

Oregon Offshore Wind Energy Planning Fisheries Data Review Workshop

August 11, 2021

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Bureau of Ocean Energy Management (BOEM) Pacific Regional Office

Andy Lanier
Oregon Department of Land Conservation and Development (DLCD)

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.*



Agenda

Time	Topic
9:00 am	Welcome
9:05 am	Overview of Oregon offshore wind energy planning
9:15 am	Fisheries data overview
9:50 am	Break
10:00 am	Fisheries datasets in OROWindMap and draft Vessel Monitoring System (VMS) analysis
11:55 am	Next steps



Meeting Participation Tips

Please join audio by either phone or computer, not both.

During data review presentation

- Turn off your video and stay on mute
- Rename yourself to include your organization/affiliation

During the public input section, use “Raise Your Hand” button to get in the queue; if joined by phone, press *9 to raise hand

- Facilitator will call on you
- Turn on your video
- Say your name and affiliation before speaking

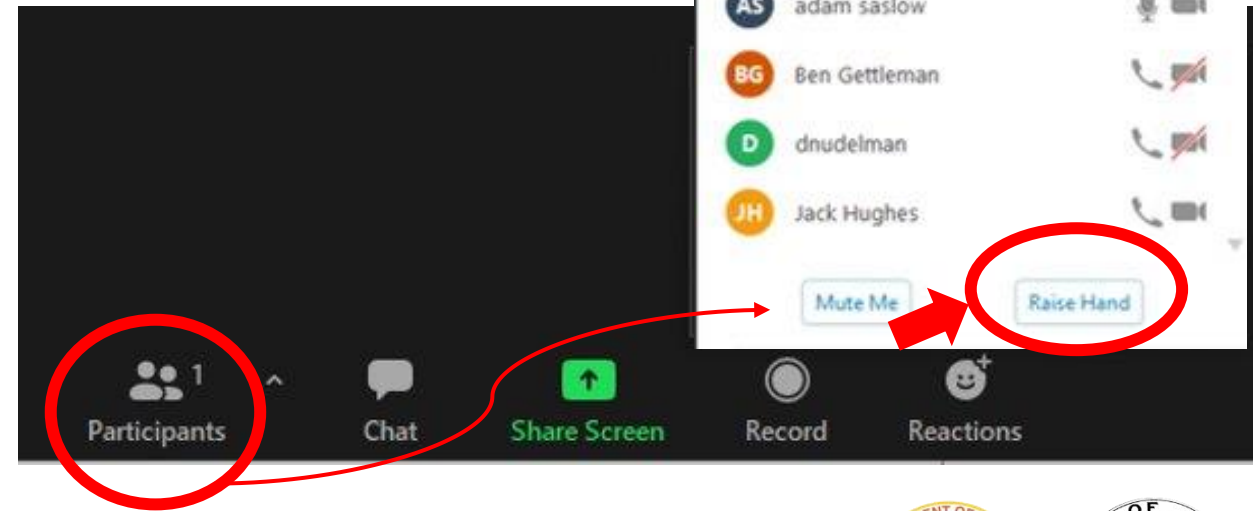
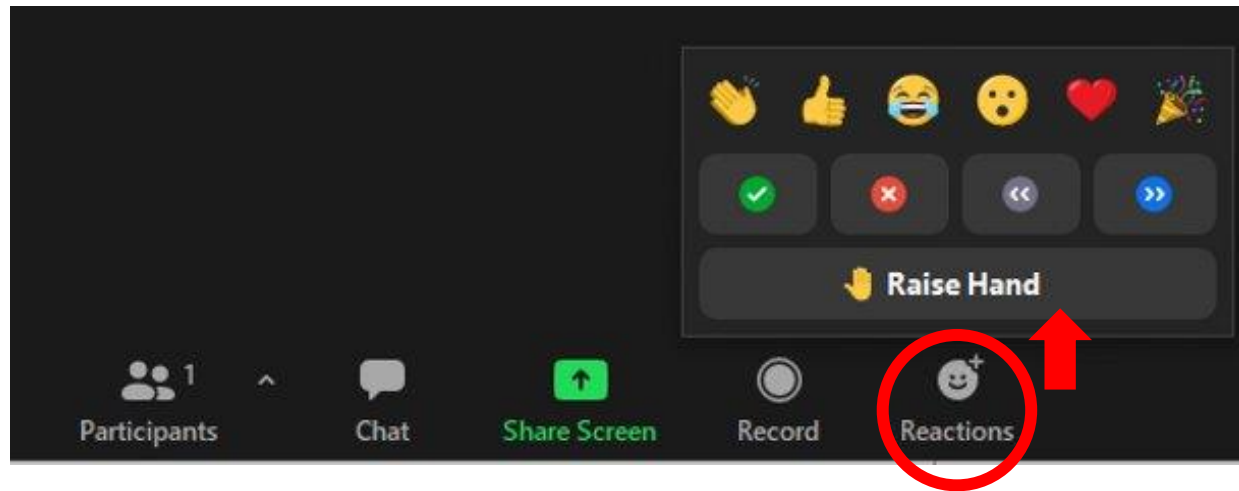
For Zoom technical issues, email aDahlin@kearnswest.com or call 541-659-5852

Meeting recording and presentation will be posted at

www.boem.gov/oregon-virtual-meeting-room

How to Raise Hand

Raise your hand by selecting the reactions tab or by selecting the “Participants” tab



Meeting Participation Ground Rules

Raise comments for discussion during the public input session.

Be respectful of speaking time during the public input session.

Respect differences of opinion and perspectives.

Listen and speak with respect.



Welcome

**Necy Sumait, Renewable Energy Section Chief
BOEM Pacific Regional Office**



Overview of Oregon Offshore Wind Energy Planning

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



Bureau of Ocean Energy Management (BOEM)



Mission: Manage the development of U.S. Outer Continental Shelf (OCS) energy and mineral resources in an environmentally and economically responsible way.

Jurisdiction on the U.S. West Coast

- Federal waters from 3 to 200 nautical miles (i.e., the OCS)
- Excludes National Marine Sanctuaries

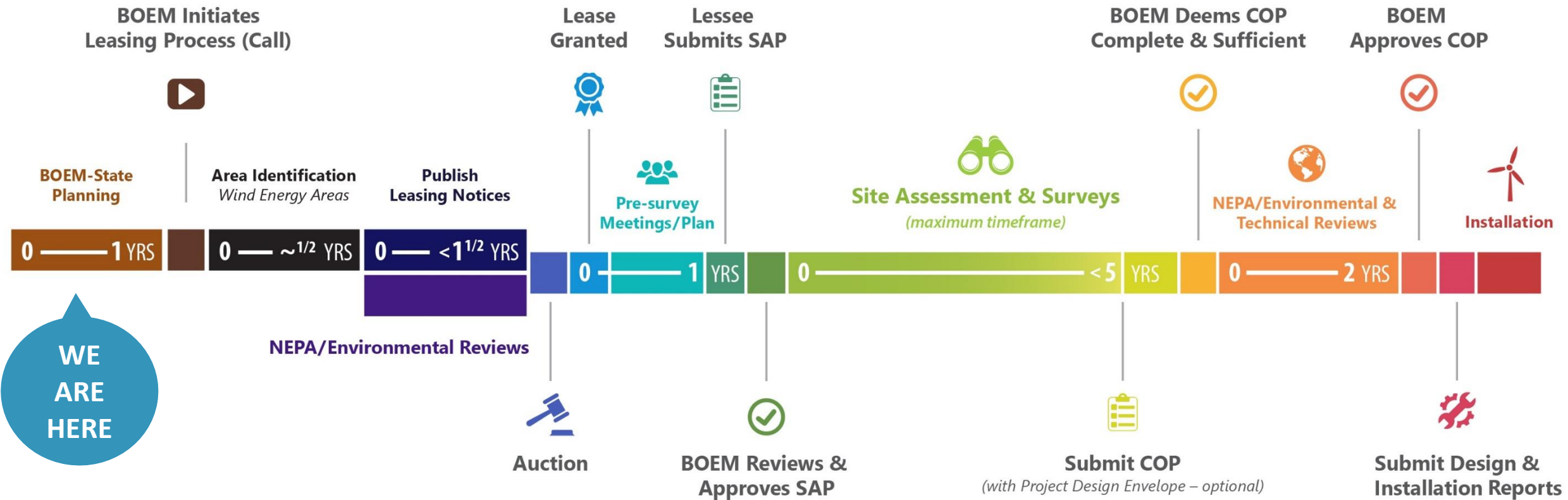
BOEM Offshore Wind Energy Authorization Process

[Planning & Analysis]

[Leasing]

[Site Assessment]

[Construction & Operations]



BOEM Oregon Intergovernmental Renewable Energy Task Force



Provides coordination with governmental bodies and input into BOEM’s renewable energy leasing process

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

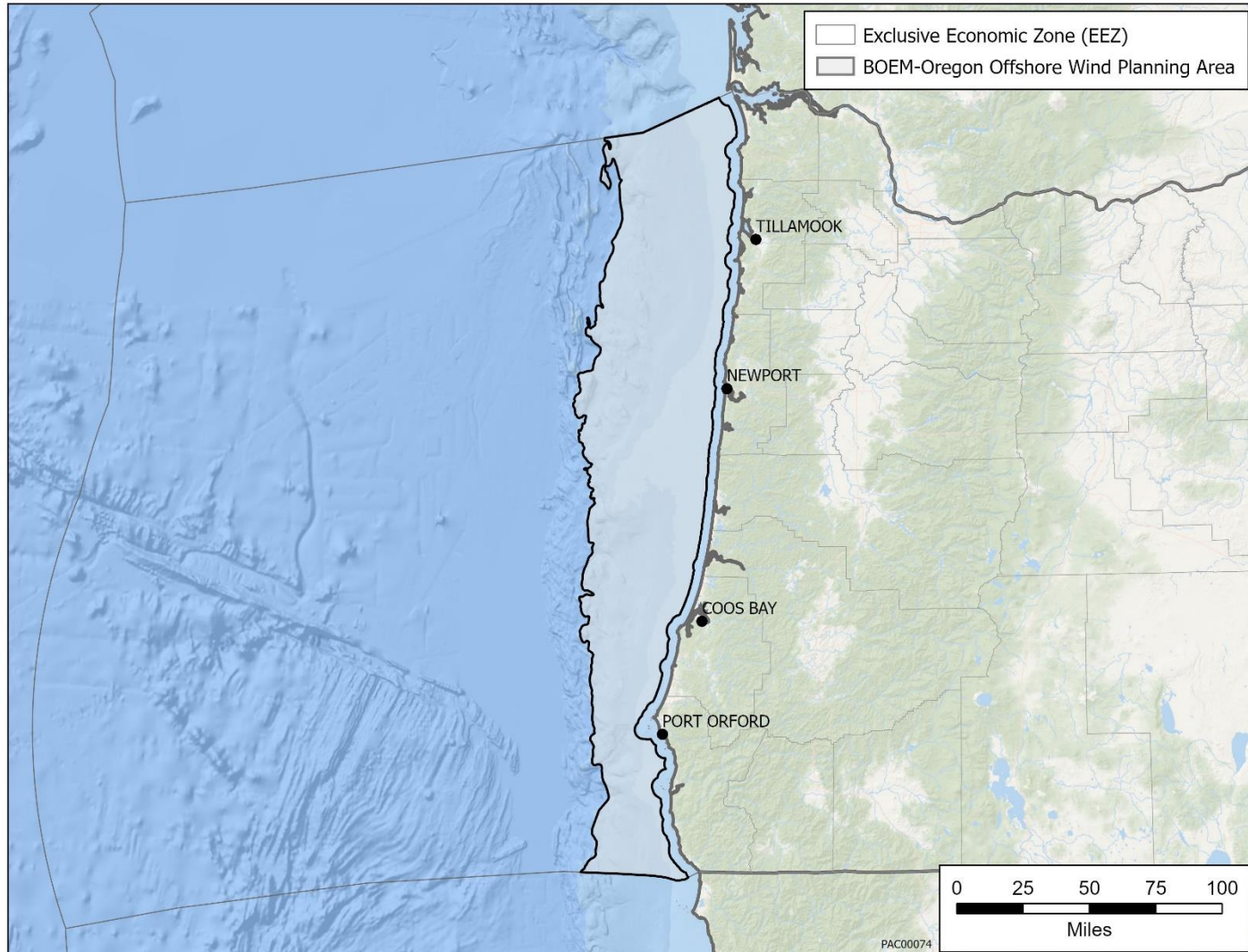
June 2020 meeting: discussed draft plan

- 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”



Oregon Offshore Wind Energy Planning



OROWindMap launched in 2020

Potential Area for Leasing:

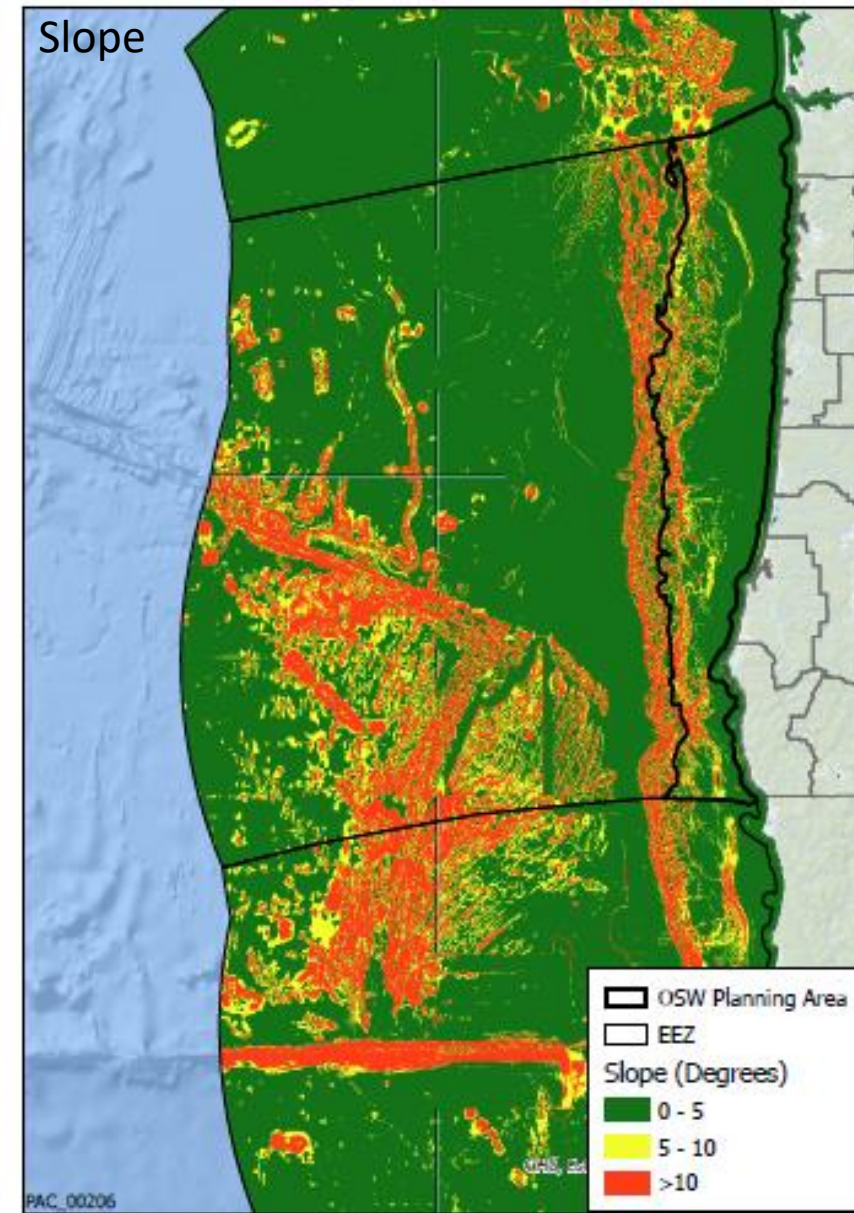
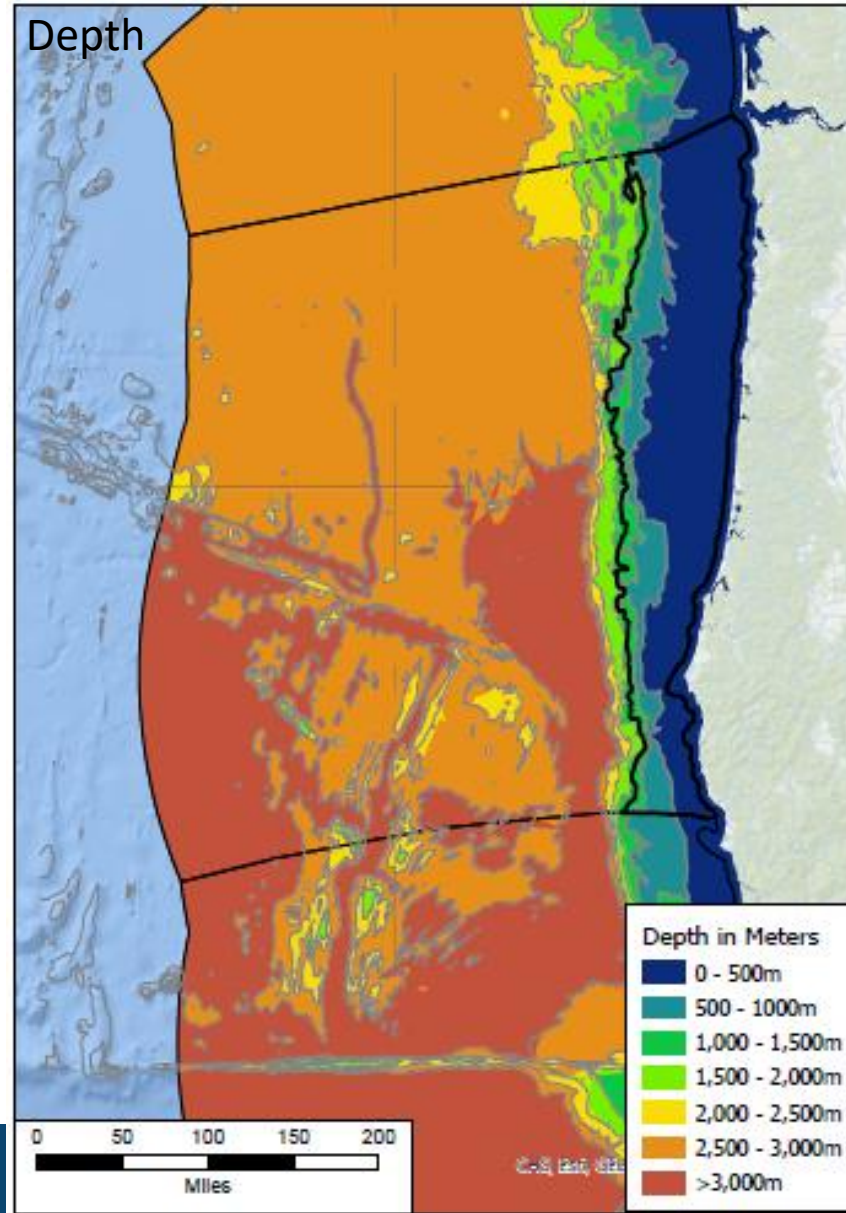
- Federal waters offshore Oregon
- Water depths <1,300 m (4,625 ft)
- Average wind speed >7 m/s (13.6 knots)

Planning Area: State and federal waters, and onshore with pertinent data and information

Depth and Slope

**Bathymetry data
from NOAA**

**Slope derived from
bathymetry**



Oregon Offshore Wind Energy Planning Public Webinars

OROWindMap Introductory Webinar (March 2021)

- Functionality of OROWindMap

Oregon Offshore Wind Energy Planning Public Webinars (May 2021)

- Provide an overview and update of planning effort
- Gather feedback

Data Review Virtual Workshops (August 2021)

- Provide an overview of the datasets in OROWindMap
- Gather feedback/input on datasets
- August 4, 2021 – Physical, human use, and biological data review
 - *Provide written feedback to renewableenergypocs@boem.gov by August 18, 2021*
- Today – Fisheries-related data review
 - *Provide written feedback to renewableenergypocs@boem.gov by August 25, 2021*

Webinar materials and recordings available at www.boem.gov/Oregon



Additional Resources

Selected BOEM-Funded Research

BOEM
Bureau of Ocean Energy Management

Selected BOEM-Funded Research Informing Renewable Energy Offshore Oregon
JUNE 2021

Biological Studies	PAGE 1
Cultural & Archaeological Studies	PAGE 5
Information Synthesis Studies	PAGE 6
Physical Oceanography & Geology Studies	PAGE 7
Resource, Technology & Infrastructure Studies	PAGE 7
Socioeconomic Studies	PAGE 9

Biological Studies

Ongoing (2014-2022) — Potential Impacts of Submarine Power Cables on Crab Harvest
This two-part research effort is to learn more about whether the electromagnetic fields (EMF) emitted from subsea power-transmission cables may affect the movement and harvest of commercial crab species. The first part was conducted by the University of California, Santa Barbara, which collected data on red rock crab in the Santa Barbara Channel and Dungeness crab in Puget Sound. The second part is collecting and analyzing additional data.
Study Profile: <https://www.boem.gov/pc-19-02/>

Ongoing (2014-2021) — Year-round and Diel Patterns in Habitat-use of Seabirds off Oregon
This study by Oregon State University and the U.S. Geological Survey will provide information about the distribution, movements and behaviors of Oregon seabirds and identify patterns in their habitat use 24/7. New data collected with state-of-the-art tracking devices will be integrated with existing data to map and predict the distribution of species and their potential vulnerability to renewable energy devices.
Study Profile: <https://www.boem.gov/pc-14-03/>

Ongoing (2016-2021) — Analysis of Long-term Seabird Colony Legacy Data in the Pacific Northwest as a Regional Baseline
This study by the U.S. Fish and Wildlife Service is summarizing data regarding the abundance and distribution of birds in seabird breeding colonies along the coasts of Oregon and Washington. It will provide an environmental baseline against which to evaluate potential effects of offshore energy projects on seabird colonies and populations.
Study Profile: <https://www.boem.gov/pc-16-06/>

Ongoing (2019-2022) — Development of Computer Simulations to Assess Entanglement Risk to Whales and Leatherback Sea Turtles in Offshore Floating Wind Turbine Moorings, Cables, and Associated Derelict Fishing Gear Offshore California
This study, in partnership with the National Oceanic and Atmospheric Administration's National Centers for Coastal Ocean Science, will develop morphologically accurate 3-D computer models of protected whale species (fin and humpback) and leatherback sea turtles. These models will be run through simulations that incorporate behavioral data, as well as the physical and technical attributes of the ocean environment and gear configurations, to simulate the potential interactions of these protected species with offshore floating wind turbine moorings, power cables, and associated derelict fishing gear. These simulations will assess the risk and potential severity of entanglement in varied scenarios, and potentially identify mitigation measures to reduce the risk. Although the study area is offshore California (specifically, in the vicinity of one or more of the Cal Areas for offshore wind energy), the study findings may inform other areas along the West Coast and Hawaii.
Study Profile: <https://www.boem.gov/pr-19-ent-profile/>

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Technology Overview Webinar

NREL
NATIONAL RENEWABLE ENERGY LABORATORY

Overview of Floating Offshore Wind

Walt Musial
Offshore Wind Research Platform Lead
National Renewable Energy Laboratory
February 26, 2020

Available at www.boem.gov/Oregon

Fisheries Data Overview

Andy Lanier, DLCD

Jon Bonkoski, Ecotrust

Brian Corrigan, NOAA Office of Law Enforcement

Frank Pendleton, BOEM



Fisheries Data to Support Oregon Offshore Wind Energy Planning

Andy Lanier, Marine Affairs Coordinator
Oregon Department of Land Conservation and Development



Ocean Planning in Oregon

Oregon's ocean planning framework:

- **Statewide Planning Goal 19, Ocean Resources**
(mandates protection of important marine habitat and fisheries)
- **Oregon Ocean Resources Management Act (ORS 196.405)**
(creates state-ocean governance structure)
- **Ocean Policy Advisory Council** (legislatively established stakeholder advisory body)
- **Oregon Territorial Sea Plan (TSP) – Rocky Habitats (Part 3), Subsea Cables (Part 4), Marine Renewable Energy (Part 5)**
(TSP contains specific enforceable policies for state ocean management)
- **CZMA Review Authority for Marine Renewable Energy** (through a GLD)



