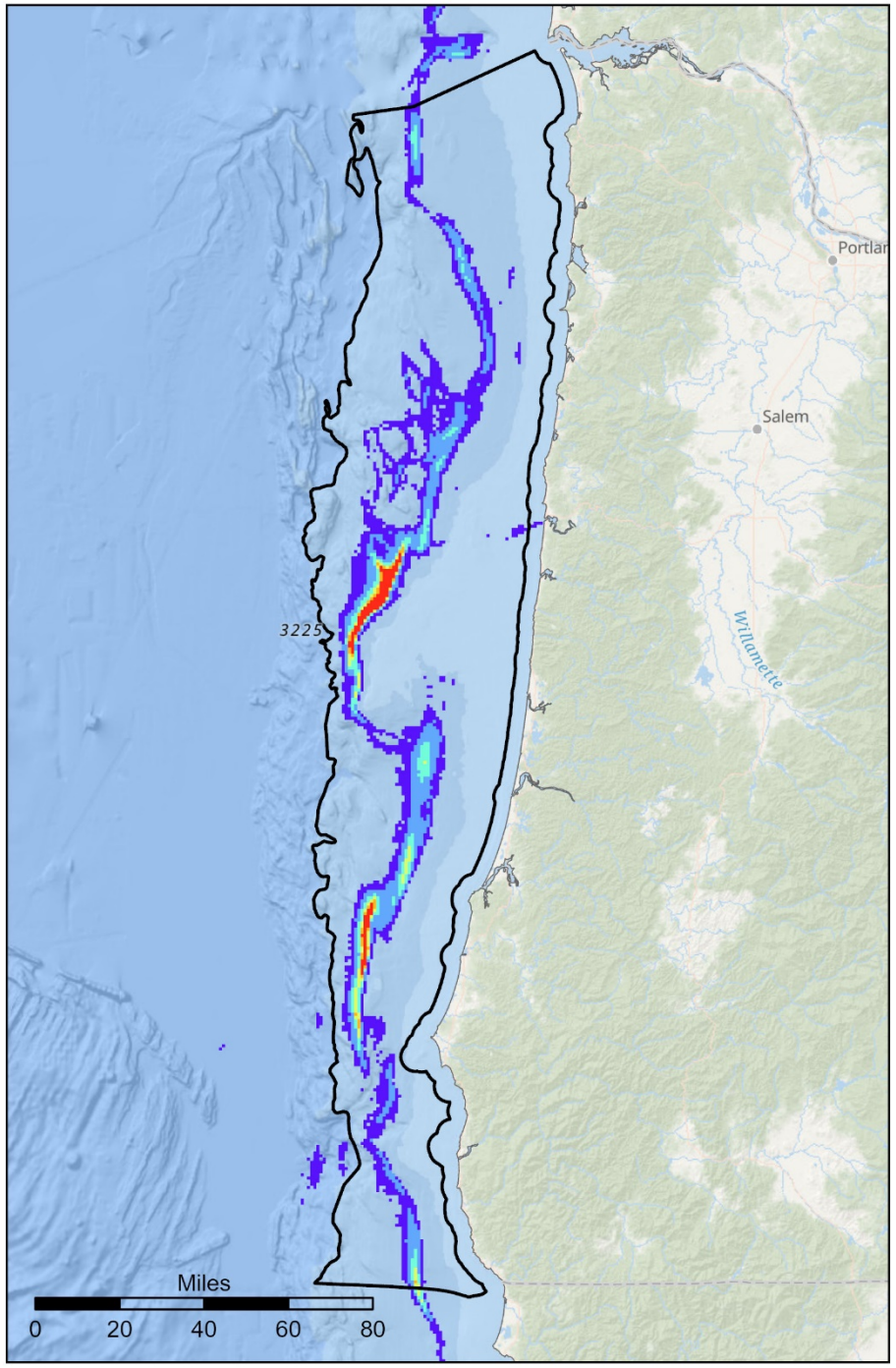


VMS Draft

Midwater Trawl 2010-2017

Midwater Trawl 220-223
2010-2017

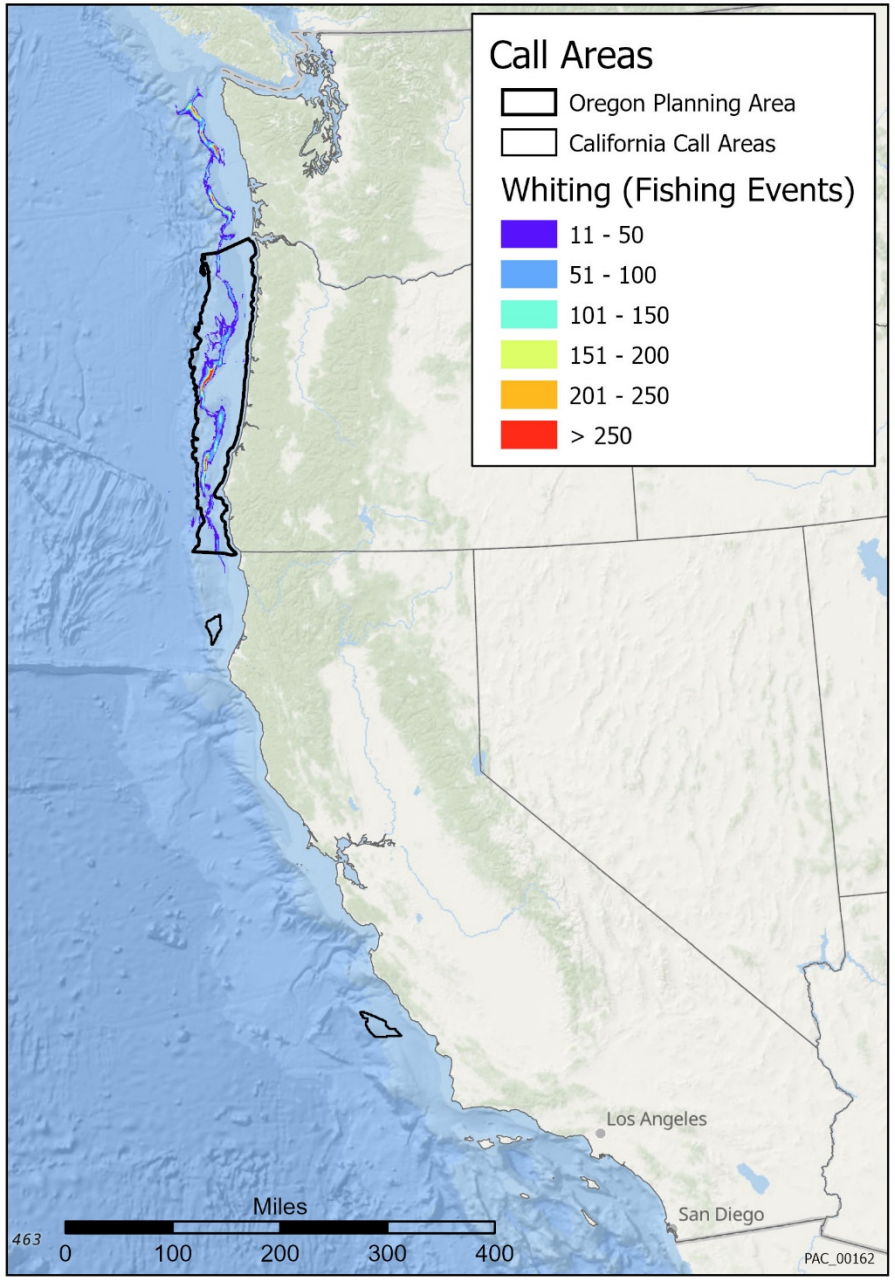


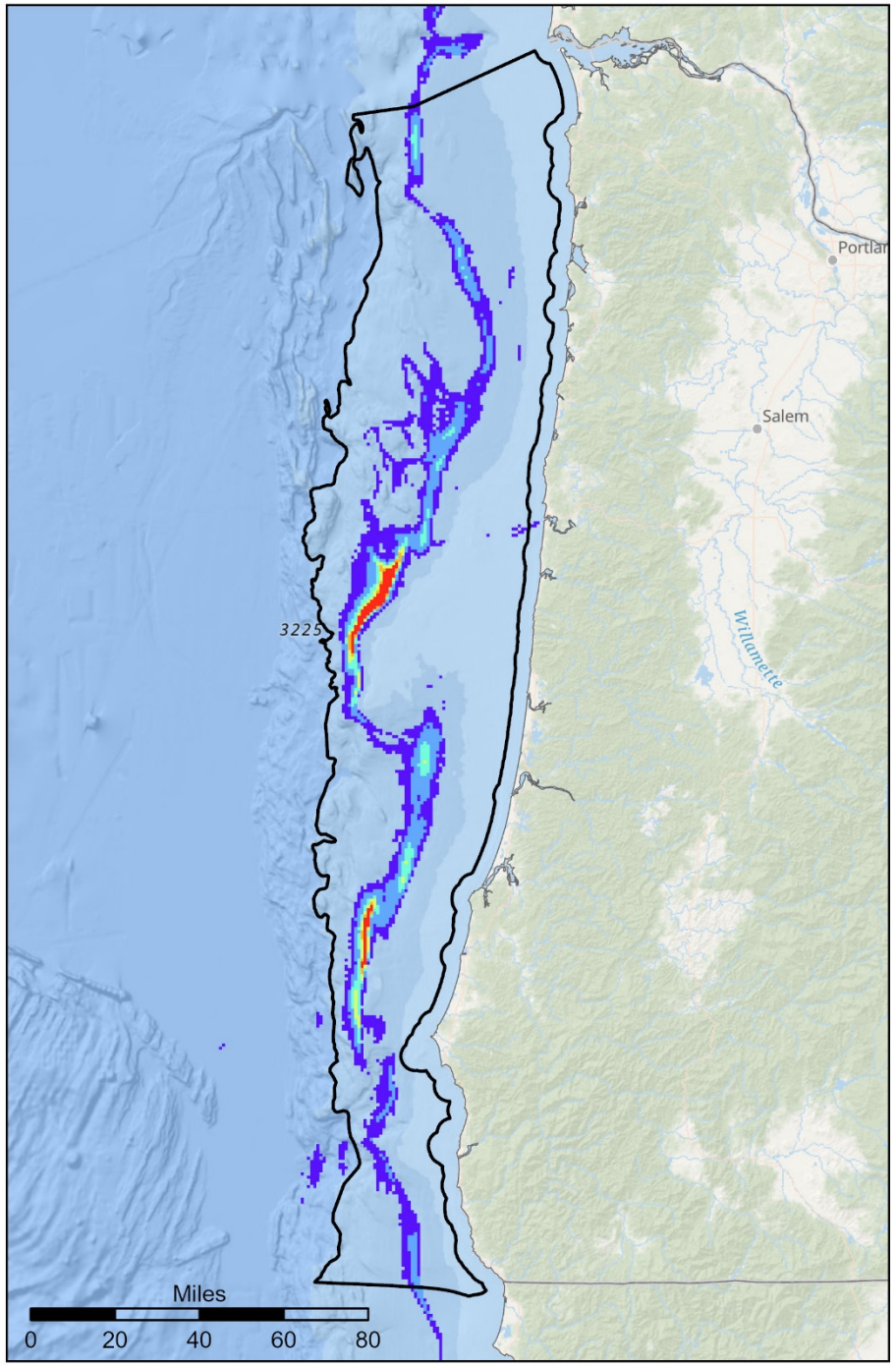


VMS Draft

Whiting Trawl 2010-2017

Whiting 221-223

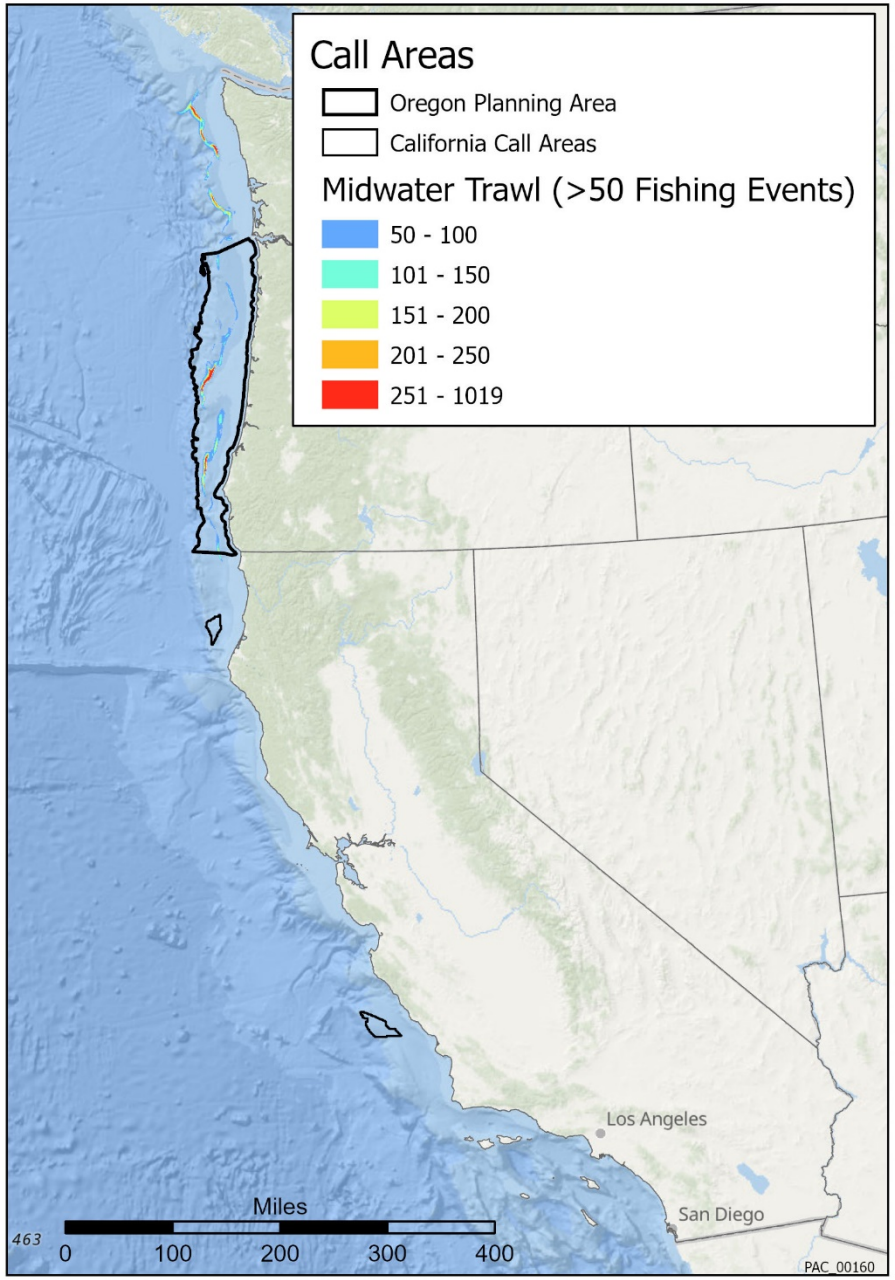


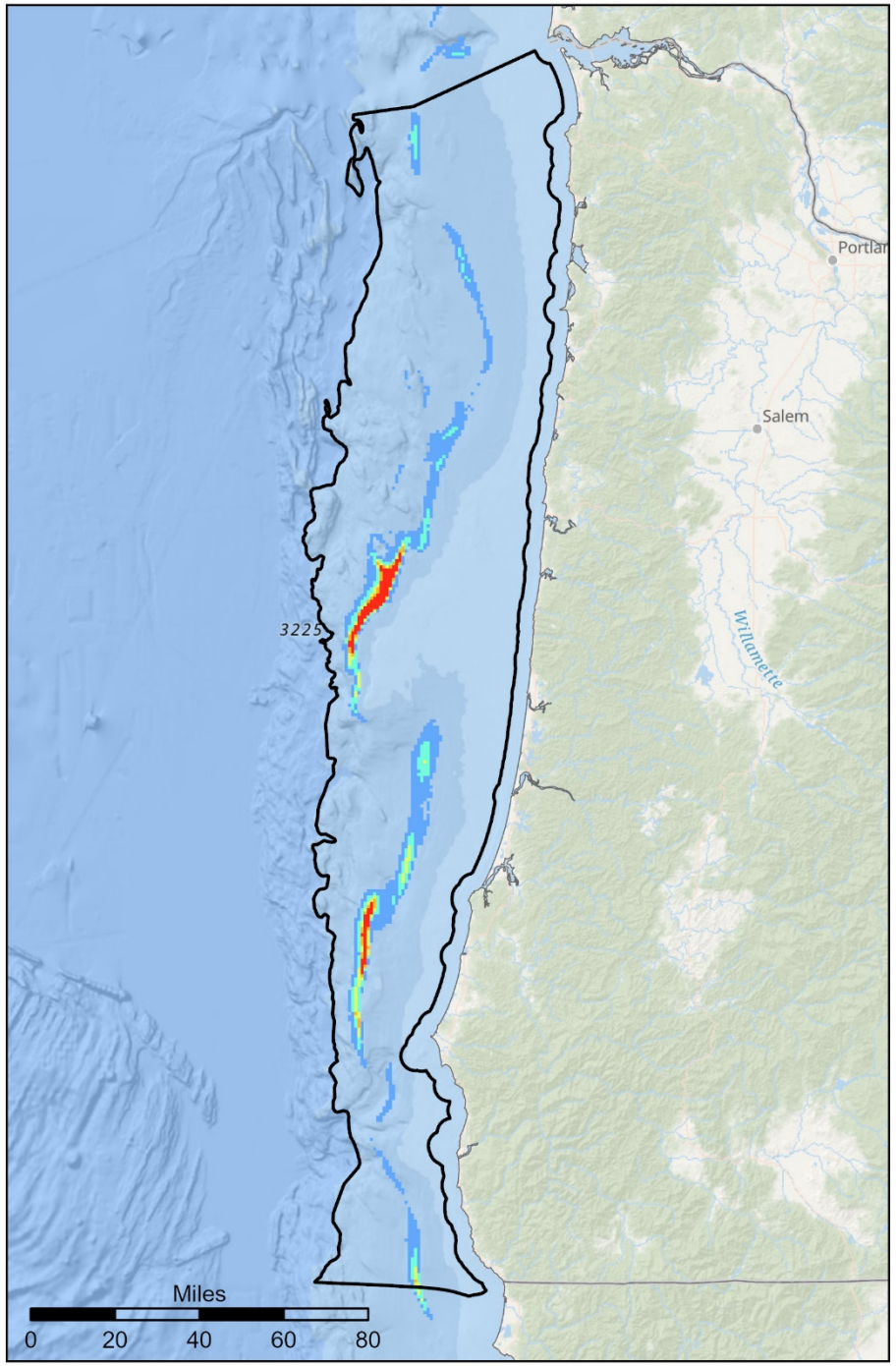


VMS Draft

Whiting Trawl
2010-2017

Midwater Trawl 221-223

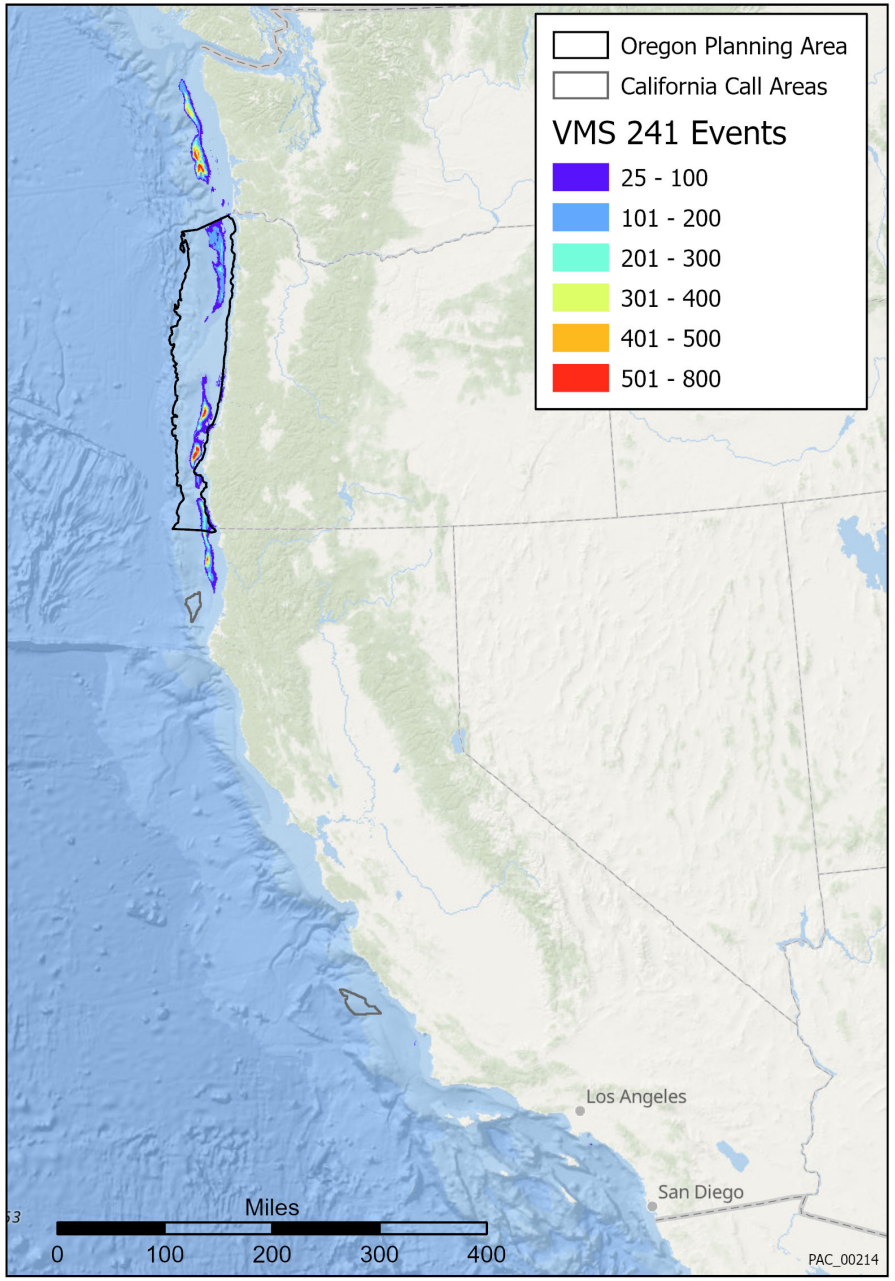


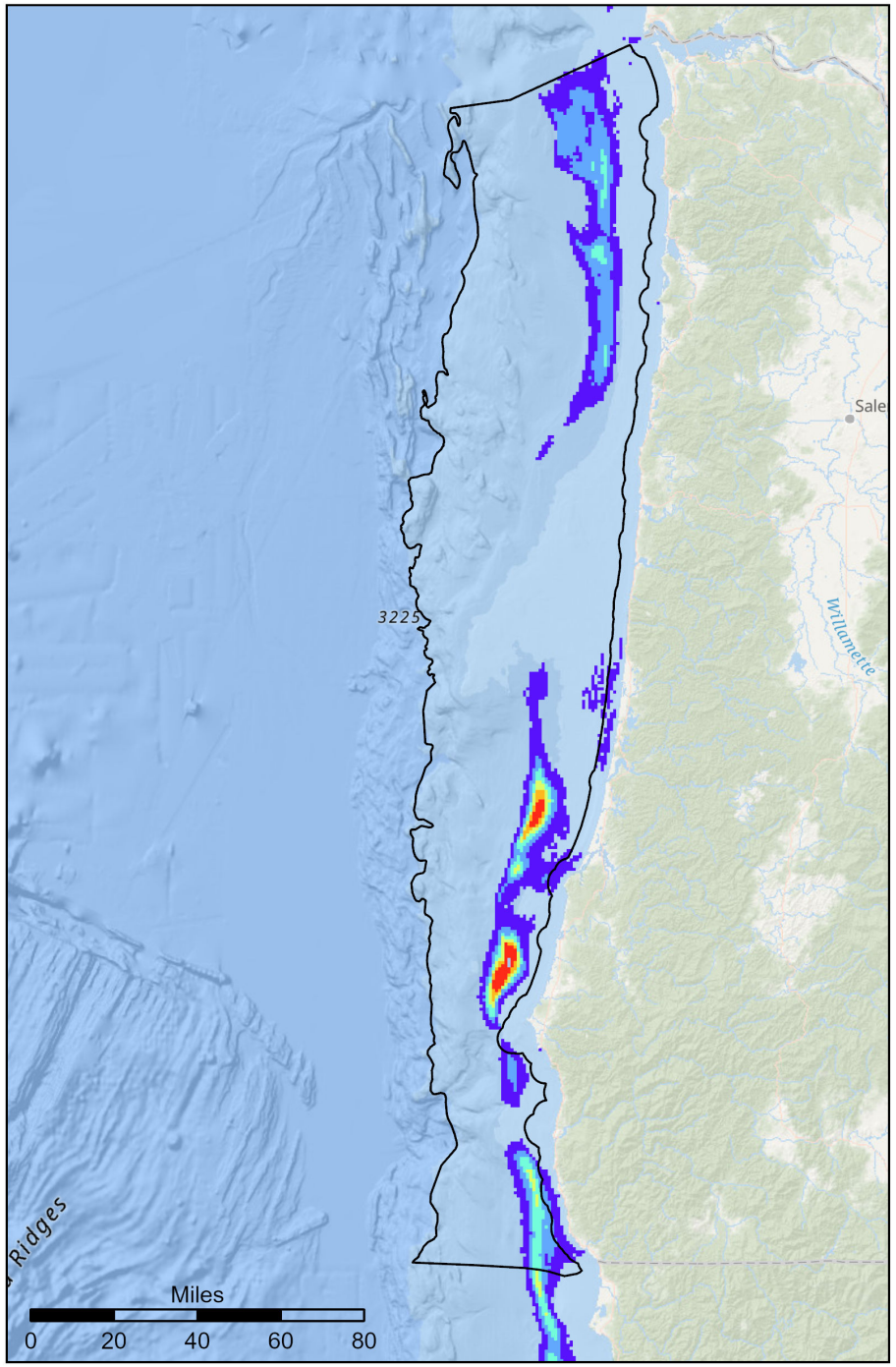


VMS Draft

Pink Shrimp
2010-2017

241_Non-Groundfish Trawl Gear for Pink Shrimp

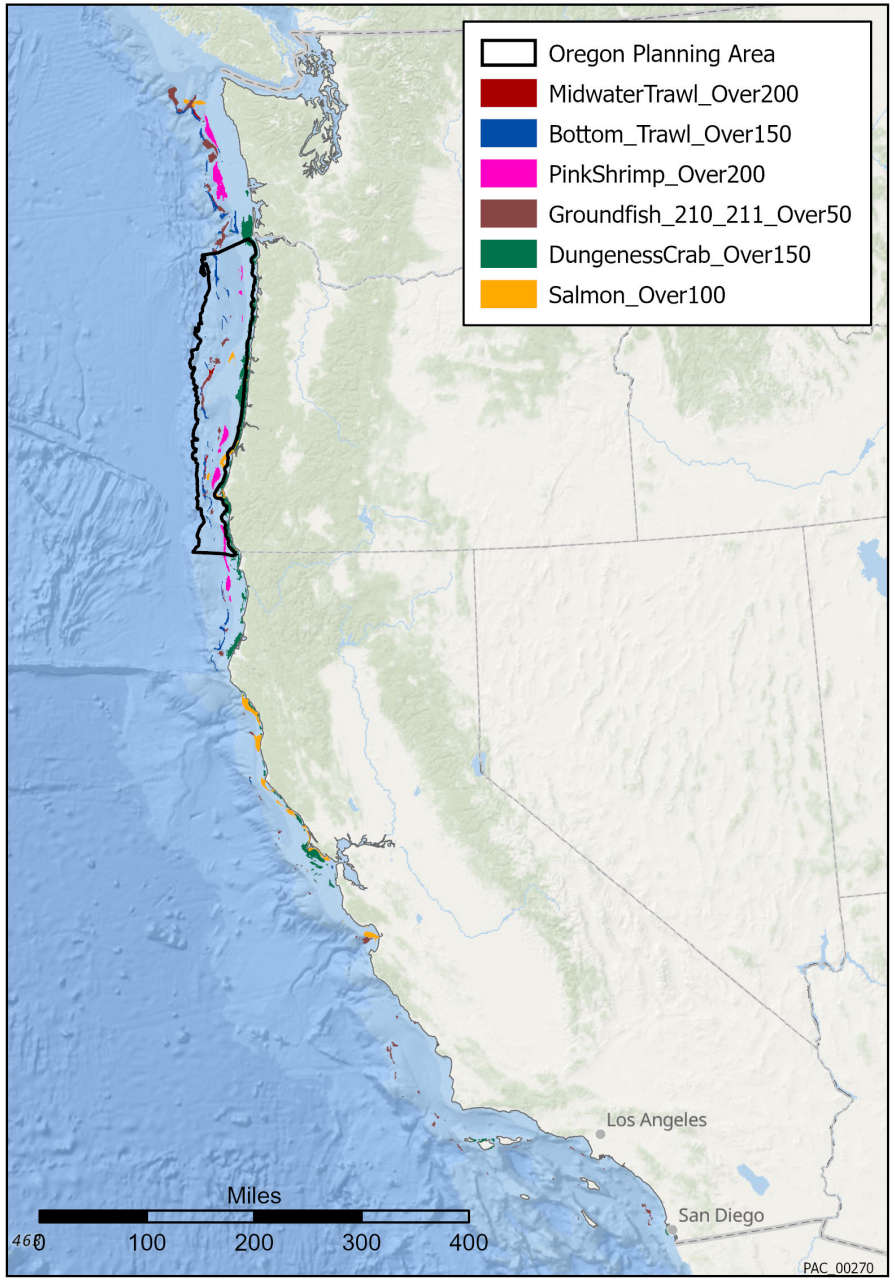


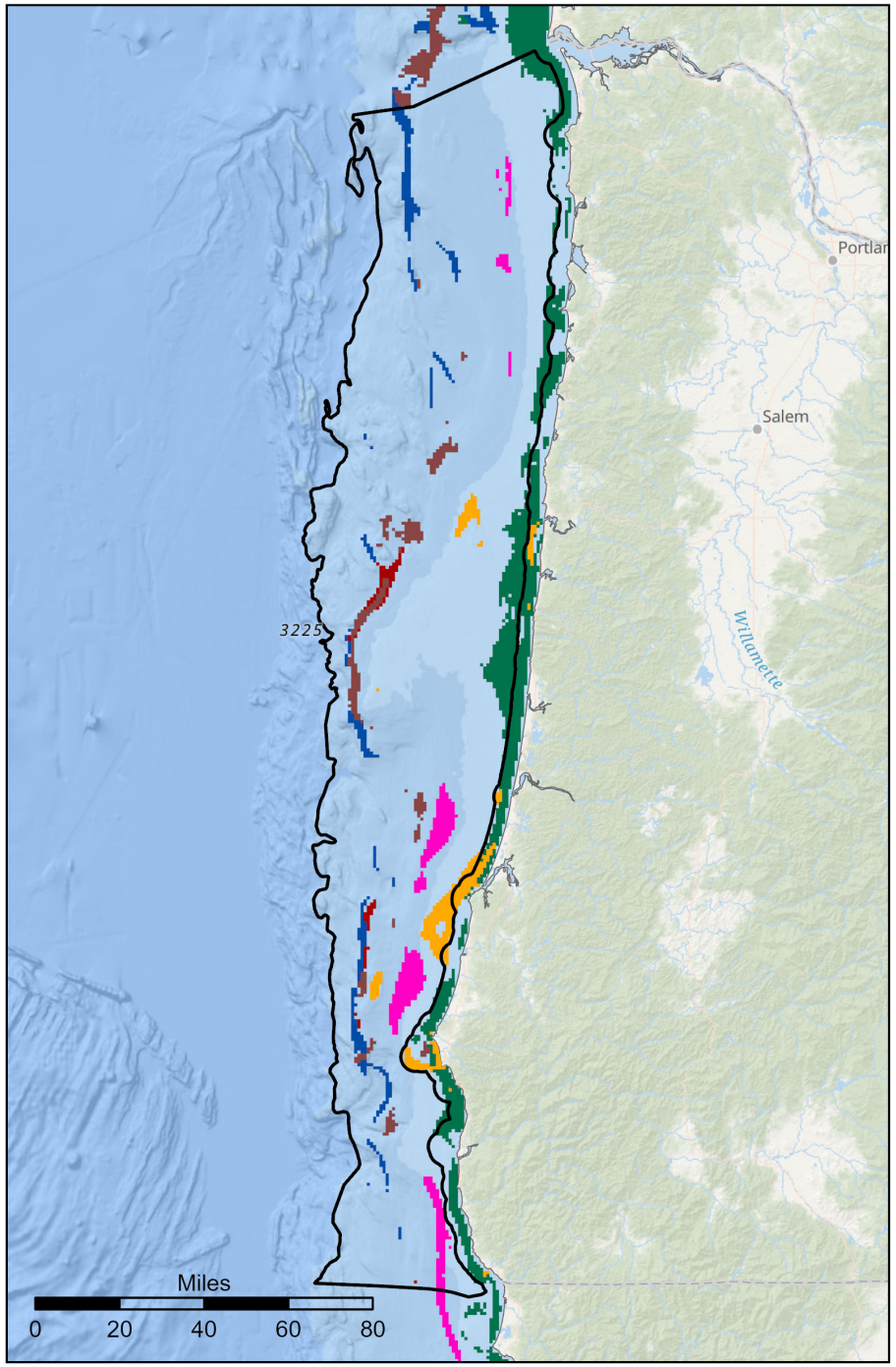


VMS Draft

Highest Use by Fishing Type

Highest Fishing Effort by Fishing Type





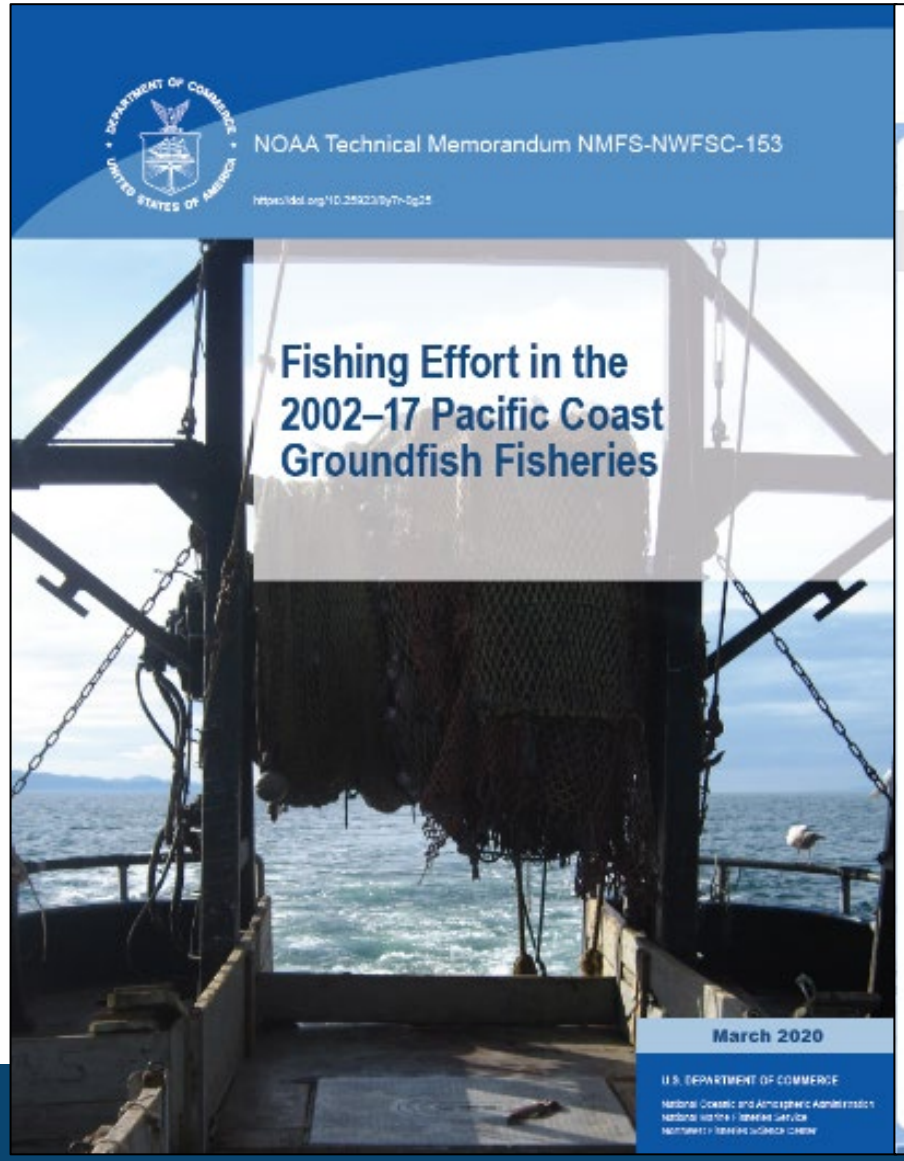
Fishing Effort in the 2002-2017 Pacific Coast Groundfish Fisheries

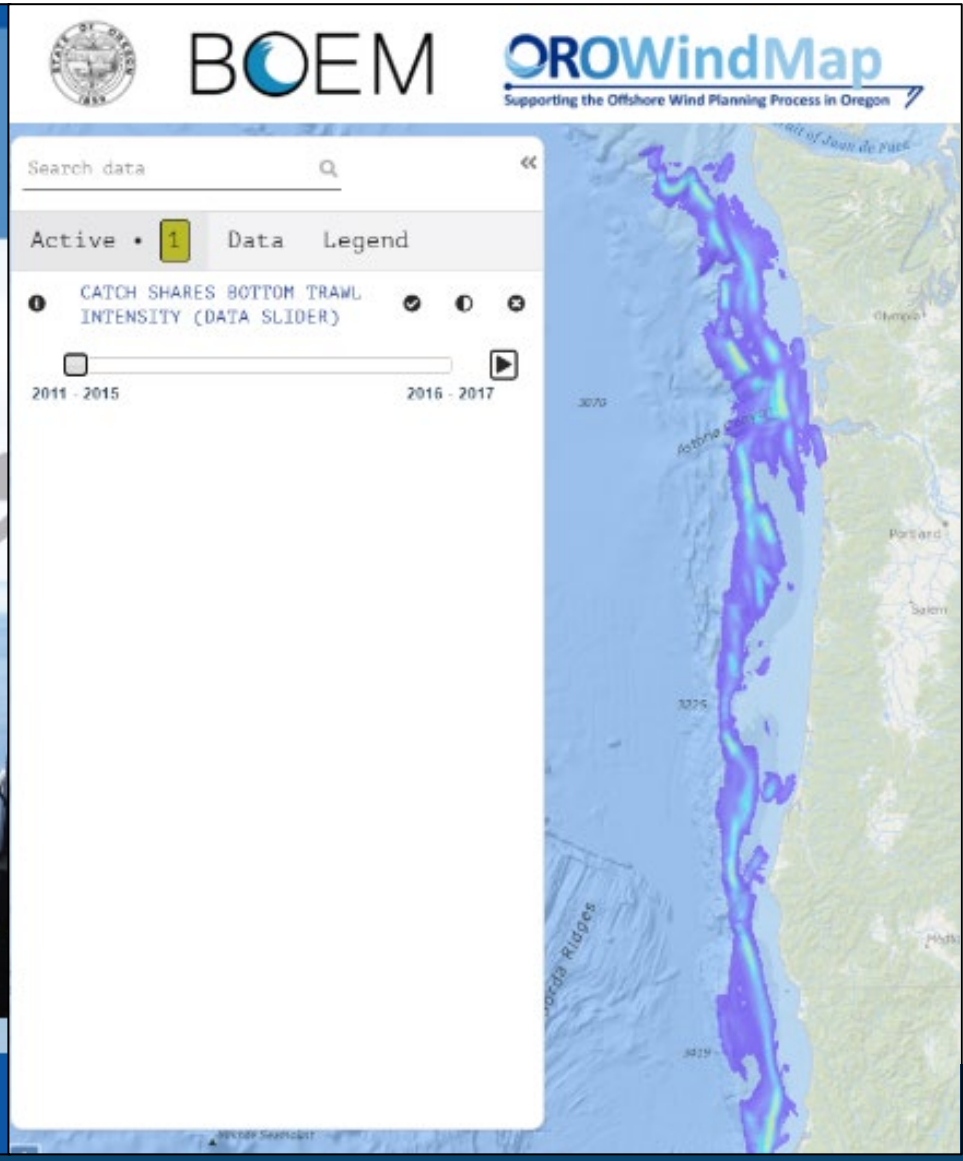
NMFS NWFSC

- March 2020

Input Data

- Observer Data
- State Logbooks
- Fish Tickets
- Electronic Monitoring

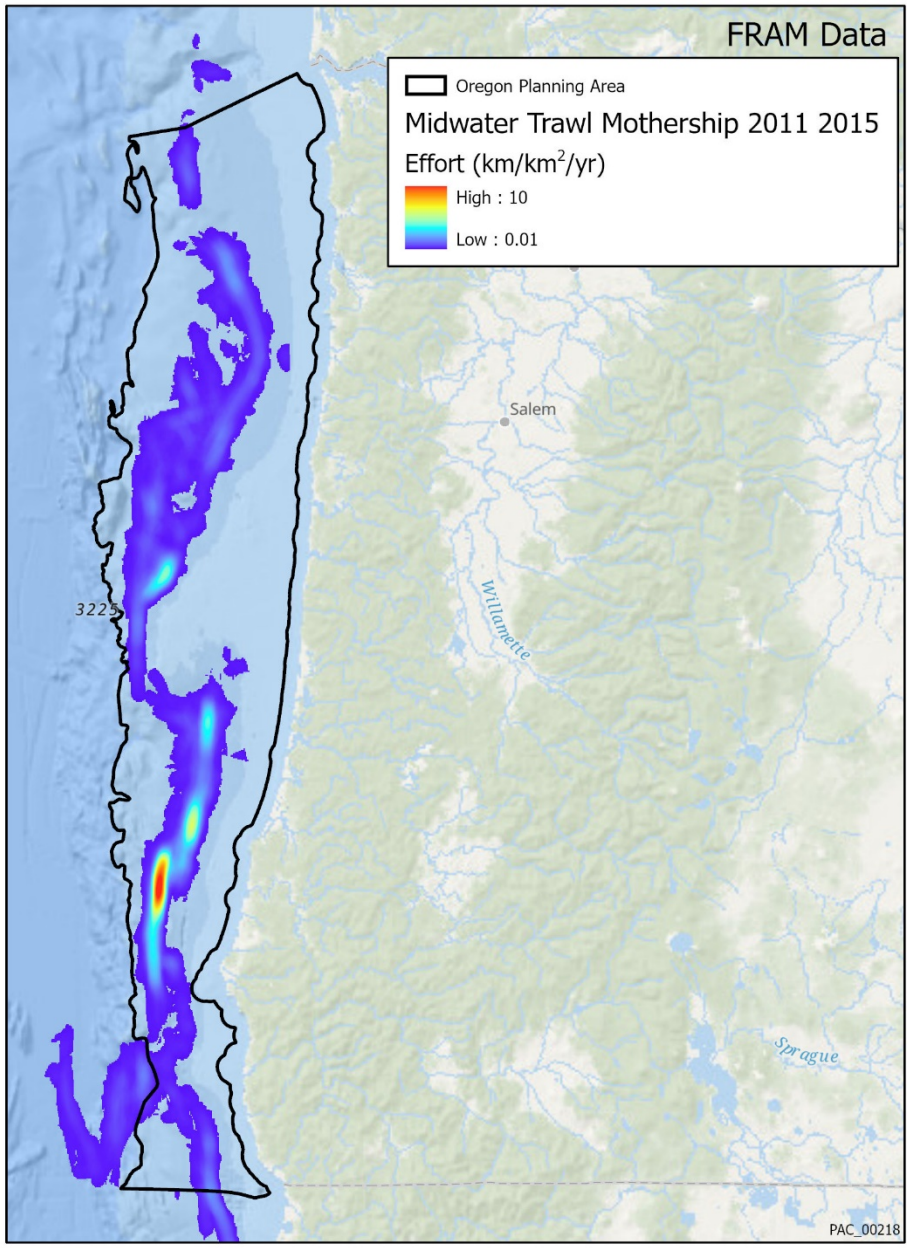


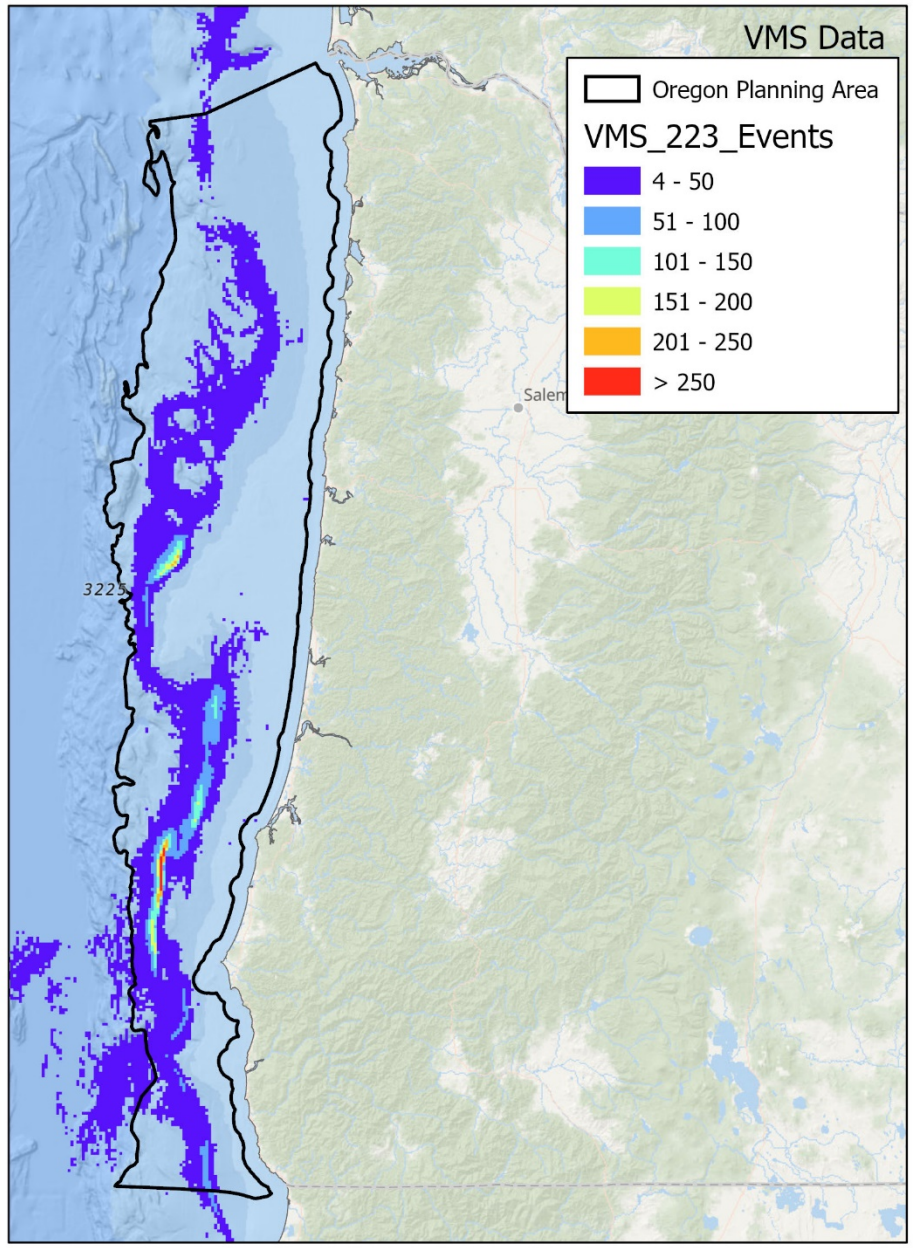


https://repository.library.noaa.gov/view/noaa/23712

NOAA Observer / VMS Comparison

FRAM Observer & Logbook / VMS Comparison
Midwater Trawl for Whiting Mothership





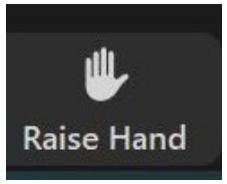
Task Force Roundtable Q&A and Discussion

Task Force Meeting Morning Session Adjourned

Public Input Opportunity

Interested members of the public are encouraged to provide input

Process Guidelines for Public Input Opportunity



- **Public input opportunity: 12:00 – 12:30 pm**
- **Raise your hand to join the public input queue**
- **The facilitator will call on you when it is your turn to speak. You will then be unmuted.**
  - If you are a phone call-in user, dial *9 on your phone to raise hand
- **Provide your name and affiliation before you speak**
- **When providing input, please:**
  - Respect time limits as assigned
  - Use respectful language

Lunch Break
Meeting will resume at 1:00 pm

Welcome Back
Task Force Meeting Afternoon Session

Floating Offshore Wind Technology and Oregon Offshore Wind Energy Studies

Walt Musial, Offshore Wind Manager
National Renewable Energy Laboratory

Floating Offshore Wind Technology and Oregon Offshore Wind Energy Studies

Walt Musial | Principal Engineer |National Renewable Energy Laboratory

BOEM Oregon Intergovernmental Renewable Energy Task Force Webinar

October 21, 2021

Presentation Outline

1. Industry Overview
2. Cost Model
3. Technology Assumptions
4. Physical Site Assessment
5. Grid Study Results
6. Cost Study Results
7. Conclusions and References

Background

- The projects presented were funded by the Bureau of Ocean Energy Management(BOEM) under an interagency agreement M19PG00025 with the DOE National Renewable Energy Laboratory.
- The work builds on a 2019 National Renewable Energy Laboratory (NREL) floating offshore wind power cost study in Oregon (Musial et al. 2019) and a recent NREL California cost analysis (Beiter et al. 2020).