Offshore Wind Data Catalog Organizational Plan

Oregon Data Catalogs

+

Federal Data Catalogs



Curated Offshore Wind Catalog

Coastal and Marine Data

Oregon Coastal Atlas



Oregon Statewide GIS Data Catalog

Oregon Spatial Data Library



Oregon Ocean Information



Oregon Explorer (ORES A Project)



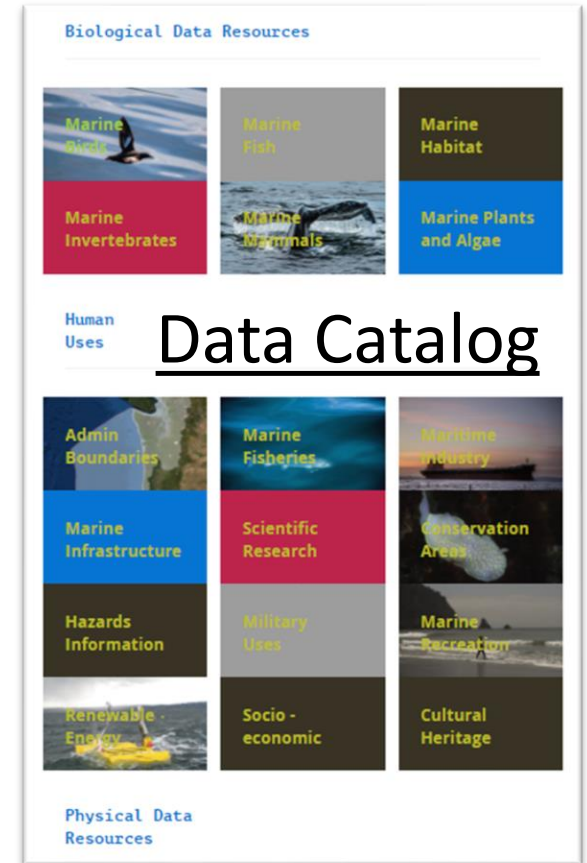
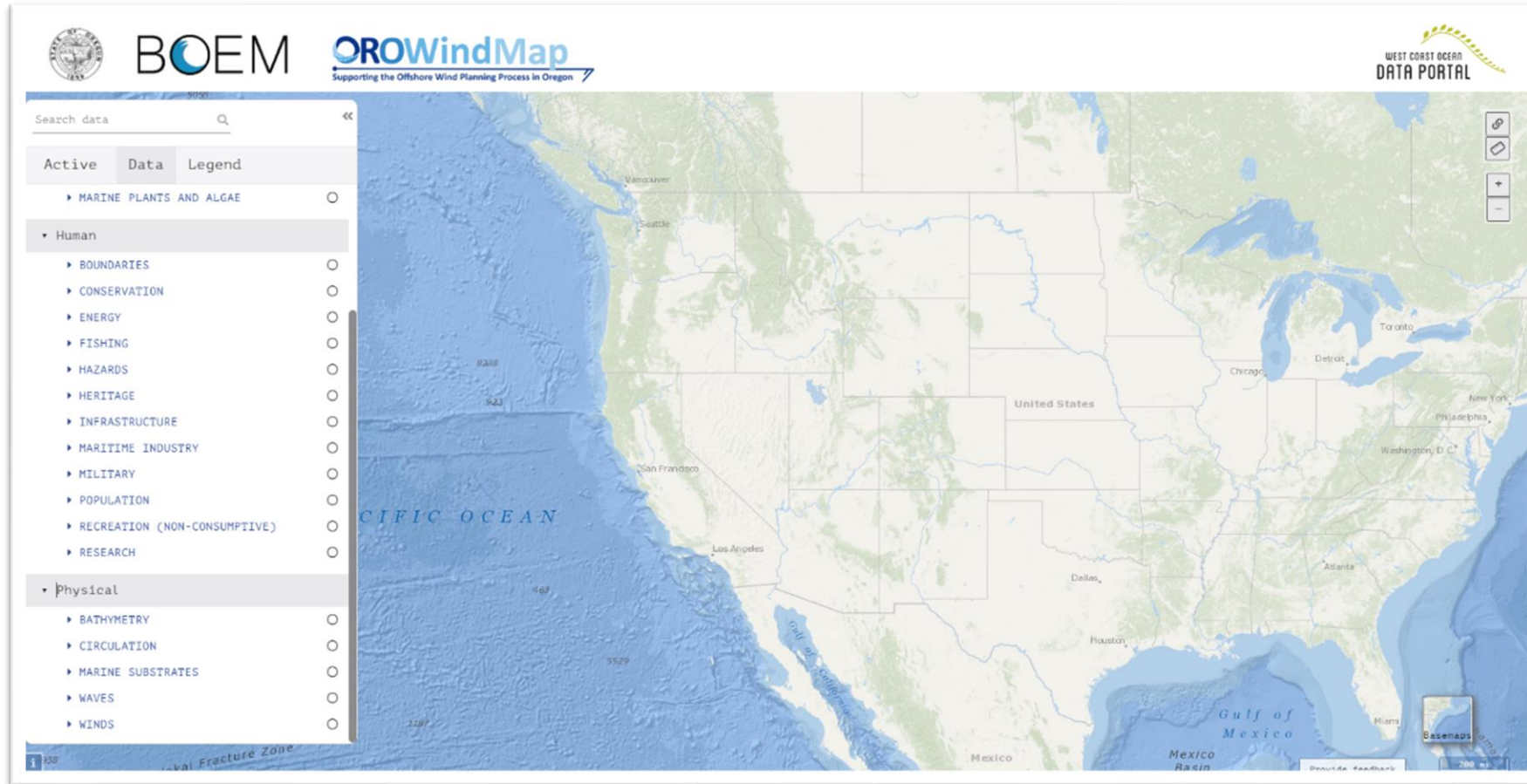
Marine Cadastre
Ocean Reporting Tool
Digital Coast
NOAA Fisheries (FRAM)
NREL Data Catalog
Ocean Observing Initiative
USGS
...and many more



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

Offshore Wind Data Visualization Tool and Data Catalog

The Oregon Offshore Wind Mapping Tool (OROWindMap), found at <https://offshorewind.westcoastoceans.org>, has been developed to provide visualization capabilities for data that has been discovered through the catalog compiled and curated on the West Coast Ocean Data Portal.

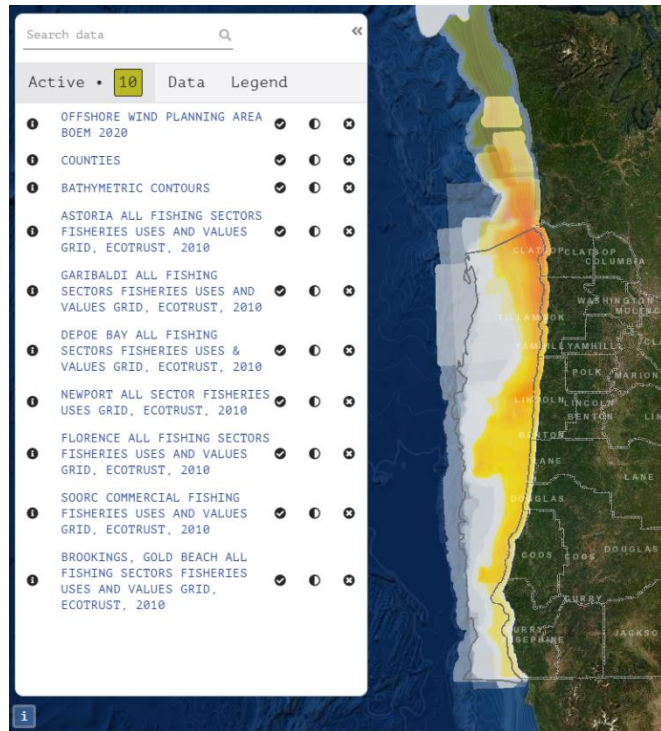


Human Use Data

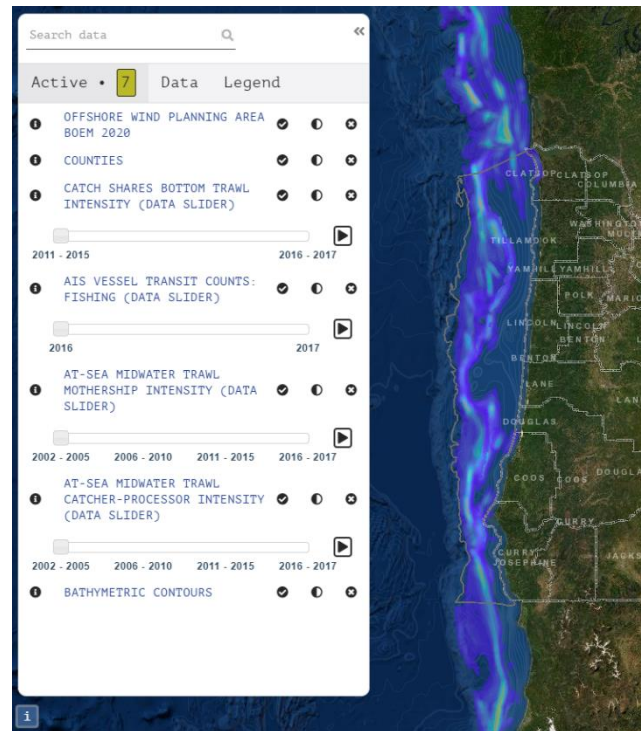


Marine Fisheries Data Catalog Review

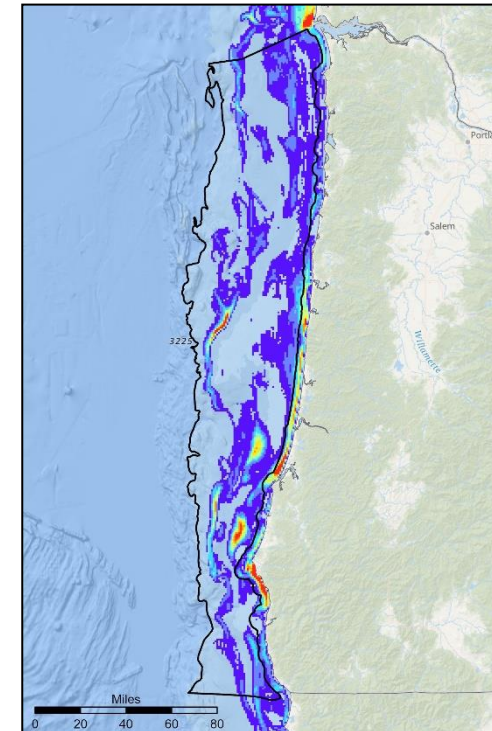
TSP Part Five



NOAA Fisheries (FRAM)



BOEM VMS Analysis (Draft Products)



Mapping Fisheries Uses and Values for Oregon's Territorial Sea Plan Revision

PRESENTED BY
Jon Bonkoski
Knowledge Systems Program Director

Ecotrust

Project Background

- In 2010, Oregon initiated an amendment process for its Territorial Sea Plan (TSP) focused on developing policies to guide the approval of renewable energy facilities.
- The TSP includes Goal 19 (Protects Ocean Resources)
 - To conserve marine resources and ecological functions for the purpose of providing long-term ecological, **economic**, and **social** value benefits to future generations
 - Protect and encourage the beneficial uses of ocean resources--such as navigation, **food production**, **recreation**, aesthetic enjoyment, and uses of the seafloor--provided that such activities do not adversely affect the resources protected—
- Mapping process initiated by fishing community
 - The Southern Oregon Ocean Resources Coalition (SOORC) organized to bring fishing community voice to process

Project Goal

- Comprehensively describe Oregon's commercial and recreational fishing community and incorporate fishermen's knowledge into the development of future amendments to the Oregon Territorial Sea Plan (TSP);
- Develop accurate maps depicting the extent of the local fishing grounds and their stated and economic importance to local fleets (just stated importance for the consumptive recreational fleet)
- Analyze areas of high or valuable use in relation to existing or prospective alternative ocean uses

Methods

Ports to survey:

- Brookings, Gold Beach, Port Orford, Florence, Newport, Depoe Bay, Pacific City, Garibaldi/Tillamook, and Astoria

Data collection period: in-person and online (recreational only)

- December 1, 2009 – August 31, 2010

Quality assurance and control

- Individual and group reviews for accuracy and presentation

Spatial analysis and map products

- Aggregate individual responses
- Map products created based on fishing community and state's needs

Methods

Commercial Sector

- Identify commercial fisheries: Differentiate by fishery and gear type (E.g., Crab, rockfish, sablefish, halibut, salmon, hagfish, urchin, and trawl fisheries)
- Goal was to represent at least 5 fishermen and 50% of the total landings (ex-vessel revenue) from 2004-2008 in each fishery, gear type, and port complex combination.

Charter/Recreational

- Recreational sectors: dive, kayak, private vessel
- Target fisheries – salmon, Dungeness crab, rockfish, Pacific Halibut, abalone (dive), shrimp/prawn, and flatfish
- We attempted to capture all the charter and six-pack operations in each of the port group

Fisheries by Sector

Commercial (Species - Gear Type)	Charter	Recreational
Dungeness Crab - Trap	Albacore Tuna	Private Vessel & Kayak
Hagfish - Trap	Dungeness Crab	Dungeness Crab
Pacific Halibut - Longline	Pacific Halibut	Pacific Halibut
Petrale Sole - Bottom Trawl	Rockfish	Rockfish/Bottomfish
Pink Shrimp - Trawl	Salmon	Salmon
Rockfish - Hook and Line (dead)		Flatfish
Rockfish - Hook and Line (live)		
Rockfish - Longline (dead)		Dive
Rockfish - Longline (live)		Dungeness Crab
Rockfish - Trap		Rockfish/Bottomfish
Sablefish - Longline		Flatfish
Sablefish - Trap		Abalone
Salmon - Troll		Scallops
Sardine - Net (Seine)		Clams
Seaward RCA Trawl		Other shellfish
Shelf Bottom Trawl		
Tuna – Troll*		
Urchin – Dive		
Whiting - Midwater Trawl*		

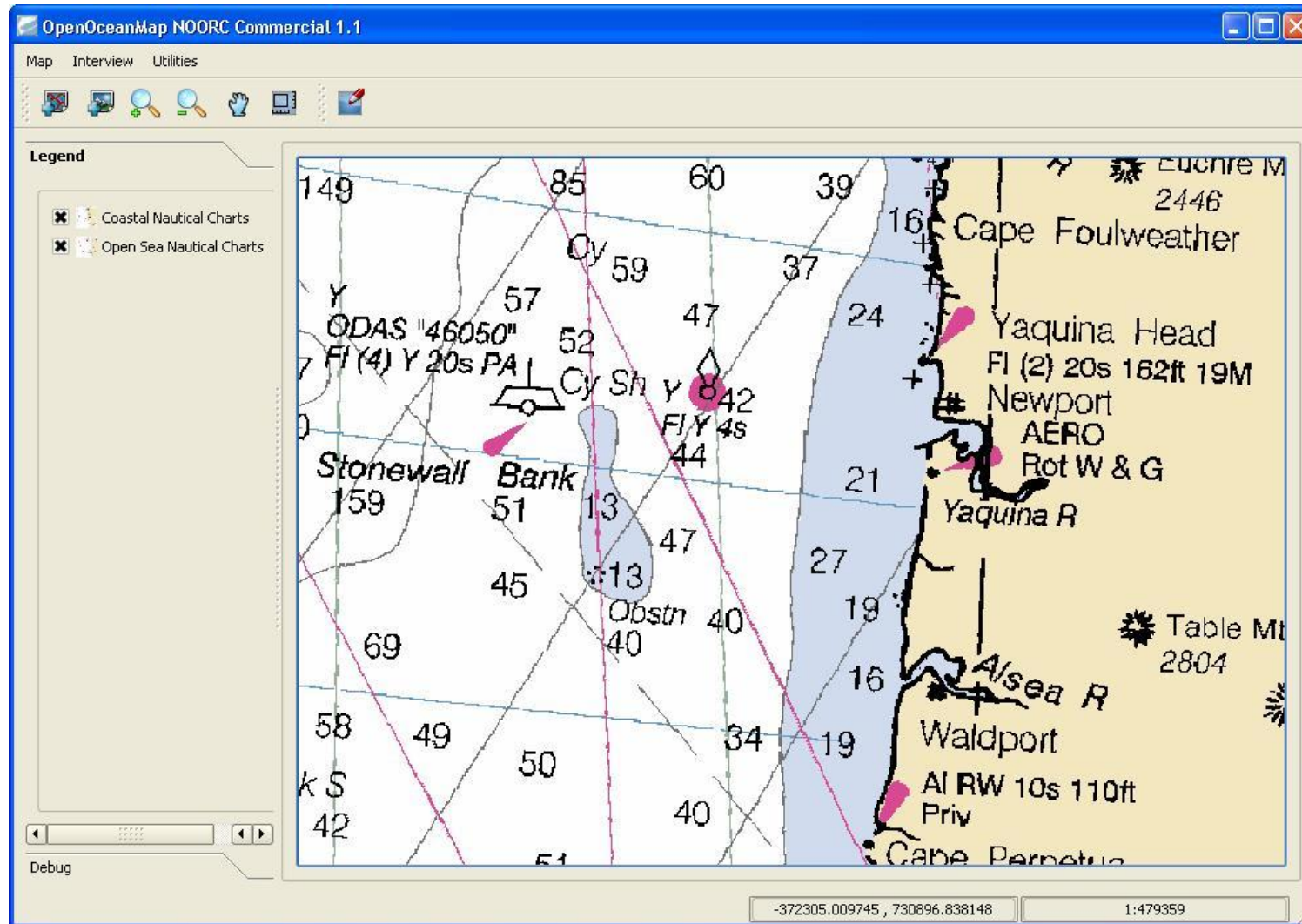
Total participation by sector
 Commercial Fishing: 244
 Charter: 63
 Private recreational: 237

Methods: interview process

- Fishermen **identified all fishing areas/locations that were of economic importance** over their cumulative fishing experience
- Fishermen **ranked these areas using a weighted percentage** — by allocating 100 points that they distribute over the fishing grounds (100 points per fishery)
- Also collected voluntary non-spatial information pertaining to demographics, fishing characteristics, and socioeconomic data

	Port	Dungeness Crab – Trap	Hagfish - Trap	Pacific Halibut - Longline	Petrale Sole - Bottom Trawl	Pink Shrimp - Trawl	Rockfish - Hook & Line (dead)	Rockfish - Hook & Line (live)	Rockfish - Longline (dead)	Rockfish - Longline (live)	Rockfish - Trap	Sablefish - Longline	Sablefish - Trap	Salmon - Troll	Sardine - Net (Seine)	Seaward RCA Trawl	Shelf Bottom Trawl	Tuna - Troll	Urchin - Dive	Whiting - Midwater Trawl	Dungeness Crab	Flatfish	Pacific Halibut	Rockfish	Salmon	
Commercial	Astoria	X		X	X	X	X					X		X		X	X	X		X						
	Garibaldi	X		X		X	X	X				X		X			X	X								
	Depoe Bay	X					X	X						X					X							
	Newport	X	X	X	X	X	X	X				X	X	X		X	X	X		X						
	Florence	X		X								X	X	X				X								
	Coos Bay/Charleston/Winchester Bay	X	X	X	X	X	X	X	X			X	X	X		X	X	X	X	X						
	Port Orford	X	X	X			X	X	X	X		X		X				X	X							
	Gold Beach/Brookings	X			X	X	X	X	X			X	X	X		X		X	X							
Charter	Astoria																				X		X	X	X	
	Depoe Bay																				X		X	X	X	
	Newport																				X		X	X	X	
	Florence																				X		X	X	X	
	Coos Bay/ Charleston/Bandon/ Winchester Bay/Reedsport																					X		X	X	X
	Gold Beach/Brookings																					X		X	X	X
Private vessel	Astoria																				X	X	X	X	X	
	Garibaldi																				X		X	X	X	
	Salmon River																				X		X	X	X	
	Depoe Bay																				X		X	X	X	
	Newport																				X	X	X	X	X	
	Florence																				X		X	X	X	
	Coos Bay/Charleston/Bandon/ Winchester Bay/Reedsport																					X		X	X	X
	Gold Beach/Brookings																					X		X	X	X

Open OceanMap Tool



Step 1: Collect data on fishing characteristics

The screenshot displays the OpenOceanMap NOORC Commercial 1.1 interface. A central dialog box titled "OpenOceanMap - Interview" is overlaid on a nautical chart. The dialog box contains the following fields:

Section	Field	Value
Interviewee	First Name	John
	Last Name	Smith
	Age	48
	Gender	Male
	City of residence	Florence
Interviewer	Interview Date (mm/dd/yyyy)	04/02/2010
	First Name	Cheryl
	Last Name	Chen
	Interviewer Mood	10
Commercial Fishing Information	Years experience	30
	% income from fishing	100
	Home Port	Newport
	Landing Port 1	Newport
Landing Ports	Landing Port 2	Florence
	Landing Port 3	
	Landing Port 4	

Buttons: Cancel, Select Fishery

Legend: Coastal Nautical Charts, Open Sea Nautical Charts

Debug: Starting Interview Dialog...

Coordinates: -296466.629498 , 749464.018843 1:368912

Step 2: Select the fishery to map

The screenshot shows the OpenOceanMap NOORC Commercial 1.1 interface. The main window displays a nautical chart of the Portland, Oregon area, including the Willamette River and Tillamook Bay. A dialog box titled "OpenOceanMap - Select Fishery" is open in the center, allowing the user to select a fishery and enter related data.

Legend

- Coastal Nautical Charts
- Open Sea Nautical Charts

OpenOceanMap - Select Fishery

Select Fishery :

Percent income from this fish:

Years participating in this fish:

traps owned/hooks used:

Months of fishing effort:

Avg # days fishing per year:

Federal Vessel ID:

State Vessel ID:

Buttons: Finished With Interview, Start Drawing Shapes

Map labels: Portland, Willamette River, Tillamook Bay, Neah Bay, Cape Lookout, Neahhuc Bay, Salem.

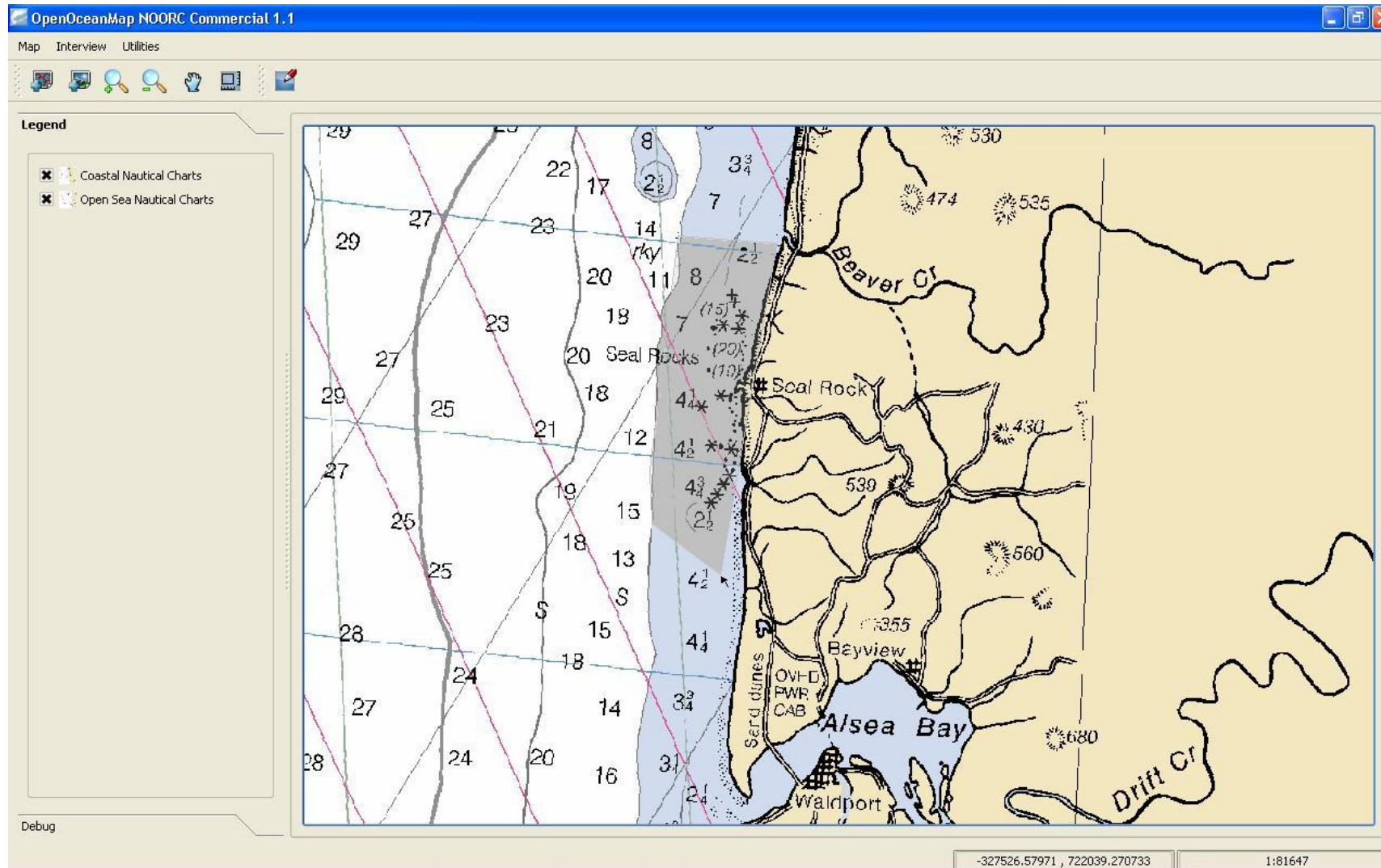
CAUTION
SUBMERGED PIPELINES AND CABLES
Channel submarine pipelines and cables and submarine pipeline and cables shown on this chart.

Debug

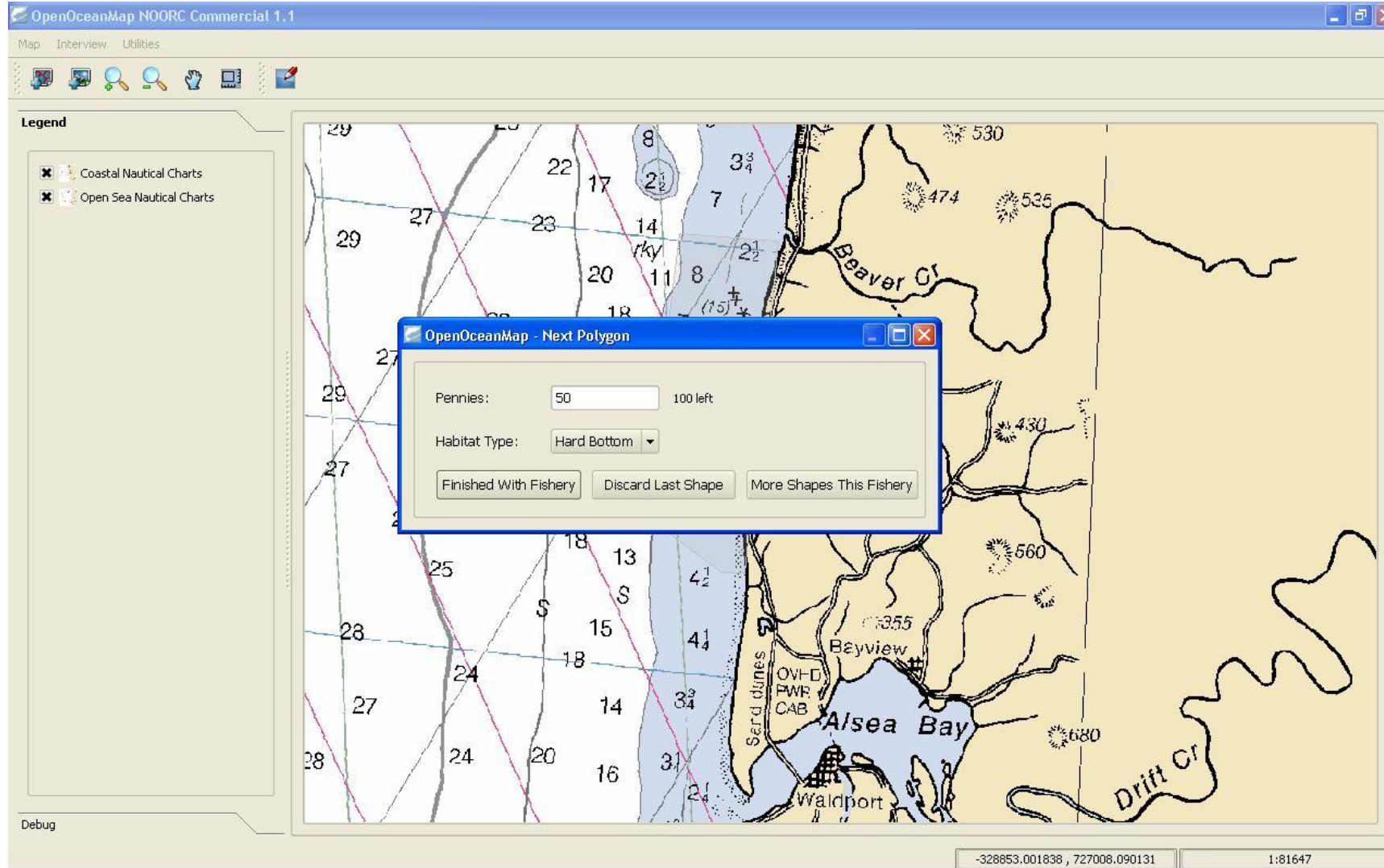
Drawing fisheries

-312207.140086, 837438.2102 1:1181350

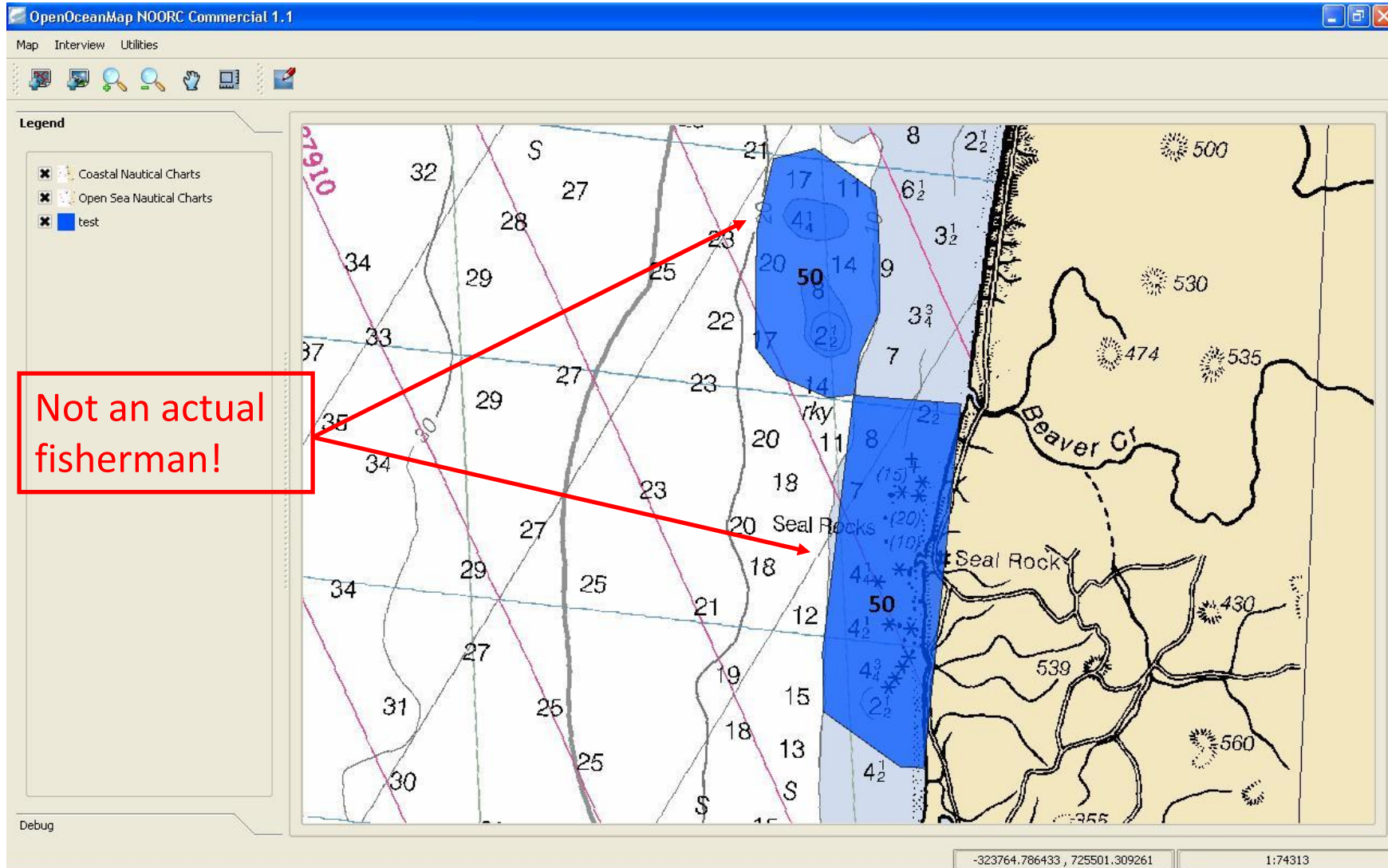
Step 3: Draw fishing area



Step 4: Assign points to fishing area



Repeat steps 1-4 to create a map for each fishery



Recreational Online Survey Tool



[Main Menu](#) | [FAQ](#) | [Sign out](#)

Recreational Fishing Areas and Value in Oregon

Instructions

Complete each section below one at a time. You will be asked to **finalize each section** before moving onto the next. You can logout of the survey at any time and your survey will be saved for you to finish at a later time.

We strongly encourage feedback. If you have technical problems please read our [Frequently Asked Questions](#). If you are finding the online interview too difficult to complete, or have additional questions, please email us at fish@ecotrust.org and we will respond within a few hours if not sooner.

Interview status: in-progress

[Logout and finish later](#)

- ➔ **Main Questions:** Not yet started
 - [Answer questions](#)
- ⊖ **Sport Boat Fishing "Non-charter":** Not yet started
- ⊖ **Kayak or Non-Motorized Vessel Fishing:** Not yet started
- ⊖ **Dive/Spear Fishing:** Not yet started
- ⊖ **Socio-Economic Questions:** Not yet started

The survey is split by sector

Step 1: Answer questions on your fishing characteristics

Step 2: Select the fisheries you fish for

Step 3: Begin mapping

The Map Interface

The screenshot shows a web-based map interface. On the left, a sidebar contains a progress bar with three steps: '1. Select Species', '2. Navigate' (highlighted in orange), and '3. Draw Introduction'. Below the progress bar is an 'Instructions' section with three sub-tasks (a, b, c) and small inset images showing map navigation and the 'Nautical Charts' checkbox. At the bottom of the sidebar are buttons for '<< Go Back' and 'Continue >>'. The main map area shows a satellite view of a coastline with various towns labeled. A 'Go To Main Menu' button is in the top left of the map area. A 'Nautical Charts' checkbox is in the top right. A yellow box highlights the 'Cods Bay' area on the map. At the bottom, the text 'POWERED BY Google' and 'Imagery ©2010 TerraMetrics, NASA, Map data ©2010 Google - Terms of Use' is visible, along with the coordinates '-124.71680, 44.51218'. Three callout boxes are present: one for 'Nautical Chart Layer' pointing to the checkbox, one for 'Navigation Controls' pointing to the zoom and pan buttons on the right side of the map, and one for 'Help Videos' pointing to the '<< Go Back' button.

1. Select Species → **2. Navigate** → 3. Draw Introduction

Go To Main Menu

Nautical Charts

Instructions

First, navigate the map to the general area of your primary *Salmon* fishing ground as a *sport boat fisherman*.

a. To move the map, use the blue arrow buttons. To zoom the map in and out, use the blue '+' and '-' buttons.

b. To turn on 'Nautical Charts' use the selection window on the top right. Click the checkbox to turn them on or off.

c. Get as close as you can to your fishing ground, then press the continue button.

[View Video Demonstration](#)

<< Go Back Continue >>

Seaside
Tillamook
Bea New
McMinnville
Lincoln City
Newport
Florence
Reedsport
Veneta
Cotta Grov
Myrtle C
Myrtle C
Cods Bay
Cascadia
Rosebu
Wira
Bandon
Myrtle Point
Gold Beach
Grants Pass
Cave Junction
Brookings

POWERED BY Google
Imagery ©2010 TerraMetrics, NASA, Map data ©2010 Google - Terms of Use

-124.71680, 44.51218

Nautical Chart Layer

Navigation Controls

Help Videos

GPS Coordinates

Drawing a fishing area

2. Navigate → **3. Draw Introduction** → 4. Penny Introduction

Go To Main Menu Cancel Fishing Ground

Instructions

Draw your first sport boat fisherman *Salmon* fishing ground on the map. (You'll be able to draw more)

- Click once on the map to create the first point.
- Move mouse and click to create a second point.
- Continue tracing being as accurate as you can.
- Double-click the last point to complete your fishing ground.
- If you make a mistake, click the 'Cancel' button at the top.
- You can control the map while you're drawing.

[View Video Demonstration](#)

<< Go Back

If you are unhappy with your area, you may **cancel** it

Are you satisfied with this fishing ground?

Yes No

Verify that you are happy with the area you have drawn before proceeding

Drawing additional areas

You may **draw more areas** as well as **delete previous areas**

2. Navigate → **3. Draw** → 4. Penny Introduction → Go To Main Menu

Instructions

a. **At this time**, finish drawing all of your *Salmon* fishing grounds you target as a sport boat fisherman. Draw them the same way you drew your first.

b. Each of the Salmon fishing grounds you draw can be found in the table below. Click any table row to highlight, remove or zoom to that fishing ground.

c. Click the 'Continue' button when you are satisfied with the fishing grounds you've drawn.

[View Video Demonstration](#)

How do I draw, again?

Your Salmon Fishing Grounds		
▶ 1	✗ Remove	🔍 Zoom To
▶ 2	✗ Remove	🔍 Zoom To

Show All

<< Go Back Continue >>

Selected Shape (#2)

In this section, you can:

- Select areas**
- Delete areas**
- Zoom to areas**
- Zoom to all areas**

Penny Introduction


3. Draw → **4. Penny Introduction** → 5. Allocate Pennies

Instructions

Now imagine you have **100 pennies**. You're going to allocate those pennies over the *Salmon* fishing grounds you just drew. The more pennies you place on a fishing ground, the more value or importance it has to you.

Look over your *Salmon* fishing grounds on the map and think about which are the most important to you. Those are the ones on which you will allocate the most pennies.

Click the 'Continue' button to begin allocating pennies.



The map shows a coastal area with three fishing grounds highlighted in orange. The top ground is labeled '30', the bottom-left ground is labeled '20', and the bottom-right ground is labeled '50'. The map also shows 'Florida State', 'Cape B State A', and 'Cape Blanco State Park'.

<< Go Back Continue >>

Pennies are used to give weights to each area

You have 100 pennies to divvy up between the areas for each species

The more pennies you give an area, the more important it is to you

Penny Allocation

4. Penny Introduction → **5. Penny Allocation** → 6. Finish Species

Go To Main Menu

Instructions

- a. Click 'Edit Pennies' below and give each of your fishing grounds a penny value. You must use all 100 pennies.
- b. Click 'Go Back' if you need to change your fishing grounds.
- c. Click 'Continue' after you have allocated 100 pennies.

[View Video Demonstration](#)

Your Salmon Fishing Grounds

	Pennies		
▶ 1	40	Edit Pennies	Zoom To
▶ 2	25	Edit Pennies	Zoom To
▶ 3	0	Edit Pennies	Zoom To

Show All

Remaining: 35

Status: Incomplete, use all 100 pennies

<< Go Back Continue >>

Select “Edit Pennies” to allocate pennies to each area.

Edit values until you are satisfied

Your Salmon Fishing Grounds

	Pennies		
▶ 1	40	Edit Pennies	Zoom To
▶ 2	25	Edit Pennies	Zoom To
▶ 3	0	Edit Pennies	Zoom To

Show All

Remaining: 35

Status: Incomplete, use all 100 pennies

of your fishing grounds a penny value. You must use all 100 pennies.

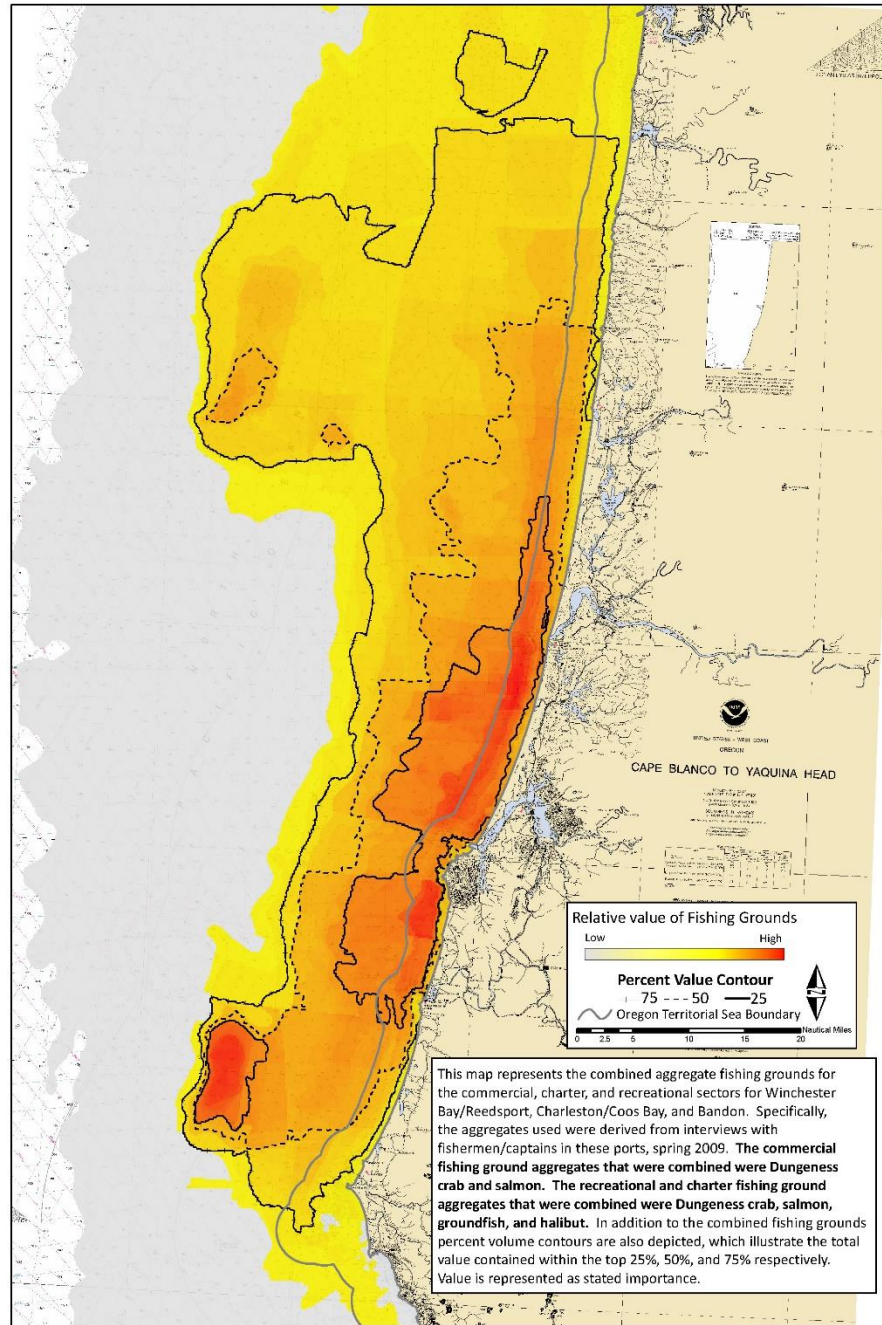
Enter a Penny Value

Pennies: 35 35 available

Save Cancel

Your Salmon Fishing Grounds

	Pennies		
▶ 1	40	Edit Pennies	Zoom To
▶ 2	25	Edit Pennies	Zoom To
▶ 3	0	Edit Pennies	Zoom To



Cross Sector Aggregate Map

Combines all three sectors by:

- 1) Giving equal weight to each fishery in a sector
- 2) Giving equal weight to each sector

- Commercial weighted by ex-vessel revenue
- Charter weighted by gross revenue
- Recreational weighted equally

Max Normalization equation:

$$X_i = (X_y - X_{min}) / (X_{max} - X_{min})$$

i = index value

y = grid cell value



Thank you for joining us

[Ecotrust.org](https://ecotrust.org) | [@ecotrust](https://twitter.com/ecotrust)

Ecotrust

NOAA Fisheries OLE Vessel Monitoring System (VMS) Program



Brian Corrigan

*NOAA Fisheries Office of Law Enforcement – West Coast Division
(OLE-WCD)*

Vessel Monitoring System (VMS)

– **WHAT:**

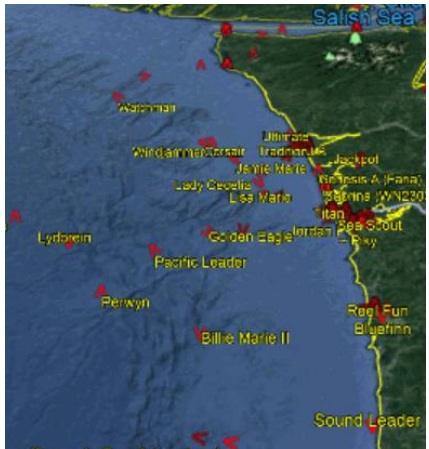
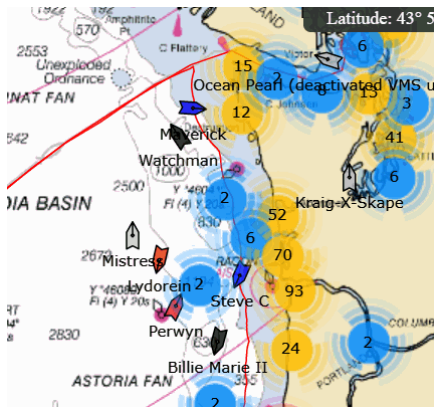
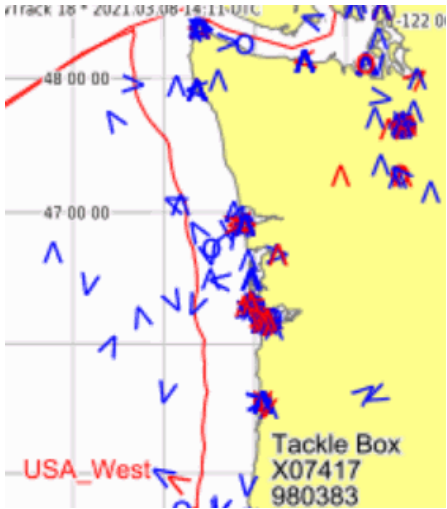
- *24/7/365 monitoring*
- *Variable transmission rate*

– **WHY:**

- *Implemented 2004 under WC Groundfish Regulations*
 - *Enforcement: Conservation Areas*
 - *Fisheries Management: Fishing Effort*

– **HOW:**

- *Satellite based tracking (cellular used in other regions)*
- *vTrack Software (includes AIS data)*
- *Monitored in real time & with remote alarms*
- *No limit to historical data*
 - *Data Confidentiality*



Vessel Monitoring System (VMS)

– WHO:

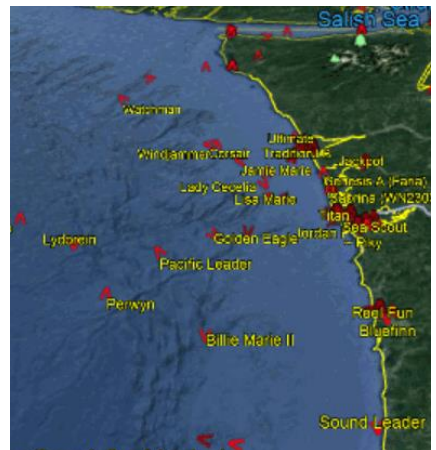
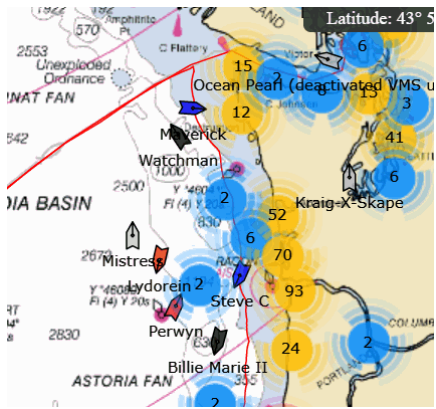
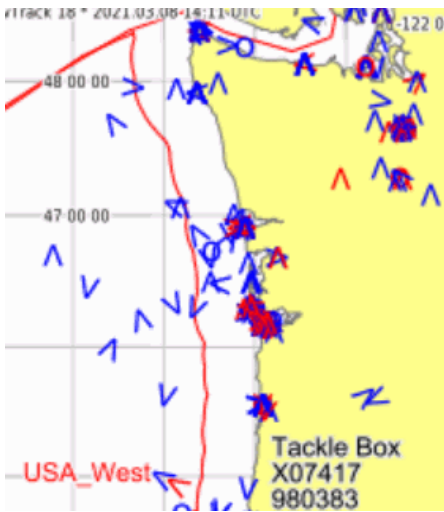
- *Dependent on gear & catch*
 - *1,616 vessels monitored*

– WHEN & WHERE:

- *Underway & In Port*
- *VMS Declarations*
- *VMS Exemptions*

– WHO & WHEN & WHERE ELSE:

- *Non-VMS Vessels*
- *High Seas VMS Vessels*
- *Alaska VMS Vessels*



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VMS Analysis and NOAA Northwest Fisheries Science Center (NWFSC) Observer Program Spatial Data

Frank Pendleton, GIS Specialist
BOEM Pacific Regional Office



Fisheries Datasets

We are asking for your expertise.
Is there...