- The cost study* (published Oct 4, 2021) provides heat maps showing updated estimates of the levelized cost of energy (LCOE) for floating offshore wind energy off the coast of Oregon.
- The grid study** "Evaluating the Grid Impact of Oregon Offshore Wind" (published Oct 19, 2021) investigates the robustness in Oregon OSW's value and grid operations impact for the western interconnection.
- The studies do not prioritize specific sites or make judgments about marine spatial planning viability.

* https://www.nrel.gov/docs/fy22osti/80908.pdf

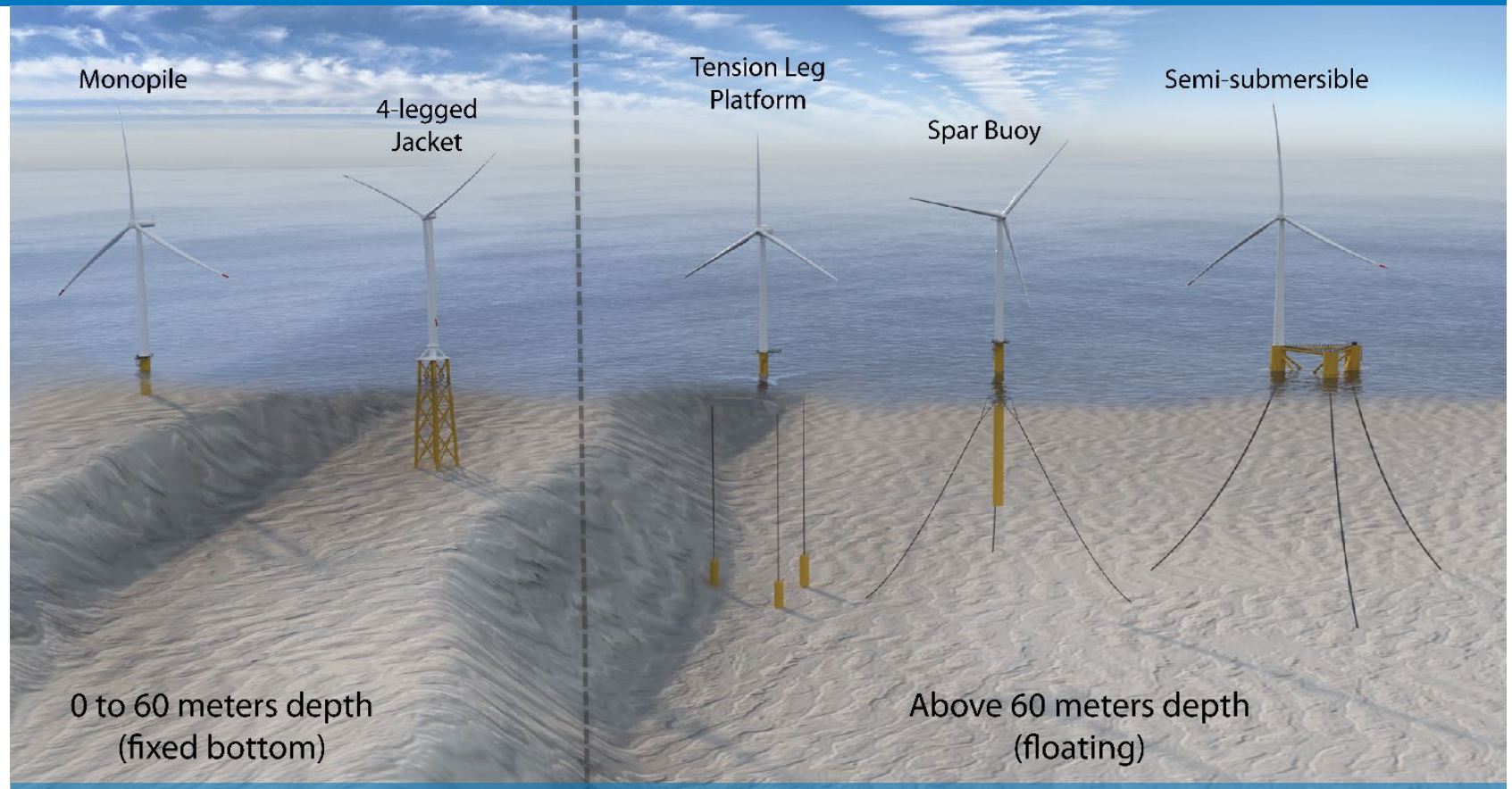
** https://www.nrel.gov/docs/fy22osti/81244.pdf

Most Offshore Wind Deployment has been on Fixed-bottom Support Structures

Leading Offshore Wind Countries
(Installed Capacity)
5,519 MW added in 2020

United Kingdom	9222 MW
China	8181 MW
Germany	7756 MW
Netherlands	2639 MW
Belgium	2262 MW
Denmark	1935 MW
Sweden	196 MW

Figures current as of 31Dec 2020



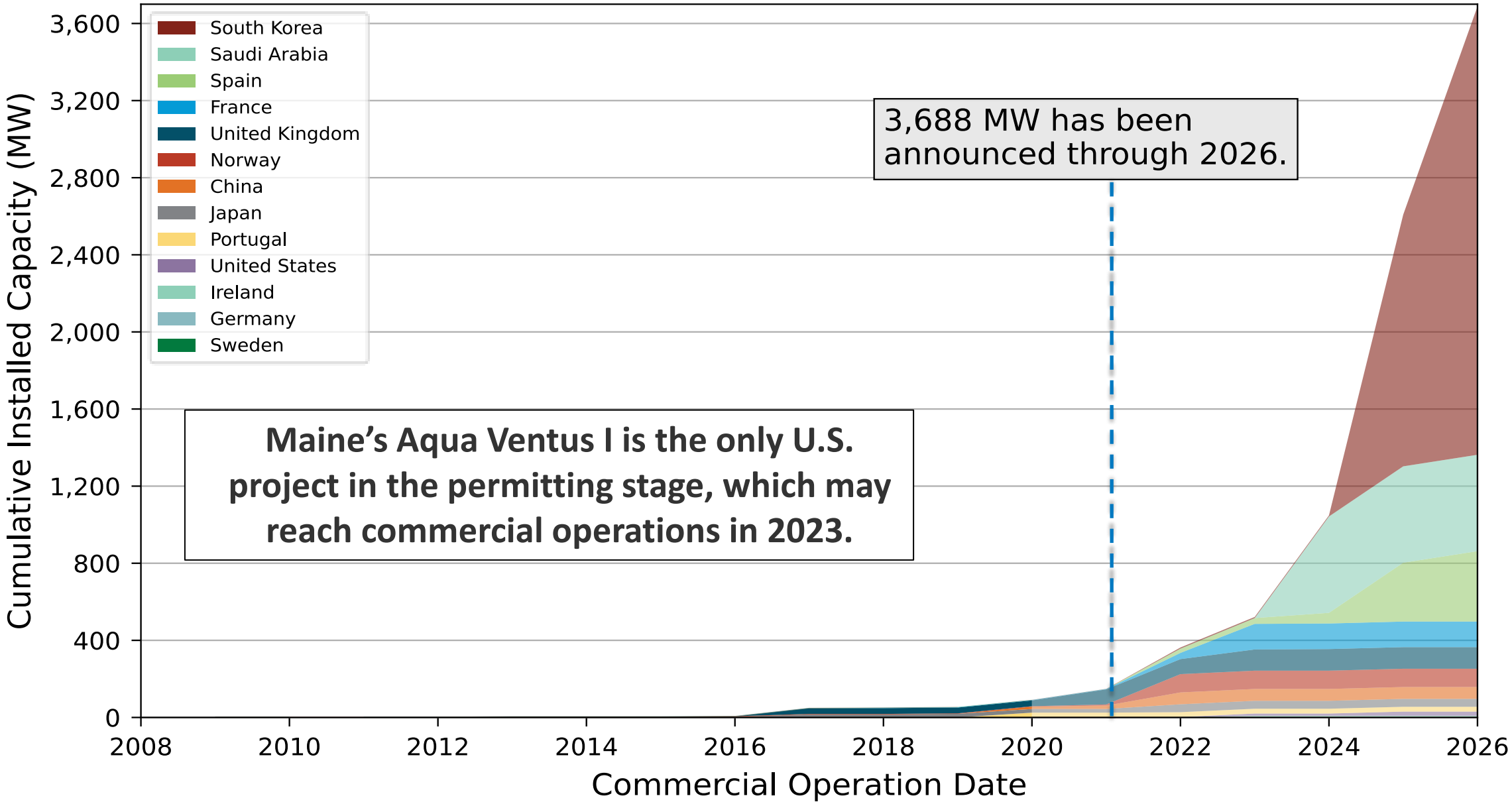
Offshore Turbine Substructure Type Depends on Water Depth

Fixed Bottom
32,906 MW Installed

Floating Offshore Wind
79 MW Installed

The future floating wind energy market may be bigger than the fixed-bottom market

Projected Floating Offshore Wind Capacity



World's Largest Floating Wind Plant: 50-MW Kincardine

- Kincardine floating wind farm was completed in 2021.
- Five, 9.5-MW Vestas turbines mounted on steel semi-submersibles substructures – Principle Power Inc.
- Located 15-kilometers off Aberdeen, Scotland.

Kincardine 50-MW Floating Offshore Wind Plant

Photo: courtesy of Principle Power Inc.

Cost Modeling and Technology Assumptions

Focus: Floating Levelized Cost of Energy

LCOE is the cost to produce one unit of electricity in megawatt-hours (MWh) for an offshore wind energy project averaged over the 25-year life cycle of the project.

$$LCOE = \frac{FCR(C_{turbine} + C_{BOS}) + C_{O\&M}}{AEP}$$

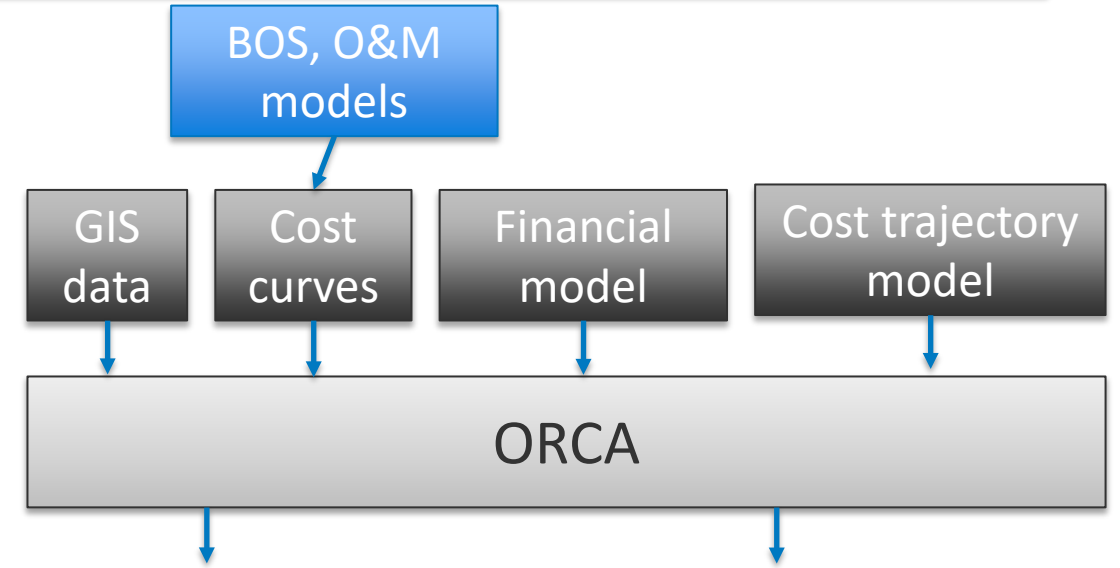
- LCOE: $/megawatt-hour (MWh)
- FCR: Fixed charge rate
- $C_{turbine}$: Turbine capital expenditures, $/kilowatt (KW)
- C_{BOS}: Balance of system (BOS) capital expenditures, $/KW
- $C_{O\&M}$: Operation and maintenance (O&M) annualized costs, $/KW/year
- AEP: Annual energy production, MWh.

LCOE is helpful to compare projects/technologies with different cash flow profiles and over time.
LCOE does not capture the locational and time value of the generated energy and other services.

Description of ORCA Model: Offshore Regional Cost Analyzer

Techno-economic model calculates the spatial and temporal variation of offshore wind costs.

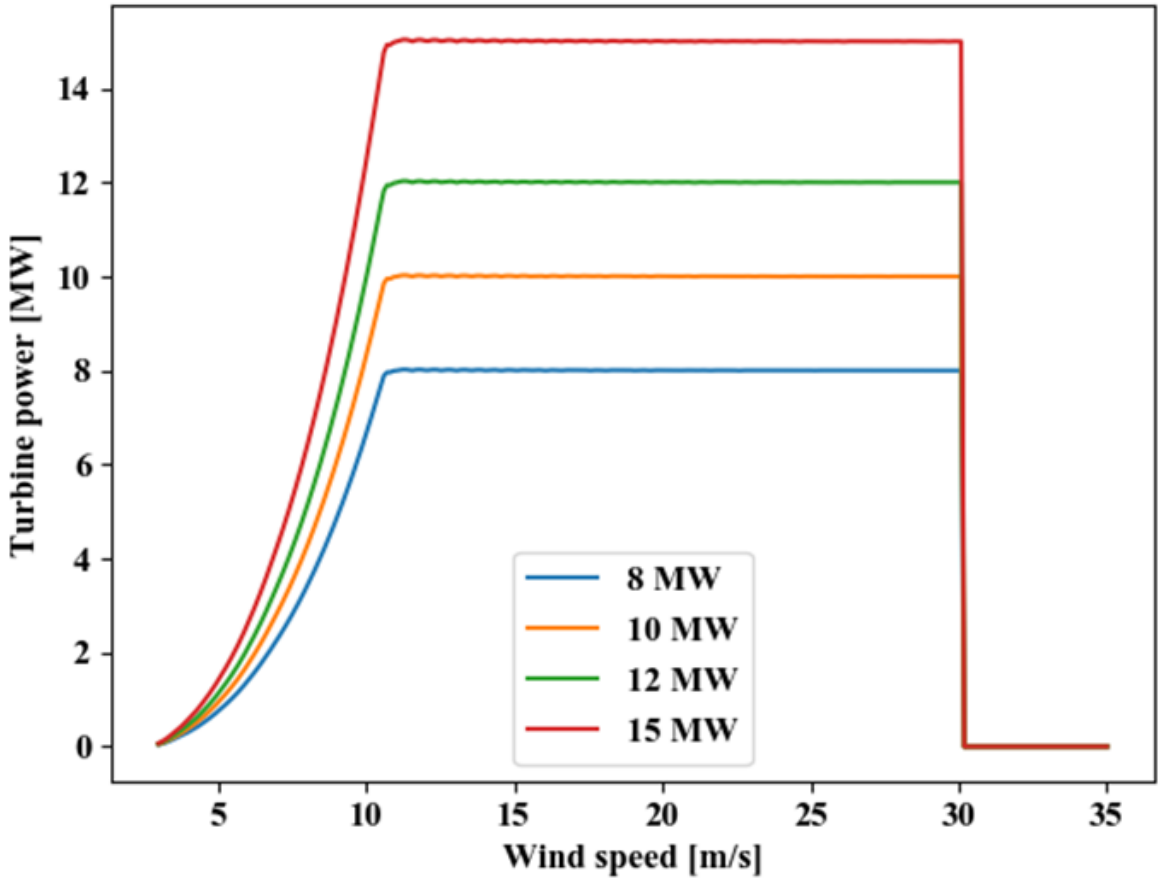
- The bottom-up model uses current cost and wind resource data.
- The **geospatial** cost variables help assess potential offshore wind energy sites on the Outer Continental Shelf (OCS); e.g., depth, distance, resource.
- The **temporal** model estimates the future costs for operation dates up to 2032 based on technology timelines and learning curve.
- The model evaluates the impact of technological, financial, and O&M decisions on LCOE.
- The model is continuously updated to reflect changing market conditions.