Another dataset(s) that show where fishing occurs?

A specific concern we should address in our analysis?

Something about a fishery we should consider when analyzing the data?

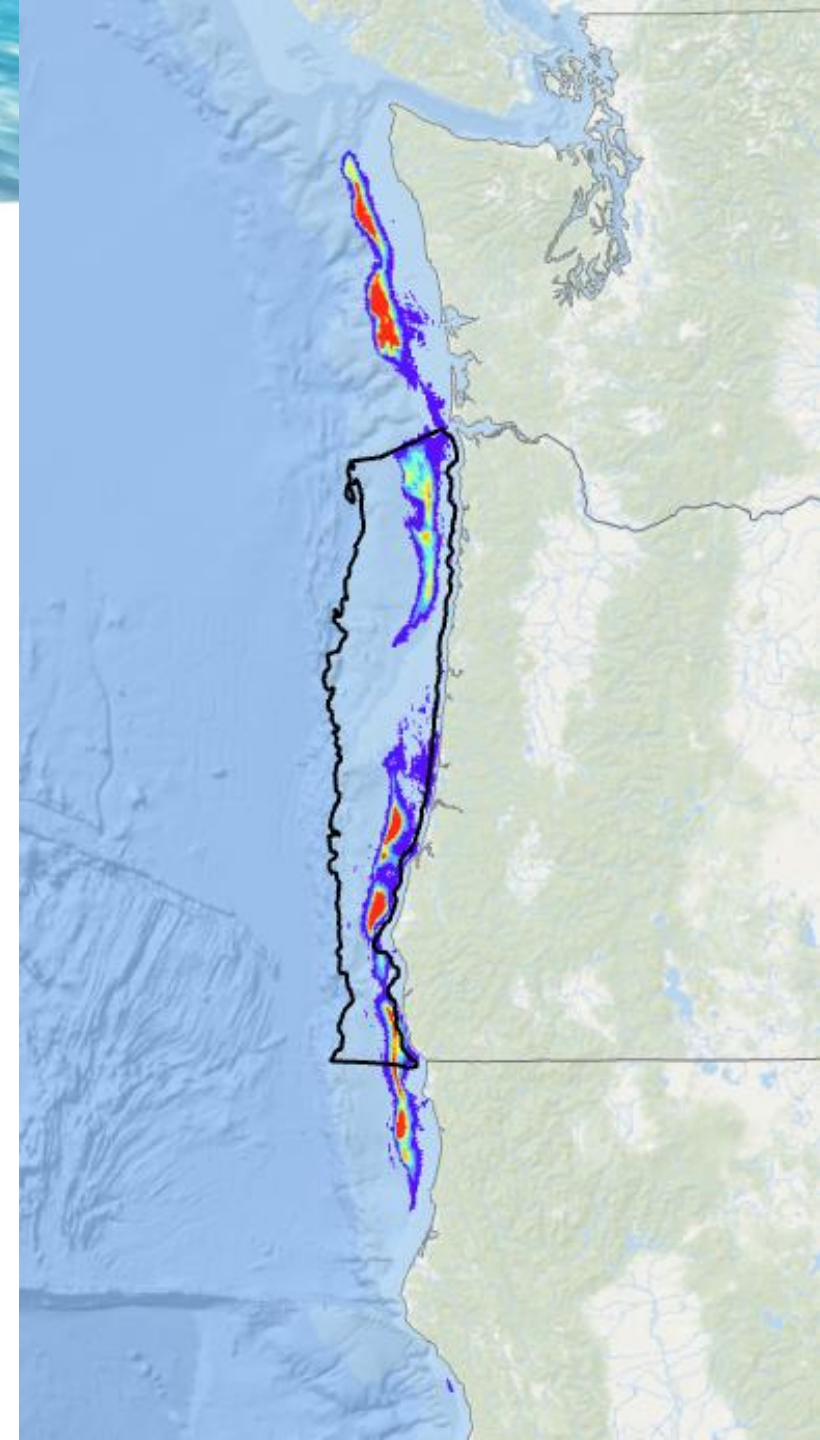
- Fishing speeds vs Transit speeds

- Fishing times

- Big change by year

People/Organizations/Fishing Meetings BOEM and the States should talk to about Offshore Wind Planning or datasets?

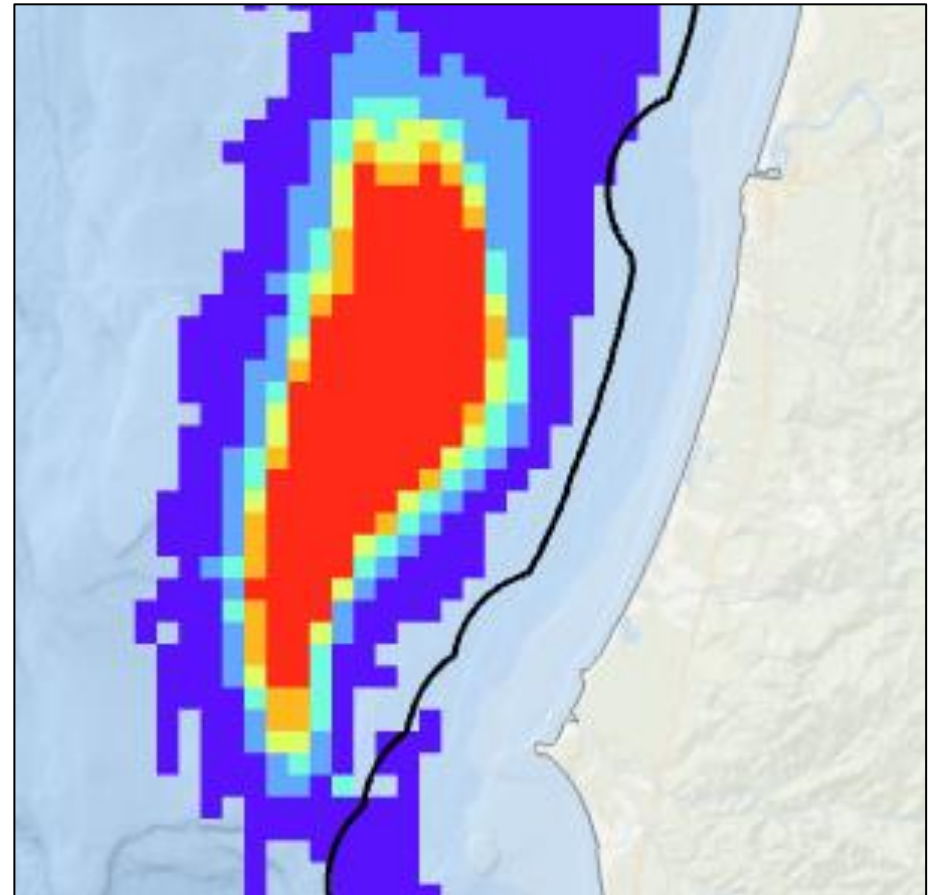
Anything else?



Fisheries Datasets

Extensive data discussions, including with:

- Oregon Dept of Fish and Wildlife
- California Dept of Fish and Wildlife
- NOAA Aquaculture Team
- NOAA Northwest Fisheries Science Center
- NOAA Office of Law Enforcement
- Pacific Fisheries Management Council
- Pacific States Marine Fisheries Commission
- Fishing Commissions



Vessel Monitoring System (VMS)

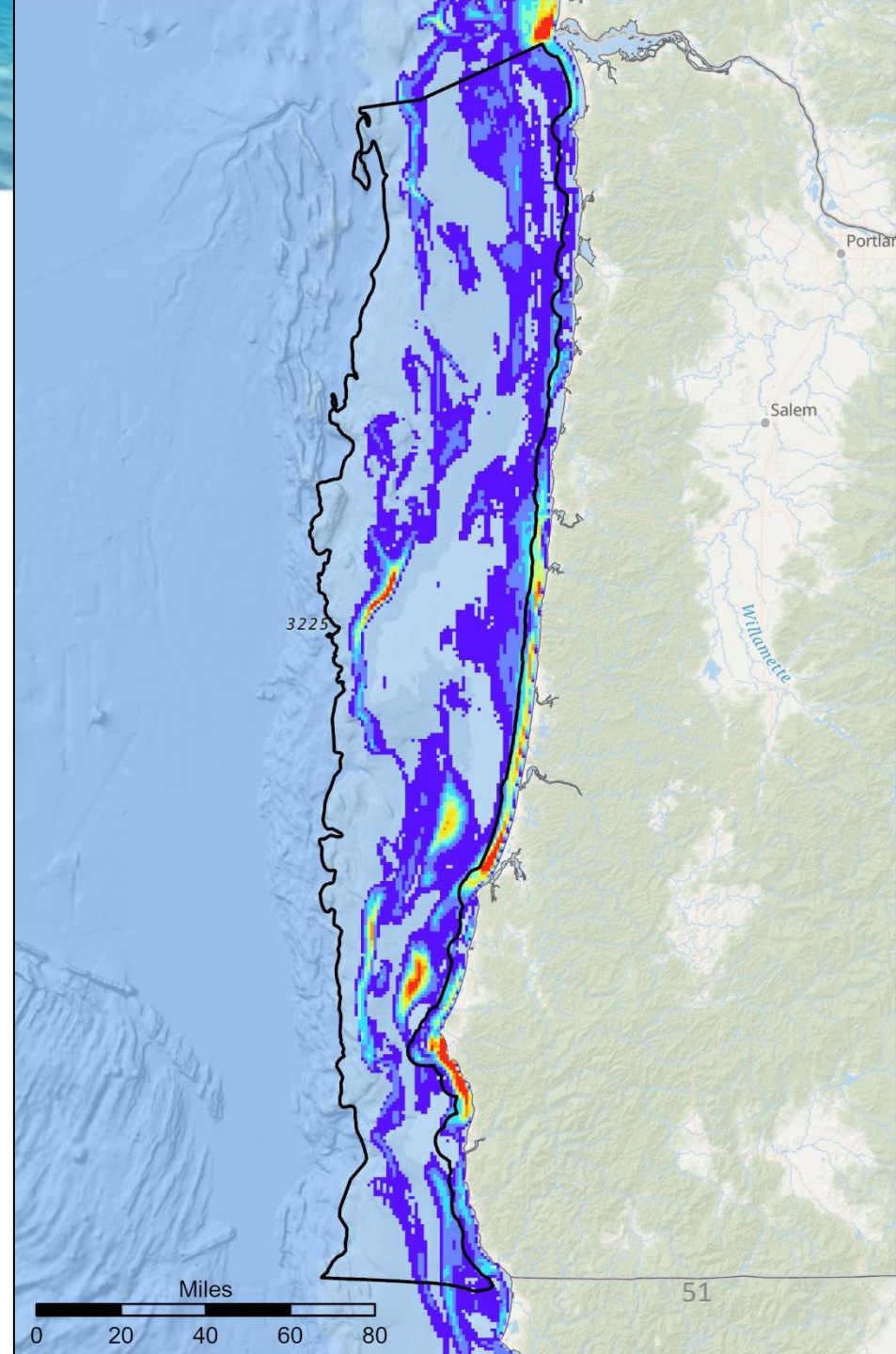
Non-Disclosure Agreement

At least 3 vessels in any block
(Example is AIS data)

Data

Vessel ID
Declaration code
Date Time, Lat/Long, Course, Speed

Our Dataset = 2010 – 2017

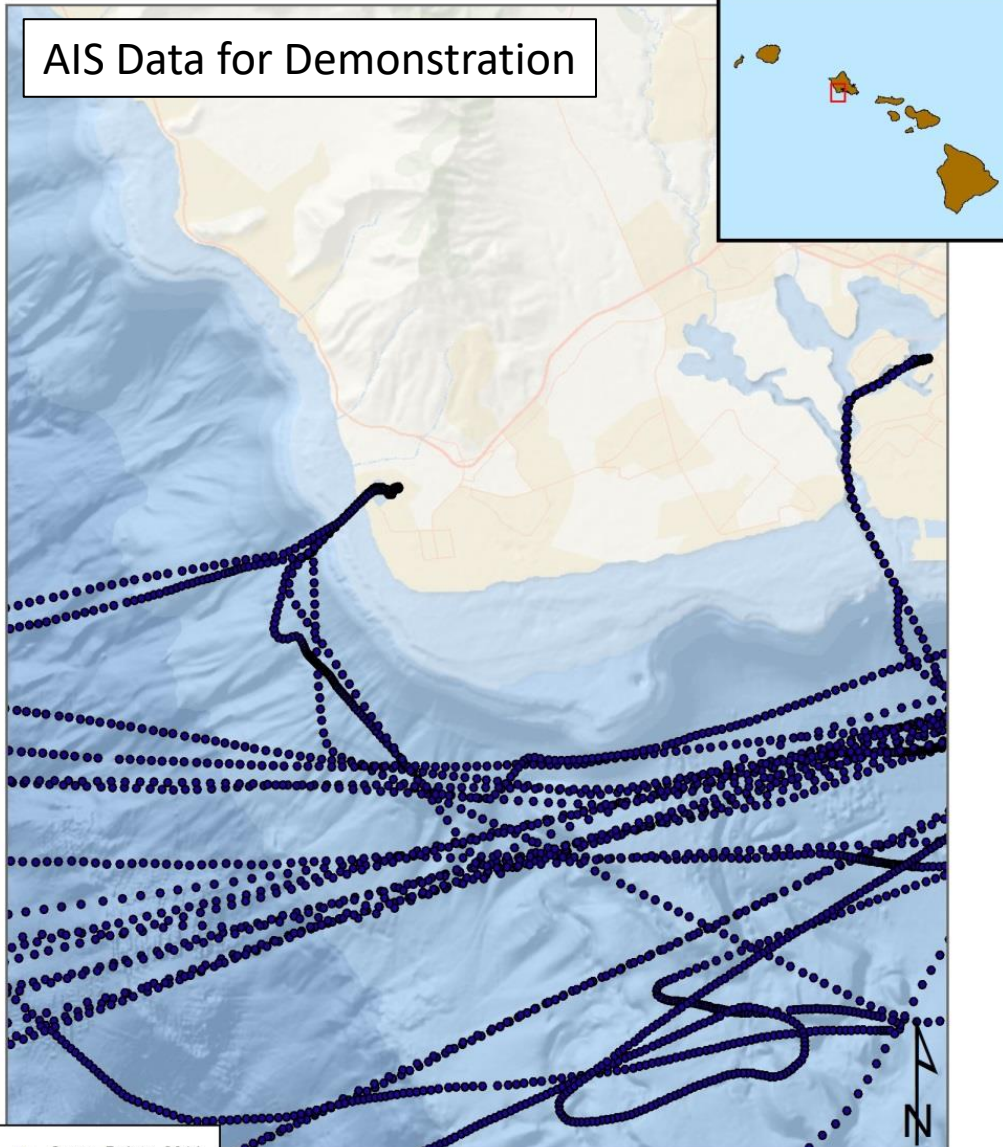


VMS Declaration Codes (West Coast)

Declaration ID	Description
210	Limited entry fixed gear, not including shorebased IFQ
211	Limited entry groundfish non-trawl, shorebased IFQ
220	Limited entry midwater trawl gear, non-whiting shorebased IFQ
221	Limited entry midwater trawl, Pacific whiting shorebased IFQ
222	Limited entry midwater trawl, Pacific whiting catcher/processor sector
223	Limited entry midwater trawl, Pacific whiting mothership sector (catcher vessel or mothership)
230	Limited entry bottom trawl, shorebased IFQ, not including demersal trawl
231	Limited entry demersal trawl, shorebased IFQ
233	Open access longline gear for groundfish
234	Open access groundfish trap or pot gear
235	Open access line gear for groundfish
240	Non-groundfish trawl gear for ridgeback prawn
241	Non-groundfish trawl gear for pink shrimp
242	Non-groundfish trawl gear for California halibut
243	Non-groundfish trawl gear for sea cucumber
250	Tribal trawl gear
260	Open access prawn trap or pot gear,
261	Open access Dungeness crab trap or pot gear
262	Open access Pacific Halibut longline gear
263	Open access salmon troll gear
264	Open access California halibut line gear
265	Open access sheephead trap or pot gear
266	Open access Highly Migratory Species line gear
267	Open access Coastal Pelagic Species net gear
268	Open access California gillnet complex gear

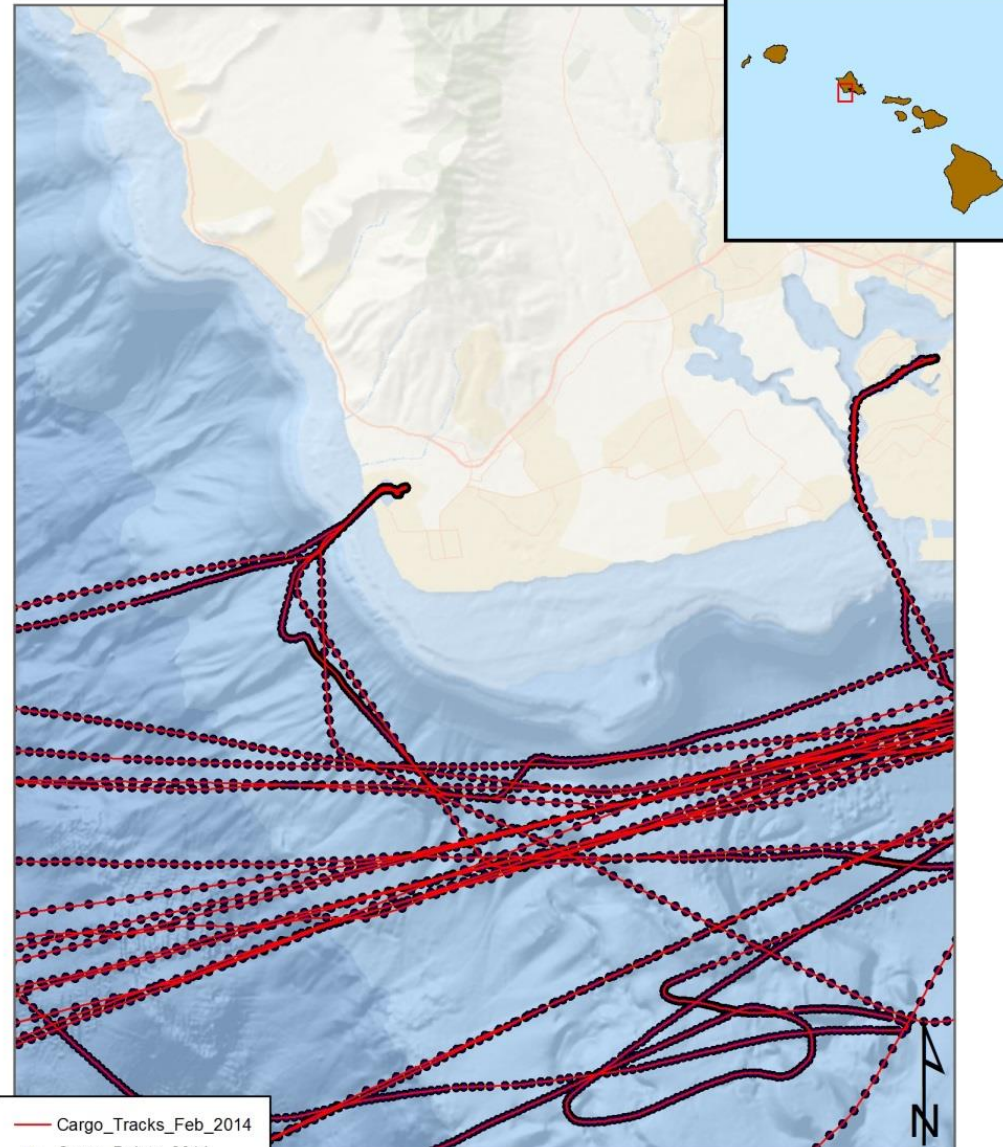
AIS Vessel Traffic

AIS Data for Demonstration



Automatic Identification System (AIS) data downloaded from <http://marinecadastre.gov/ais/>. Point data was converted to tracks, and then summarized by BOEM aliquot (1200m x1200m). Color represents the number of AIS vessels traveling through an aliquot in 2013.