Spatial and temporal LCOE results

Offshore Wind Technology Assumptions

- All wind turbines in the model are based on the International Energy Agency (IEA) Wind 15-MW offshore reference turbine (Gaertner et al. 2020).
- Turbine capacities are assumed to increase over time from 8 MW to 15 MW based on market trends:
  - 8 MW (2019)
  - 10 MW (2022)
  - 12 MW (2027)
  - 15 MW (2032)
- Cut-out wind speed was increased from 25 meters/second (m/s) to 30 m/s in all turbines to account for the higher wind speeds in southern Oregon.



Offshore wind turbine power curves correspond to 2019, 2022, 2027, and 2032

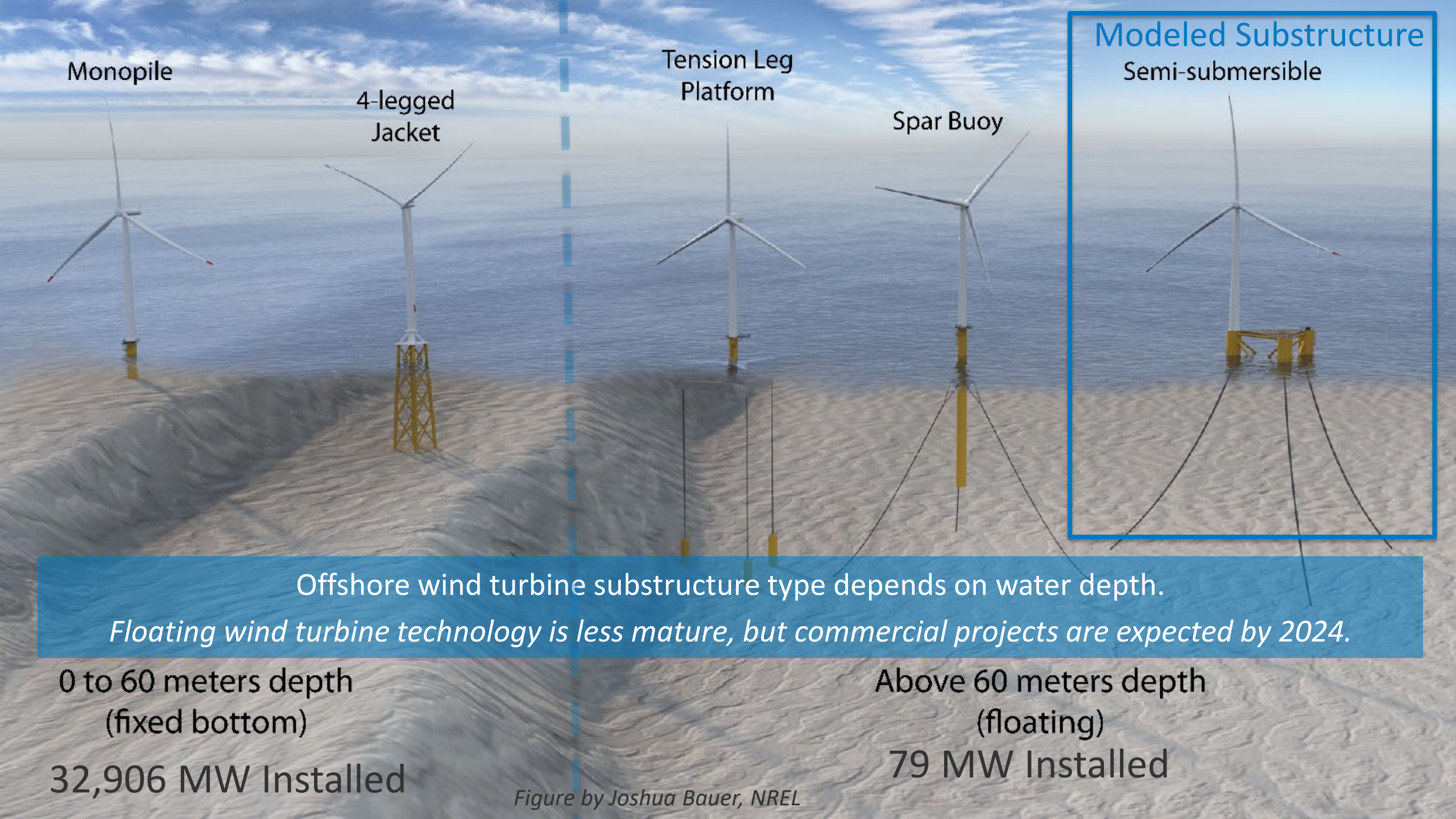
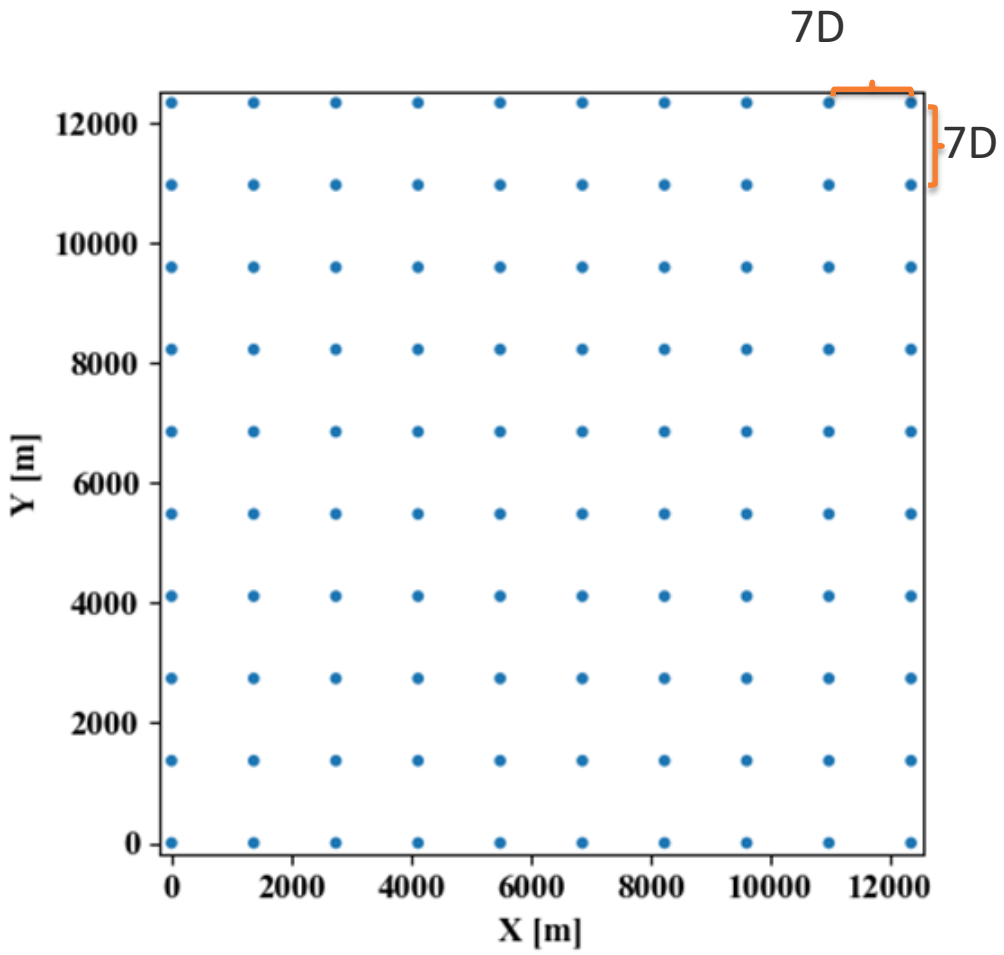


Figure by Joshua Bauer, NREL

Wind Power Plant Assumptions

- A nominal wind plant capacity of 1,000 MW is assumed.
  - Actual plant capacity varies due to integer wind turbine capacity in the commercial operation date (COD):
    - 2019: 1,000 MW (125 x 8 MW)
    - 2022: 1,000 MW (100 x 10 MW)
    - 2027: 1,008 MW (84 x 12 MW)
    - 2032: 1,005 MW (67 x 15 MW)
- Turbines are laid out on a square grid with 7-rotor-diameter (7D) spacing (see figure).*
- AEP and wake losses are calculated using NREL's wake modeling toolbox, FLORIS (NREL 2021).
- Export cable costs include the cost of a 3-kilometer (km), land-based spur line after landfall (likely not a full accounting of interconnection costs).

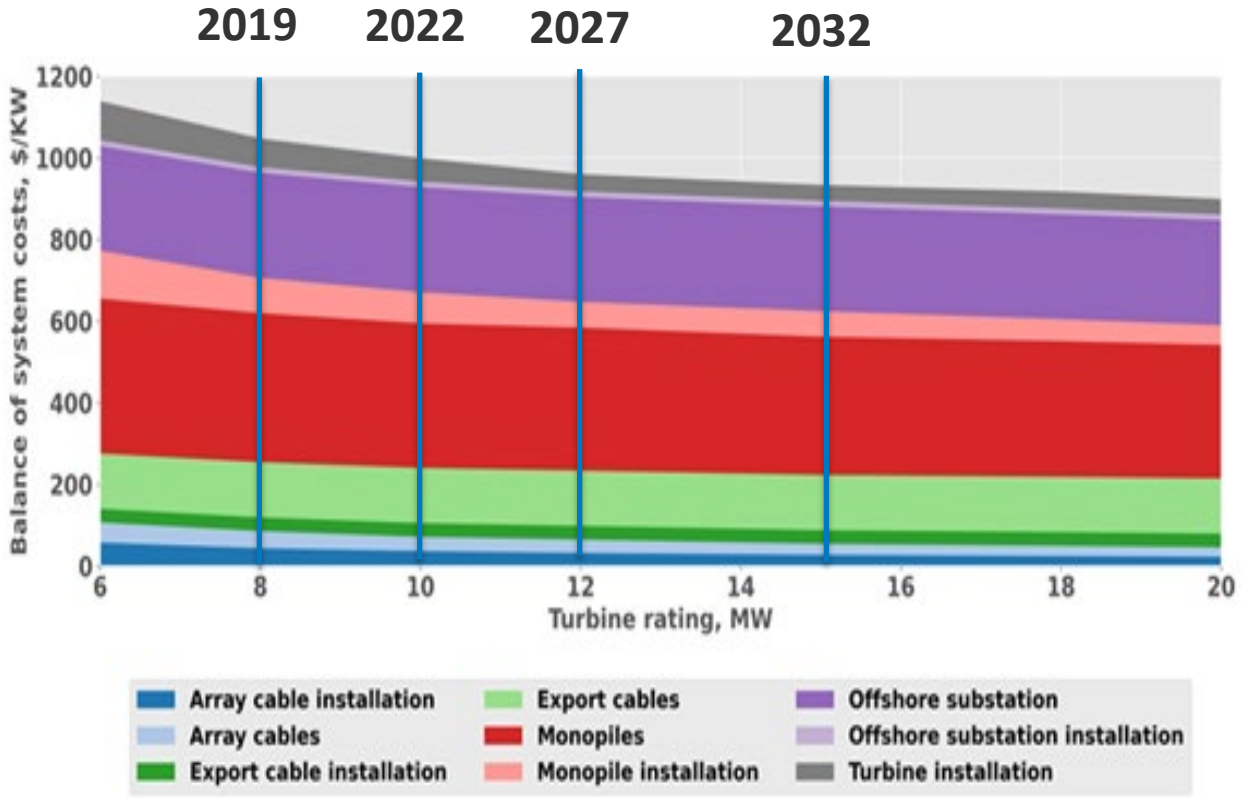


Plant layout for COD 2022 (10-MW wind turbines) has a dot radius representing a 1-rotor diameter.

* Note that 7D spacing is not recommended from this analysis as a layout option for Oregon. The spacing was a conservative layout option chosen to calculate the wake losses. A site optimization of projects in Oregon will likely show lower wake losses.

Main Capital Expenditure Drivers

- Turbine upscaling is a primary driver for BOS cost reduction (see figure).
- Increasing plant size has a large cost benefit due to economies of scale.
- Substructure costs are based on proprietary developer vendor quotes for 1,000-MW projects.
- Lower BOS costs have a cascading effect on soft costs (calculated as percent of BOS).
- Port and bulk transmission upgrade costs are not included in the LCOE or CapEx numbers.



This graph shows the impact of turbine size from Offshore Renewables Balance-of-System and Installation Tool (ORBIT). *Graph from Shields et al. (2021)*

Note: Labor cost multipliers are not used in this study.

Local Port Requirements for a Viable Floating Offshore Wind Energy Industry in Oregon

Image by Harland and Wolff Heavy Industries

Wharf

Serial turbine, substructure assembly, and component port delivery due to depth, waves off coast.

Navigation Channel and Wet Storage

Storage and wet tow-out of assembled turbines with year-round access. Width/depth varies by substructure design.

Upland Yard

50- to 100-acre storage and staging of blades, nacelles, and towers and possible fabrication of floating substructures.

Crane

Minimum 600-ton lift capacity at 500 feet height to attach components.

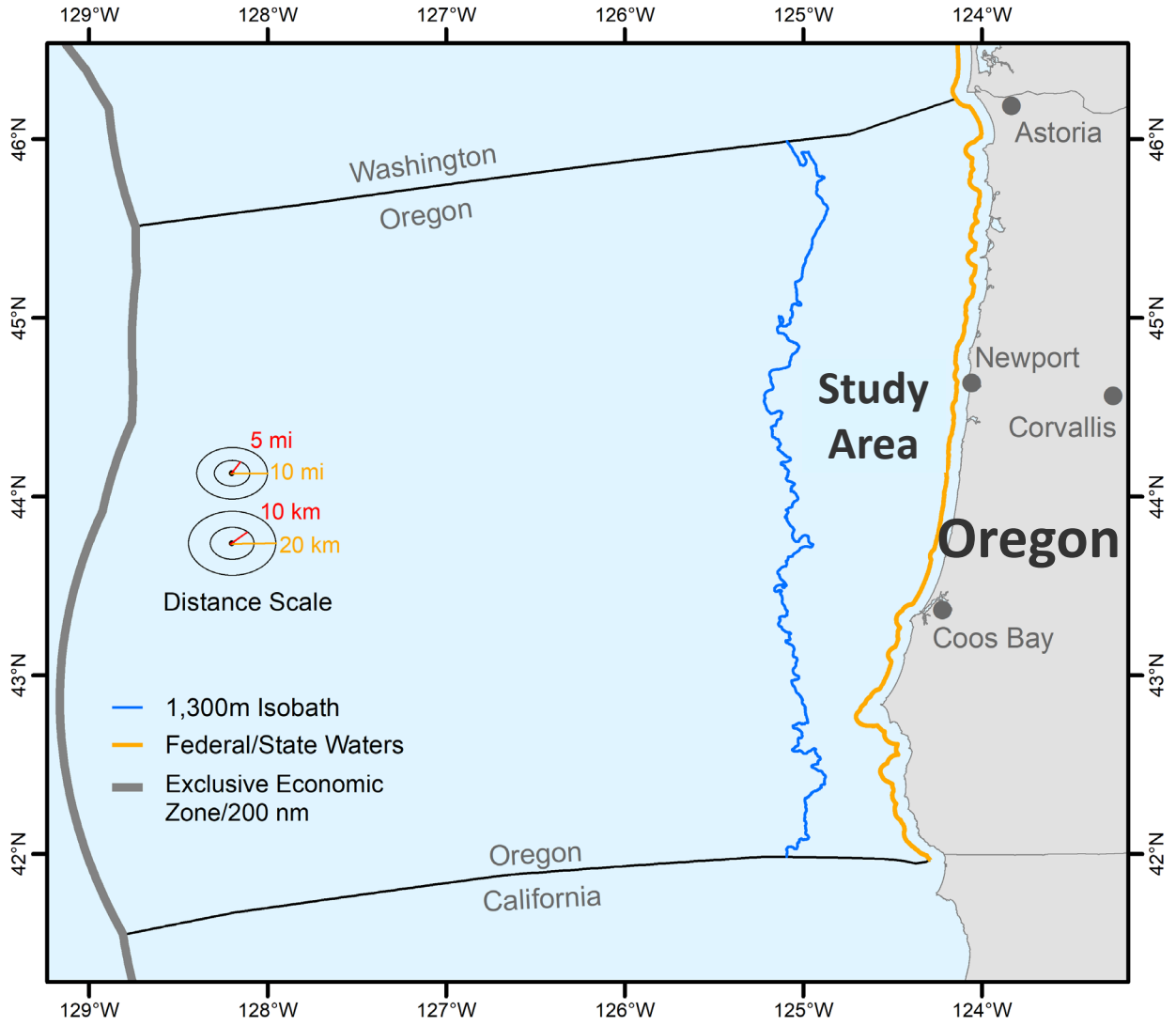
Crew Access & Maintenance

Moorage for crew access vessels. O&M berth for major repairs of full system.

Physical Site Characteristics

Oregon Study Area

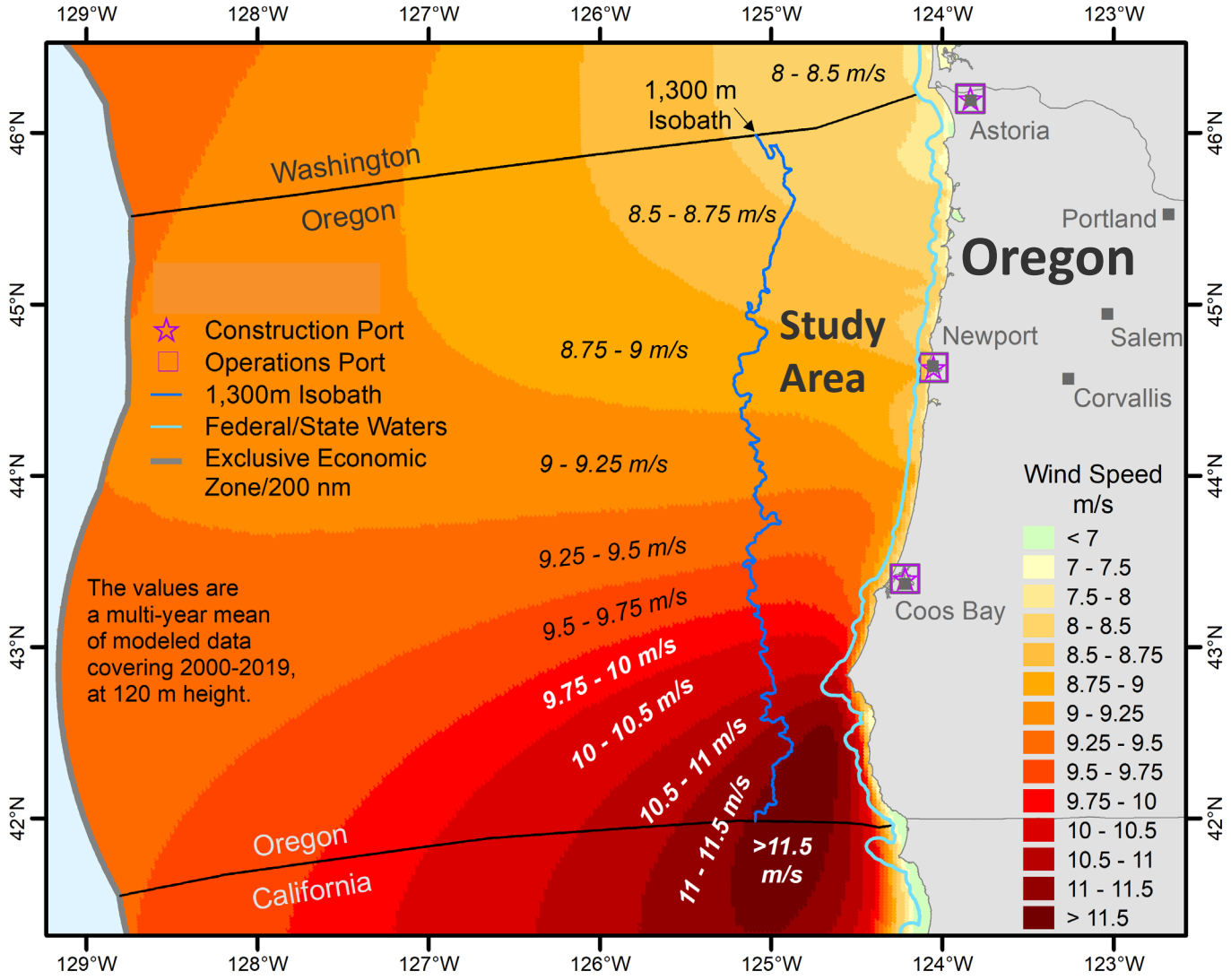
- Study area is bounded by:
  - A 1,300-m isobath to the west, based on present technology limits
  - Washington and California state borders to the north and south
  - 3 nautical miles (nm) federal/state water boundary to the east.
- All ocean space has at least a 7-m/s annual average wind speed.
- No additional areas were excluded (e.g., for conflicting use or environmental reasons).
- Note: the study is not intended to address marine spatial planning or stakeholder concerns; those will be part of a later public review.



This map shows the study area used. Map created by *NREL*

New Oregon Offshore Wind Resource Dataset

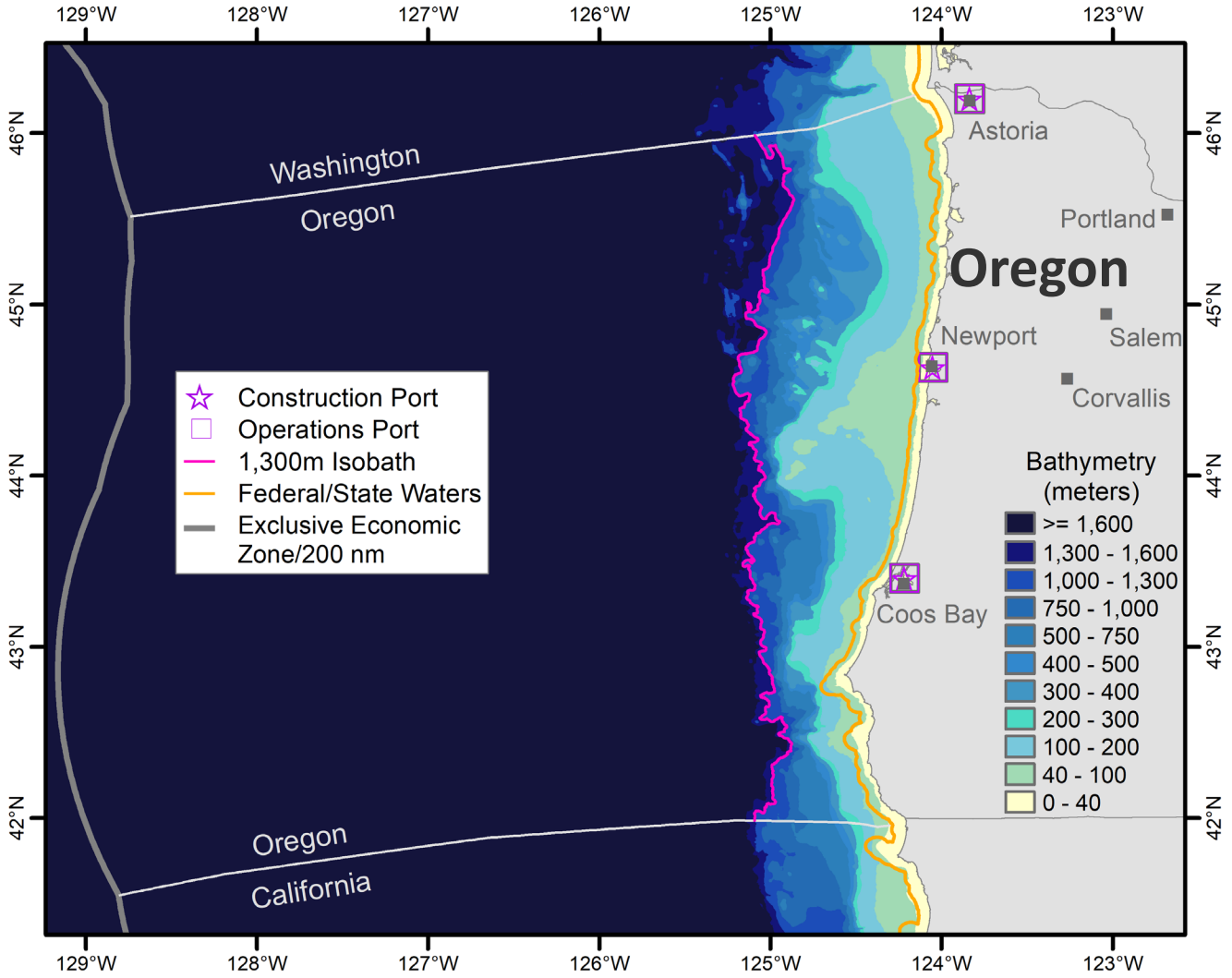
- New OR-WA20 offshore wind dataset produced a 120-m wind resource map (see figure) using 20 years of data.
- This is the best assessment of offshore wind resources in the Pacific Northwest to date.
- The study indicates higher wind speeds than the earlier WIND Toolkit in most regions (by up to 1.8 m/s; see figure).
- The data shows a strong north/south gradient (8 m/s to 11 m/s), with the best wind resources being in the south.



Wind Resource Offshore Oregon – source NREL

Bathymetry Offshore Oregon

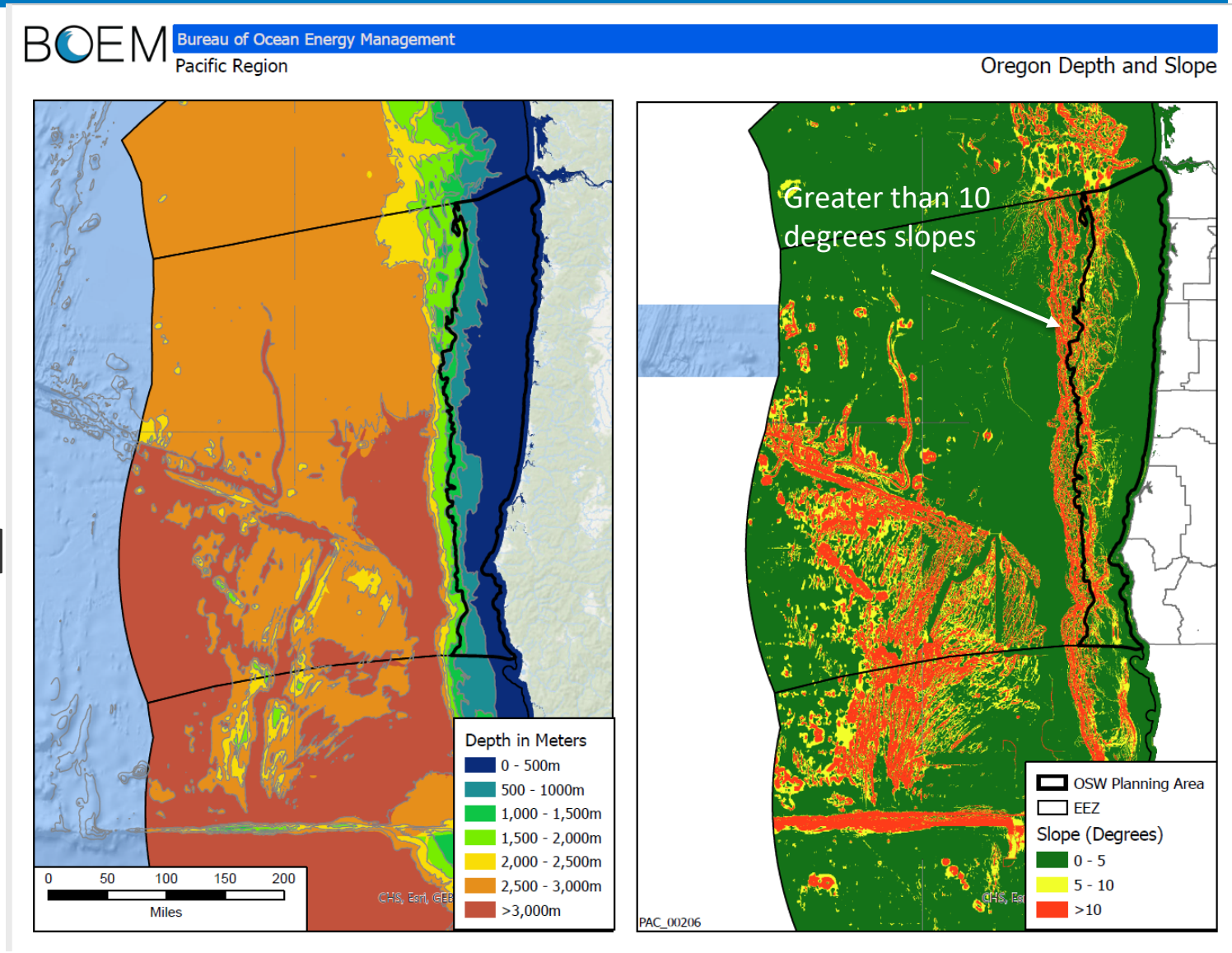
- 97% of the waters on the OCS off the state of Oregon are greater than 60 m in depth, indicating a need for floating wind turbine foundations.
- Most of the technical resource area is less than 30 miles from the shore due to steep slopes on the OCS near the 1300-m isobath.



Bathymetry Offshore Oregon – source NREL

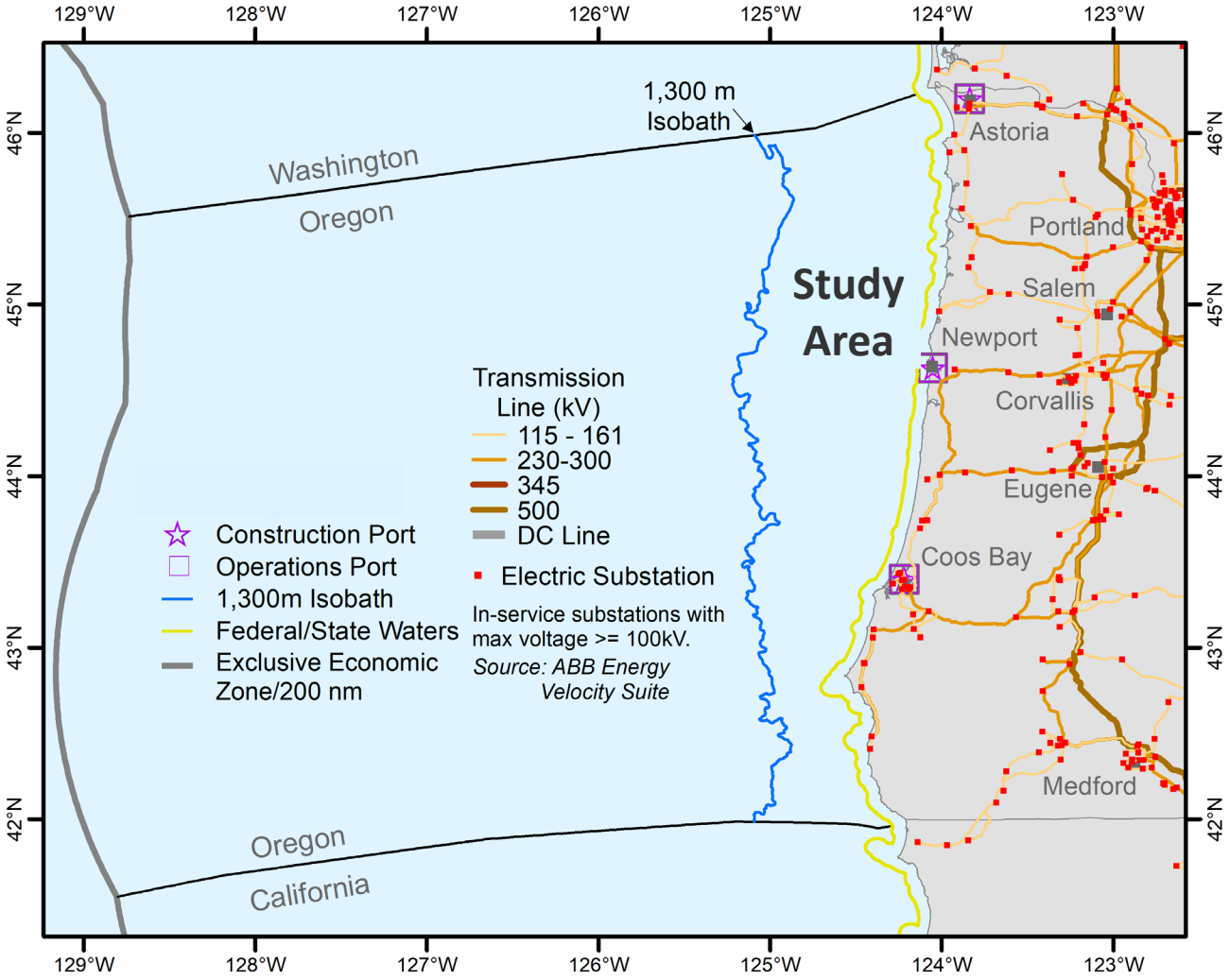
Water Depth and Bottom Slope Steepness Considerations

- Deeper waters beyond the 1300-m study area cut off yield very little additional resource area.
- Steeper slopes are found between the 1000-m and 2000-m isobaths that would make offshore wind development difficult.



Coastal Oregon Electrical Infrastructure

- Almost all power generation in Oregon is currently inland.
- Electric power flows from the east to the west to serve the coastal communities.
- Offshore wind would reverse the direction of power flow and reduce impacts on inland grids.
- NREL OR grid study (Novacheck and Schwartz. 2021) assessed potential impacts of offshore wind to the Oregon power grid.



Electric Infrastructure in Oregon Relative to Study Site – source NREL

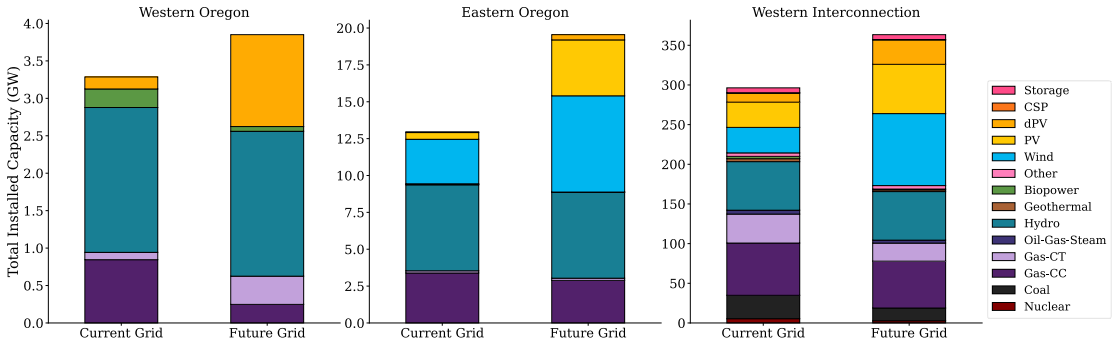
NREL Oregon Grid Study Objective

Investigate the robustness in Oregon OSW's value and grid operations impact across a range of scenarios using a detailed production cost model of the Western Interconnection.

Five scenario dimensions

1. **Offshore wind penetration**: Base (0-GW), Mid (2.6-GW), or High (5-GW)
2. **Western Electricity Coordinating Council (WECC) infrastructure year**: Current grid (21% Wind/Solar), or future system (46% Wind/Solar).
3. **Trans-coastal transmission expansion**: no expansion, or expansion along trans-coastal corridors to avoid congestion with 5 GW of offshore wind.
4. **Co-located energy storage**: no storage, or co-located storage at the onshore point of interconnection.
5. **Historical year:** 7 historical weather years (2007-2013) for three select scenario combinations.

Installed Generation Capacity by Type for both Infrastructure Scenarios



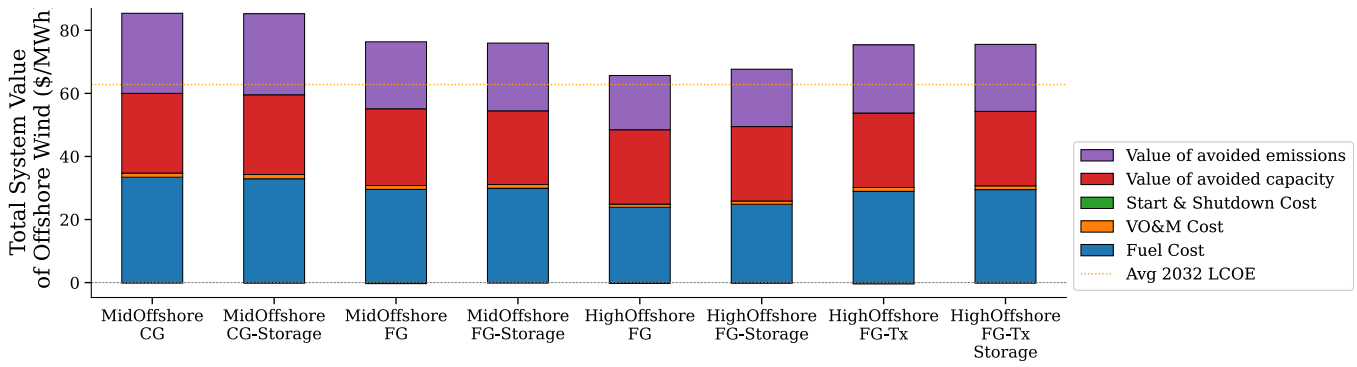
Offshore Wind Capacity in the Mid Scenario

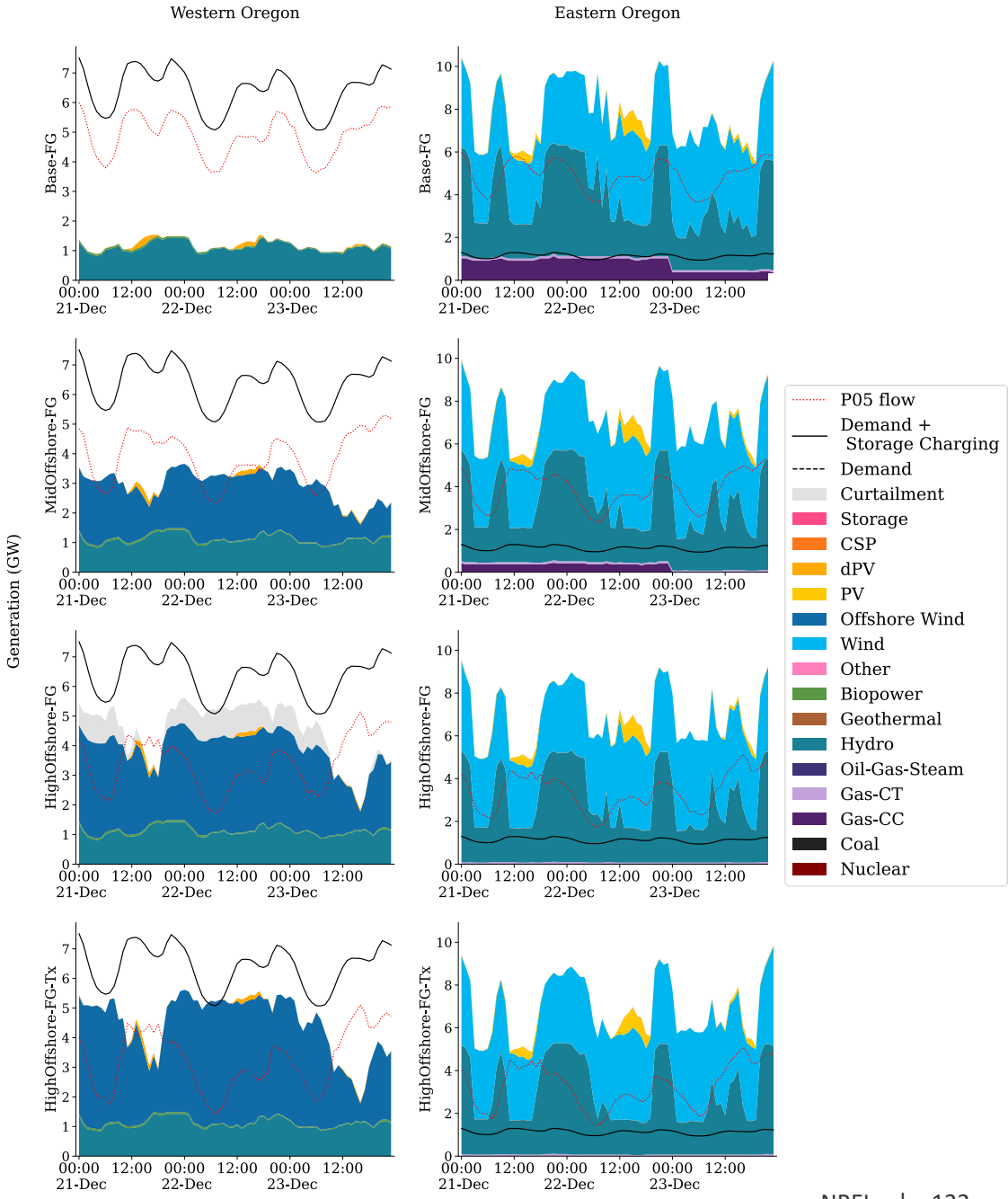
Offshore Wind Point of Interconnection	Max Nameplate Capacity (MW)	Max Injected power* (MW)
Clatsop (1-North)	361	301
Tillamook (2-North Central)	553	461
Toledo (3-Central)	156	130
Wendson (4-South Central)	613	512
Fairview (5-South)	941	785
Total	**2625**	**2189**

*Due to internal loses, max injected power is 83.4% of nameplate

Key Grid Study Findings

1. Existing system can support up to 2.6 GW of Offshore Wind (OSW).
2. Trans-coastal transmission congestion is the main driver of Offshore Wind curtailment.
3. The system value of OSW ranges between $65/MWh - $85/MWh.
4. East/West cross-Cascade power flow reduces 500-550 MW for every 1000 MW of OSW output but does not eliminate high flow periods.
5. OSW can serve over 84% of hourly coastal Oregon loads.
6. OSW allows for more optimal hydropower dispatch, while hydro availability (i.e., wet vs dry year) has little impact on OSW system value.
7. OSW increases contributes to serving evening net load peak in California (i.e., duck curve), but further contribution limited by congestion.
8. Co-located storage could be a “non-wires” alternative to increase OSW capacity beyond 2.6 GW.





Oregon Offshore Wind Levelized Cost of Energy: Heat Map Analysis

Oregon Offshore Wind Capital Expenditures

- CapEx heat maps show strong dependence on distance from shore but little north-south variations.
- CapEx values drop below $3,000/KW in many areas by 2032.

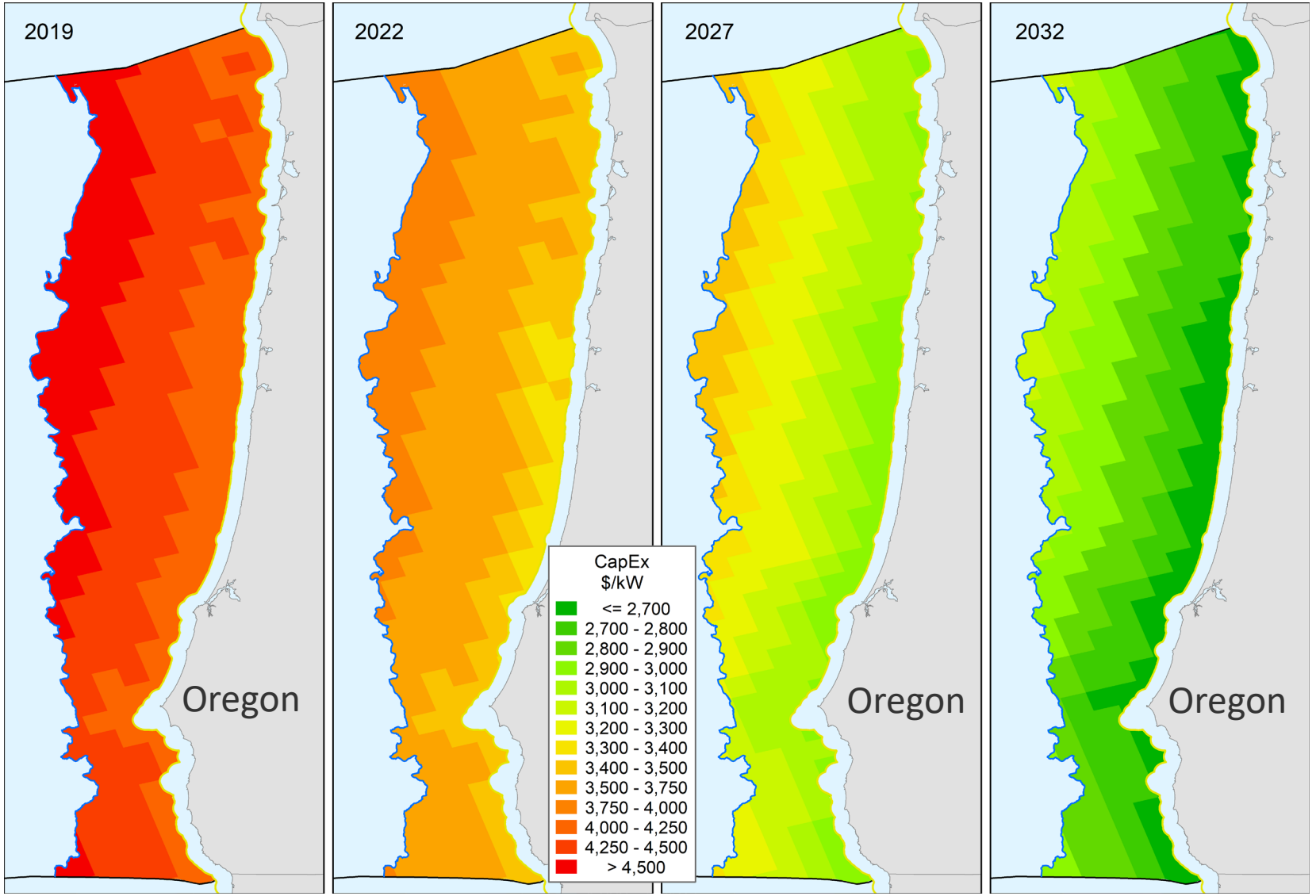


Image source NREL

Oregon Offshore Wind Operating Expenditures

- Operating expenditures (OpEx) heat maps show strong dependence on distance from shore but little north-south variations.
- OpEx costs will drop below $55/kW/year by 2032 in many regions.

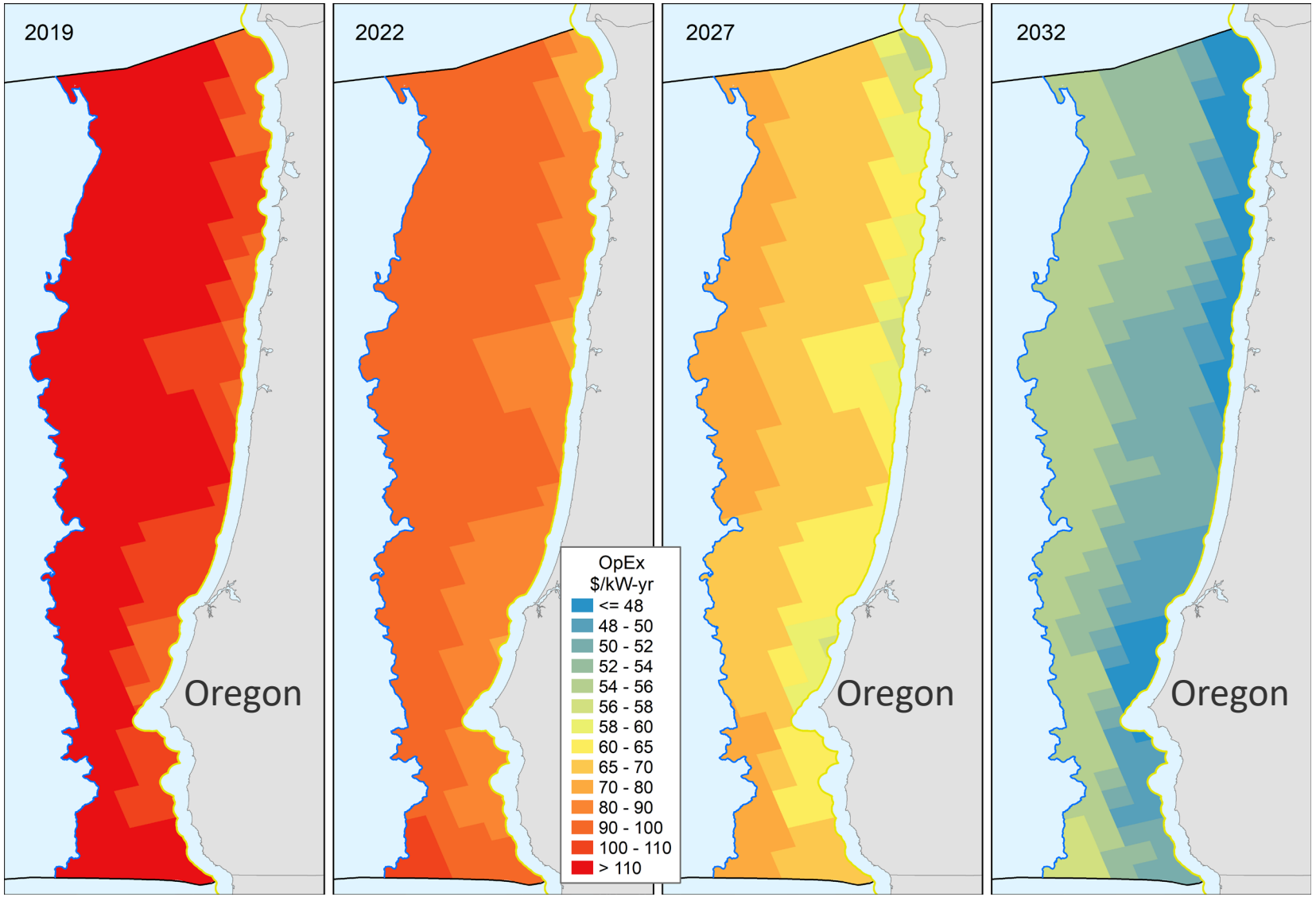


Image source NREL

Oregon Offshore Wind Net Capacity Factor

- Net capacity factor (NCF) heat maps show strong north-south variations, which are mostly due to wind resources.
- NCF values are expected to range between 39% (in the north) and 57% (in the south) by 2032.

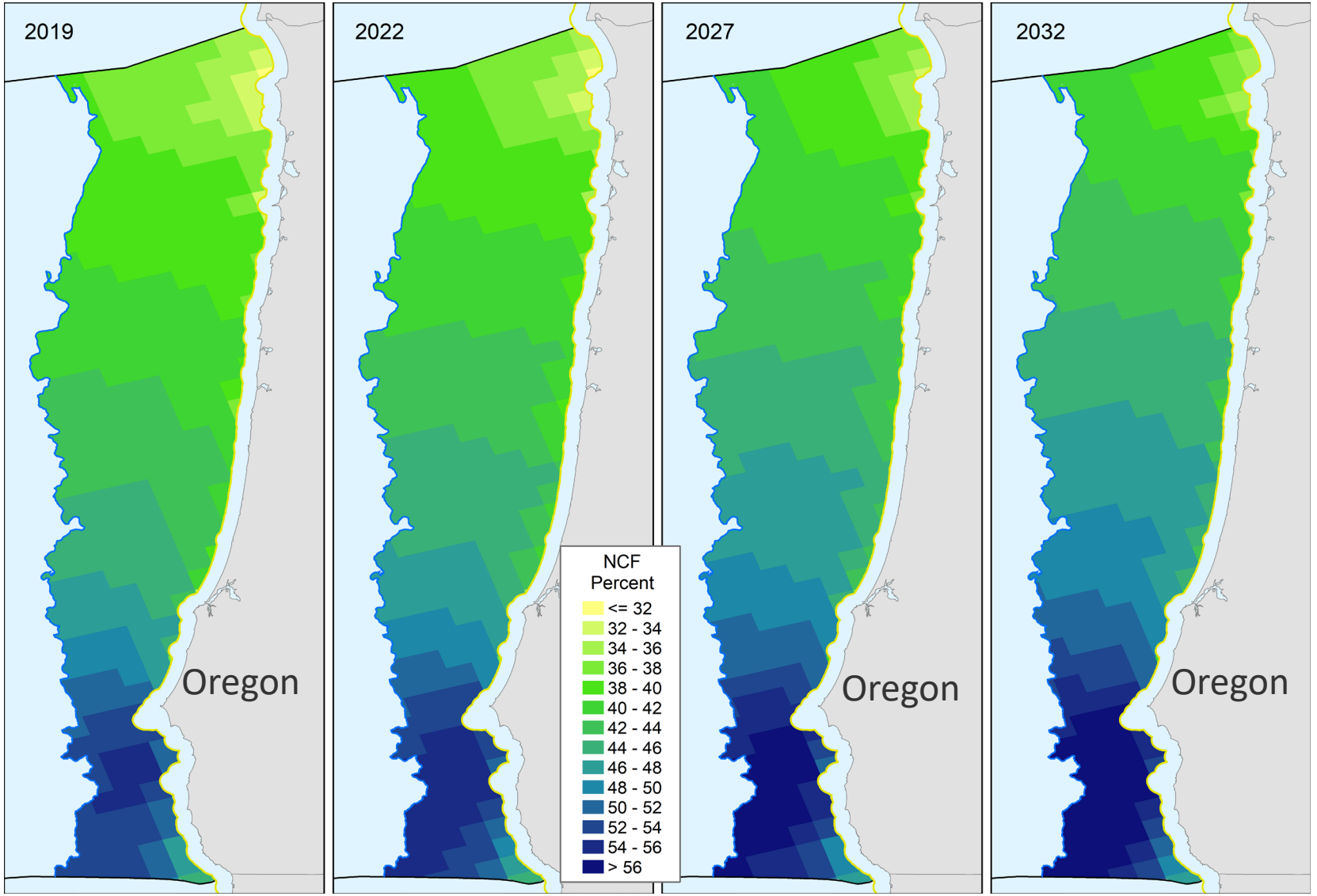


Image source NREL

Oregon Offshore Wind – Levelized Cost of Energy

- LCOE heat maps show strong north-south variations and dependence on distance from shore.
- LCOE geographic variations are mostly due to wind speed.
- By 2032, LCOE is expected to range between $75/MWh in the north to as low as $50/MWh in the south.

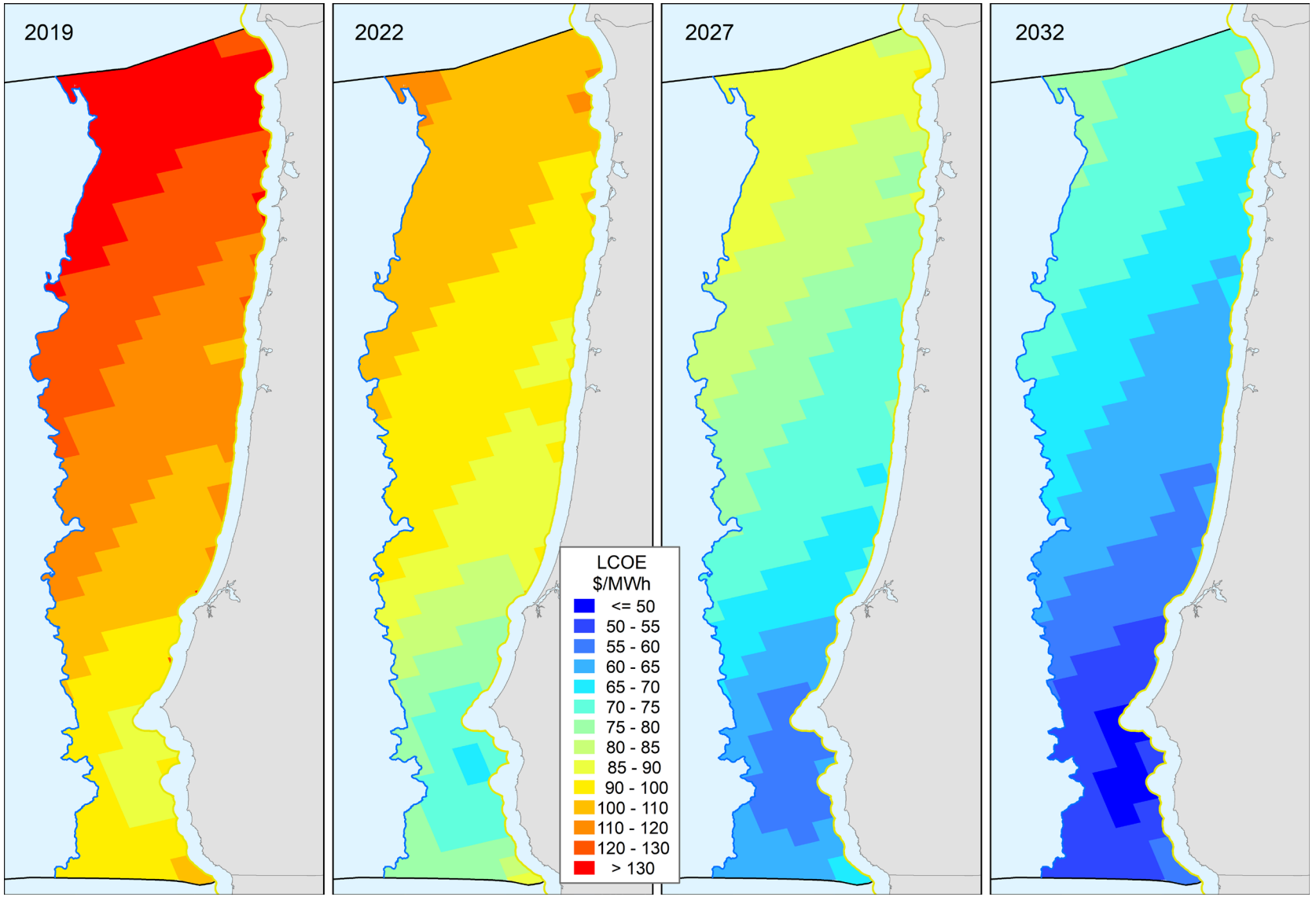


Image source: NREL

Possible Economic Benefits of Offshore Wind Energy in Oregon

- The development of offshore wind energy in Oregon would create a new, industrial economy comprising new ports and infrastructure for project construction, manufacturing, turbine assembly, and services.
- The electric grid study found that 2,600 MW (Mid scenario) of offshore wind power could be installed without the need for major grid upgrades (Novacheck and Schwarz. 2021).
- 2,600 MW of offshore wind power would require revenues of $8–$10 billion, much of which would flow through the state's economy.
- 2,600 MW of offshore wind energy would generate enough electricity to power over 1 million Oregon homes, significantly reducing the state's carbon footprint.

Key Takeaways

- Floating wind is needed for offshore wind in Oregon, and global industry is expected to enter a commercial phase by 2024.
- OR Grid study (Novacheck et al. 2021) identified significant possible benefits for the OR transmission infrastructure and indicated “no-wires” alternatives were possible from offshore wind in Oregon.
- The cost study indicated that LCOE for floating offshore wind in Oregon could range from $75/MWh in the north to $50/MWh in the south.
- A marshalling port to serve offshore wind deployment and service the wind farms would likely be needed.
- Significant economic benefits may be available with Oregon offshore wind energy.

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Carpe Ventum!

Thank you

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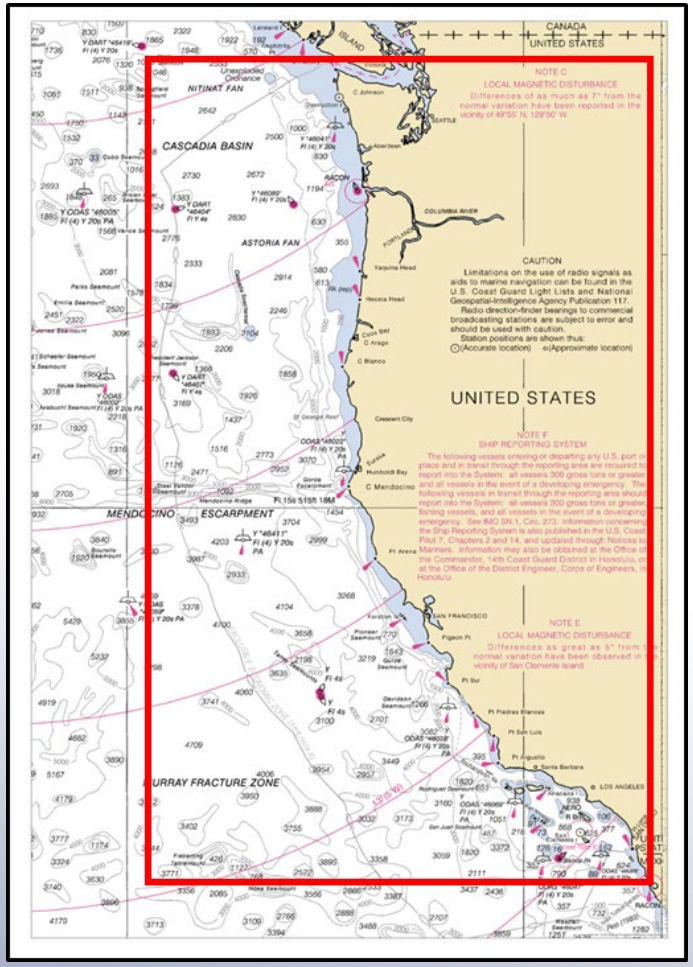
State/Federal Studies

John Moriarty, U.S. Coast Guard
Jason Sierman, ODOE
Dave Pereksta, BOEM
Dave Ball, BOEM

PACIFIC COAST PORT ACCESS ROUTE STUDY (PAC-PARS)

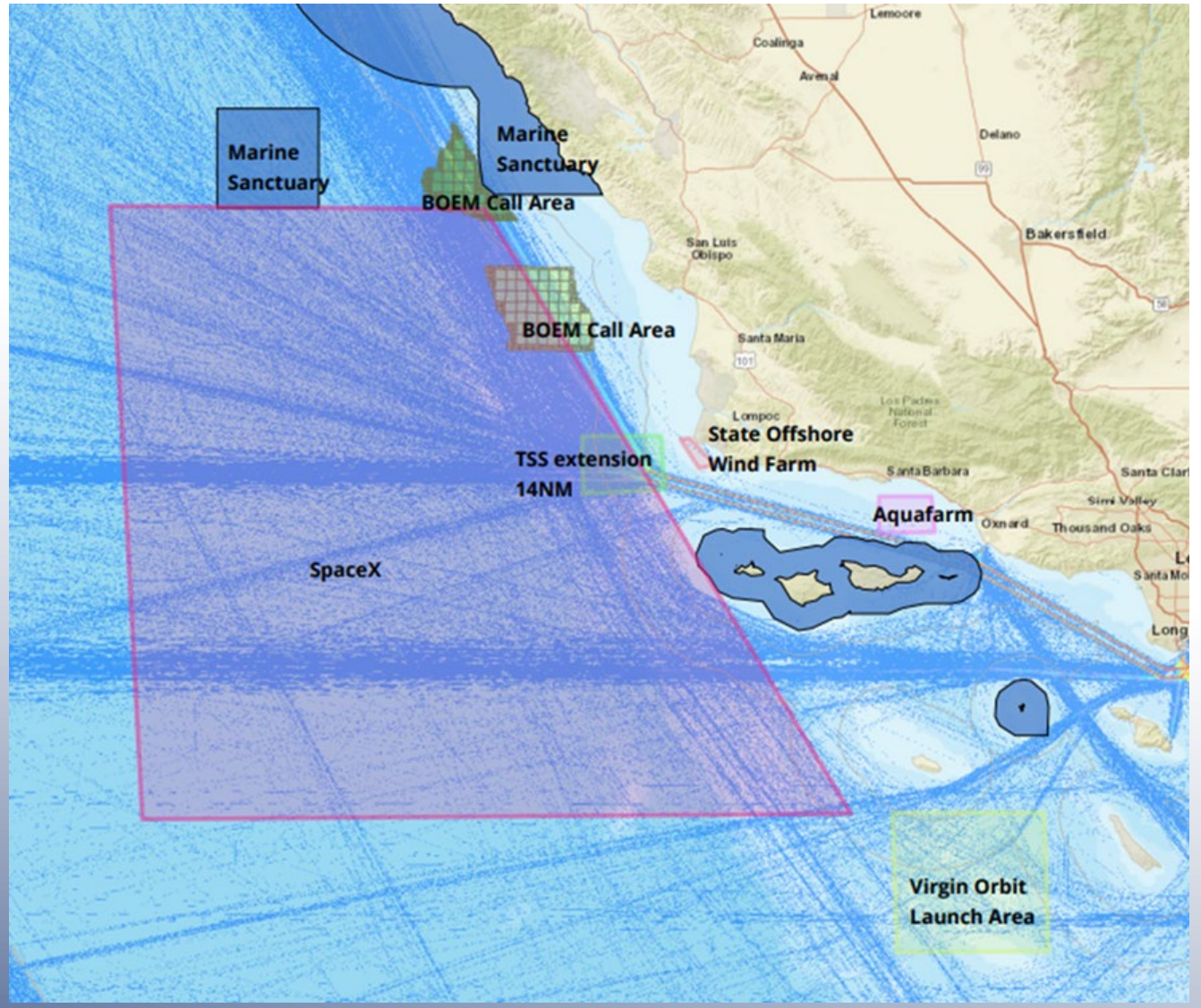
What is the Pacific Coast Port Access Route Study?