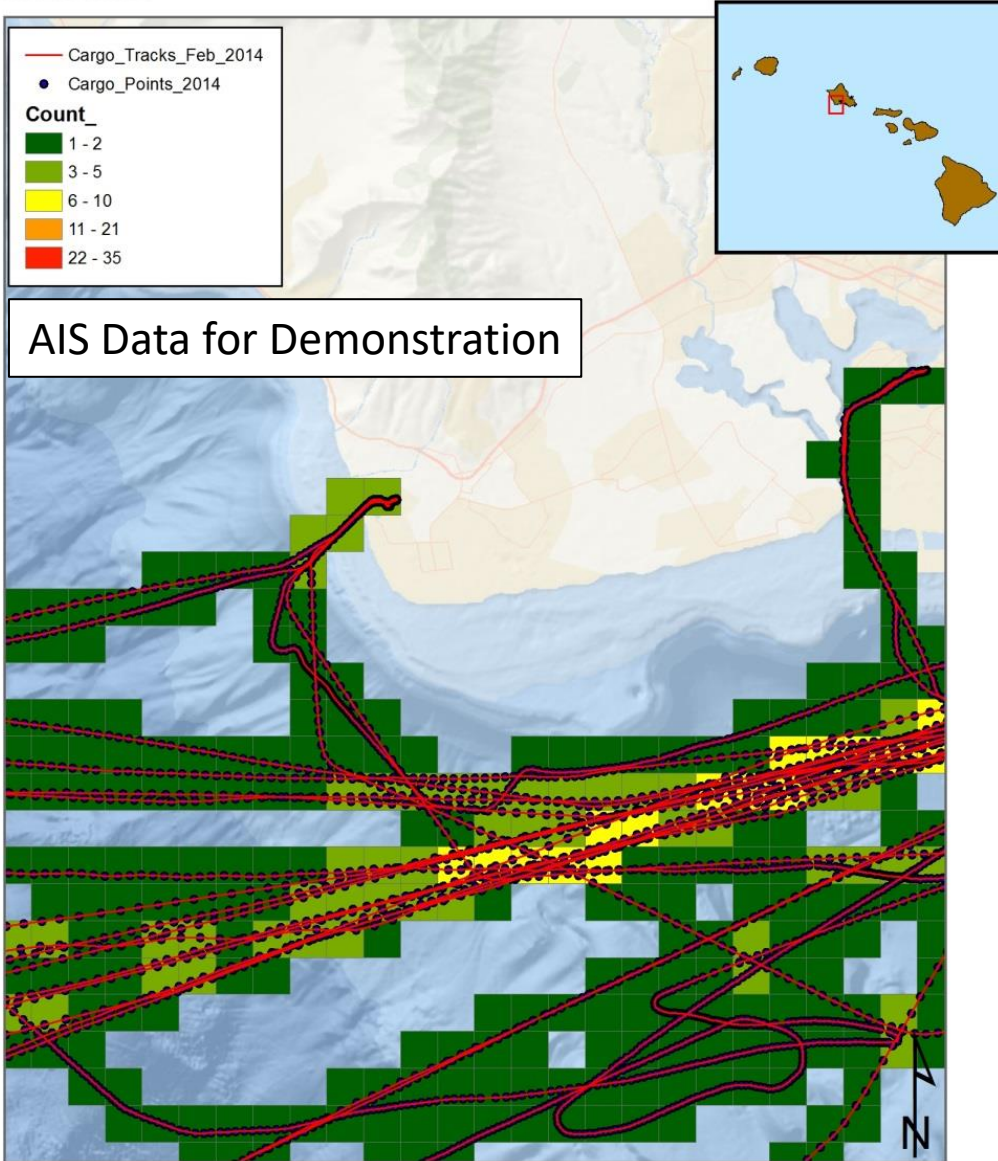
Coordinate System: WGS 84; UTM Zone 4N
Service Layer Credits: Esri, DeLorme, GEBCO, NOAA NGDC, and other
Document Path: H:\GIS\Maps\HawaiiCall\Hawaii Call (AIS 2014) (4-19-16).mxd



Automatic Identification System (AIS) data downloaded from <http://marinecadastre.gov/ais/>. Point data was converted to tracks, and then summarized by BOEM aliquot (1200m x1200m). Color represents the number of AIS vessels traveling through an aliquot in 2013.

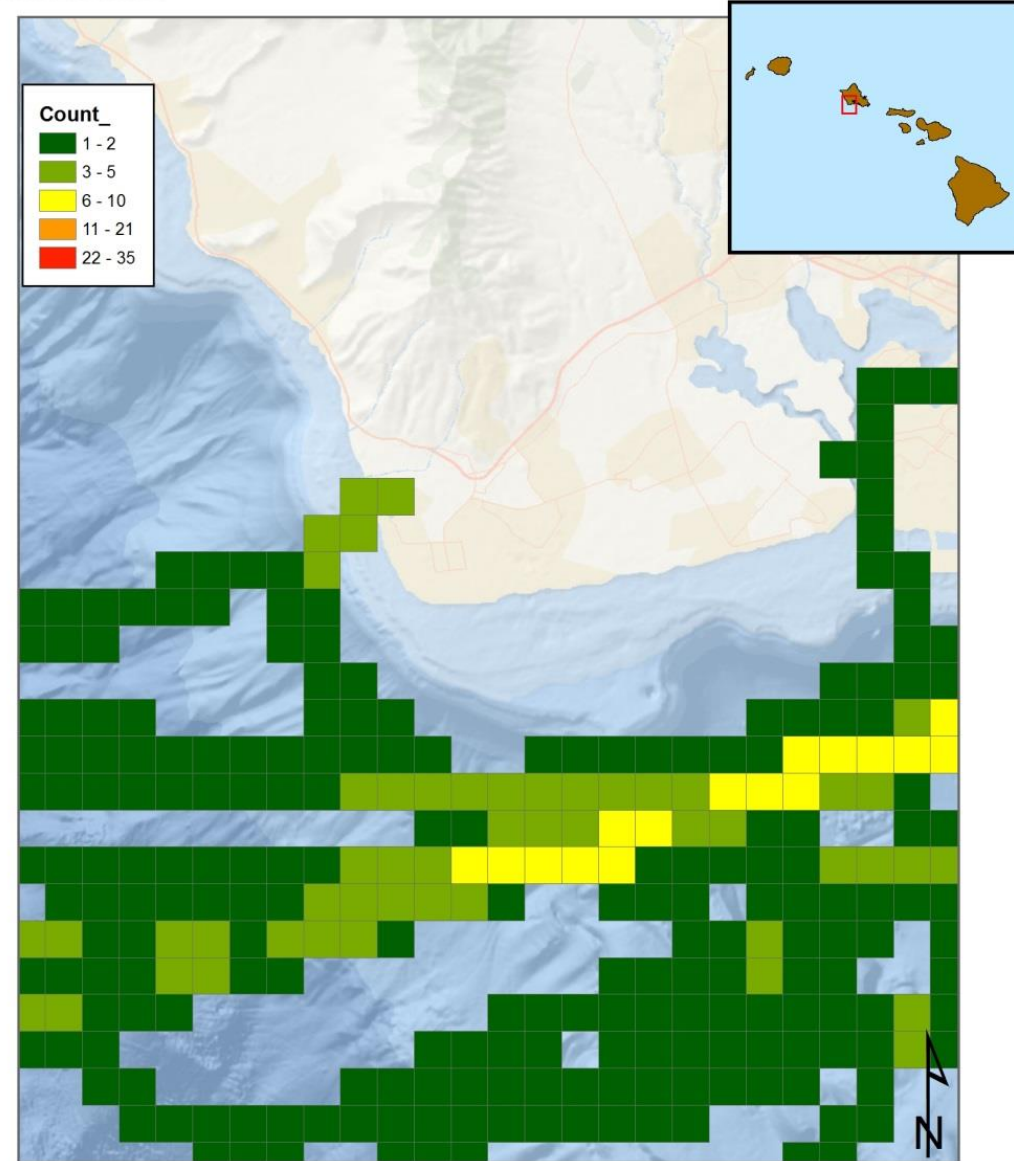
Coordinate System: WGS 84; UTM Zone 4N
Service Layer Credits: Esri, DeLorme, GEBCO, NOAA NGDC, and other
Document Path: H:\GIS\Maps\HawaiiCall\Hawaii Call (AIS 2014) (4-19-16).mxd

AIS Vessel Traffic



Automatic Identification System (AIS) data downloaded from <http://marinecadastre.gov/ais/>. Point data was converted to tracks, and then summarized by BOEM aliquot (1200m x1200m). Color represents the number of AIS vessels traveling through an aliquot in 2013.

Coordinate System: WGS 84: UTM Zone 4N
 Service Layer Credits: Esri, DeLorme, GEBCO, NOAA NGDC, and other
 Document Path: H:\GIS\Maps\HawaiiCall\Hawaii Call (AIS 2014) (4-19-16).mxd



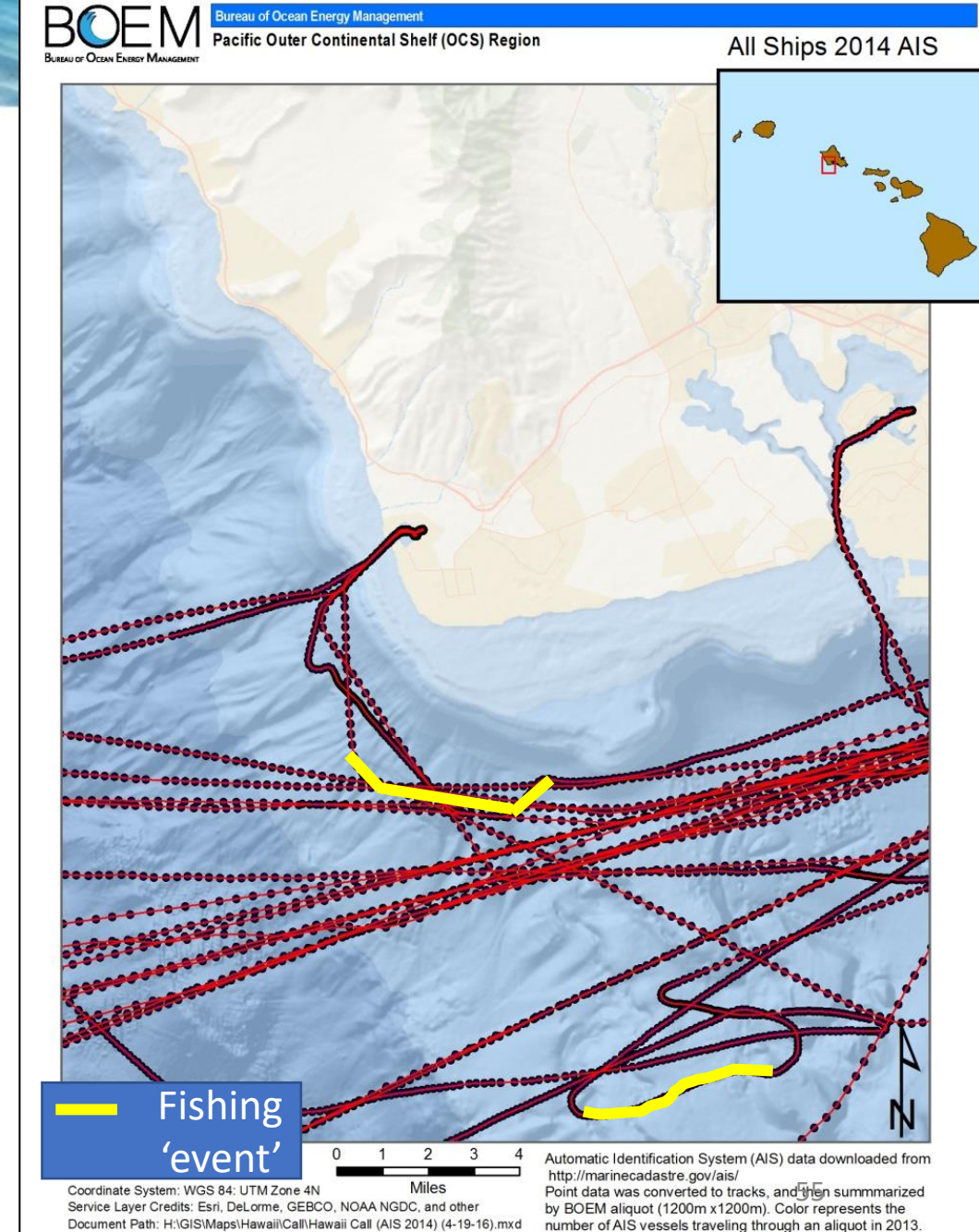
Automatic Identification System (AIS) data downloaded from <http://marinecadastre.gov/ais/>. Point data was converted to tracks, and then summarized by BOEM aliquot (1200m x1200m). Color represents the number of AIS vessels traveling through an aliquot in 2013.

Coordinate System: WGS 84: UTM Zone 4N
 Service Layer Credits: Esri, DeLorme, GEBCO, NOAA NGDC, and other
 Document Path: H:\GIS\Maps\HawaiiCall\Hawaii Call (AIS 2014) (4-19-16).mxd

VMS Processing

Fishing Trip begins when a vessel leaves port, ends when it enters a port

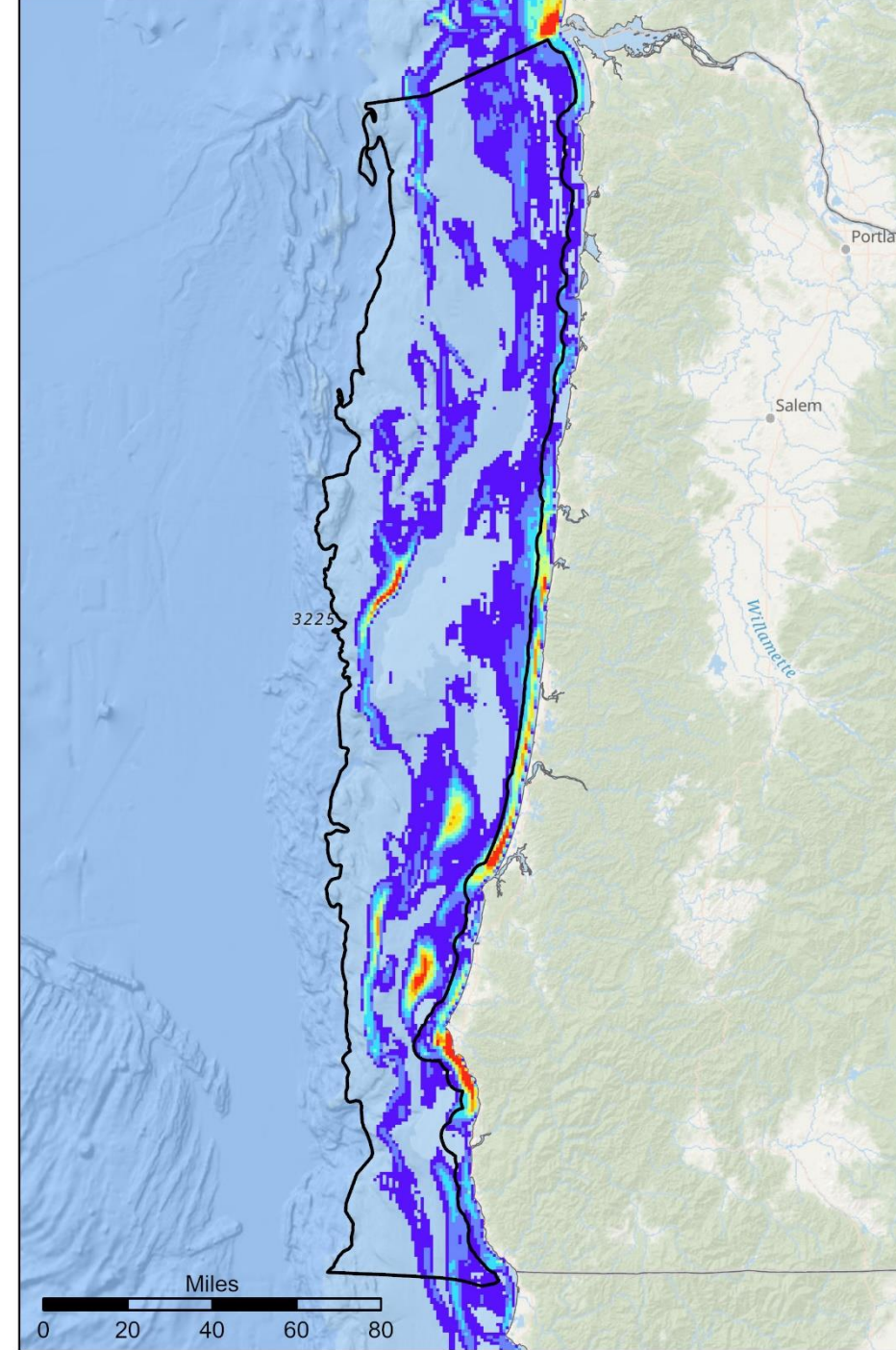
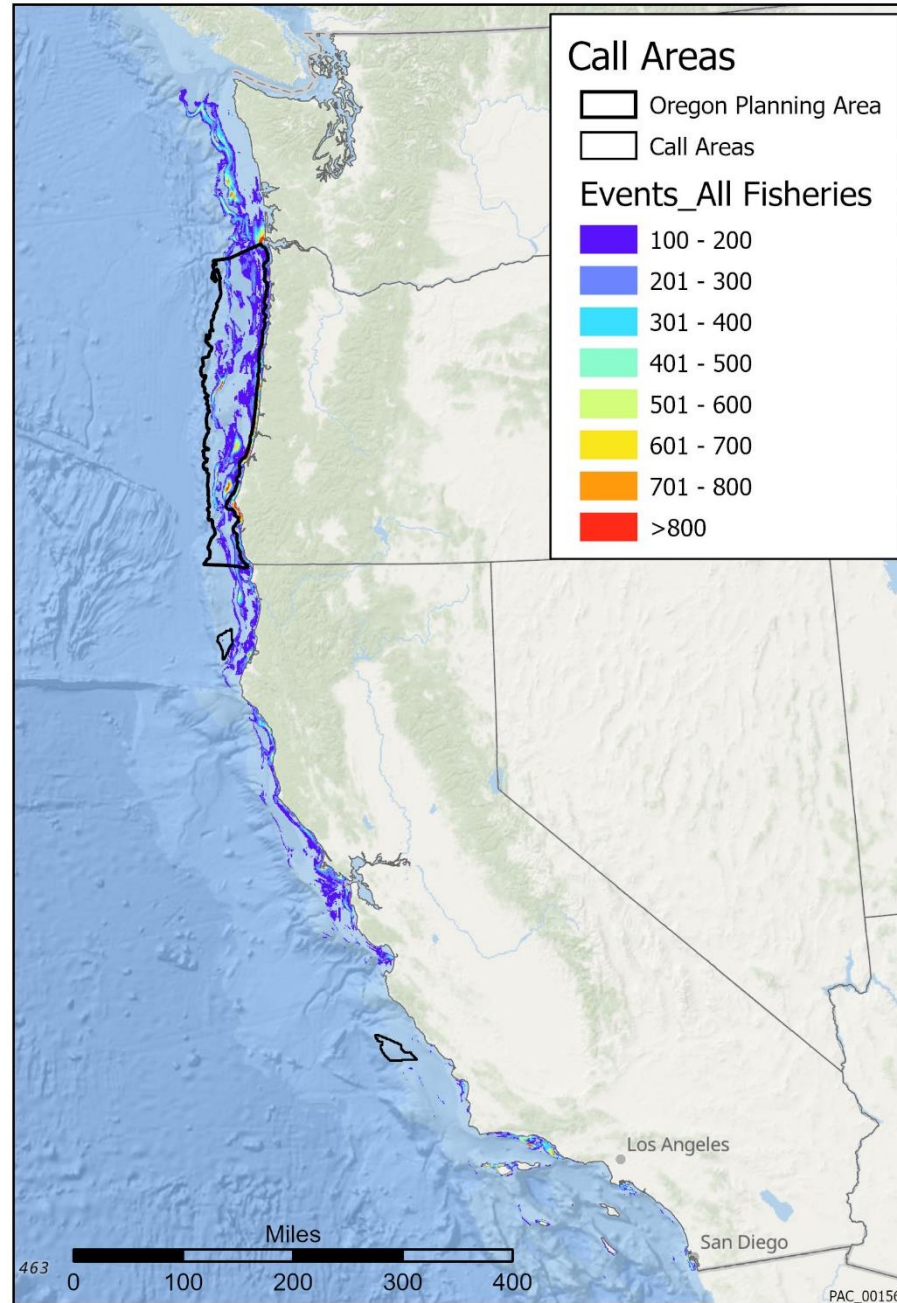
Fishing Event begins when a vessel slows to fishing speed, ends when it speeds up.



VMS

All VMS Fisheries

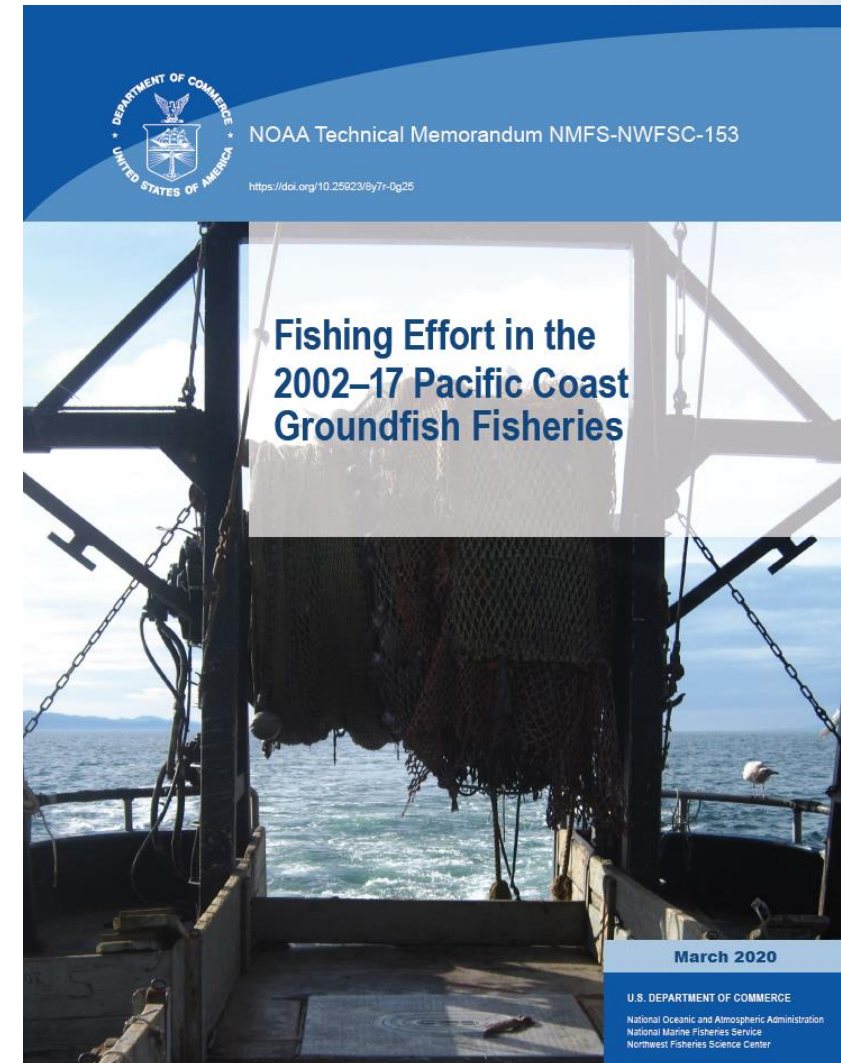
VMS All Fisheries (>100 events / aliquot)
2010-2018



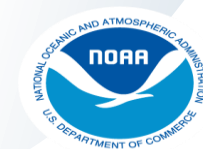
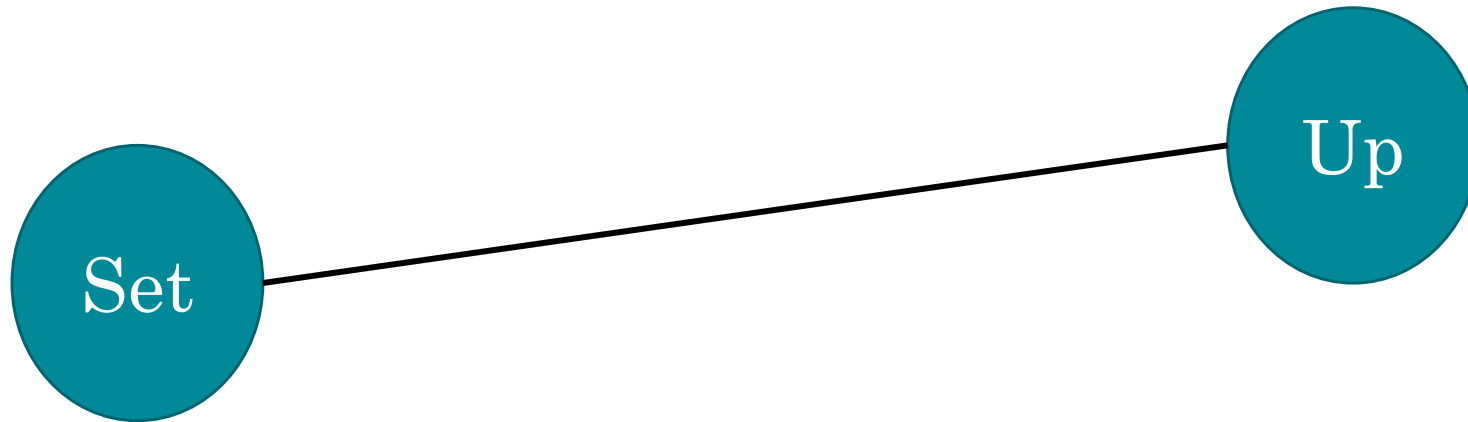
NWFSC Observer Program Spatial Data: Spatial Data Collected by Observers