- Port and Waterways Safety Act (PWSA)
  - P.L. 95-474; 33 U.S.C. 1223
- Requirements:
  - Required before establishing new or adjusting existing FAIRWAYS and/or TRAFFIC SEPARATION SCHEMES.
  - Coordinate with stakeholders for safe routes.
- Coast Guard Responsibility
  - Federal Regulations manage routes with:
    - Fairways
    - Traffic Separation Schemes
    - Channels
    - Aids to Navigation
  - Navigation Safety Risk Assessment



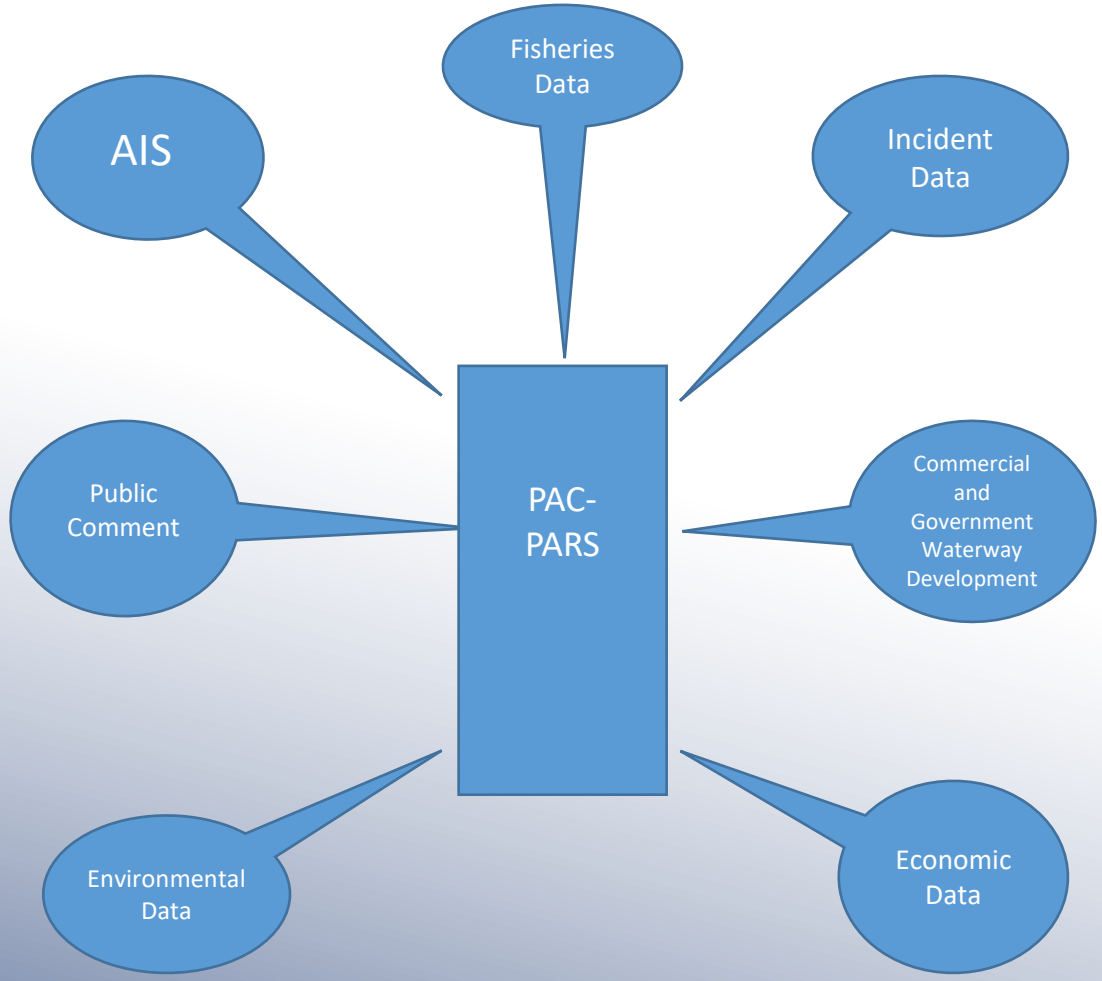
What is prompting the PAC-PARS study?

- NOAA proposed Area to be Avoided expansion around Channel Island.
- BOEM Call Areas
- Proposed Chumash Heritage National Marine Sanctuary
- New development of offshore infrastructure like:
  - Offshore Renewable Energy Platforms
  - Aquafarms
  - Commercial & Government Space Activities
  - Increased shipping
  - Military Exercises
  - Military Tests



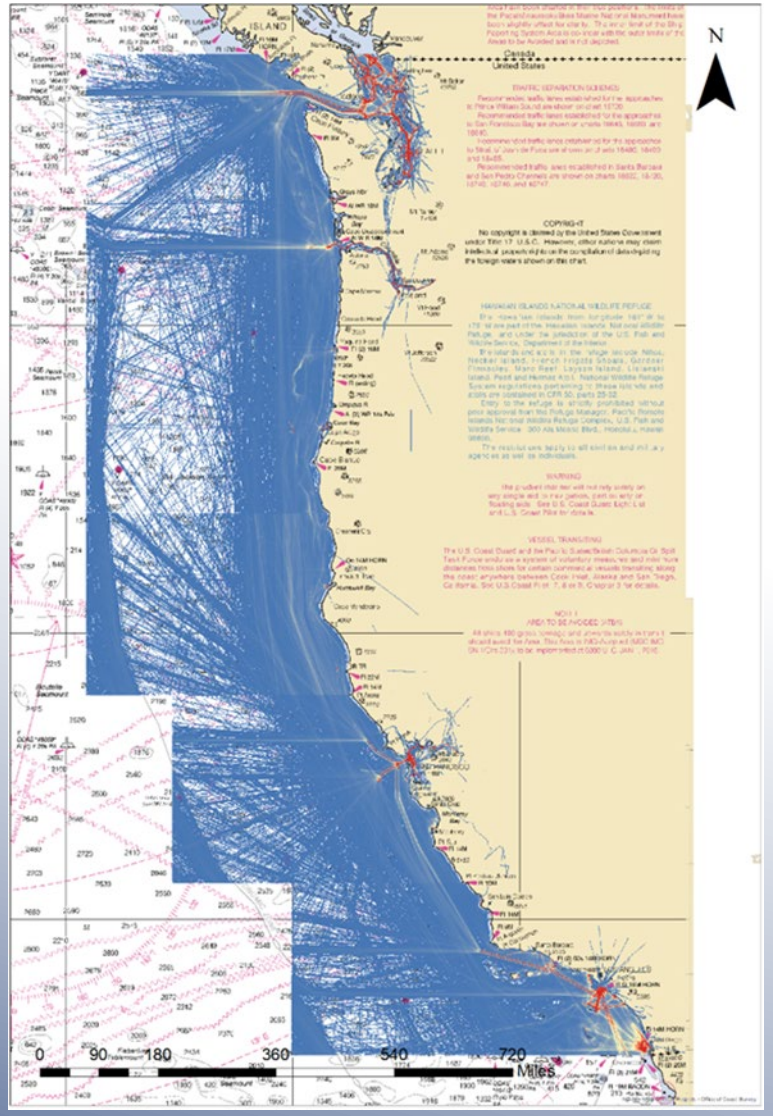
Phase 1 – Data Gathering

- Determine Shipping Routes Based on AIS
  - Data will be used to produce density plots by vessel type.
- Stakeholder & Public Outreach
  - Local, regional, national, and international port stakeholders are encouraged to comment.
  - Open communications with towing vessel industry and fisheries through public forums and federal register comments.
- Gather Marine Transportation System Data
  - Dive into the economic benefits of coastal industries.
- Planning Guidelines & Recommendations
  - Previous studies were reviewed for past comments and recommendations.



Phase 2 – Applying Suitability Criteria

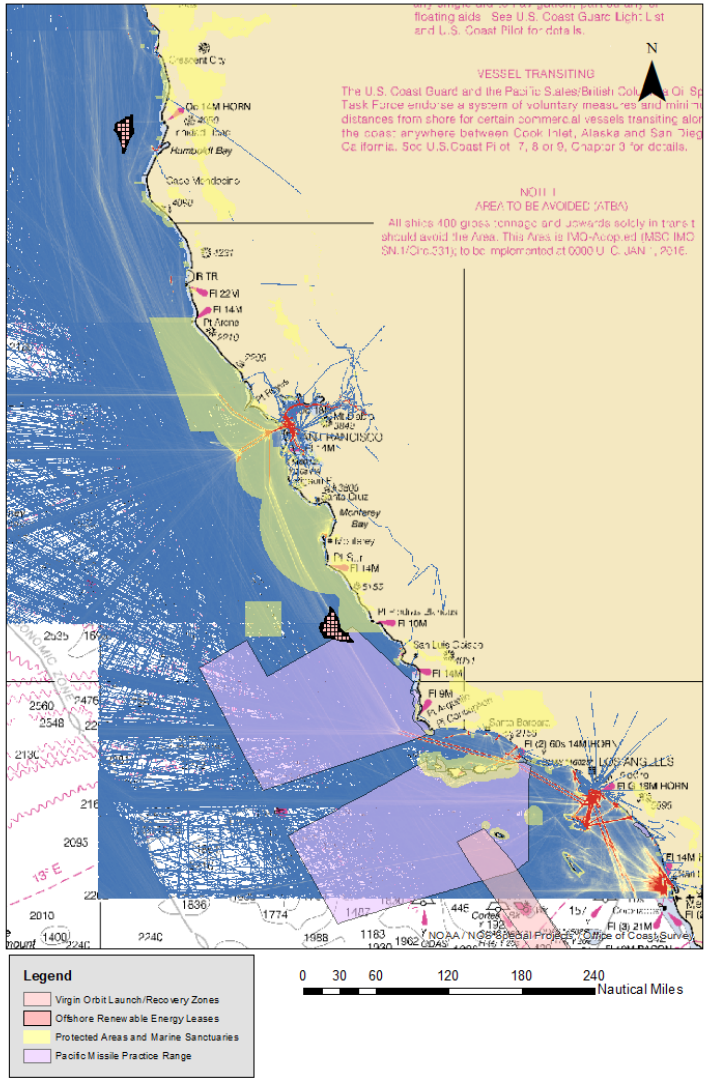
- Analyze the AIS data to determine existing shipping routes.
- The Red-Yellow-Green methodology:
  - To determine where there are high, medium, or low conflict areas of the study area.
  - Apply risk criteria to the area, and again to any proposed changes.
  - Assess if mitigating measures can be implemented to decrease risk.

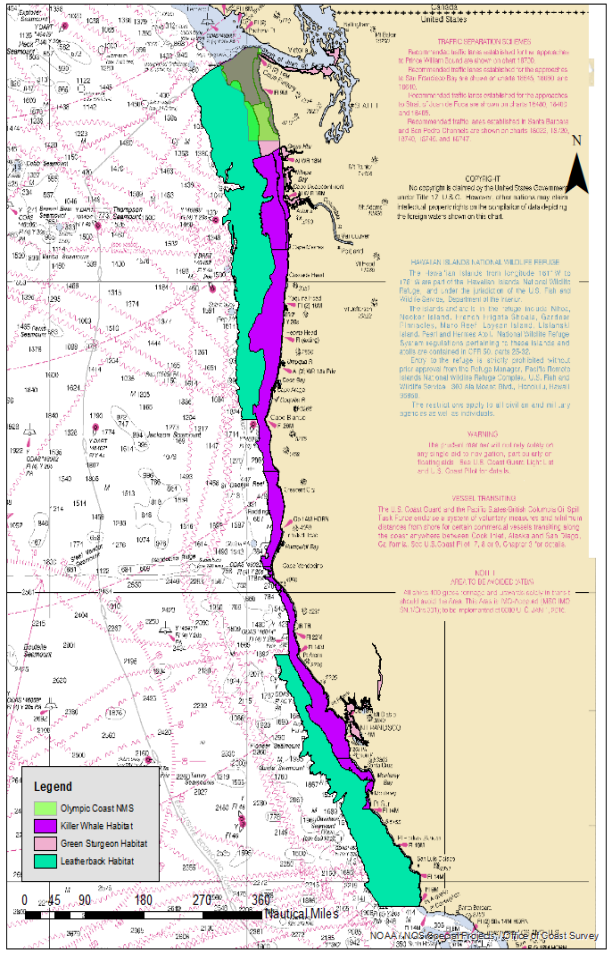


U.S. Coast Guard
Eleventh District

Phase 3 – Modeling & Analysis

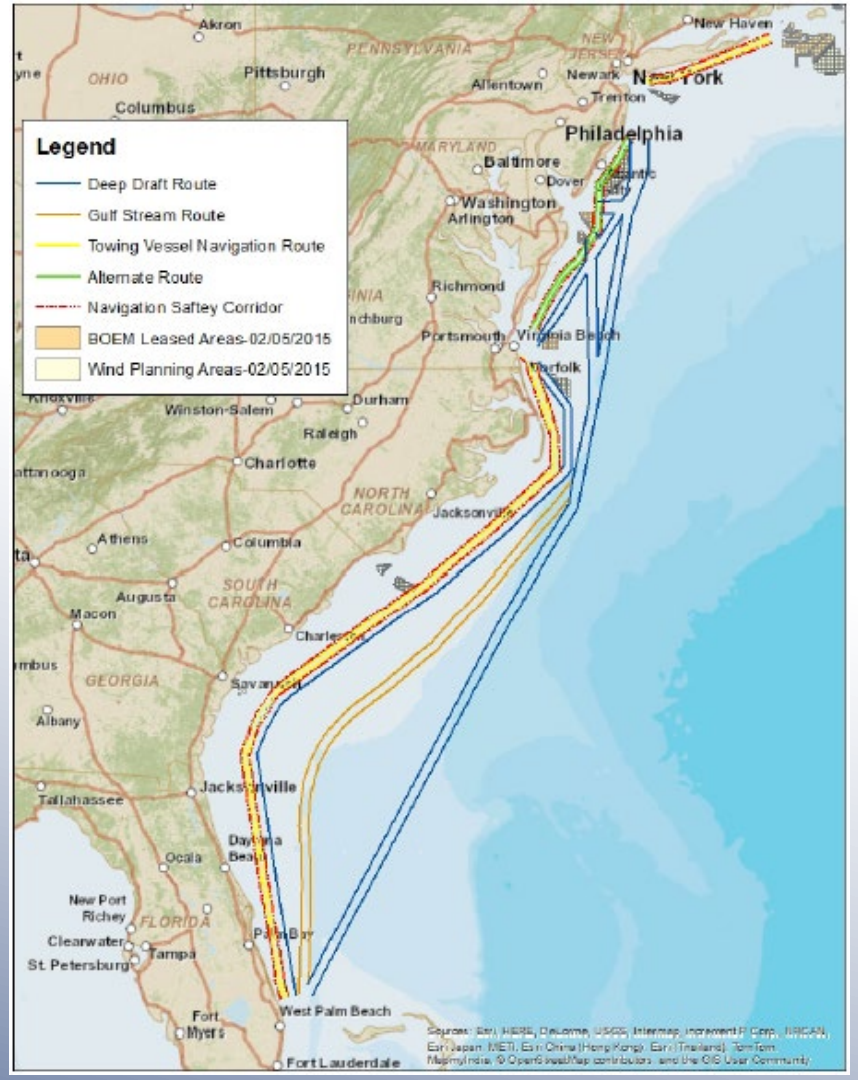
- Develop a GIS model to show all current and future developments and traffic data.
- Evaluate options if new routing measures are necessary.
- Identify navigation safety corridors from recommended routes and traffic data.
  - Develop recommendations from the model.





Phase 4 – Implementing Study Results

- Any recommendations or proposed mitigating measures will be published in the final study.
- The image to the right are the recommended routes determined by the Atlantic Coast PARS.



Questions?

- Flyers for info and access will be distributed.
- A shared mailbox was created for the study:
  - PACPARS@USCG.MIL
- Docket “USCG-2021-0345”

Oregon's Renewable Energy Siting Assessment (ORESA)

Jason Sierman
Sr. Energy Policy Analyst

October 21, 2021

OREGON DEPARTMENT OF ENERGY

ORESA Topics

- **Background**
- **Goals & Objectives**
- **Project Timeline & Its 5 Components**
- **Snapshots of the 5 Components**
- **Ways to Stay Informed**

ORESA: Background

- $1.1 million grant through U.S. Department of Defense - Office of Local Defense Community Cooperation (DOD-OLDCC).

- Grant team consists of:
  - **Oregon Department of Energy**
  - **Oregon Department of Land Conservation & Development**
  - **Oregon State University's Institute for Natural Resources**

- Project also incorporated expertise and input from:
  - **state, local, and tribal governments;**
  - **industry and technical advisors;** and
  - **cross-sectoral stakeholder and community engagement**.

ORESA: Goals and Objectives

DOD Goals

Support **military compatibility** by **raising awareness** about the importance of **early coordination** with the military and other local, state, and regional governmental agencies.

Project Goals

Create **relevant educational tools** to help **minimize conflict and support development opportunities** by informing stakeholders, agencies, local governments, and policy makers about:

- renewable energy development,
- military training and operational areas,
- economic/community benefits,
- land use considerations, such as - natural, cultural, and environmental resources,
- and other regulatory requirements.

Project Objectives

Baseline data, information, and perspectives to create **a transparent, consistent collection of trusted, accurate information** in Oregon, without recommendations or endorsements, and note where information may be imprecise or uncertain.
Project Closes March 2022.

ORESA: 5 Components

Renewable Energy Market & Industry Assessment
(ODOE / E3)

- Model future opportunity for renewables
- Perspectives of challenges and opportunities RE development community
- **COMPLETED**

Natural Resources, Environment, & Development: Opportunities & Constraints Assessment
(DLCD / CBI)

- Gather information on natural, cultural, & env. resources
- Identify opportunities and constraints for RE development
- **COMPLETED**

Mapping & Reporting Tool
(INR)

- Develop interactive mapping and reporting tool
- Engage with stakeholders to inform and test functionality and reporting features
- **Status: Convening Focus Groups Meetings; Beta process in winter**

1 2 3 4 5 =

Military Needs & Interests Assessment
(ODOE / DLCD / ESS)

- Assess interaction of current and future military activity and RE development
- **COMPLETED**

Siting Procedures Review
(ODOE / DLCD)

- Review and analysis of siting regulations, permitting, and project review processes
- **FINAL REPORT DRAFTING**

Project Deliverables

ORESA Report
&
ORESA Mapping & Reporting Tool

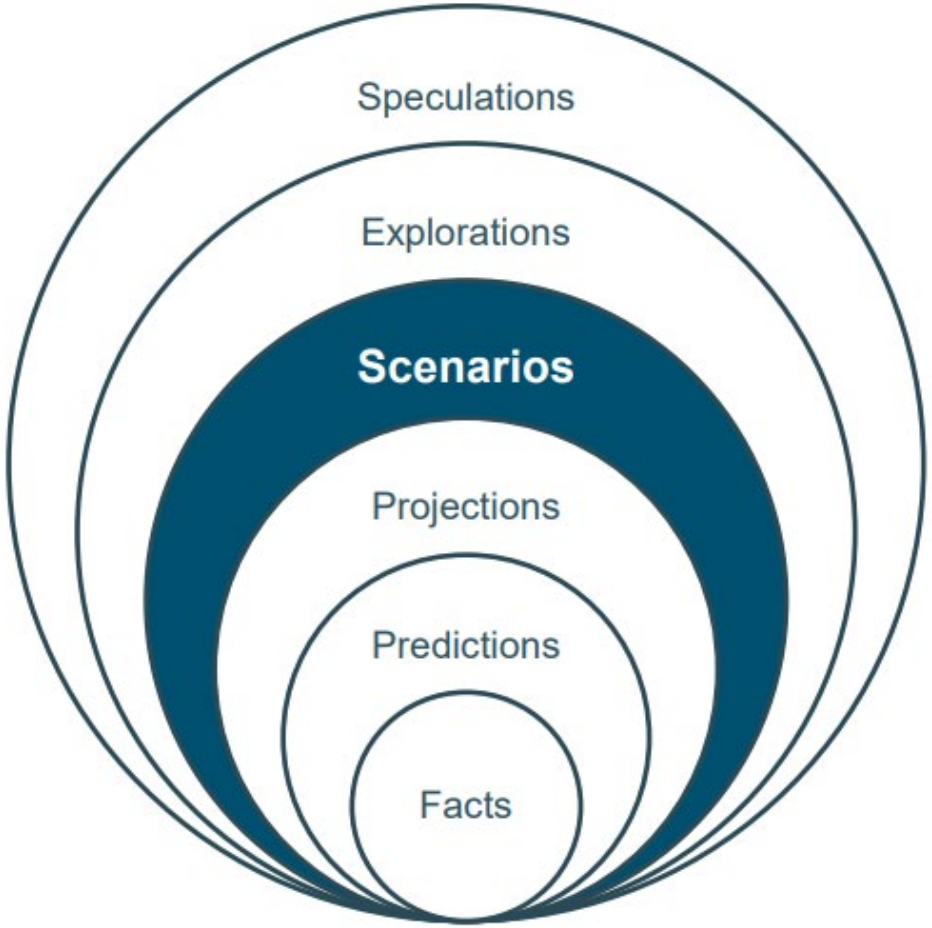
Spring 2022

1

Renewable Energy Market & Industry Assessment

+ This study uses scenario analysis to identify and analyze plausible outcomes for renewable development within the state of Oregon over the next fifteen years

+ Goal of scenario analysis is not to predict an outcome—but to highlight key drivers of and differences between scenarios to inform future decision making

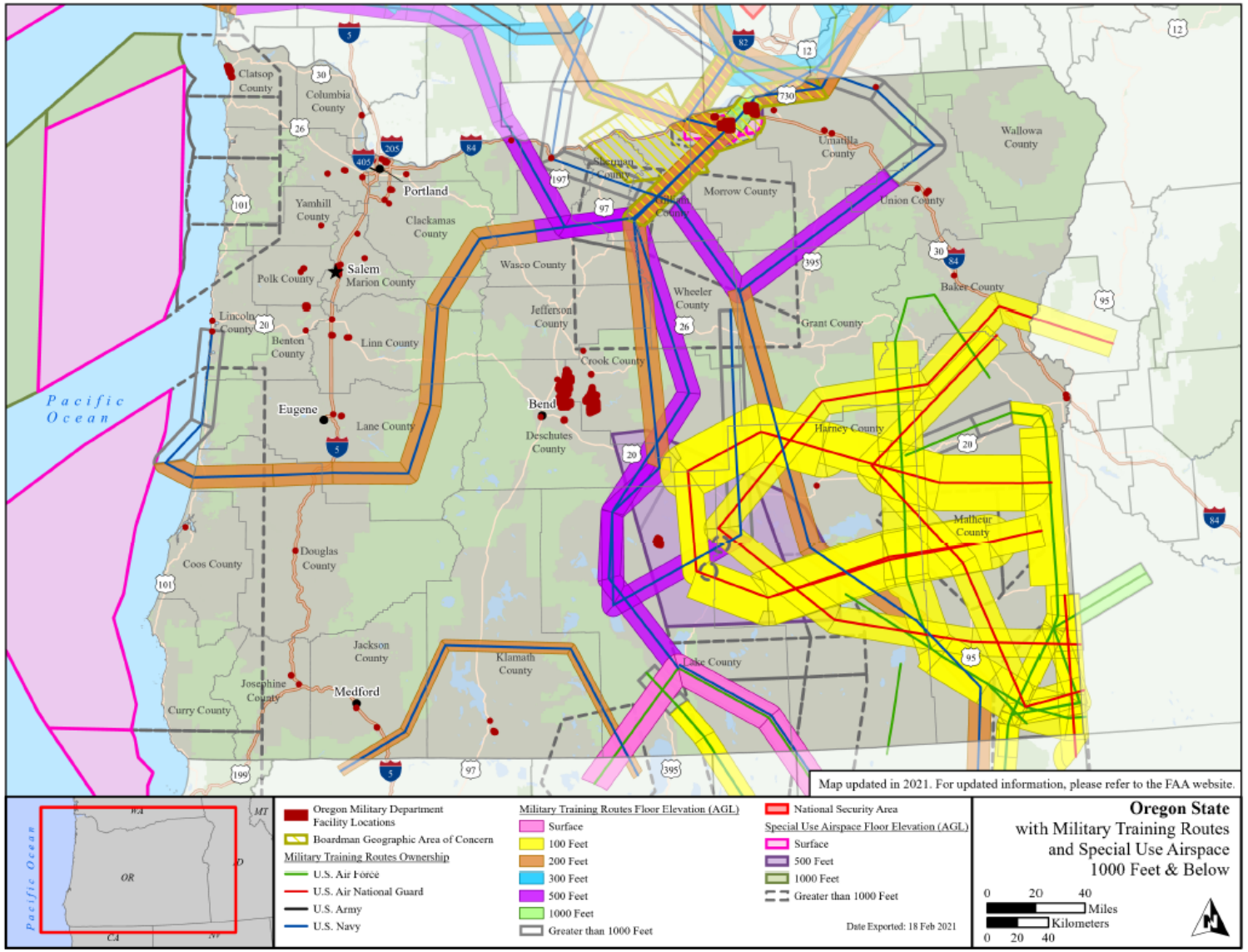


STATUS

- E3 webinar recordings available on ORESA website
- Final report completed, ORESA synthesizing findings

2

Military Needs & Interests Assessment



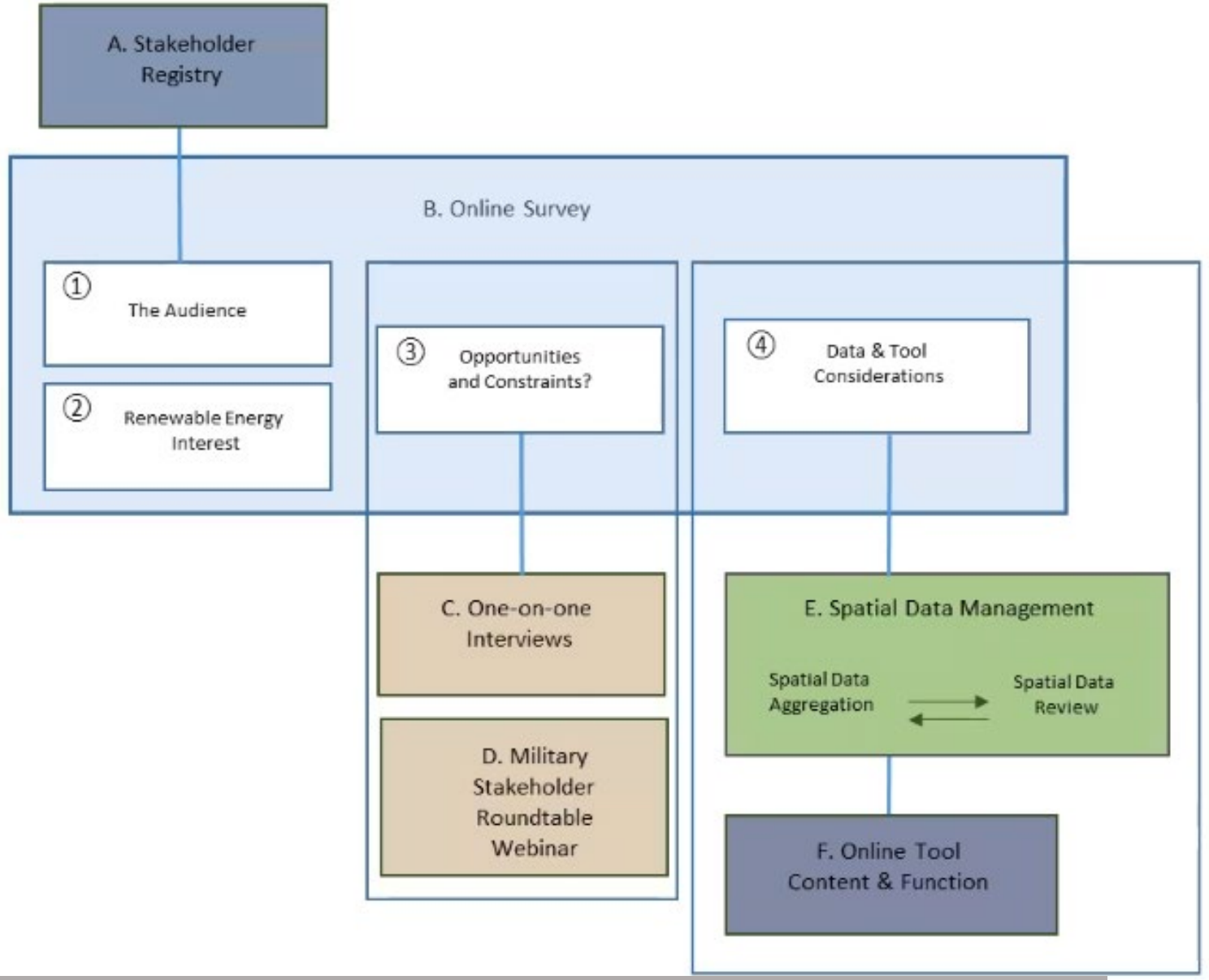
STATUS

- ESS research and feedback from Military entities complete
- Final report completed, ORESA synthesizing findings

3

Natural Resources, Environment, and Development:

Opportunities & Constraints

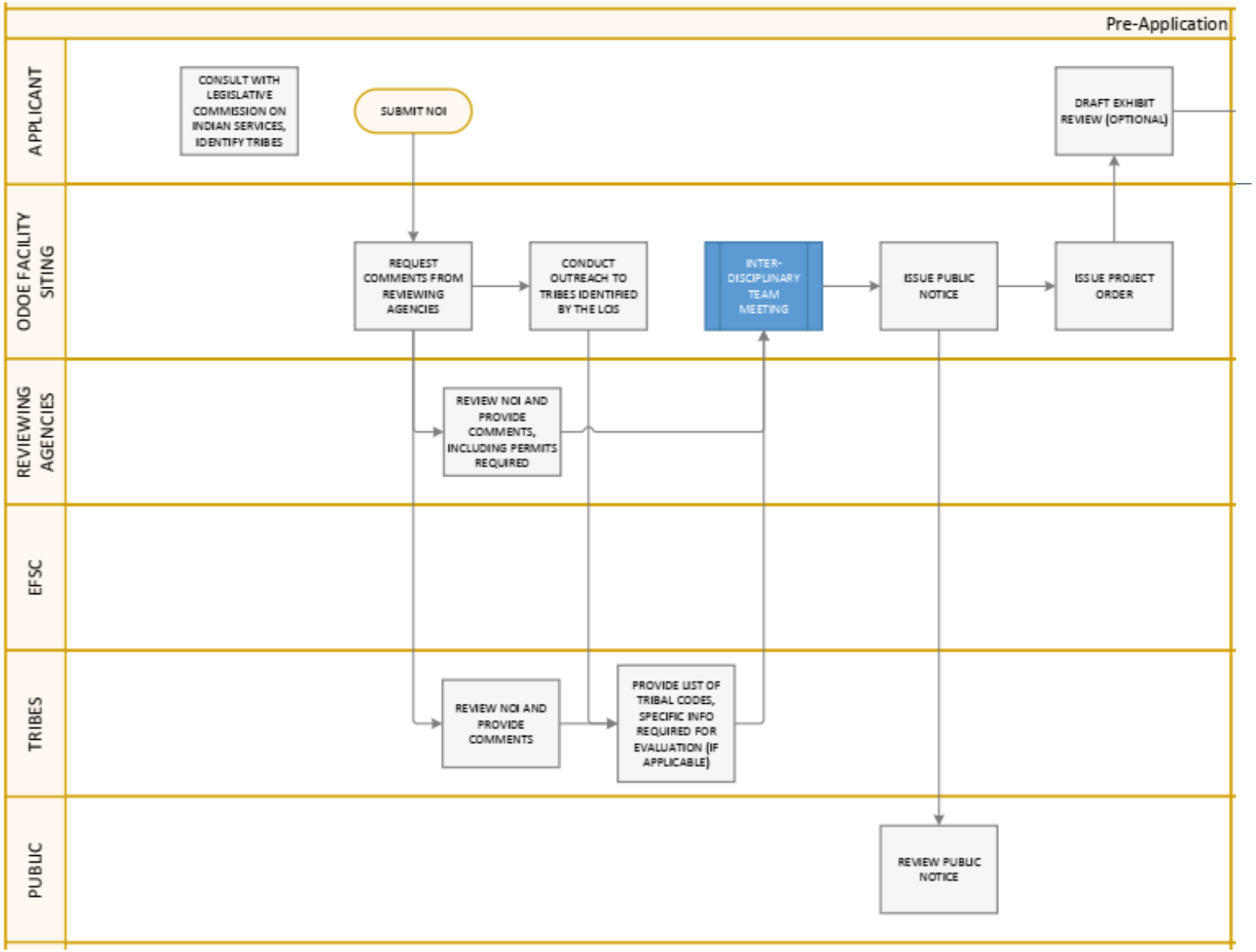


STATUS

- CBI hosted webinar series and recordings available online
- Final report completed, ORESA synthesizing findings

4

Siting Procedures Review



STATUS

- Research and external feedback received for accuracy check
- Final report in final edits and prep for publication

5

Mapping and Reporting Tool

[2-pager Summary of mapping and reporting tool]

Oregon Renewable Energy Siting Assessment
ORESA Mapping and Reporting Tool


Photo by Sam Churchill, CC BY 2.0

Primary users of the tool include renewable energy developers, land use authorities, planners and policy makers at all levels (local, state, tribal and federal)

ORESA Tool Objectives

- Facilitate easy access to data and information to support new renewable energy developments in Oregon with consideration given to military training and operational area compatibilities, economic and community benefits, current land use policies and plans, cultural and environmental resource assets, and state and local regulatory requirements.
- Promote and establish a framework for early notification and ongoing coordination and communications on potential development projects with the Military and other agencies.
- Make accessible a transparent, consistent collection of trusted, accurate data and information, without recommendations or endorsements, and note where information may be imprecise or uncertain.

Potential Use Cases

A **developer** is looking for possible sites for renewable energy development in Oregon that will be economically viable and have a high likelihood of success for approval. The ability to quickly assess many data layers and receive a simple summary of the anticipated environmental, cultural and military considerations at the specified site(s) will assist their planning activities. If a developer decides to proceed with a specific site, the Tool will enable notification and coordination with the appropriate Military contacts, as well as contact information for other interested parties.

A **county planning department** receives an application for a large utility scale renewable energy facility filed under the provisions of ORS 215.446 (HB 2329). Access to the Tool assists the planners to lets them know with whom to communicate and coordinate and prepare a thorough staff report that better answer questions that might come from the planning commission or elected officials during the public hearing process.

Project Contacts and Information

ORESA Project Coordinator: Kaci Radcliffe, ODOE (kaci.radcliffe@oregon.gov)
Oregon Explorer Contacts: Janine Salwasser, INR (janine.salwasser@oregonstate.edu) or Myrica McCune, INR (myrica.mccune@oregonstate.edu)

Revised: April 13,2021

This map with military data layers is displayed for illustrative purposes only

The tool will be housed on the Oregon Explorer, and maintained by the Institute for Natural Resources (INR) and the Oregon State University Libraries & Press

ORESA Mapping & Reporting Tool Functionality

Users will be involved in the development of the ORESA tool. Anticipated functionality includes, but is not limited to:

- Ability to filter and query data layers, measure areas and distances, view metadata, download data, add external map services, upload local data, and create maps
- Identification of restricted areas as well as sites with additional considerations and trade-offs
- Inclusion of military contact information for notification and coordination in applicable locations
- Creation of a Renewable Energy Site Report for an area of interest with additional context and maps in pdf format

Tool Timeline

Fall 2019 Project Begins

Scoping, Cross Assessment Coordination, Stakeholder Engagement & Data Gathering

Spring 2021 Data Collection Complete

Tool Development & User Group Meetings

Summer 2021 Beta Tool Ready for Testing

Beta Testing with Users & Tool Improvements

Winter 2021 Tool Launch on the Oregon Explorer

www.oregonexplorer.info

Oregon Renewable Energy Siting Assessment (ORESA) Project Partners

Oregon Department of Energy · Oregon Department of Land Conservation & Development · Oregon State University Libraries and Press · Institute for Natural Resources · NAS Whidbey Island

Funded by a grant from the Department of Defense Office of Economic Adjustment (OEA)

STATUS

- INR coordinated data transfer across the three assessments and procedures report
- Convening focus and user groups to inform tool development and beta testing

Staying Informed on ORESA

Learn more about the ORESA project & external engagement:

https://www.oregon.gov/energy/energy-oregon/Pages/ORESA.aspx

Sign up for email updates on the ORESA project:

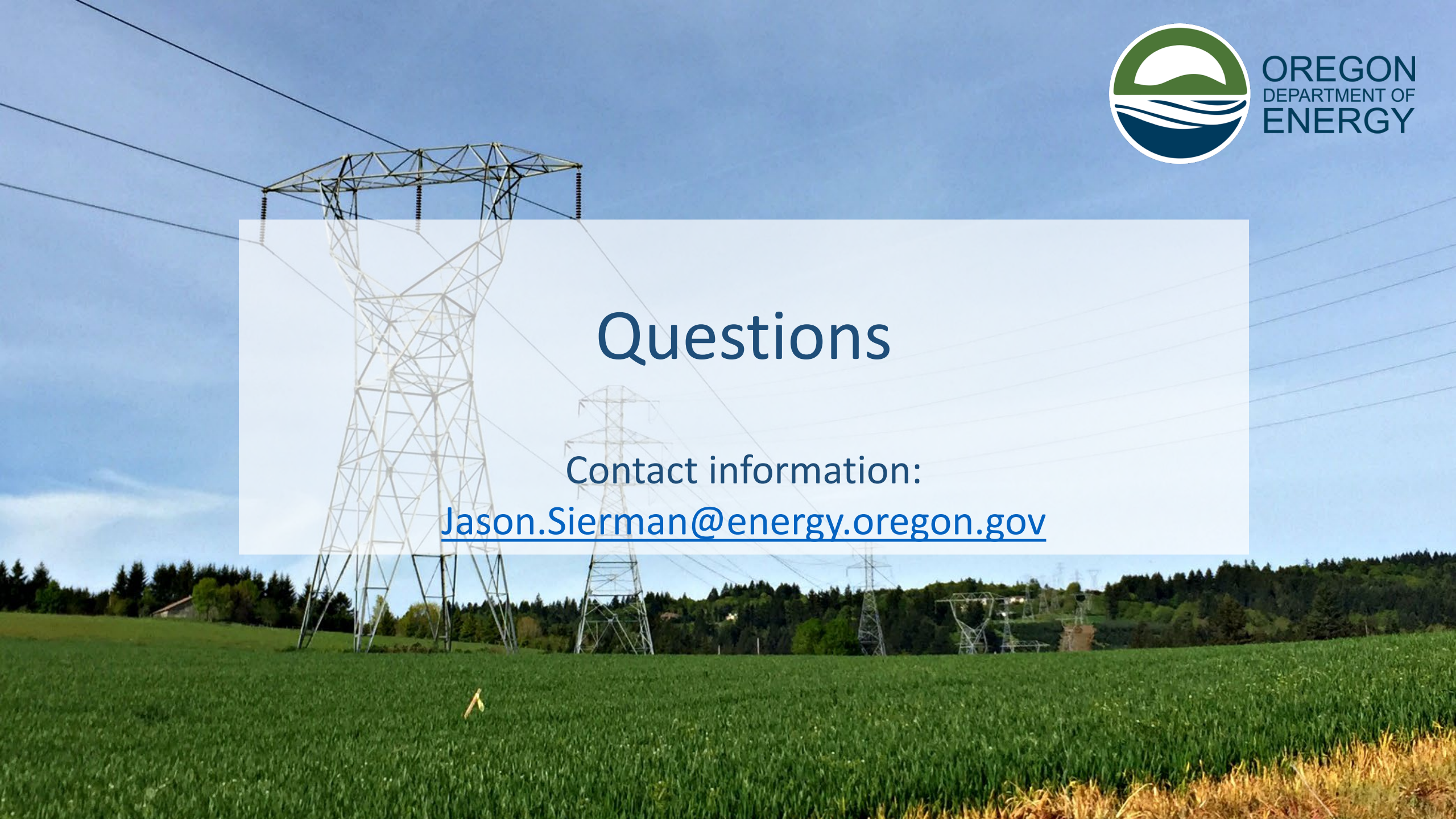
http://web.energy.oregon.gov/cn/a6n53/subscribe

OREGON DEPARTMENT OF ENERGY

INSTITUTE FOR NATURAL RESOURCES

NAS WHIDBEY ISLAND

OREGON Department of Land Conservation & Development



OREGON DEPARTMENT OF ENERGY

Questions

Contact information:

Jason.Sierman@energy.oregon.gov

BOEM Pacific Avian Study Strategy

Dave Pereksta, Avian Biologist
BOEM Pacific Office


© David Pereksta

Bird Baseline – Shore, Nearshore, and Pelagic

Species Diversity on the OCS

- **Nearshore and shoreline species**
  - Sea ducks, loons, grebes, shorebirds, gulls, terns
- **Pelagic species primarily in deep offshore waters**
  - 50+ species including tubenoses, jaegers, alcids
  - Pelagic shorebirds, terns, gulls

Special Status Species

- **4 ESA listed species in Oregon**
- **66 species with some level of special status on the Pacific OCS and coast**
  - Several very rare species endemic to the Pacific OCS

Interactions…Birds Have It Tough

Hazards

- Birds at risk from anthropogenic sources

Annual Bird Deaths in the U.S. and Canada

- Cats: 2.6-3.8 billion
  - 33 island bird extinctions worldwide!
- Windows: 624 million
- Automobiles: 214 million
- Power lines: 175 million
- Pesticides and toxics: 67-90 million
- Fossil fuel powerplants: 14 million
- Communication towers: 7 million
- Persecution: 4 million
- Oil and waste water: 1.4-2 million
- Land-based wind turbines: 100,000-440,000 (4.2 birds/MW/year)

Offshore Wind Energy Effects - Birds

Collision Hazard

- Rotors and support towers

Avoidance

- Displacement from feeding grounds
- Movement barriers
  - Migration and feeding

Attraction

- Prey base and habitat alteration/completion
- Light attraction/disorientation
- Perching – including falcons

Effects from one project could be minimal, but cumulative impacts from multiple projects could be substantial

Ecological Information for Renewable Energy

- Seasonal distribution, abundance, density
- Migration routes and patterns
- Attraction and avoidance behavior
- Displacement effects
- Prey base changes
- Nocturnal activity and movement
- Effects of noise, vibration, lights, structures
- Collision risk

Difficult information to collect due to weather, remoteness, vessel availability, etc.

Multi-tiered Approach and Goals

Broad-scale Assessments

- Facilitate planning at landscape level
- Government supported

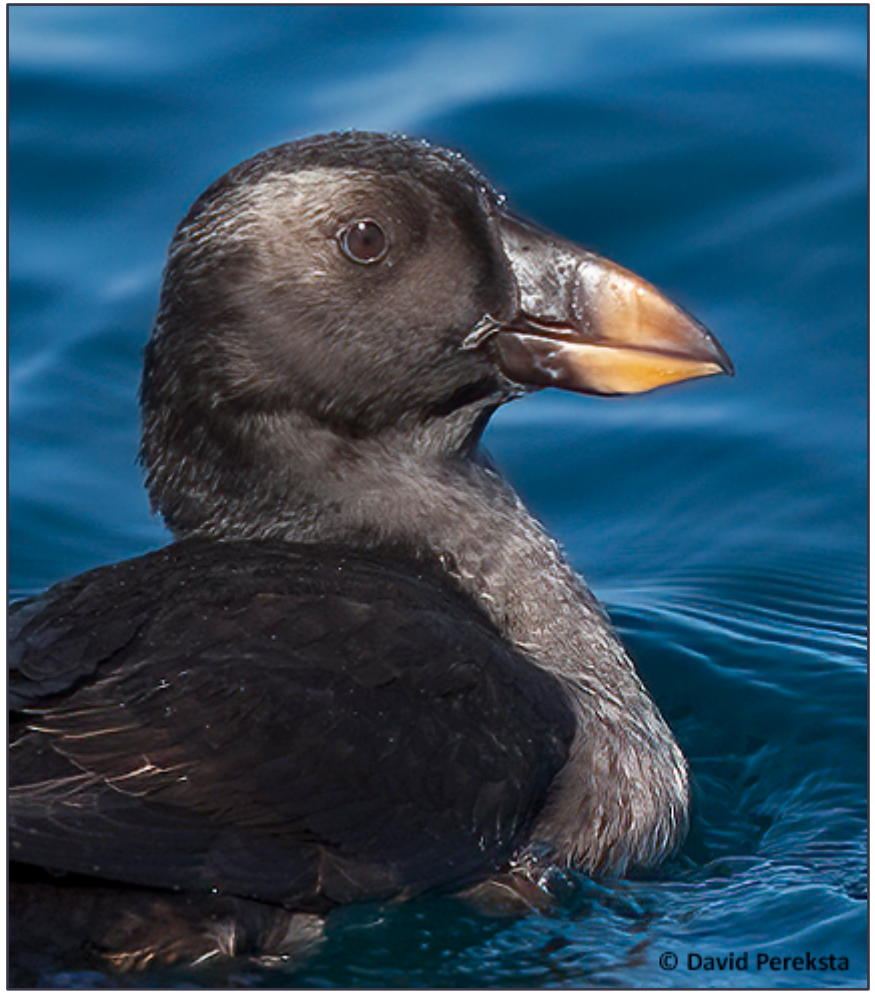
Site-specific Assessments

- Project-level planning and assessment
- Project proponent supported
- BOEM guidelines based on statistical analysis

Goals

- Identify baseline conditions
- Detect changes associated with anthropogenic effects
- Evaluate the effects of past policies and management activities
- Design and implement projects that will minimize adverse effects to marine resources to the maximum extent possible

Strategic Approach to Renewable Energy Research



Synthesize Existing Data

- Identify existing information and data gaps
- Predictive modeling

Collect New Data

- At sea surveys and colony catalogs
- Telemetry studies
- Technology advancement

Assess Risk

- Impacting factors
- Assess interactions, risk, vulnerability

Monitor

- Track change over time resulting from project construction and operation

Data Synthesis and Predictive Modeling

Objective

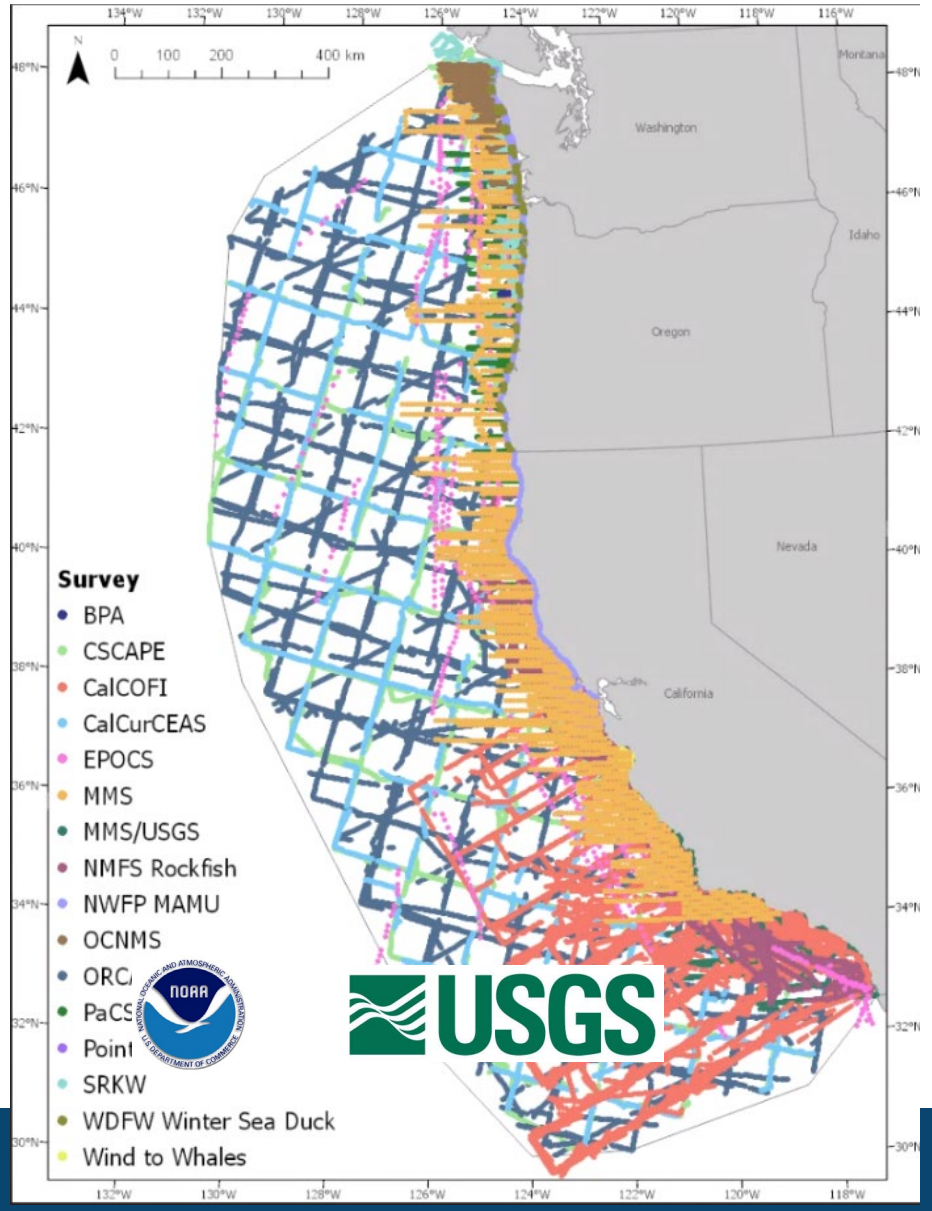
Improved species-specific distributions and density estimates of seabirds that can be extended to non-surveyed areas to provide critical information for renewable energy siting

Data Synthesis

- 21 at-sea survey datasets
- 1980-2017
  - Aerial and boat-based transects

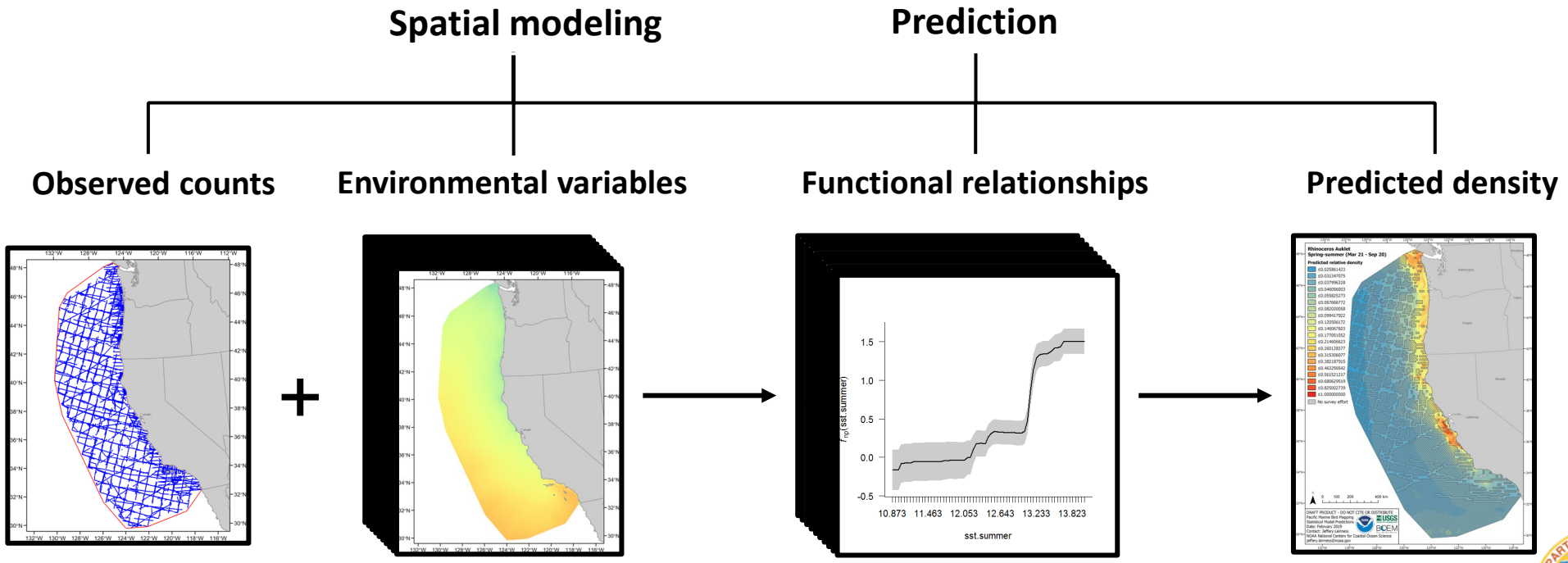
Habitat-based Spatial Models

- 33 species
- 13 taxonomic groups
  - 135 species/groups-season combinations
- 2 km resolution
- Related to environmental variables



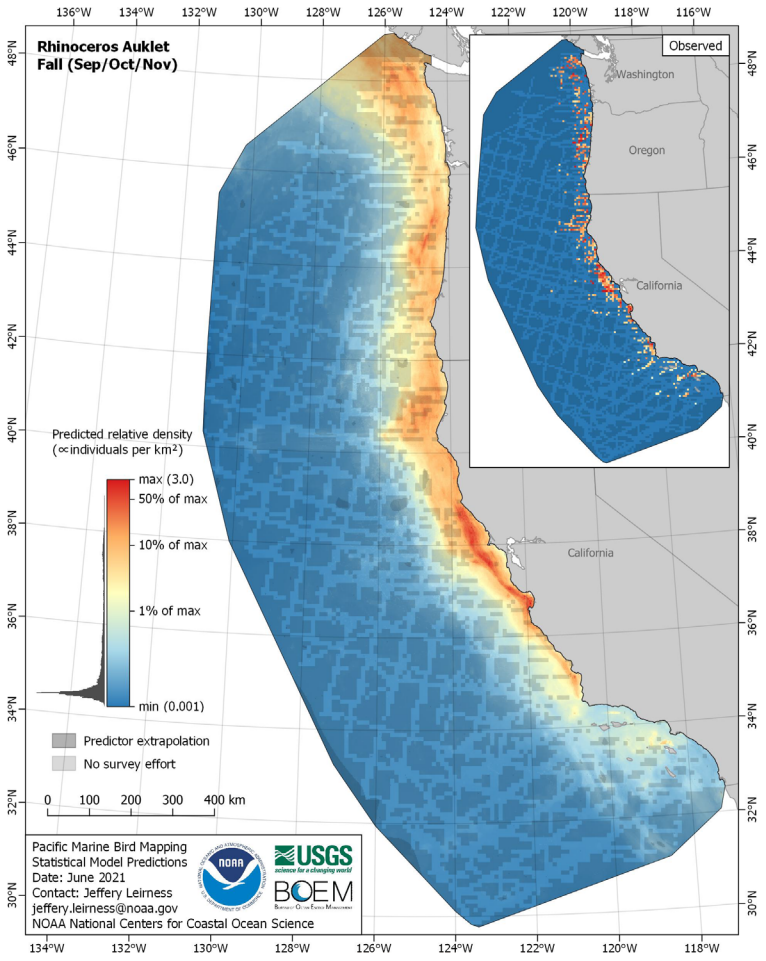
Spatial Predictive Modeling

- Survey coverage variable with gaps
- Comprehensive environmental datasets available
- Relate species counts to environmental variables
- Predict relative density across entire region