TRIP FORM - HAUL LOCATIONS

Gear Type Codes:	Haul/ Set #	Date	Time	Latitude		Longitude		Depth of Catch (fathoms)	Gear Type	Trawl BRO Present?	Target Strategy		
				Month	Day	Degree	Minute					Degree	Minute
1 - Trawl Small Footrope (<8 inches) 2 - Trawl Large Footrope (>8 inches) 3 - Midwater Trawl 4 - Danish/Scottish Seine 5 - Other Trawl Gear 7 - Vertical Hook and Line 8 - Pole (Commercial) 9 - Other Hook and Line 10 - Fish Pot 12 - Shrimp Trawl Single Rigged 13 - Shrimp Trawl Double Rigged 14 - All Net Gear Except Trawl 15 - All Troll Gear 16 - All Other Miscellaneous Gear 17 - OR Setback Flatfish Net (Pineapple) 19 - Longline (Fixed Hooks) 20 - Longline (Snap-on Hooks)	Start												
	End												
	Start												
	End												
	Start												
	End												
	Start												
	End												
	Start												
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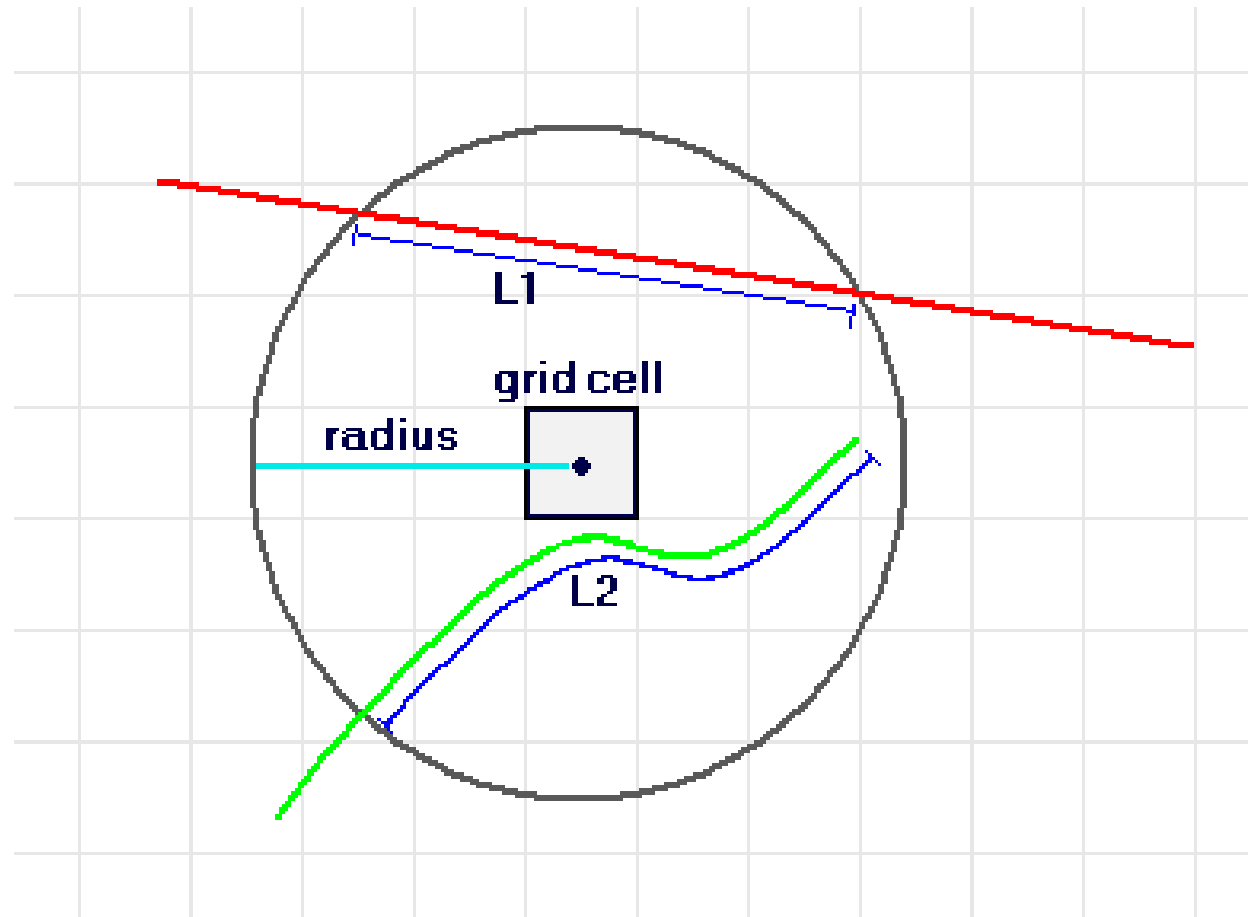


Analysis of Spatial Data

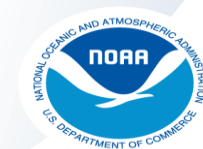
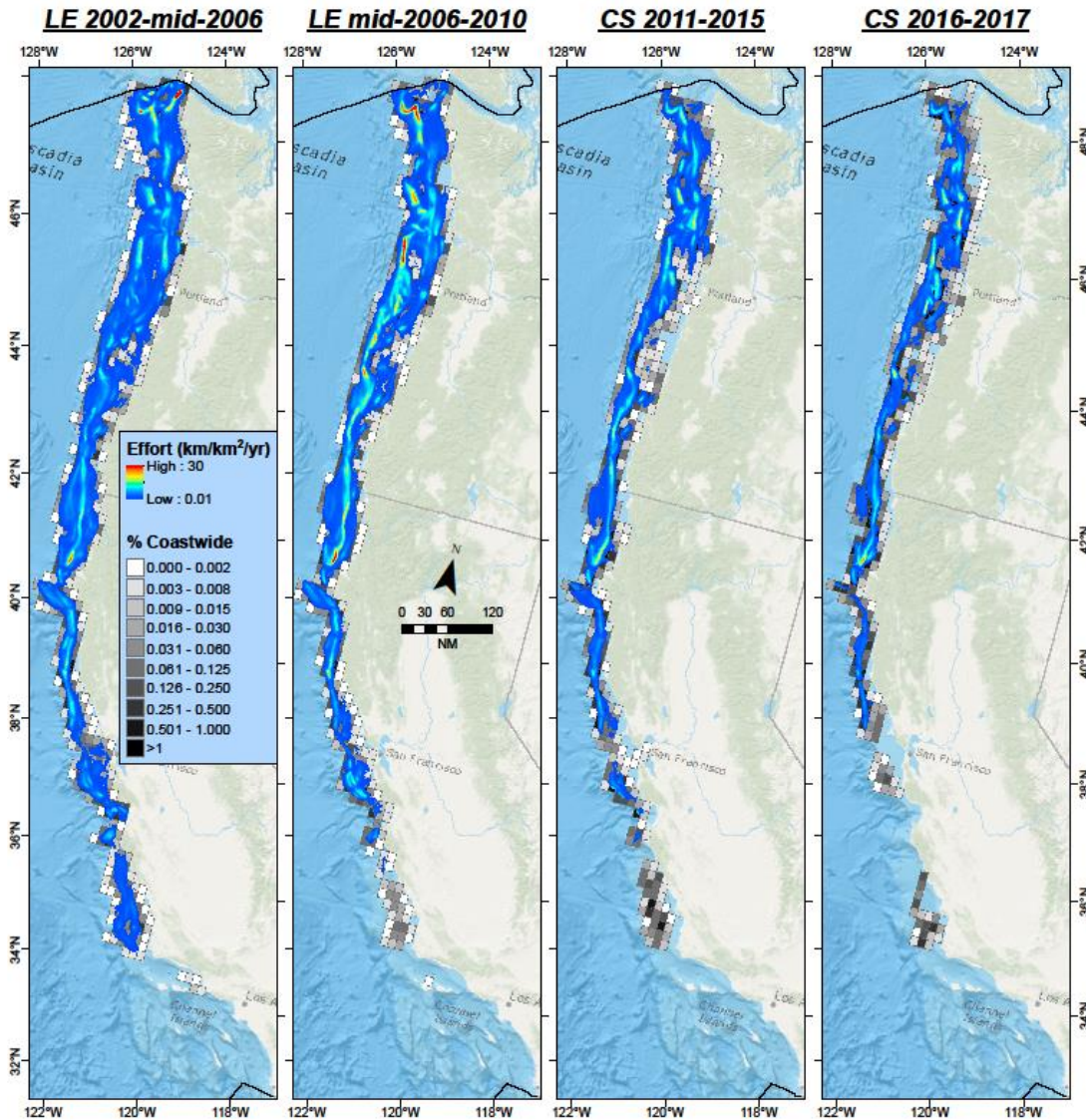


NOAA
FISHERIES

Analysis of Spatial Data



Publicly Available Spatial Data



Fisheries Datasets in OROWindMap and Draft Vessel Monitoring System (VMS) Analysis

Andy Lanier, DLCD
Frank Pendleton, BOEM



Module 1: Pacific groundfish (trawl fisheries)

Data themes: Non-trawl groundfish, bottom trawl, midwater trawl



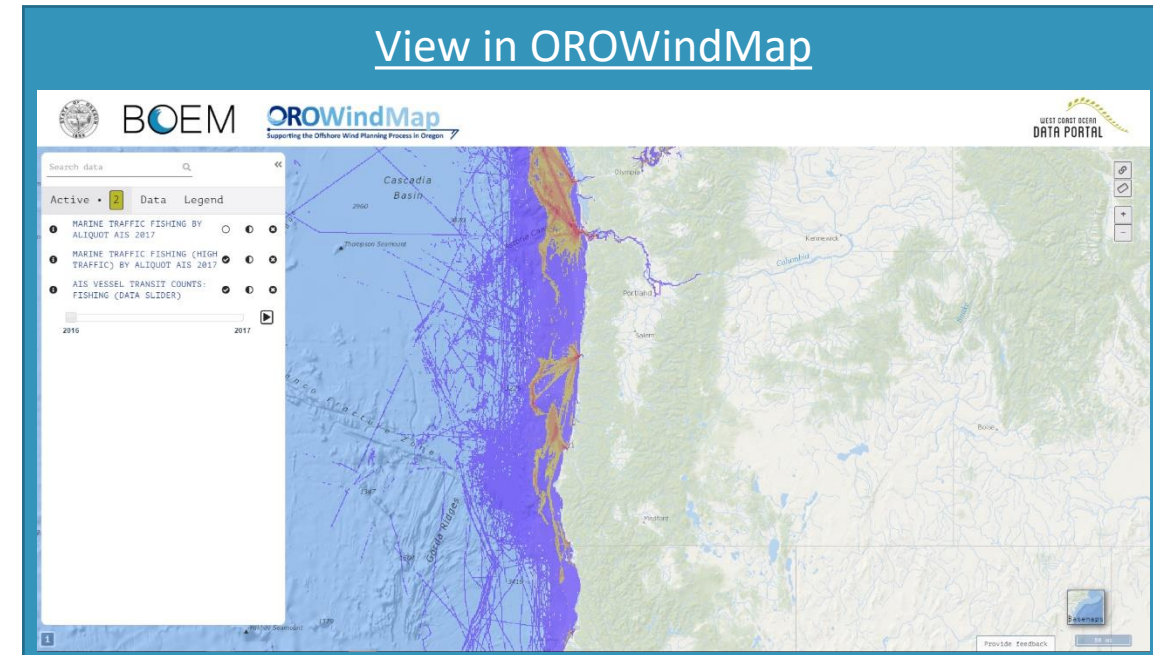
Marine Fishing (Groundfish)

Data Layers in the Catalog (1)

Automatic Identification System (AIS) Fishing Vessel Traffic

The AIS data layers below are provided by the Marine Cadastre and Ocean Reporting Tool.

- AIS Vessel Transit Counts: Fishing (2016)
- AIS Vessel Transit Counts: Fishing (2017)
- Marine Traffic Fishing (High Traffic) by Aliquot AIS 2017
- Marine Traffic Fishing by Aliquot AIS 2017

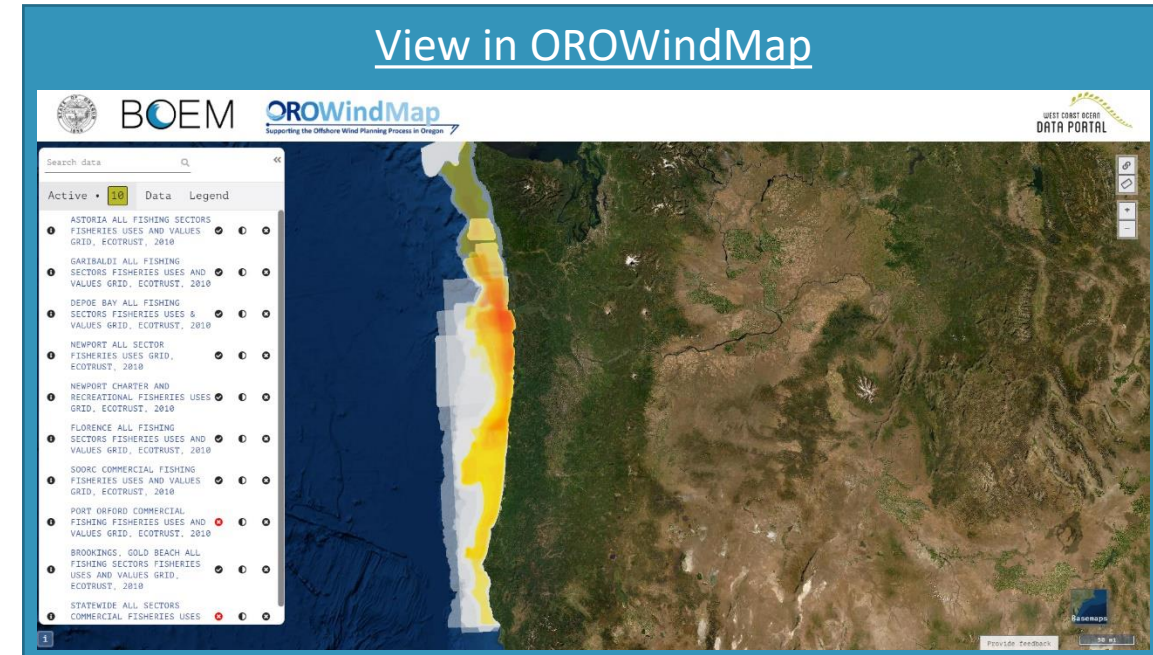


Marine Fishing (Groundfish)

Data Layers in the Catalog (2)

Oregon Marine Fisheries Uses and Values Data Products to Support the Territorial Sea Plan, Ecotrust, 2010-2012

- [Astoria All Fishing Sectors](#)
- [Garibaldi All Fishing Sectors](#)
- [Depoe Bay All Fishing Sectors](#)
- [Newport All Sector;](#)
- [Florence All Fishing Sectors](#)
- [SOORC Commercial Fishing](#)
- [Port Orford Commercial Fishing](#)
- [Brookings, Gold Beach All Fishing Sectors](#)
- [Statewide All Fishing Sectors](#)



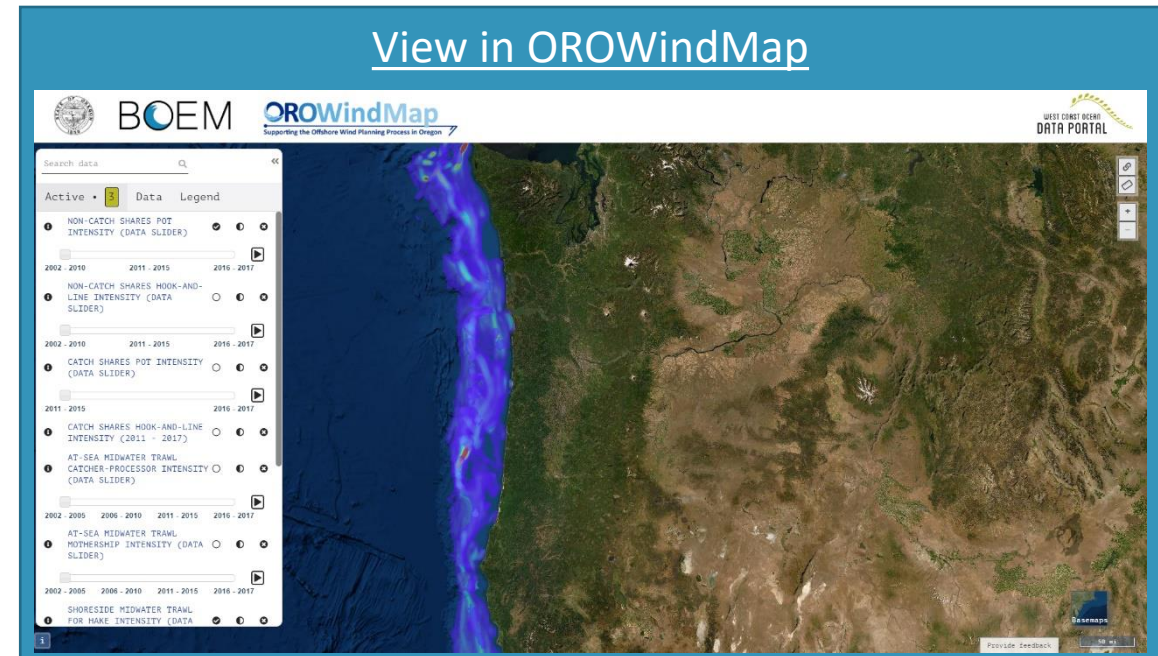
Marine Fishing (Groundfish)

Data Layers in the Catalog (3)

Fishing Effort in the 2002-2017 U.S. Pacific Coast Groundfish Fishery, NOAA

This set of map services depicts the relative intensity and proportion of commercial fishing effort for several gear types used off the U.S. West Coast from 2002-2017 (Somers et al. 2020).

- Non-Catch Shares Pot Intensity (2002-2010), (2011-2015), (2016-2017)
- Catch Shares Pot Intensity (2011-2015), (2016-2017)
- Catch Shares Hook-and-Line Intensity (2011 - 2017)
- Non-Catch Shares Hook-and-Line Intensity (2002-2010), (2011-2015), (2016-2017)
- Catch Shares Bottom Trawl Intensity (2011-2015), (2016-2017)
- Limited Entry Bottom Trawl Intensity (2002-2006); (2006-2010)
- Non-Catch Shares Hook-and-Line Intensity (2002-2010), (2011-2015), (2016-2017)
- Shoreside Midwater Trawl for Hake Intensity (2011-2015), (2016-2017)



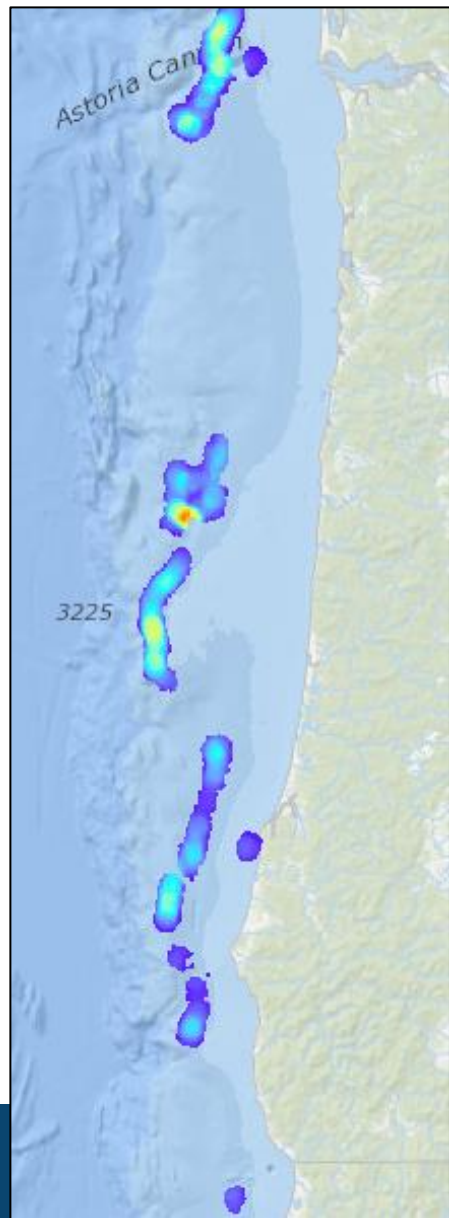
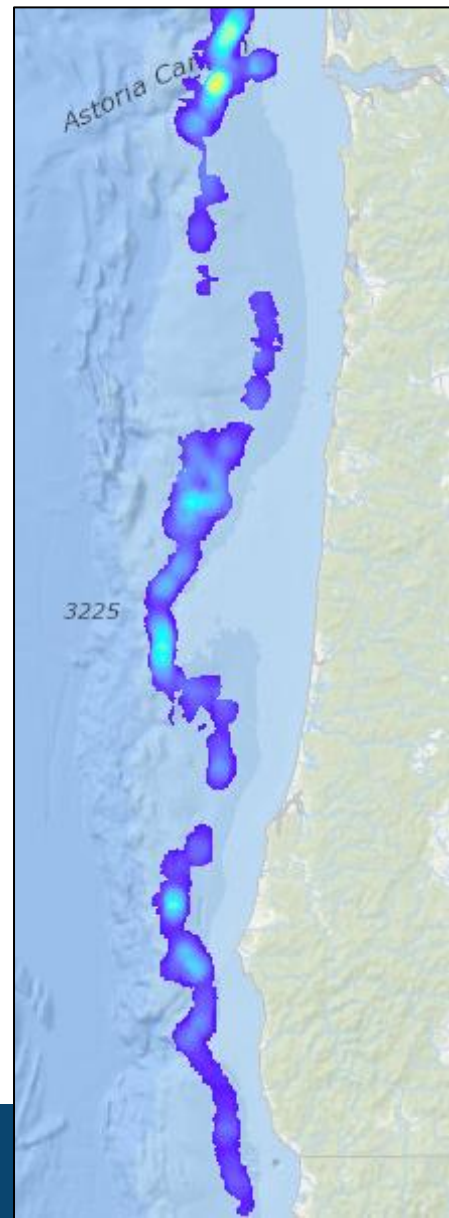
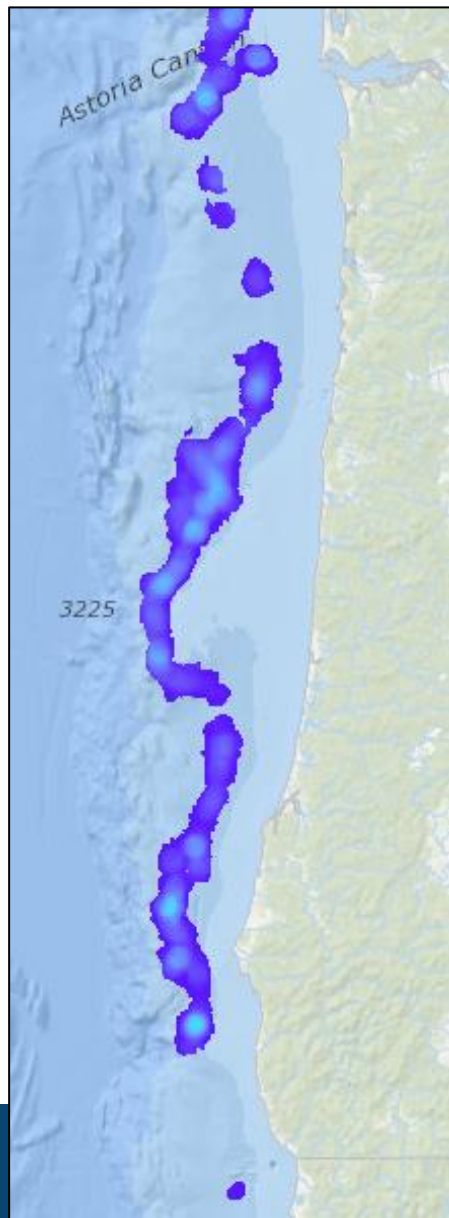
- Shoreside Midwater Trawl for Rockfish Intensity (2011-2015), (2016-2017)
- At-sea Midwater Trawl Catcher-Processor Intensity (2002-2005), (2006-2010), (2011-2015), (2016-2017)
- At-sea Midwater Trawl Mothership Intensity (2002-2005), (2006-2010), (2011-2015), (2016-2017)

2002-2010

2011-2015

2016-2017

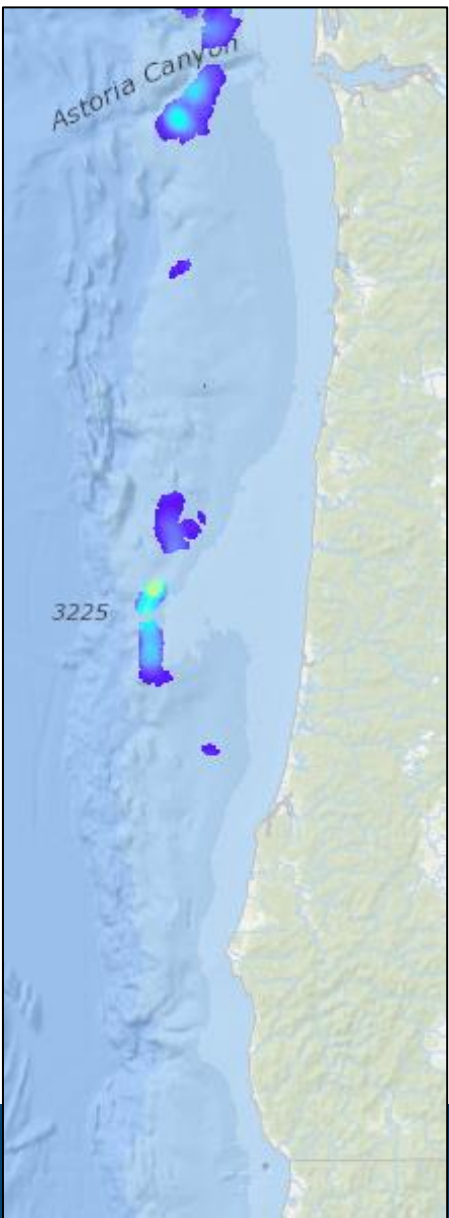
Non-Catch Shares Hook and Line



<https://www.webapps.nwfsc.noaa.gov/data/map>

2011-2017

Catch Shares Hook and Line

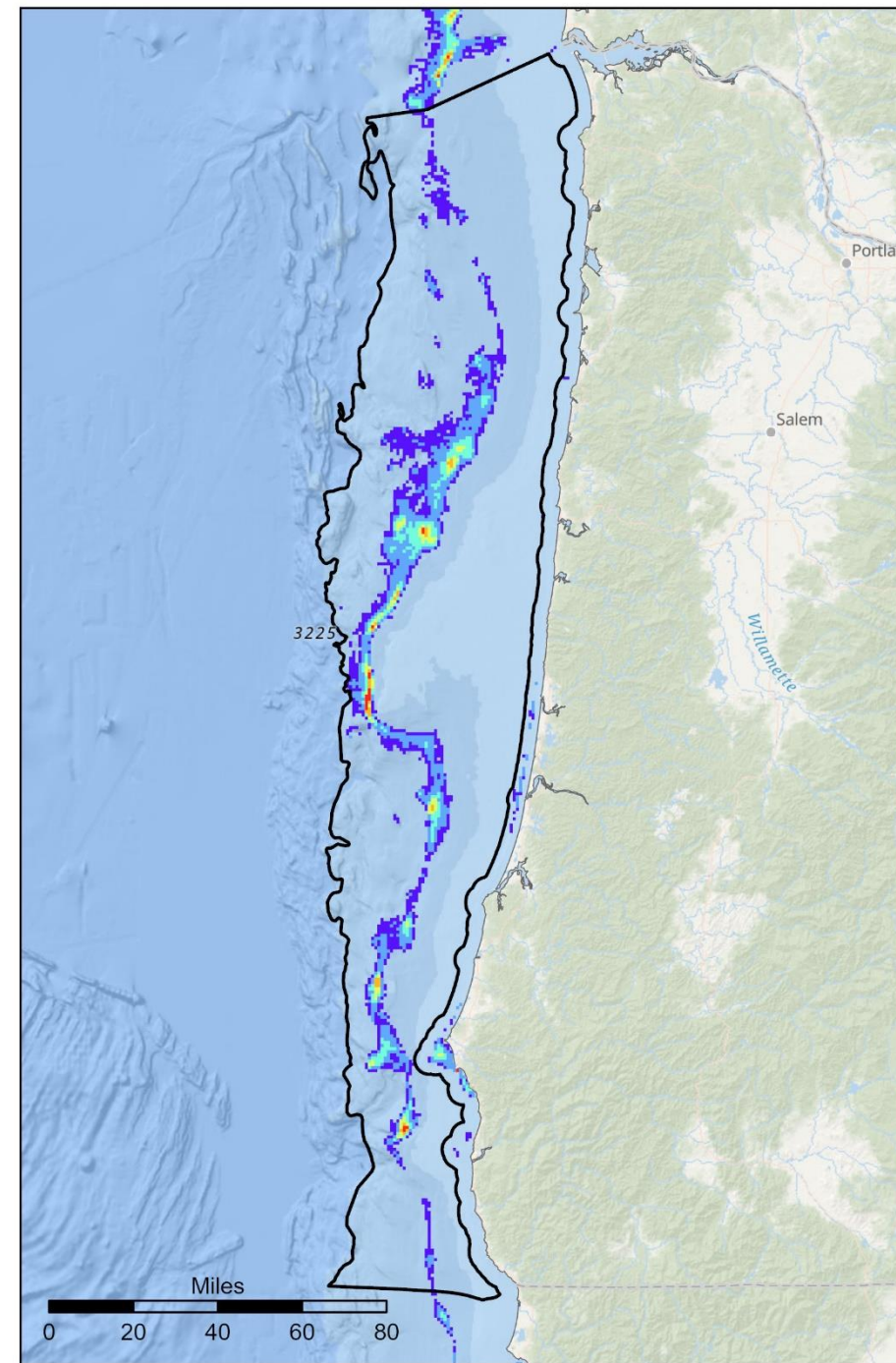
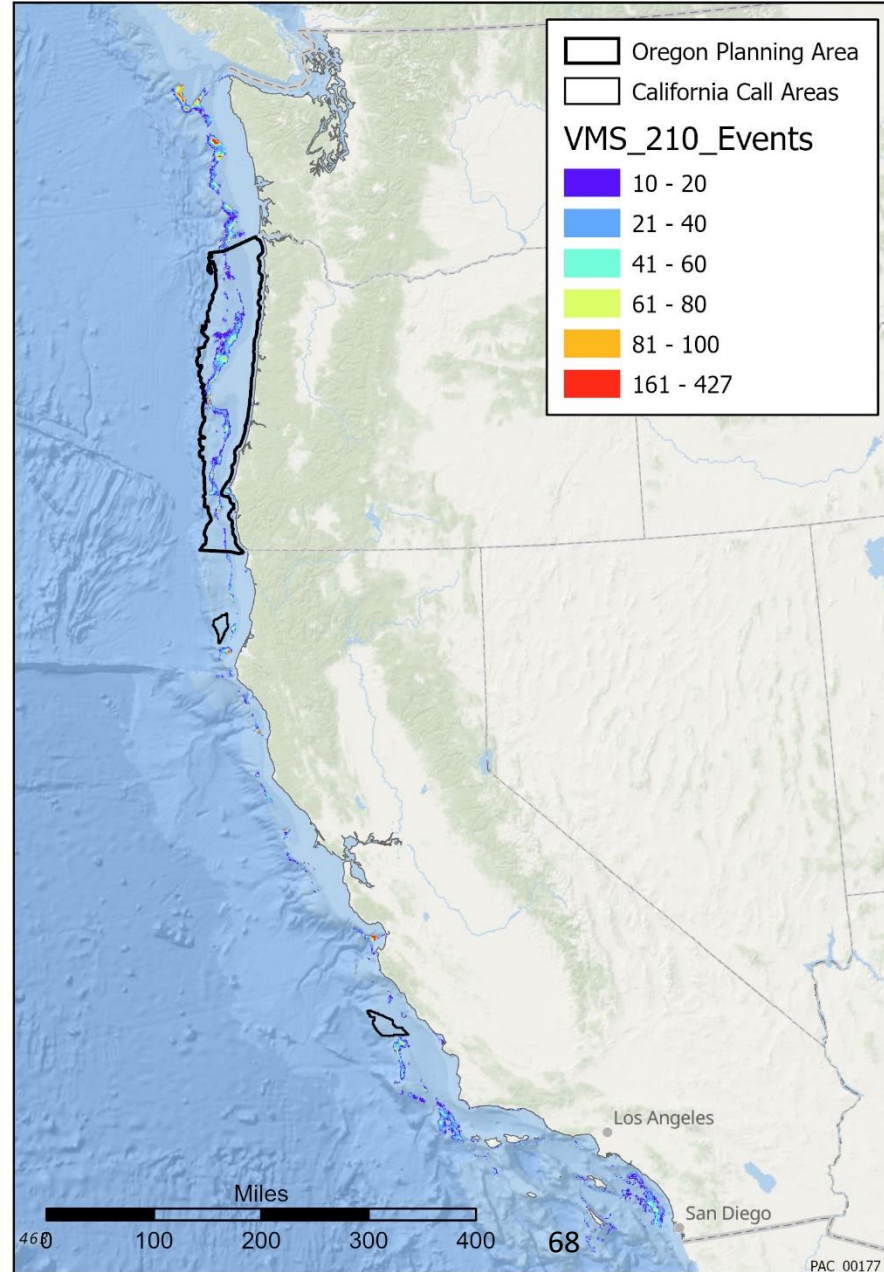


<https://www.webapps.nwfsc.noaa.gov/data/map>



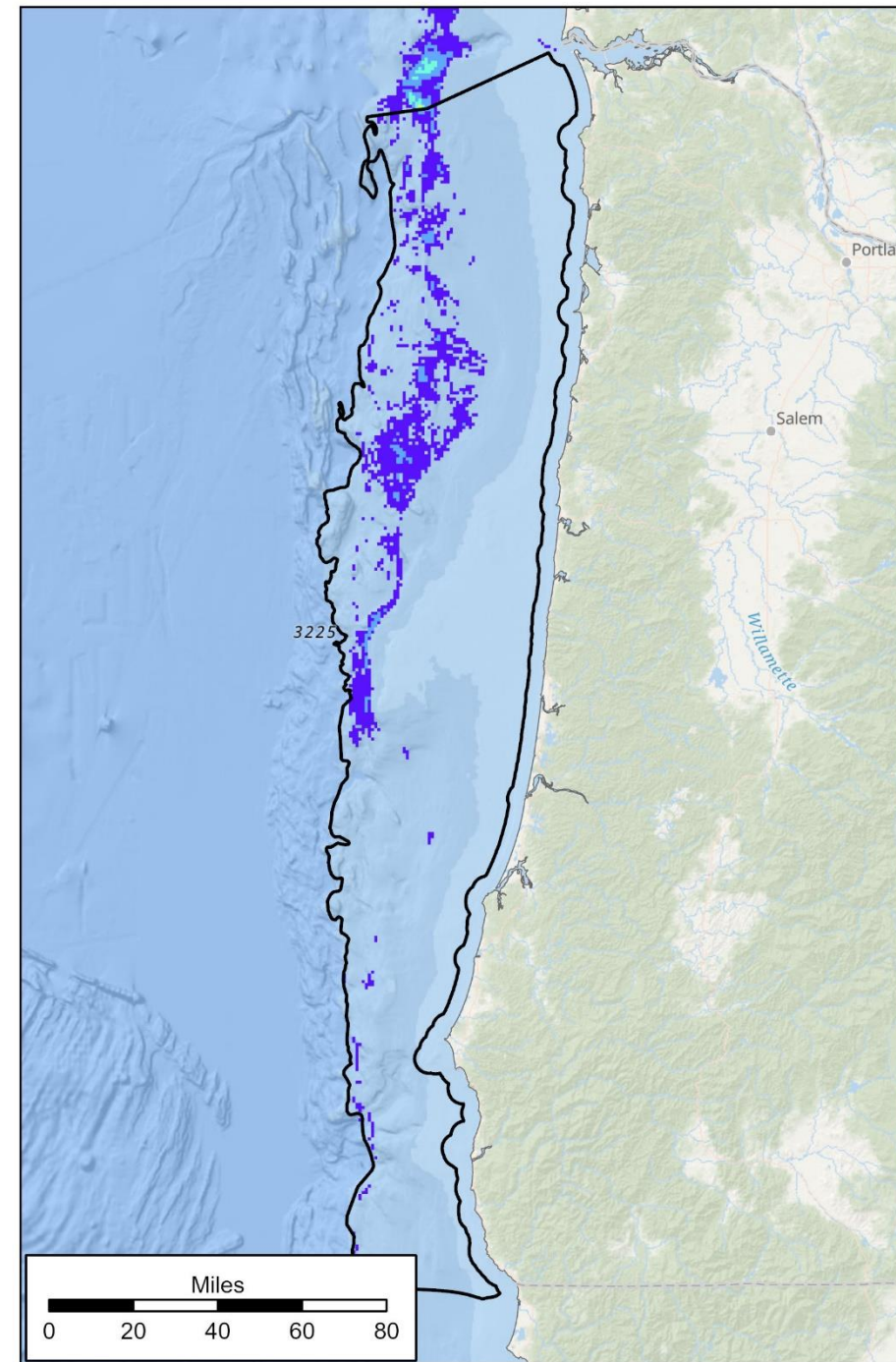
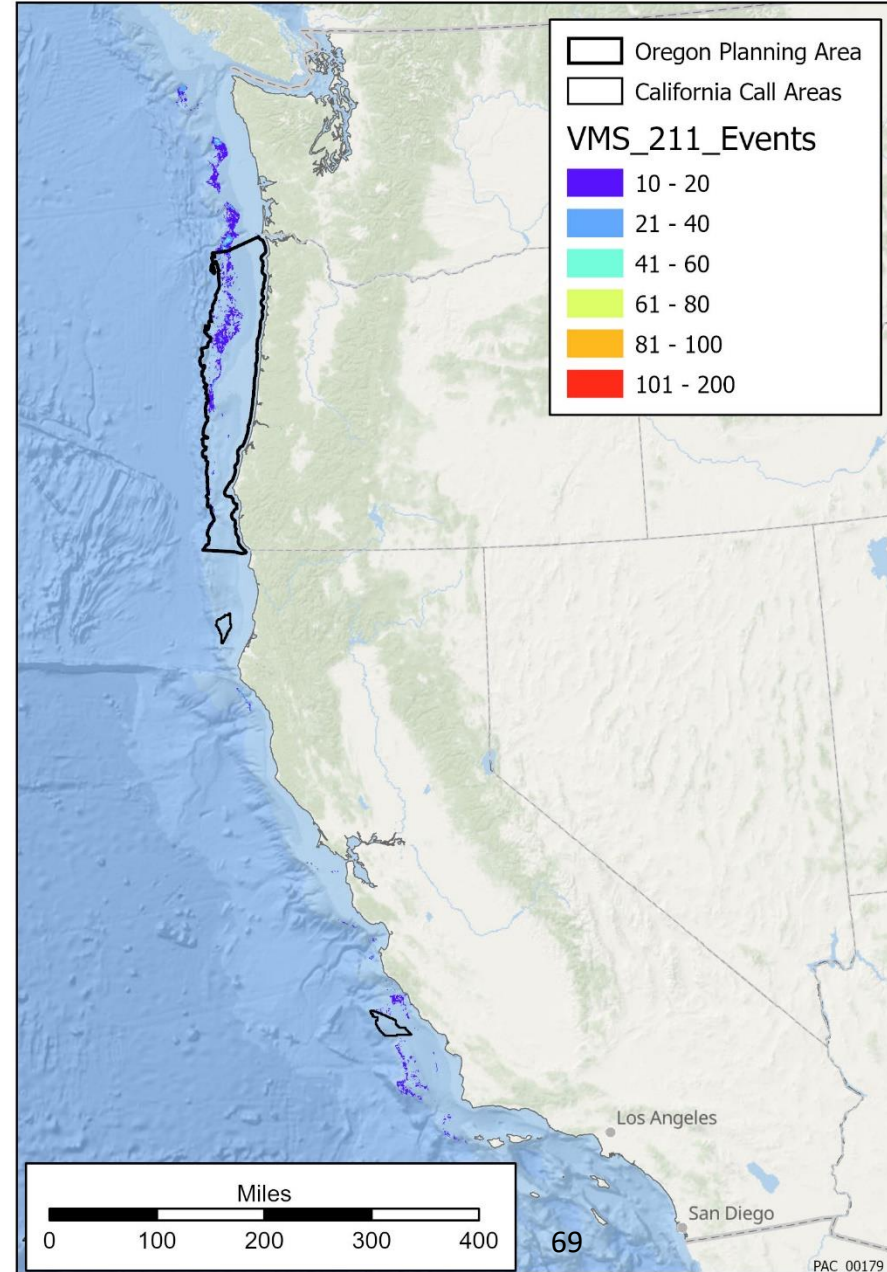
Groundfish

Limited Entry Groundfish Fixed Gear 2010-2017



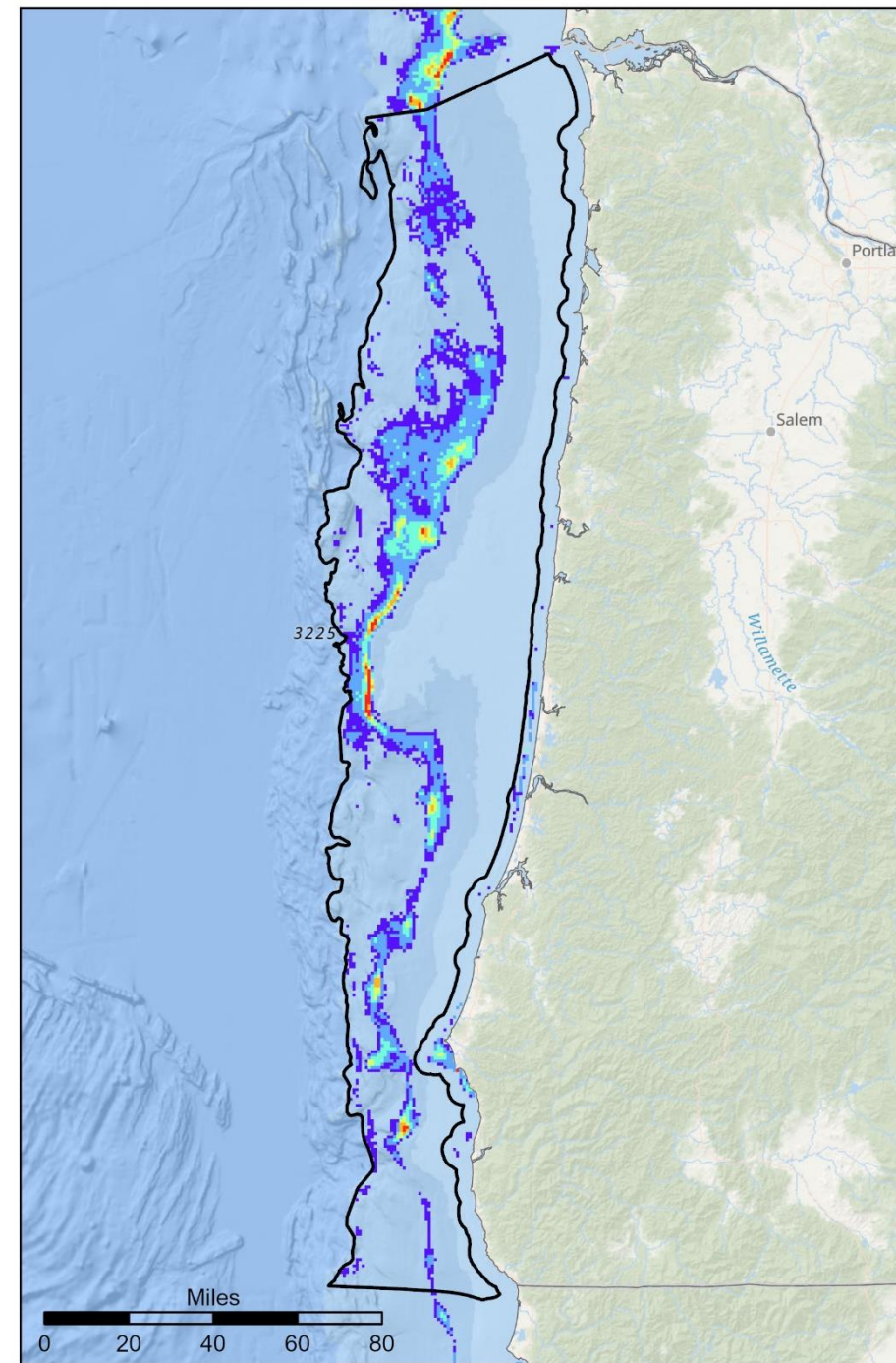
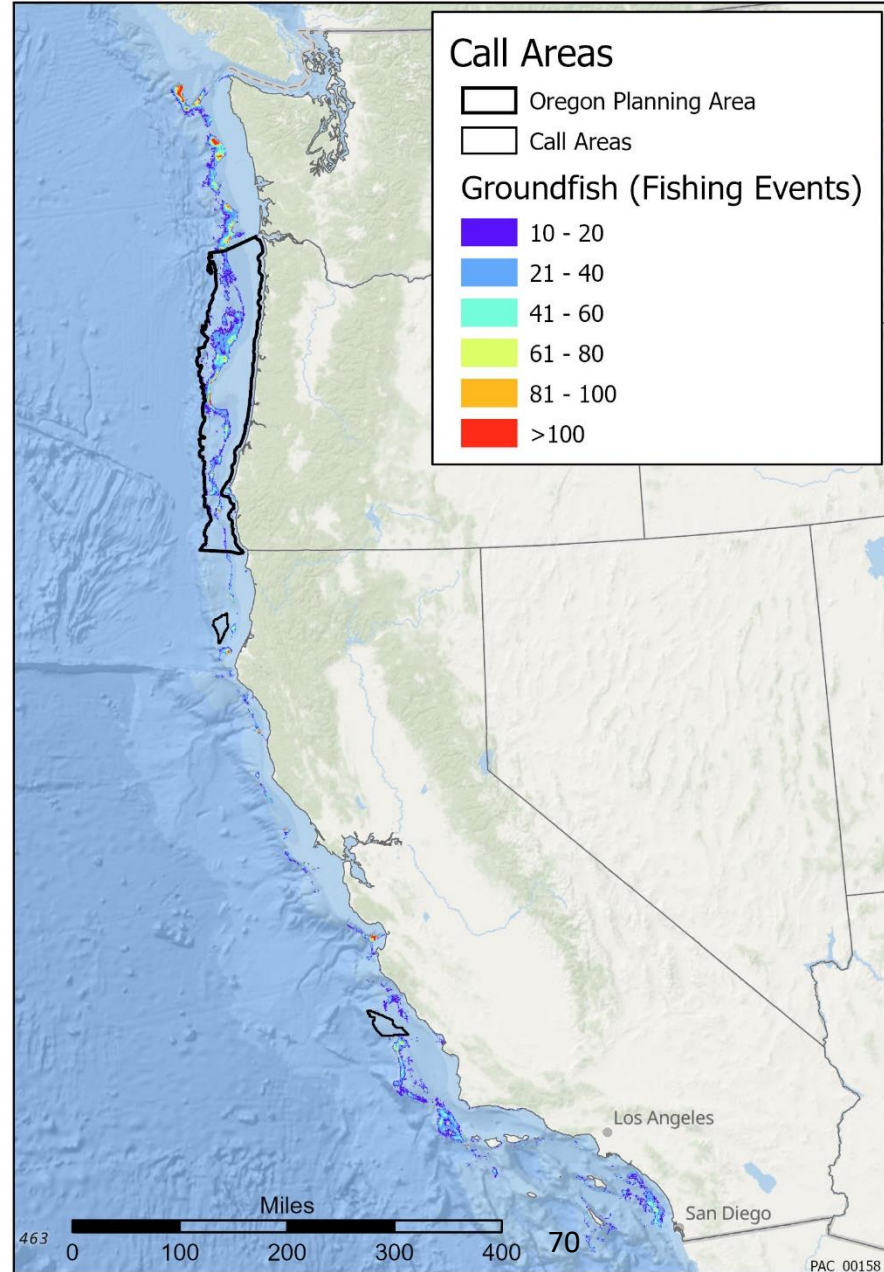
Groundfish