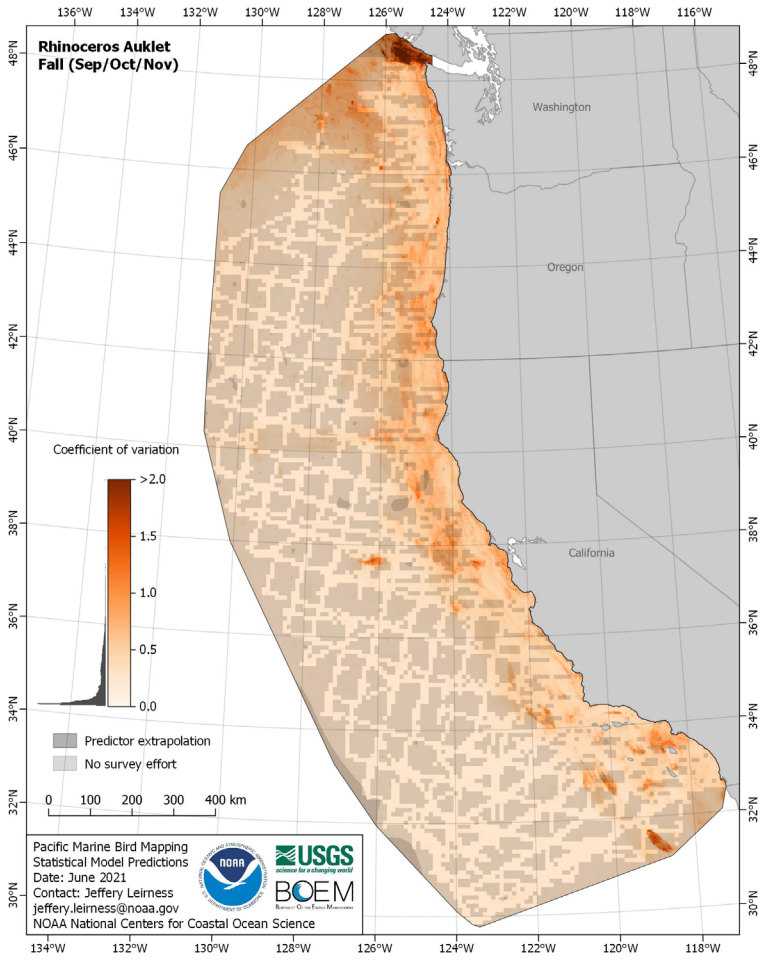


Data Synthesis and Predictive Modeling - Products

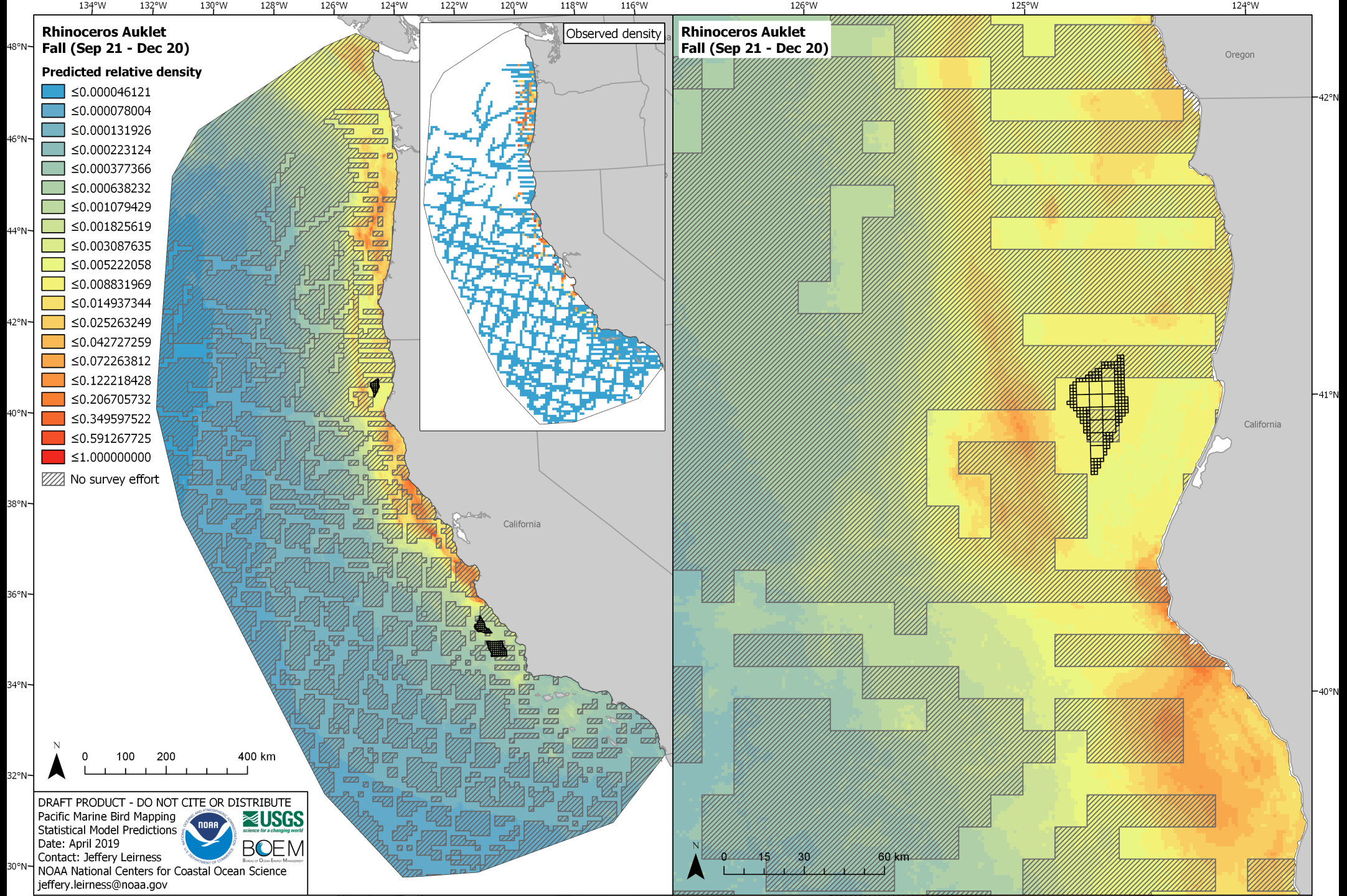
Relative Density



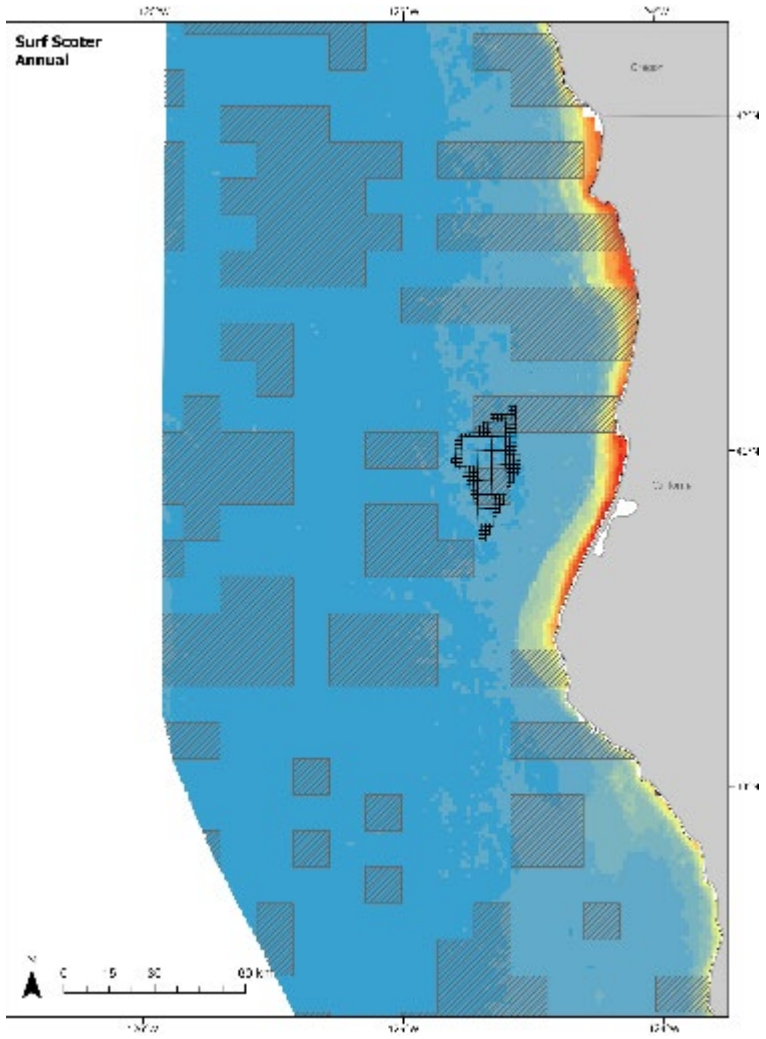
Coefficient of Variation

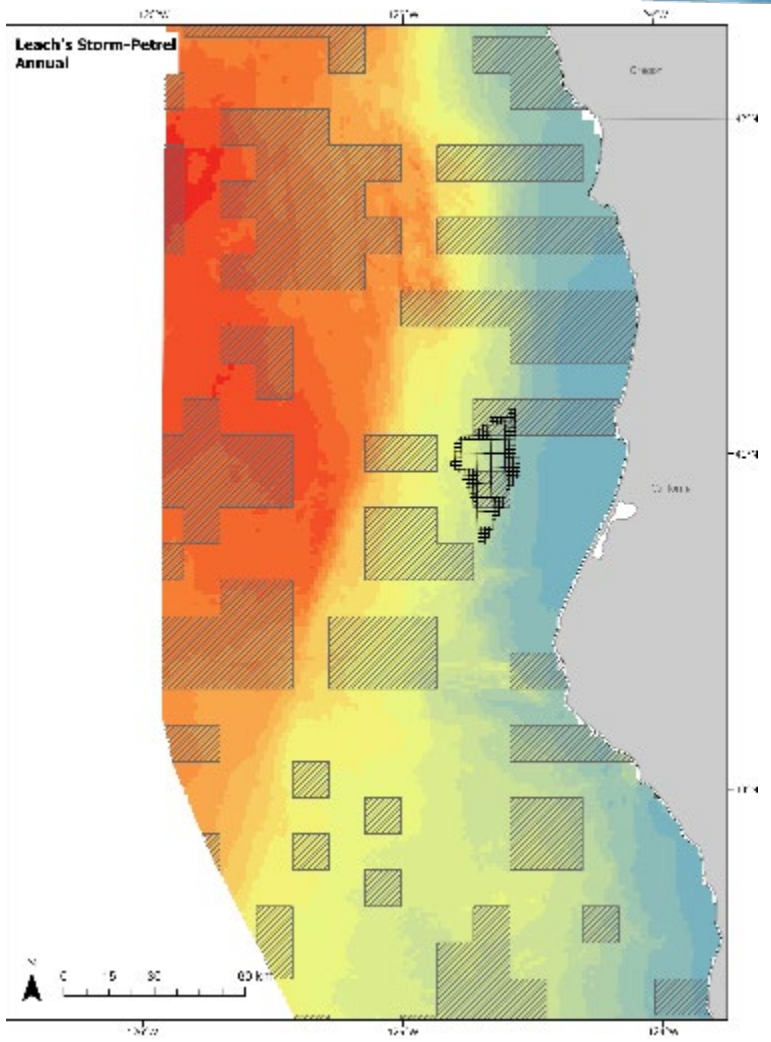


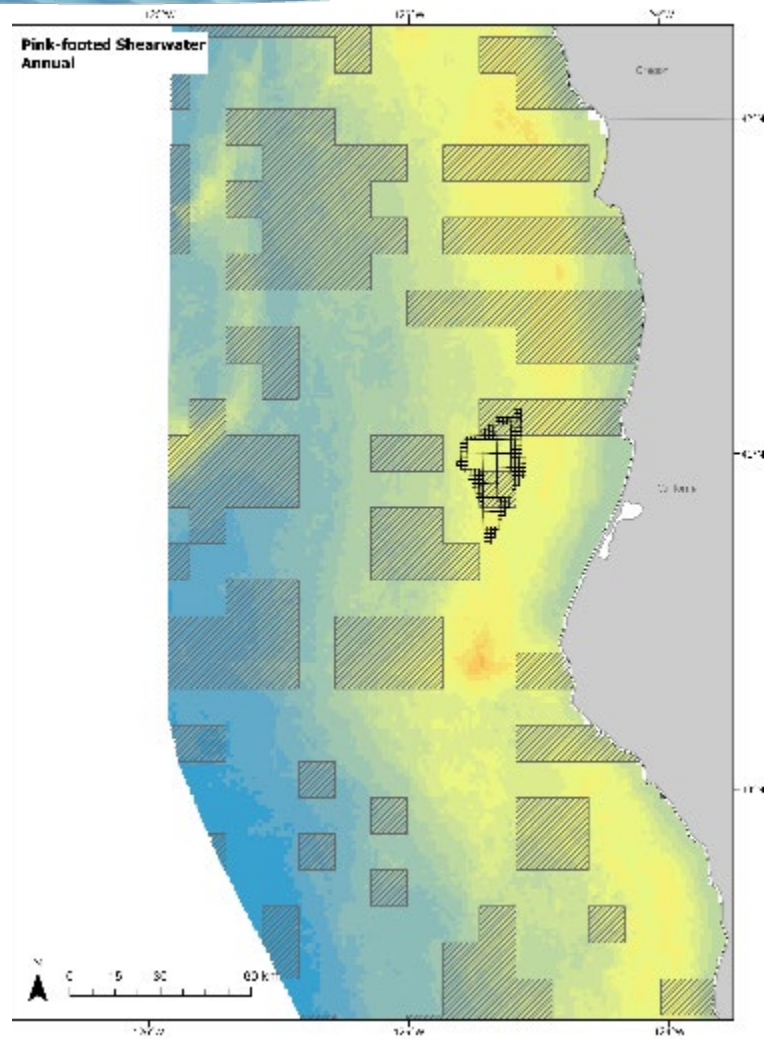
www.boem.gov/BOEM_2021-014


Rhinoceros Auklet
Fall (Sep 21 - Dec 20)
Predicted relative density
≤0.000046121
≤0.000078004
≤0.000131926
≤0.000223124
≤0.000377366
≤0.000638232
≤0.001079429
≤0.001825619
≤0.003087635
≤0.005222058
≤0.008831969
≤0.014937344
≤0.025263249
≤0.042727259
≤0.072263812
≤0.122218428
≤0.206705732
≤0.349597522
≤0.591267725
≤1.000000000
No survey effort
Observed density
California
Oregon
N
0 100 200 400 km
0 15 30 60 km
DRAFT PRODUCT - DO NOT CITE OR DISTRIBUTE
Pacific Marine Bird Mapping
Statistical Model Predictions
Date: April 2019
Contact: Jeffery Leirness
NOAA National Centers for Coastal Ocean Science
jeffery.leirness@noaa.gov
USGS
BOEM

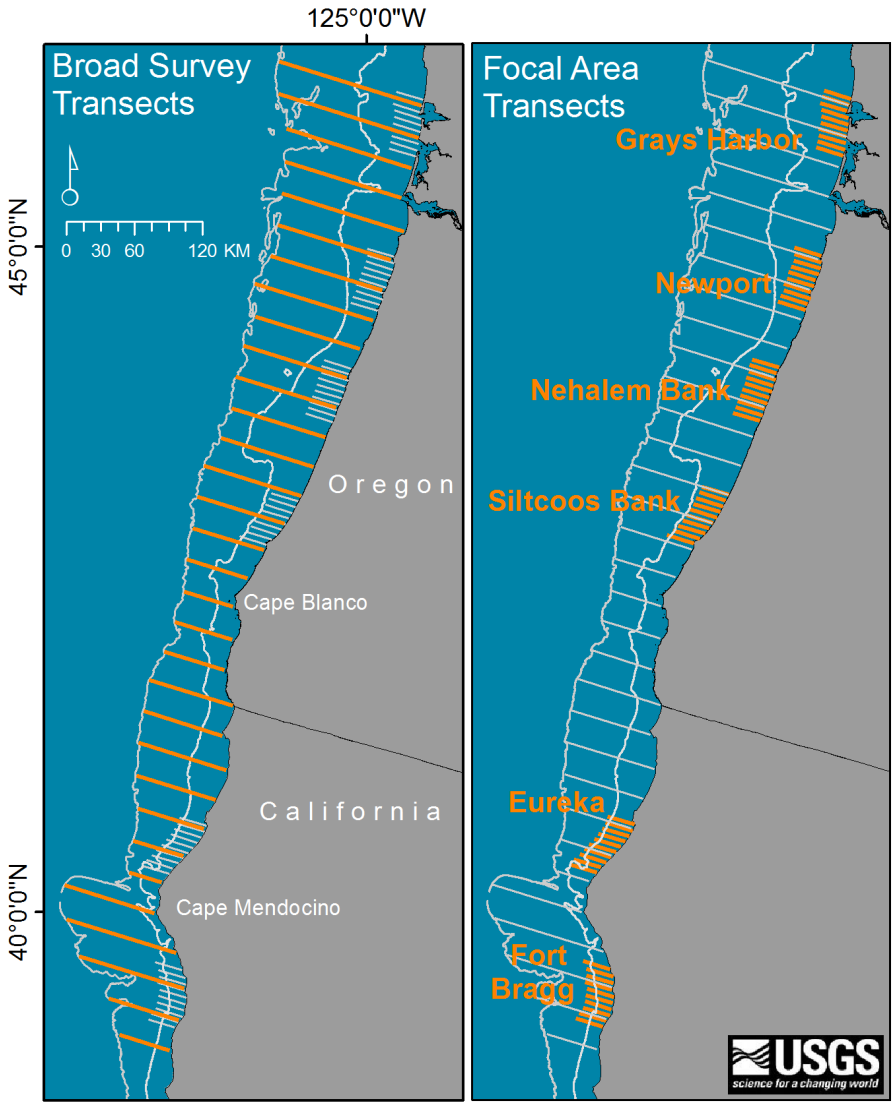
Data Synthesis and Predictive Modeling - Products







Marine Wildlife Surveys

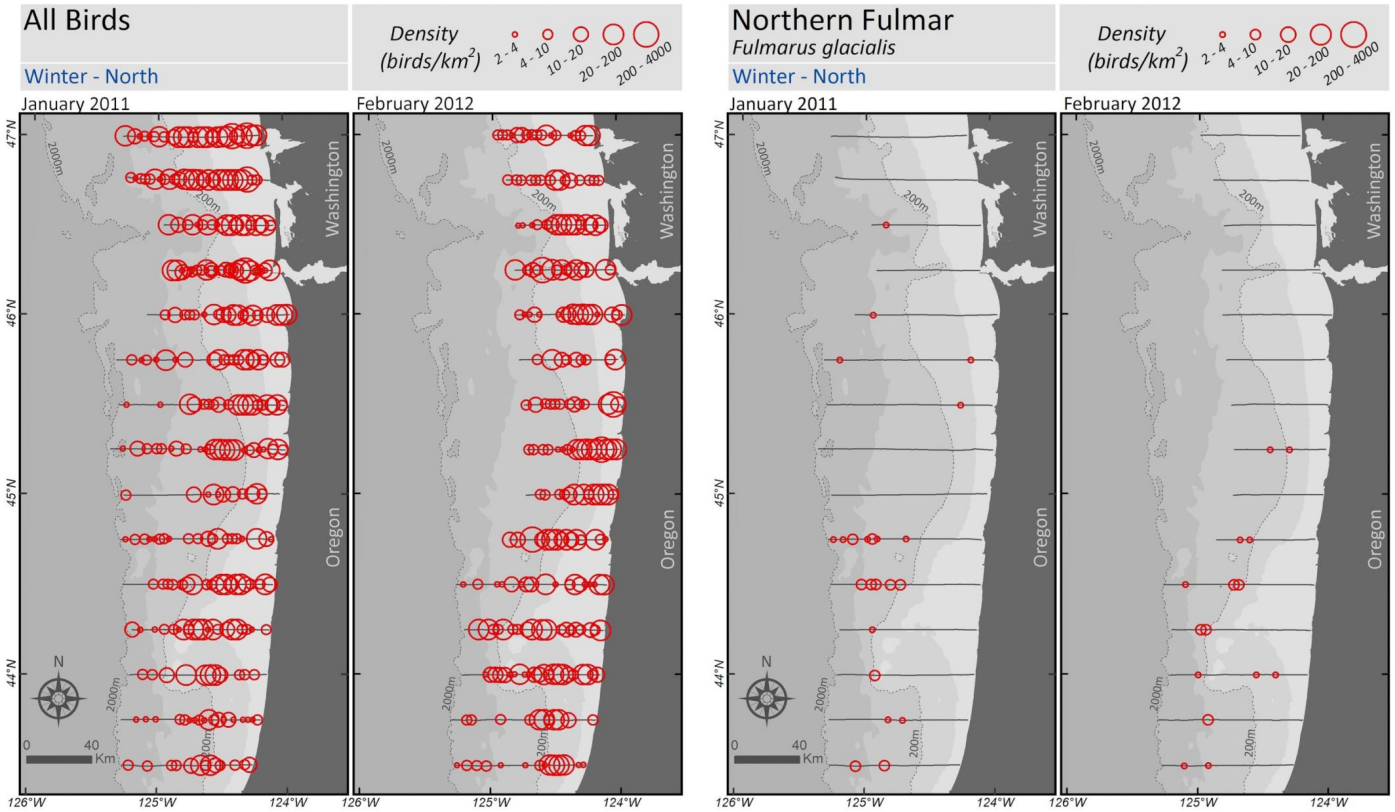


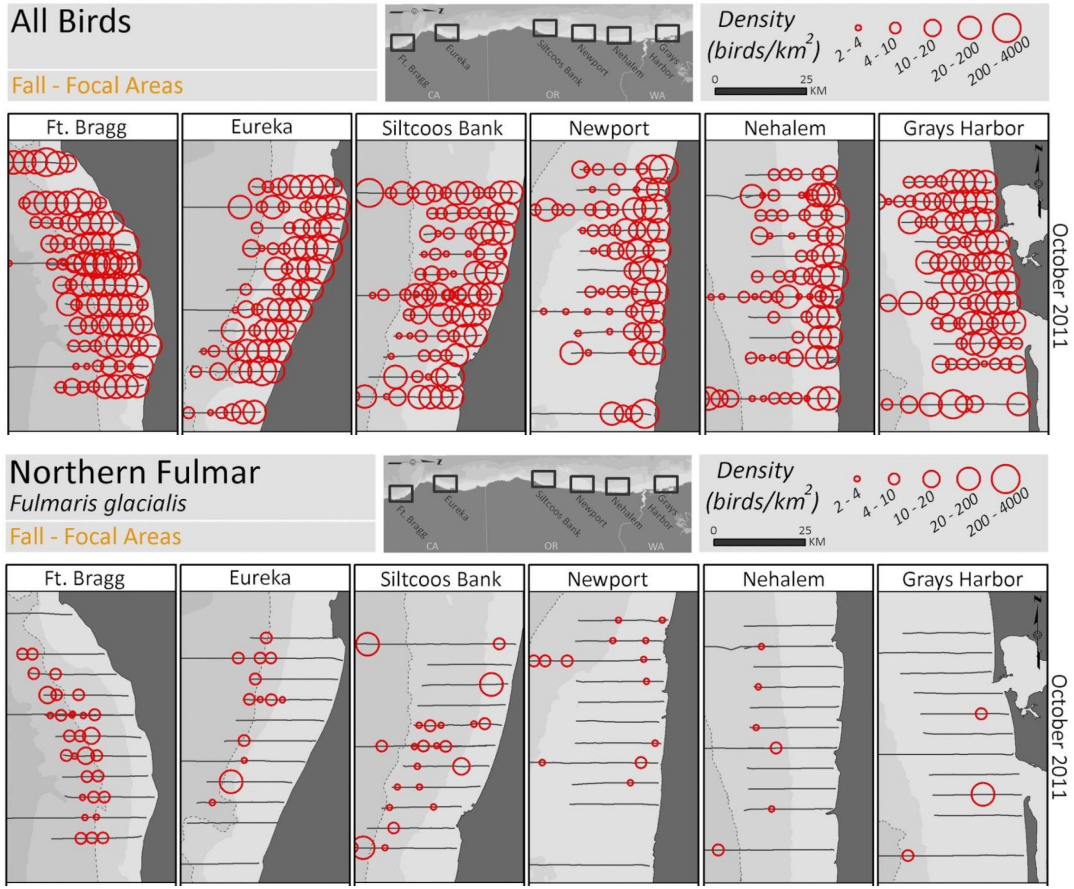
PaCSEA Design

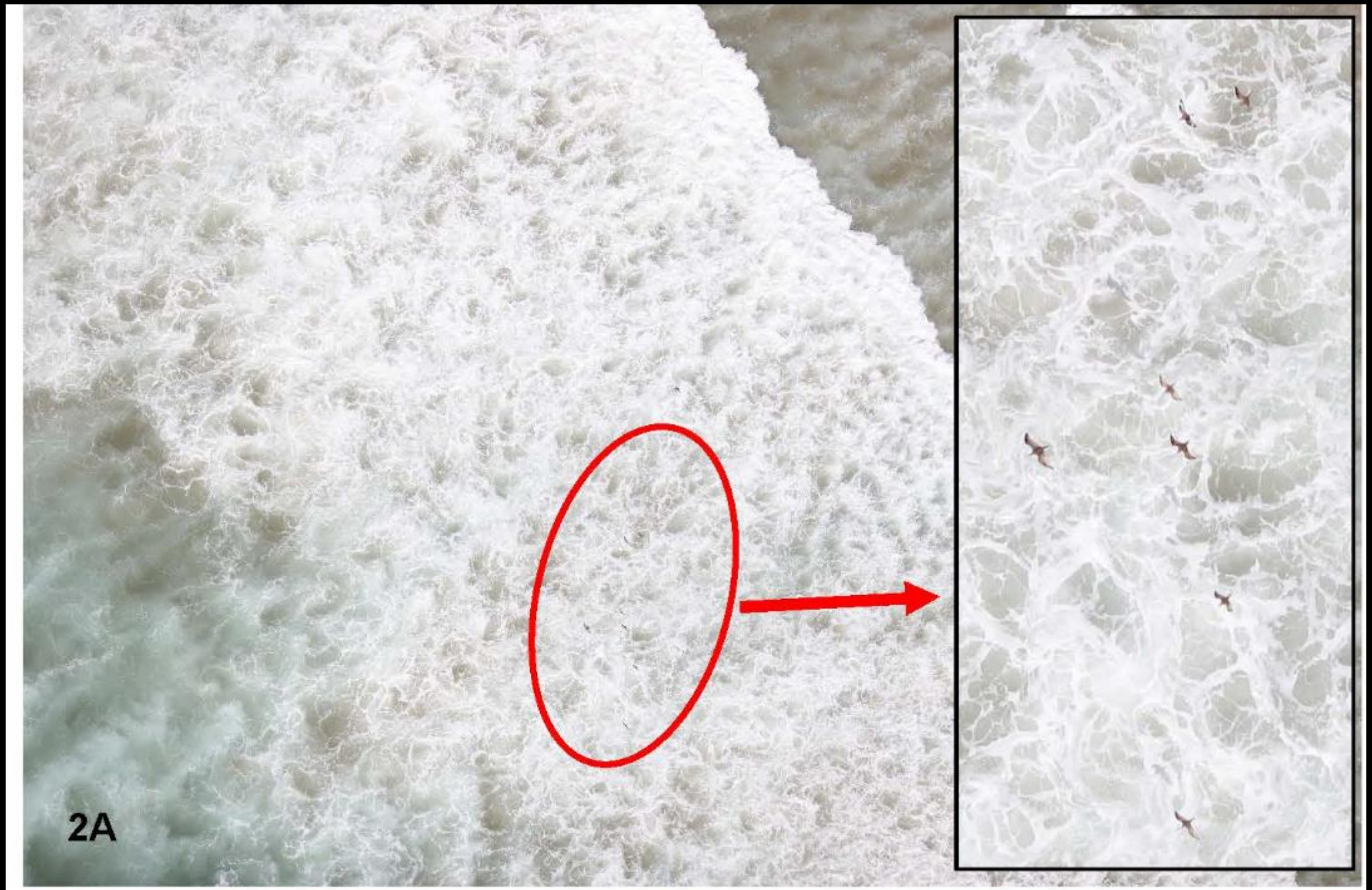
- 2 survey years: 2011 & 2012
- 3 oceanographic seasons (Winter, Upwelling, Davidson)
- Fort Bragg, CA (39.3° N) to Grays Harbor, WA (47° N)
- Focused on federal waters seaward of the 3-mile federal/state boundary
- 32 east-west-oriented uniform transects, 28-km spacing, to 2,000-m isobaths
- 6 focal areas consisting of ten 25-km parallel transect lines at 6-km spacing
- All marine birds, mammals, turtles, vessels, features

https://espis.boem.gov/final%20reports/5427.pdf

Marine Wildlife Surveys

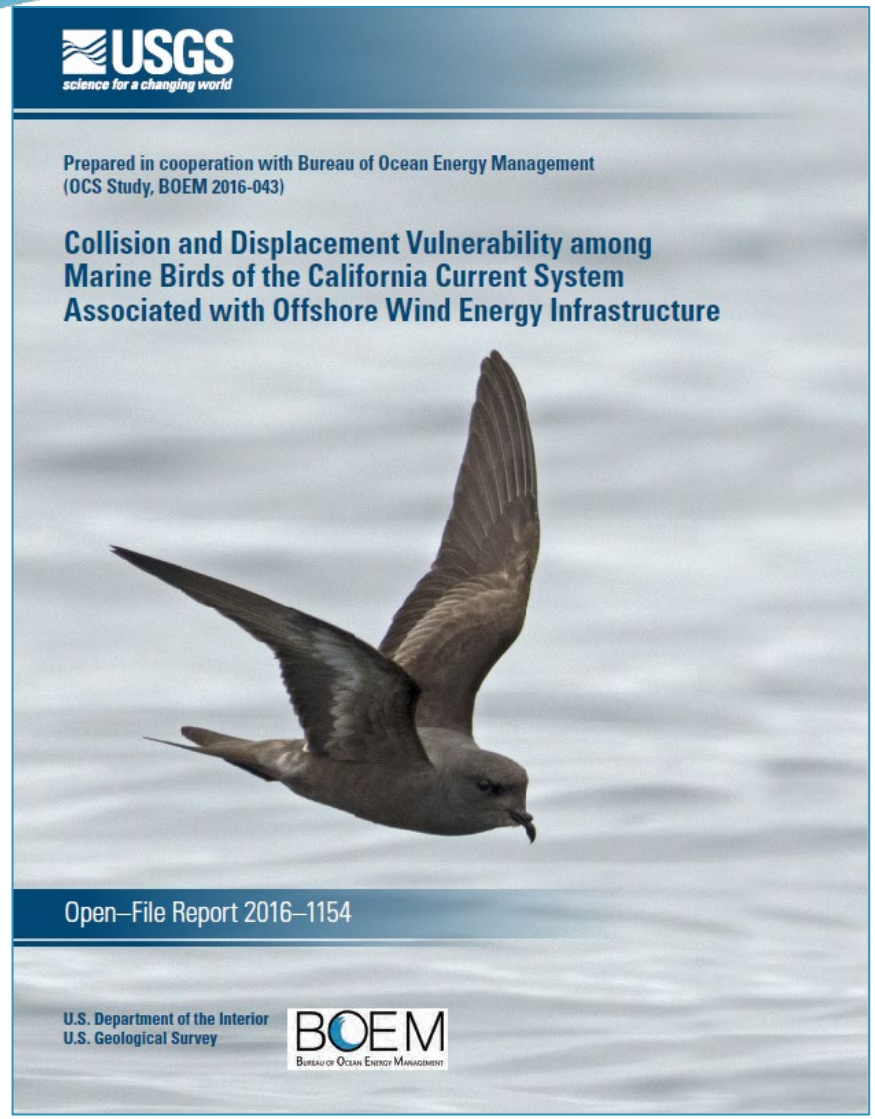





2A

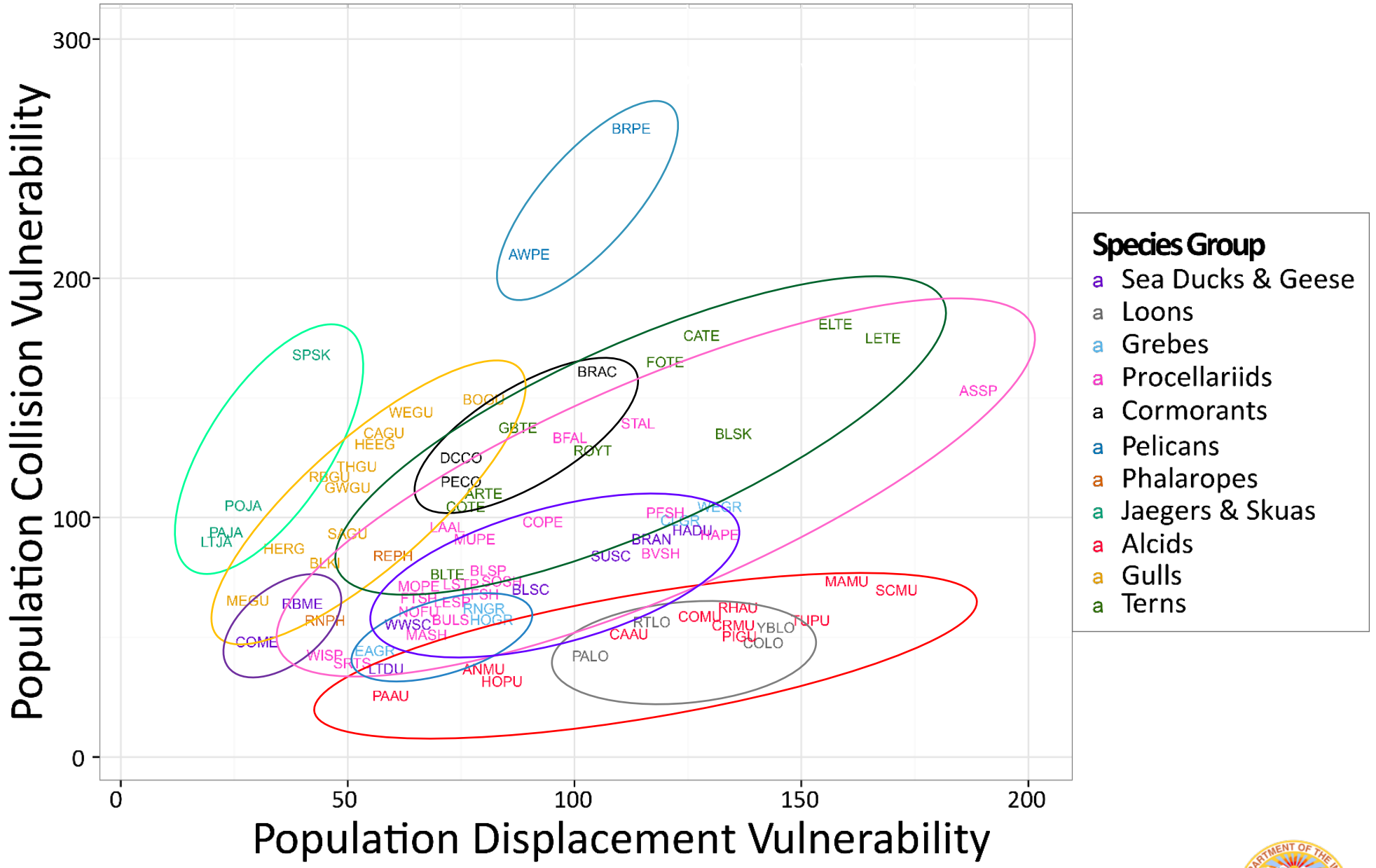

2E

Marine Bird Vulnerability to Offshore Wind Energy



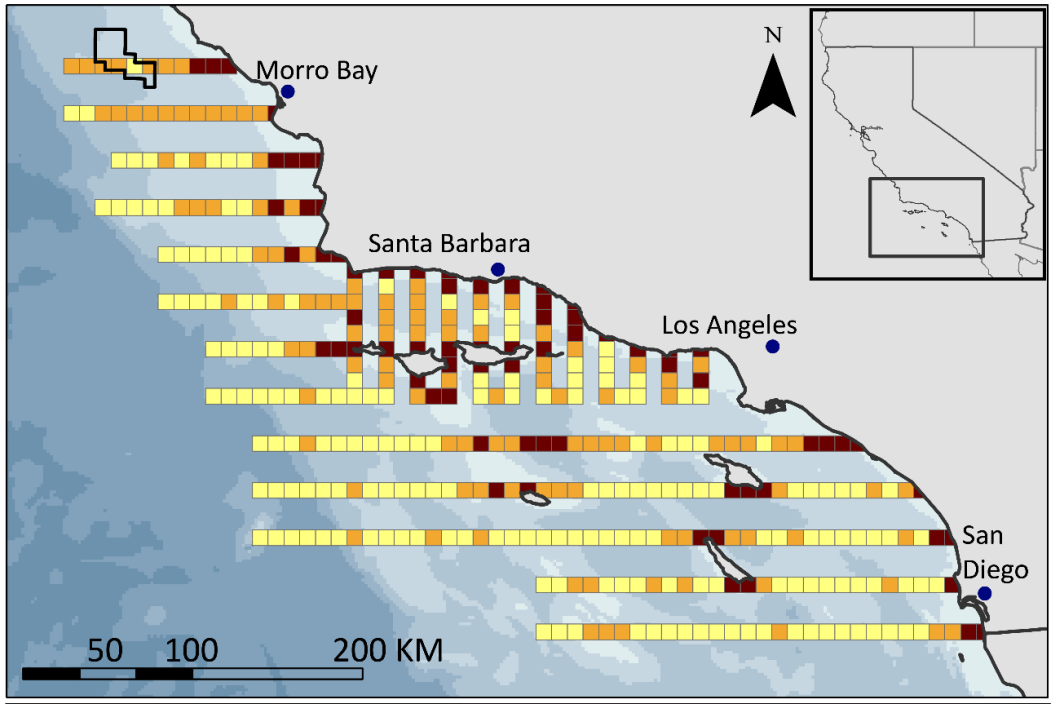
- First comprehensive evaluation of marine bird vulnerability in Pacific
- Comprehensive vulnerability database for CCS species
  - 62 seabirds
  - 19 marine waterbirds
- Vulnerability driven by species-specific parameters
- Analyzed factors of **Displacement** and **Collision** Vulnerability, as a function of **Population** Vulnerability
- Uncertainty quantification
  - Opportunities to increase understanding
  - Database can be updated
- Vulnerability scores can be mapped using bird distributions to inform spatial planning

https://pubs.er.usgs.gov/publication/ofr20161154

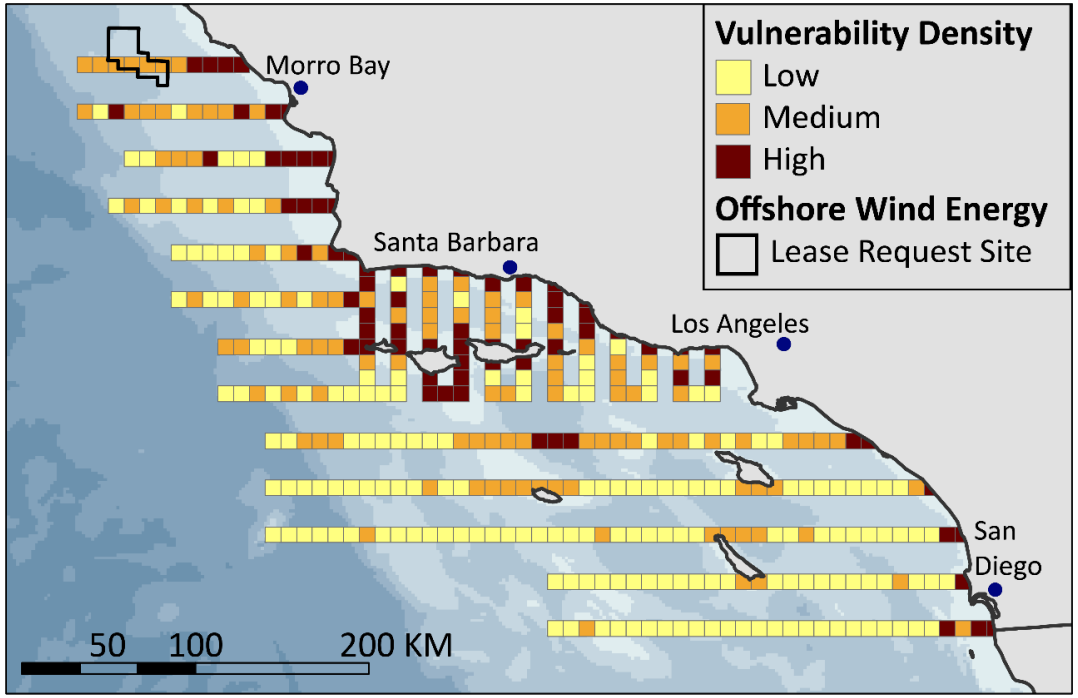

Population Collision Vulnerability
Population Displacement Vulnerability
0
100
200
300
0
50
100
150
200
BRPE
AWPE
SPSK
CATE
ELTE
LETE
FOTE
BRAC
ASSP
BOGU
WEGU
CAGU
HEEG
GBTE
BFAL
STAL
BLSK
ROYT
DCCO
THGU
RBGU
GWGU
PECO
ARTE
COTE
POJA
PAJA
LTJA
SAGU
LAAL
COPE
MUPE
PFSH
WEGR
CAGR
HADU
HAPE
BRAN
SUSC
BVSH
HERG
REPH
BLKI
BLTE
BLSP
SOSH
MOPE
LSTP
BLSC
FTSH
LESP
FISH
RNGR
NOFU
BULS
HOGR
WWSC
MASH
MEGU
RBME
RNPH
COME
WISP
EAGR
SRTS
LTDU
ANMU
HOPU
PAAU
MAMU
SCMU
RHAU
RTLO
COMU
CRMU
YBLO
TUPU
CAAU
PIGU
COLO
PALO
Species Group
a Sea Ducks & Geese
a Loons
a Grebes
a Procellariids
a Cormorants
a Pelicans
a Phalaropes
a Jaegers & Skuas
a Alcids
a Gulls
a Terns

Marine Bird Vulnerability to Offshore Wind Energy

A.



B.



Population Collision Vulnerability

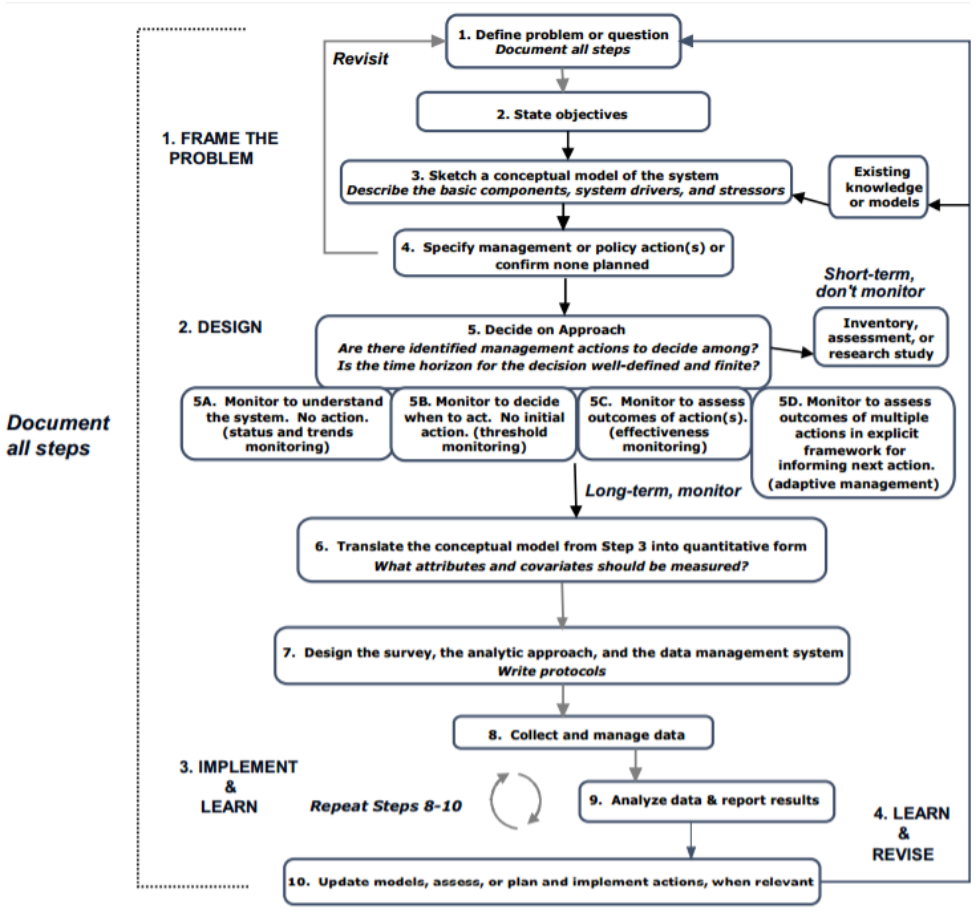
Population Displacement Vulnerability

Kelsey E, Felis J, Czapanskiy M, Pereksta D, and Adams J. 2018. Collision and displacement vulnerability to offshore wind energy infrastructure among marine birds of the Pacific Outer Continental Shelf. Journal of environmental management. 227. 229-247.

Proposed Pacific Seabird Monitoring Network

Specific Research Questions

- Using the Vulnerability Index and other sources, can we identify a suite of indicator species suitable for monitoring the potential effects of offshore energy activities in the Pacific?
- Building upon information gathered in data synthesis efforts, can we coordinate and supplement ongoing research to meet our objectives?
- Which monitoring design is the most efficient to distinguish regional population trend modifications resulting from offshore energy projects compared to other factors affecting seabirds?
- What lessons can we derive from a pilot monitoring effort to refine baseline information that can be applied to a long-term monitoring program designed to inform offshore energy?



Reynolds JH, Knutson MG, Newman KB, Silverman ED, and Thompson WL. 2016. A road map for designing and implementing a biological monitoring program. Environmental Monitoring and Assessment 188:1-25

New Avian Studies - Pacific

Acoustic Bat Study

- Enhance the understanding of seasonal bat migration activities offshore of the Pacific Coast

Over Water Migration Movements of Brant

- Identify oversea Black Brant migratory routes from Alaska to the Pacific Coast to understand pathways, timing, and flight altitude

Motus Wildlife Tracking

- Support data-collection efforts on the timing and scale of movements for shorebirds, marine birds, bats, and other taxa in relation to offshore energy and other coastal development projects
- Expand tracking capabilities along the Pacific Coast

West Coast Tribal Cultural Landscapes

Dave Ball, Historic Preservation Officer
BOEM Pacific Office

West Coast Tribal Cultural Landscapes

- A new study to work with interested Tribes along the Oregon coast and the areas around Humboldt and Morro Bays in California
- Builds on previous Cultural Landscapes efforts in the Pacific Region (Tribal Cultural Landscape[1]; Native Hawaiian Cultural Landscapes[2])
- Three-year effort with Udall Foundation's John S. McCain III National Center for Environmental Conflict Resolution, awarded August 2021

[1] Tribal Cultural Landscapes Guidance Document: https://www.boem.gov/2015-047/
[2] Native Hawaiian Cultural Landscapes Guidance Document: https://www.boem.gov/BOEM-2017-023/

West Coast Tribal Cultural Landscapes

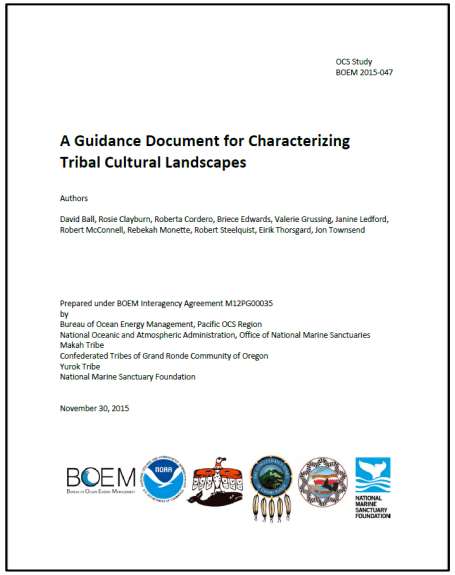
- **A holistic cultural landscape approach that integrates science with historical, archaeological, and traditional knowledge**
- **Develop working groups of interested parties to define parameters and outreach efforts**

Tribal Cultural Landscape:
Any place in which a relationship, past or present, exists between a spatial area, resources, and an associated group of indigenous people whose cultural practices, beliefs of identity connects them to that place. A tribal cultural landscape is determined by and known to a culturally related group of indigenous people with relationships to that place.

West Coast Tribal Cultural Landscapes

TCL Best Practices:

- Template for Indigenous Data Collection and Retention
- Process for application of TCL approach



OCS Study
BOEM 2015-047

A Guidance Document for Characterizing Tribal Cultural Landscapes

Authors

David Ball, Rosie Clayburn, Roberta Cordero, Briece Edwards, Valerie Grussing, Janine Ledford, Robert McConnell, Rebekah Monette, Robert Steelquist, Eirik Thorsgard, Jon Townsend

Prepared under BOEM Interagency Agreement M12PG00035
by
Bureau of Ocean Energy Management, Pacific OCS Region
National Oceanic and Atmospheric Administration, Office of National Marine Sanctuaries
Makah Tribe
Confederated Tribes of Grand Ronde Community of Oregon
Yurok Tribe
National Marine Sanctuary Foundation

November 30, 2015

Available online at:
http://www.boem.gov/2015-047/

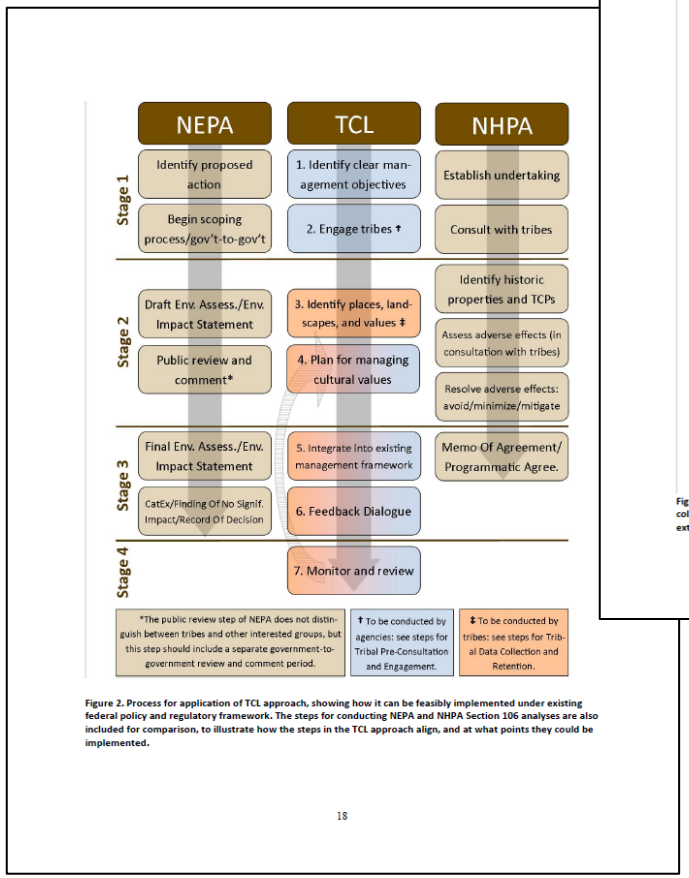


Figure 2. Process for application of TCL approach, showing how it can be feasibly implemented under existing federal policy and regulatory framework. The steps for conducting NEPA and NHPA Section 106 analyses are also included for comparison, to illustrate how the steps in the TCL approach align, and at what points they could be implemented.

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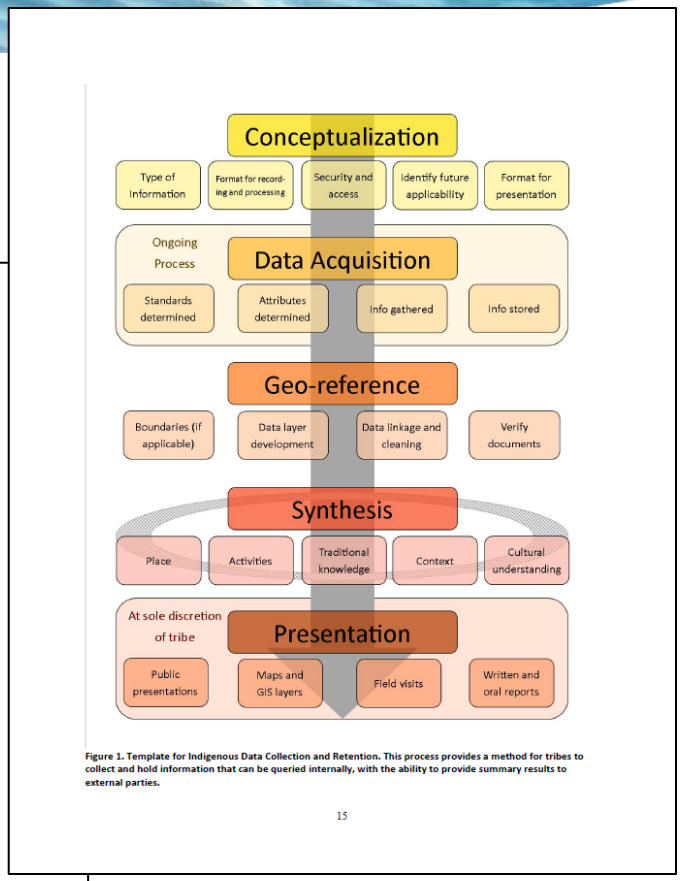

Figure 1. Template for Indigenous Data Collection and Retention. This process provides a method for tribes to collect and hold information that can be queried internally, with the ability to provide summary results to external parties.

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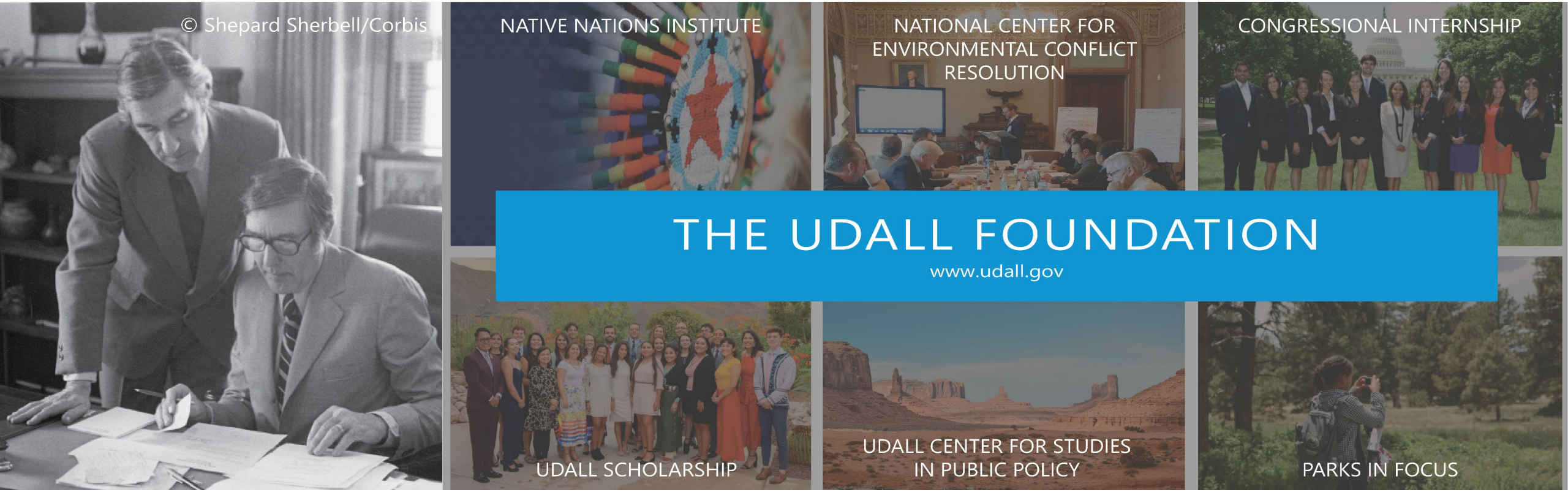


National Center for Environmental Conflict Resolution
Udall Foundation

NATIONAL CENTER

Mission

Help federal agencies and other affected stakeholders **address environmental disputes**, conflicts, and challenges, including helping agencies **build internal capacity to address those challenges**

National Center for Environmental Conflict Resolution
Udall Foundation

West Coast Tribal Cultural Landscapes

- **Objective:**
  - Build upon previous efforts and implement the framework of the TCL Guidance Document to develop new TCL assessments along areas of the Oregon coast, and Humboldt and Morro Bays in California
- **Methods:**
  - Assess the needs, issues, priorities, and obstacles associated with this effort by conducting up to 55 one-hour confidential interviews
  - Develop a strategy to engage West Coast Tribes near identified geographies, including inter-Tribal workshops or other culturally appropriate methods to develop new TCL assessments
- **Further information:**
  - www.boem.gov/PC-21-01
- **Contact information:**
  - Dave Ball (BOEM): david.ball@boem.gov
  - Dana Goodson (Udall): goodson@udall.gov

Break

Meeting will resume at 2:55 pm

Proposed Next Steps toward Offshore Wind Energy Leasing

Whitney Hauer and Dave Ball
BOEM Pacific Office

Renewable Energy Process: Calls, Wind Energy Areas and Lease Areas

Call for Information and Nominations (Call)

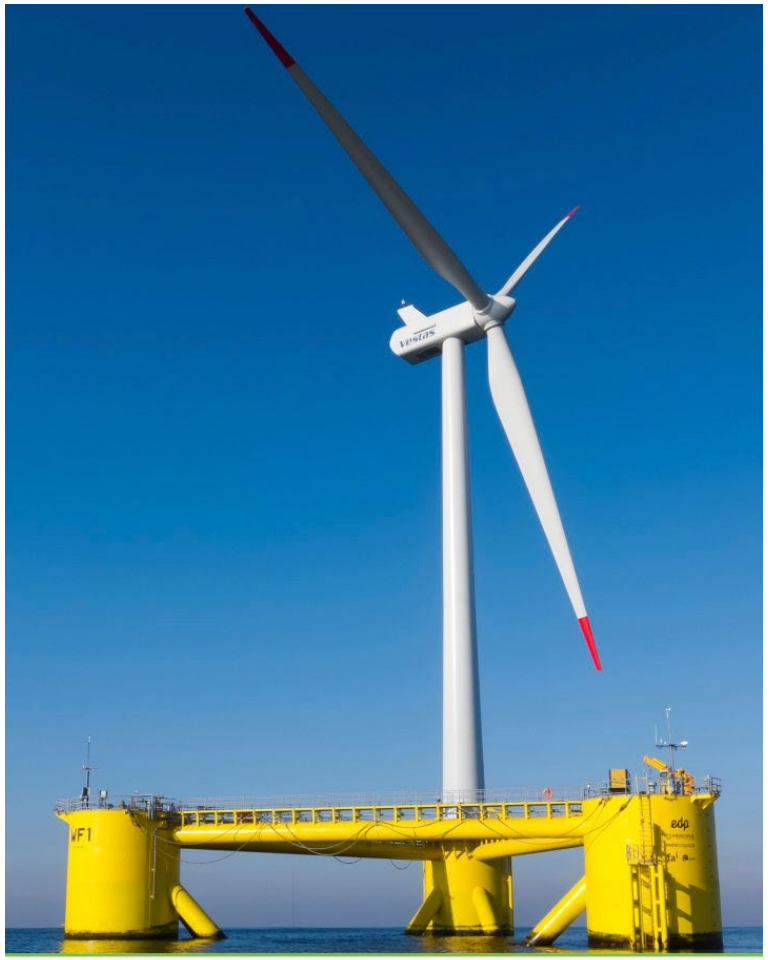
- Calls for formal public comment about the area, uses and concerns
- Requests nominations of interest for development

Wind Energy Area (WEA)

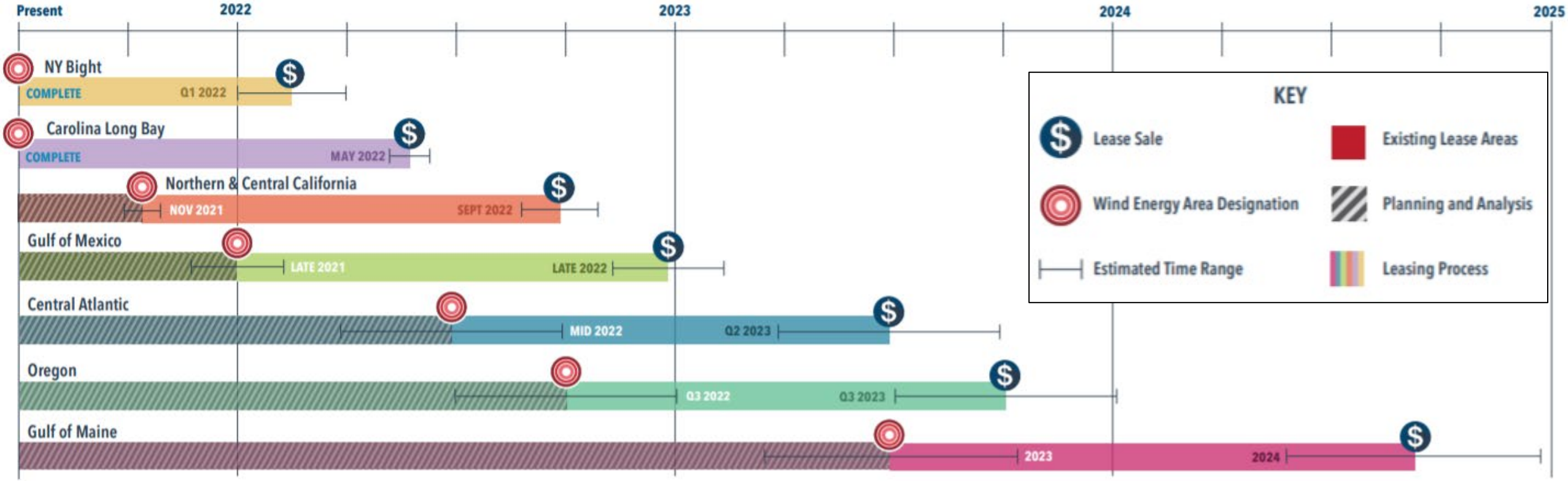
- An area within a Call Area identified by BOEM for environmental review
- Basis for a lease area(s)

Lease Area

- Areas BOEM would offer for lease during a Lease Sale

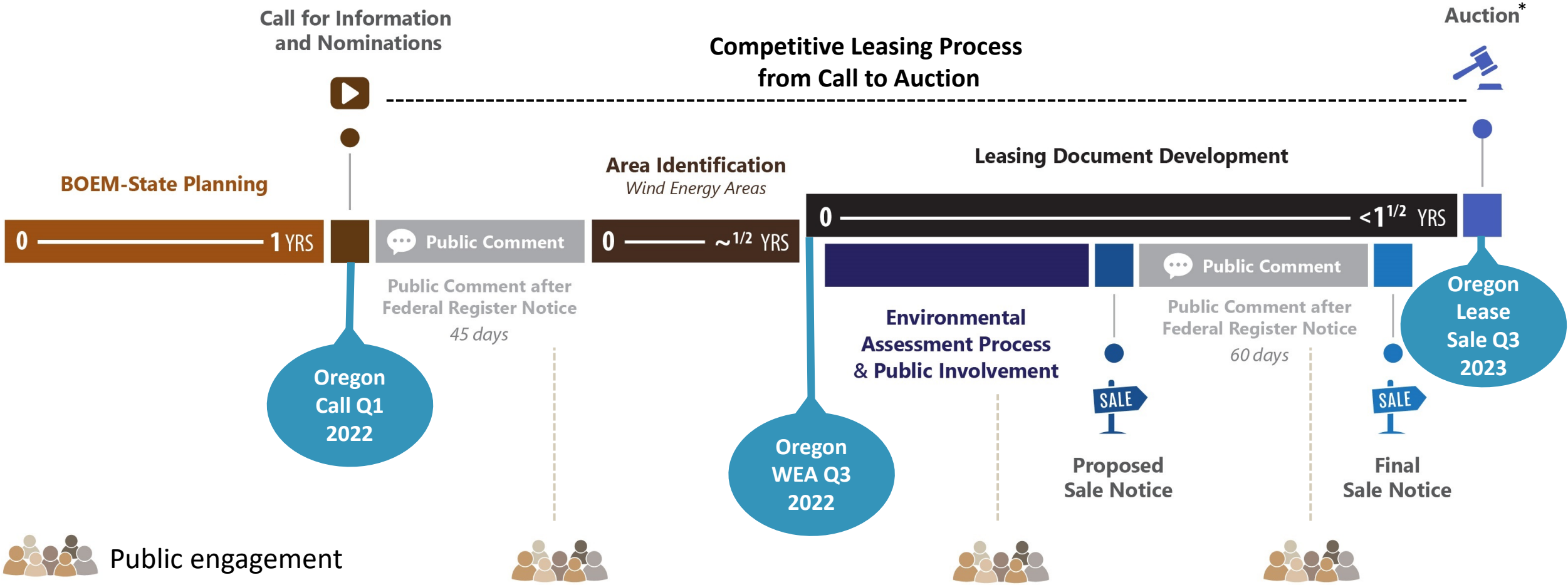


BOEM Offshore Wind Leasing Path Forward 2021-2025



Our path forward will help achieve the first-ever **national offshore wind goal** to deploy **30 gigawatts of offshore wind by 2030**, which would create nearly **80,000 jobs**

Oregon Planning and Public Input Opportunities Prior to a Lease Auction



*A lease provides the lessee the right to submit a Site Assessment Plan (SAP) and a Construction and Operations Plan (COP) for technical and environmental review and approval. A lease does not, by itself, authorize any activity within the leased area.

Continuous: Data and Information Gathering for Analysis

- Commercial and recreational fishing activity
- Marine ecosystems, including marine mammals and wildlife
- Maritime navigation/safety issues
- Tribal issues of concern and indigenous traditional knowledge
- Visual impacts of potential development
- State and local renewable energy goals
- Technical factors
- Other considerations

Next Steps toward Leasing in Oregon

- **Continuous**
  - Collect data and information to inform decision-making
  - Engage with interested and potentially affected parties
- **November – December 2021:**
  - Provide key data sets not included in OROWindMap for consideration
  - BOEM and State coordinate to identify areas suitable for leasing to initiate leasing process
- **January 2022**
  - 10th BOEM Oregon Task Force Meeting
    - Present and discuss draft Call Areas
  - BOEM publish Call in *Federal Register*

Section 106 Programmatic Agreement Offshore Oregon

Because the program

- is complex
- involves multiple undertakings
- involves phased evaluation

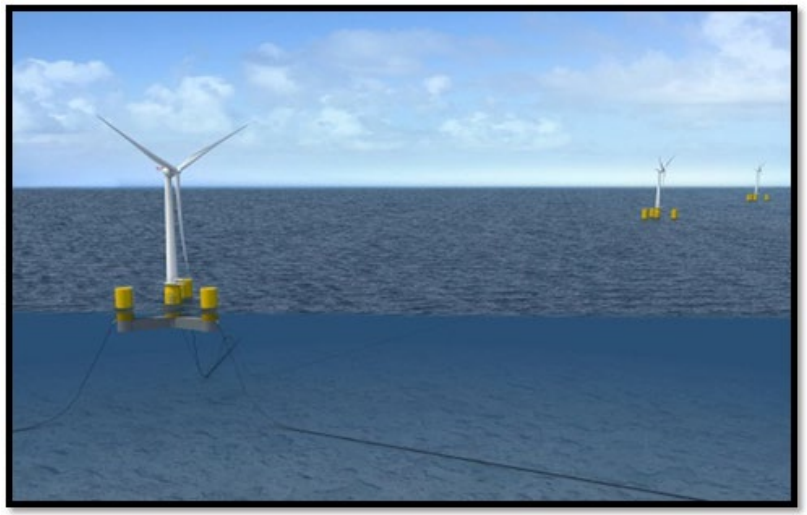
BOEM proposes to establish a standard process for Section 106 review for any offshore wind energy activities under the renewable energy regulations. These include issuance of any leases and grants and approval of any plans submitted under these leases or grants.

see 54 U.S.C. 306108, 36 CFR 800.14(b)(1), and 36 CFR 800.4(b)(2)

Section 106 Programmatic Agreement Offshore Oregon

The Programmatic Agreement will:

- Guide how BOEM and the parties will consult at the decision points under the agency's regulatory authority
- Include an agreed-upon definition of the areas of potential effect
- Include an agreed-upon definition of a reasonable and good-faith effort to identify historic properties
- Identify activities exempted from review (e.g., the collection of vibracores for the purposes of historic property identification when conducted by or under the supervision of a Qualified Marine Archaeologist)
- Administrative items (e.g., expedited and electronic review, special submission directions for certain SHPOs, etc.)



see 36 CFR 800.14(b) and (c)

Task Force Discussion

Action Items and Next Steps

Whitney Hauer
BOEM Pacific Office

Task Force Action Items

- **Provide feedback to the draft Data Gathering and Engagement Summary Report**
  - Email renewableenergypocs@boem.gov by November 2, 2021
- **Provide key data sets not included in OROWindMap for consideration**
  - Contact Frank Pendleton (frank.pendleton@boem.gov) and Andy Lanier (andy.lanier@dlcd.oregon.gov)
- **Let us know if you have any questions or would like follow-up discussions**
  - Contact Whitney Hauer (whitney.hauer@boem.gov)

Closing Remarks

Alex Campbell, Oregon Governor's Office

Doug Boren, BOEM Pacific Regional Office Director

Contact Information

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Oregon DLCD

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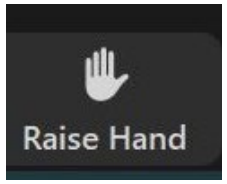
Task Force Meeting Adjourned

Public Input Opportunity

Interested members of the public are encouraged to provide input

Process Guidelines for Public Input Opportunity

- **Public input opportunity: 4:05 pm**
- **Raise your hand to join the public input queue**



- **The facilitator will call on you when it is your turn to speak. You will then be unmuted.**
  - If you are a phone call-in user, dial *9 on your phone to raise hand
- **Provide your name and affiliation before you speak**
- **When providing input, please:**
  - Respect time limits as assigned
  - Use respectful language