Limited Entry Groundfish Non-Trawl 2010-2017



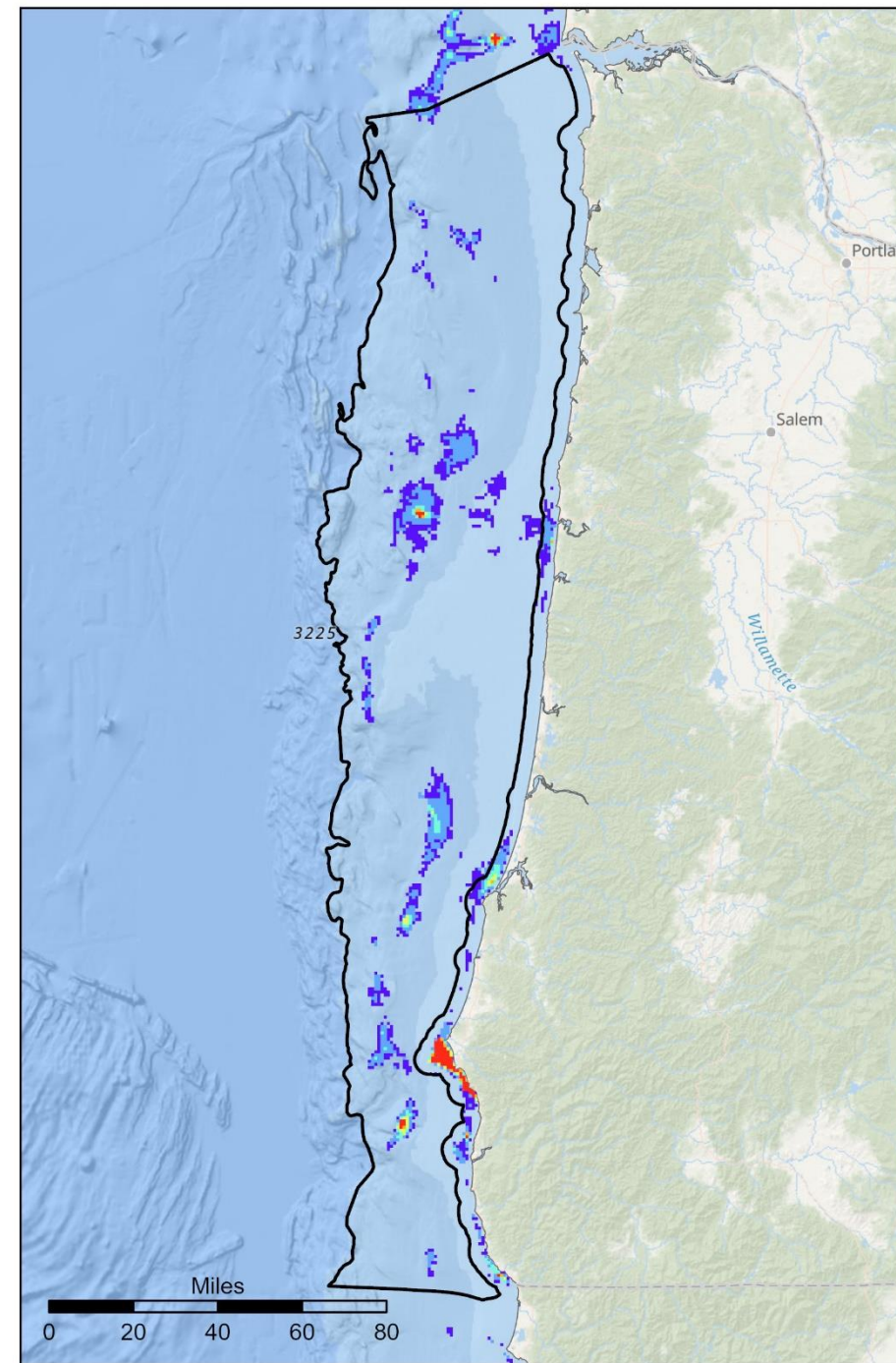
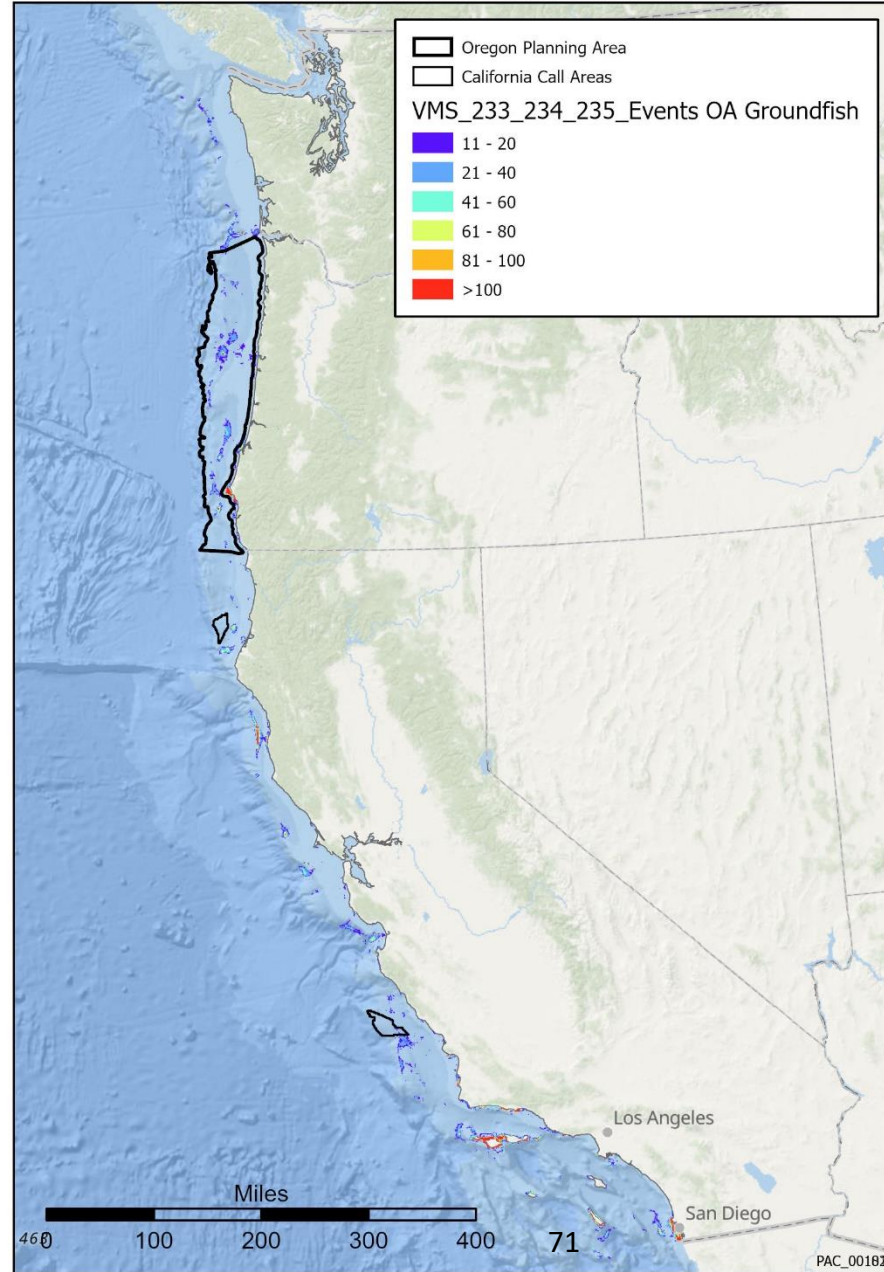
Groundfish

Limited Entry Groundfish 2010-2017



Open Access Groundfish Longline, Line, Trap or Pot 2010-2017

OA Groundfish, Longline, Trap or Pot, Line 233-235



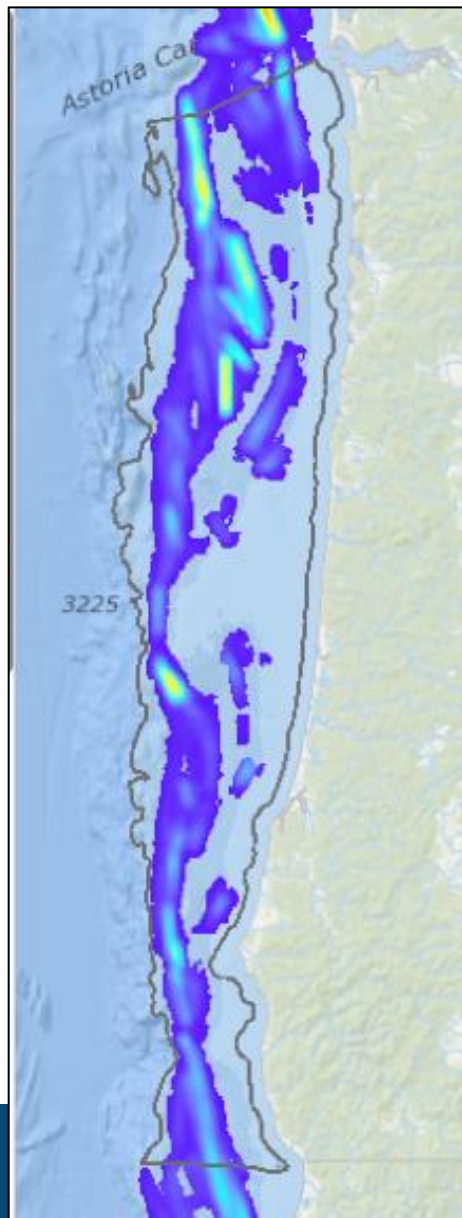
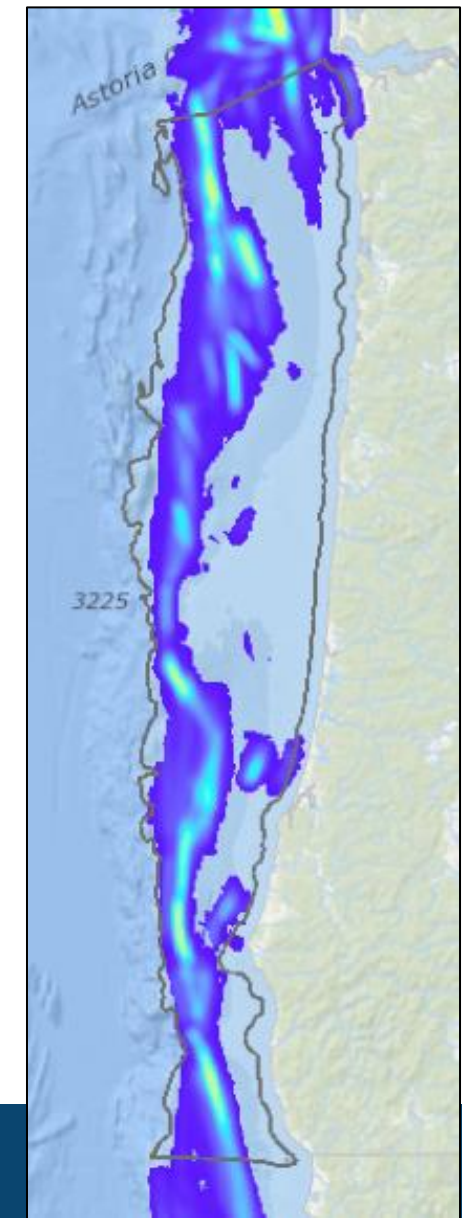
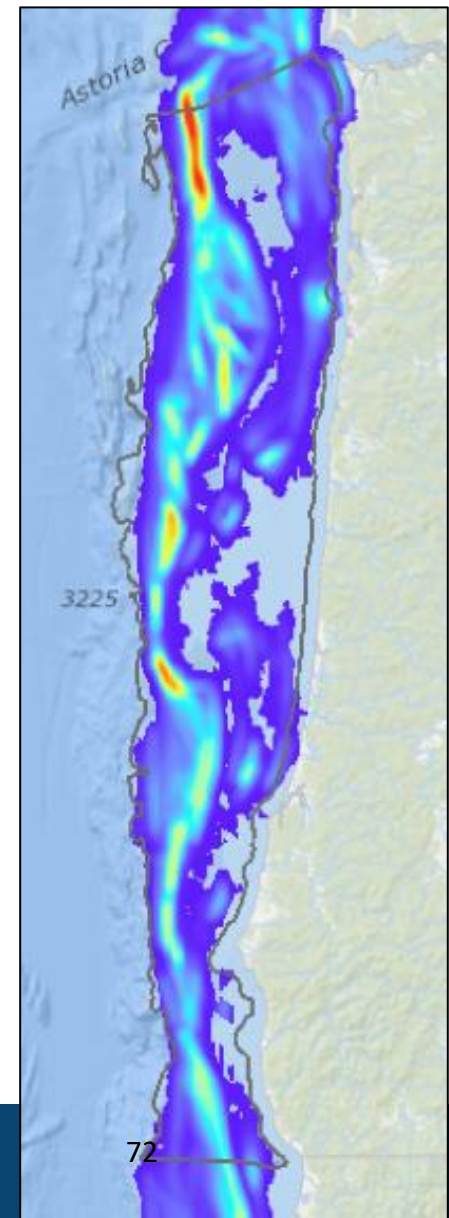
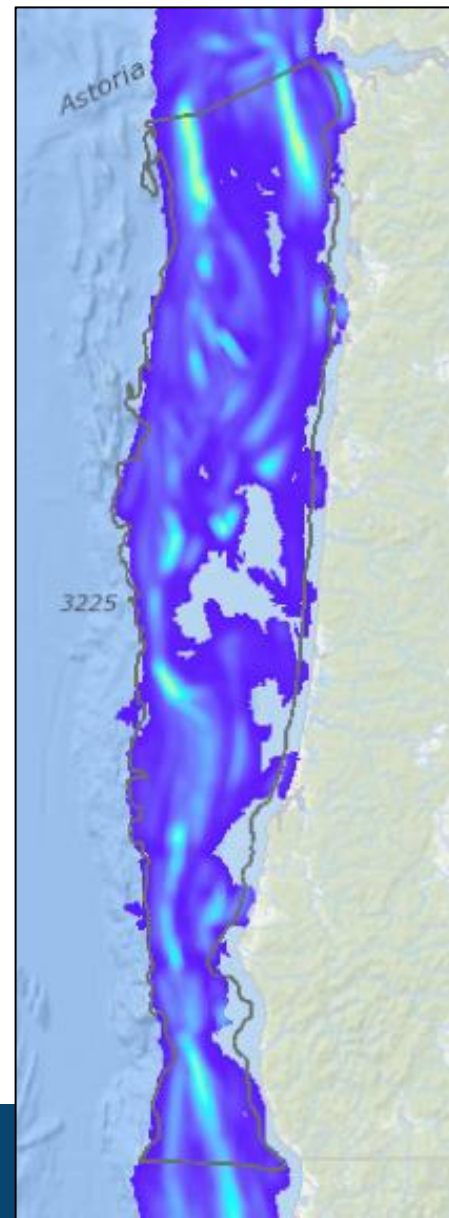
2002-2005

2006-2010

2011-2015

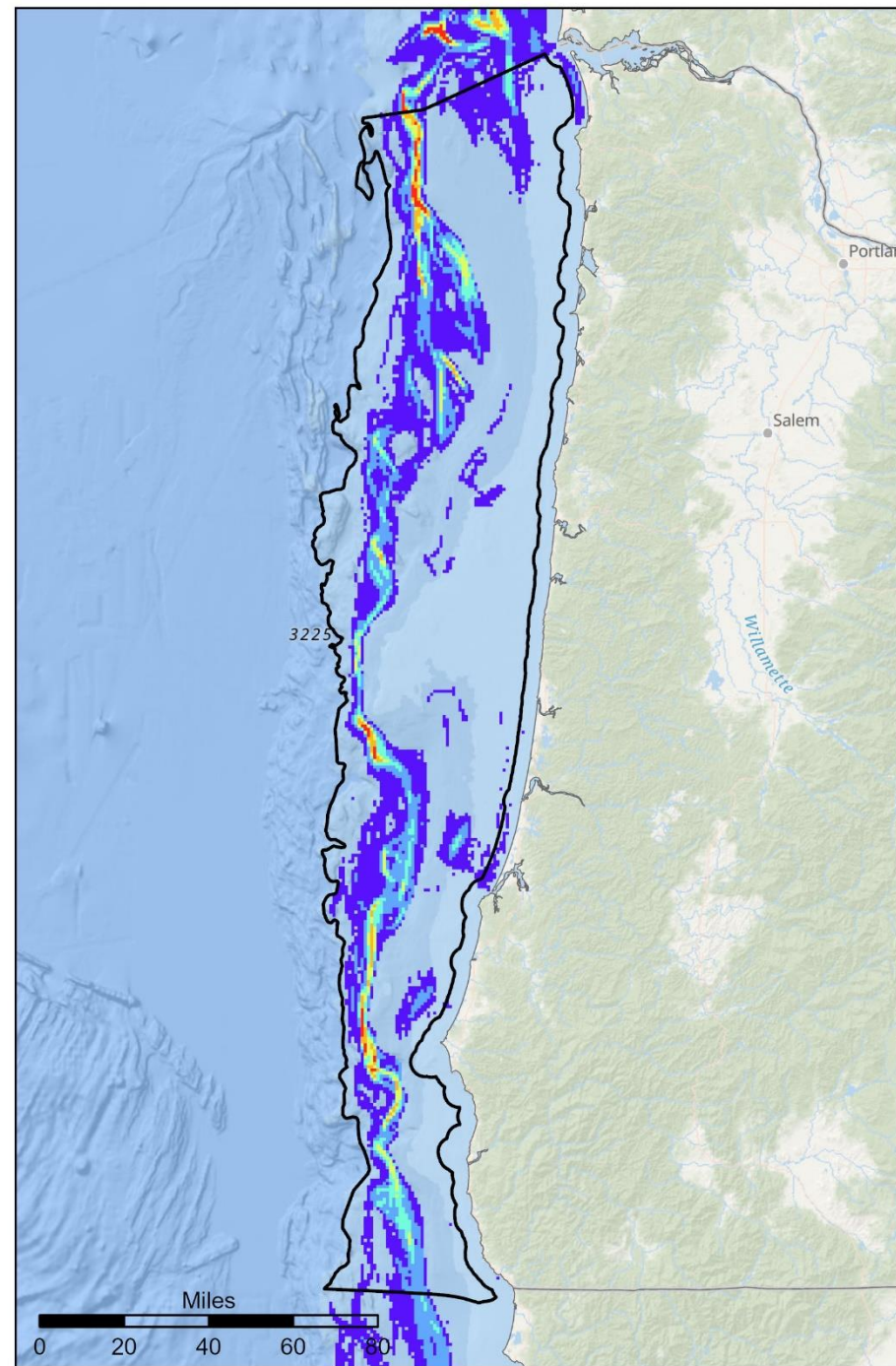
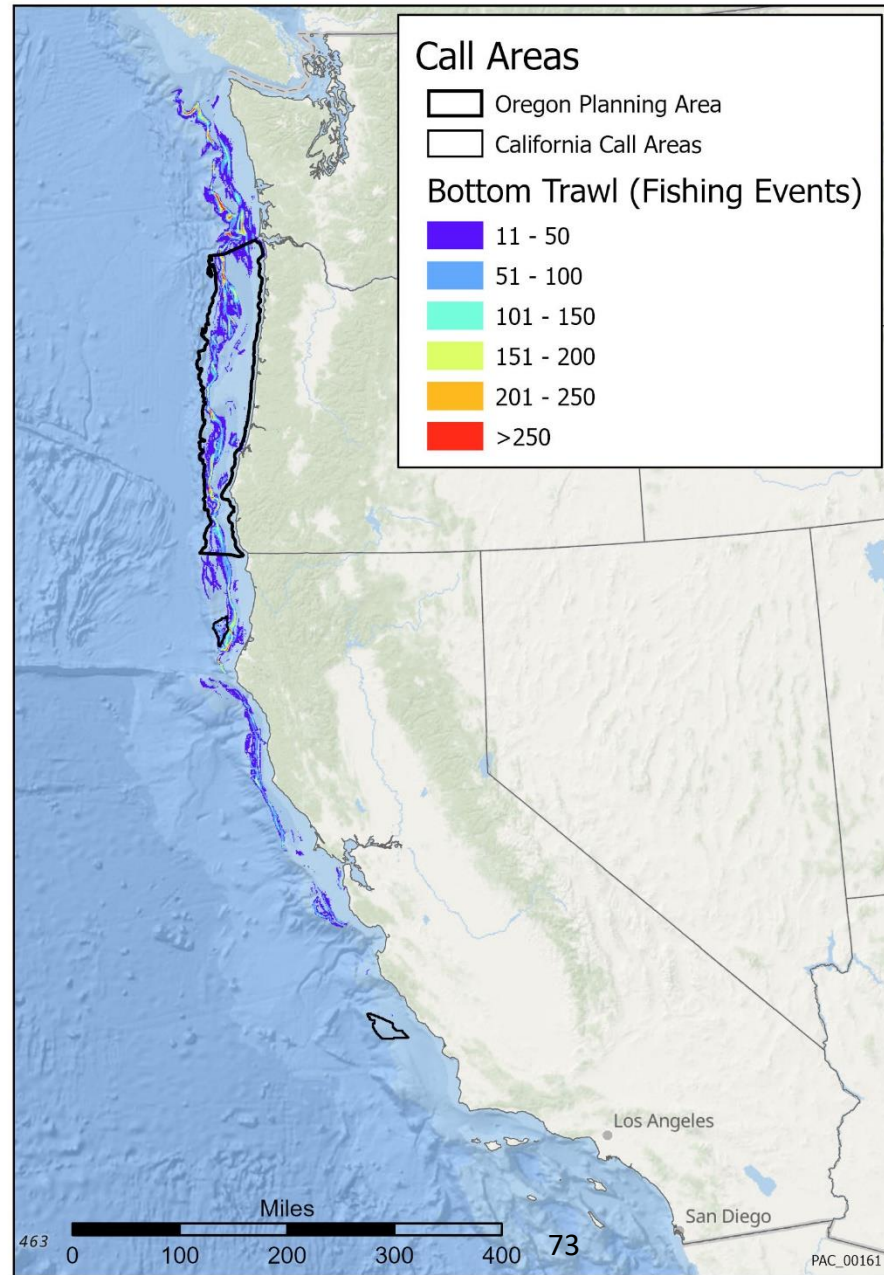
2016-2017

Bottom Trawl



<https://www.webapps.nwfsc.noaa.gov/data/map>

Bottom Trawl 2010-2017



2002-2005

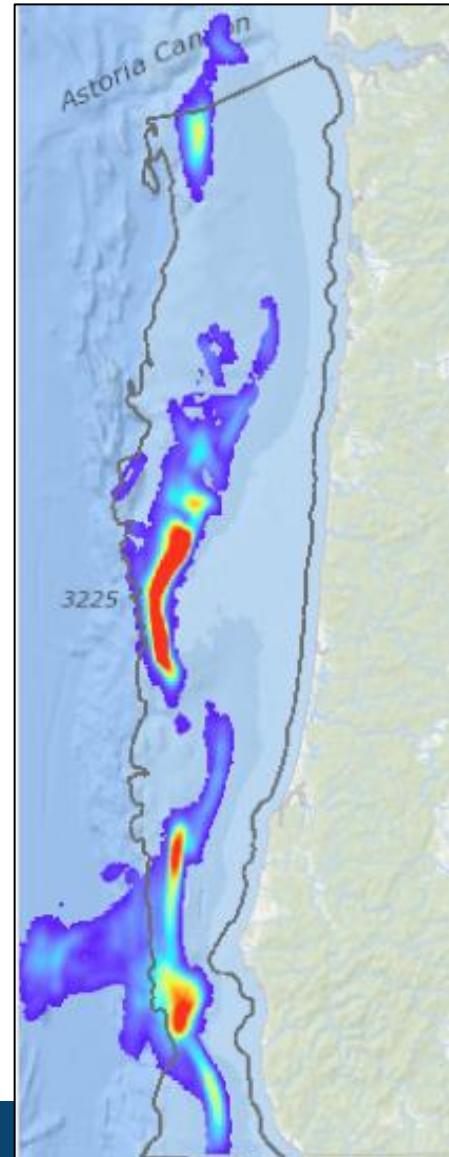
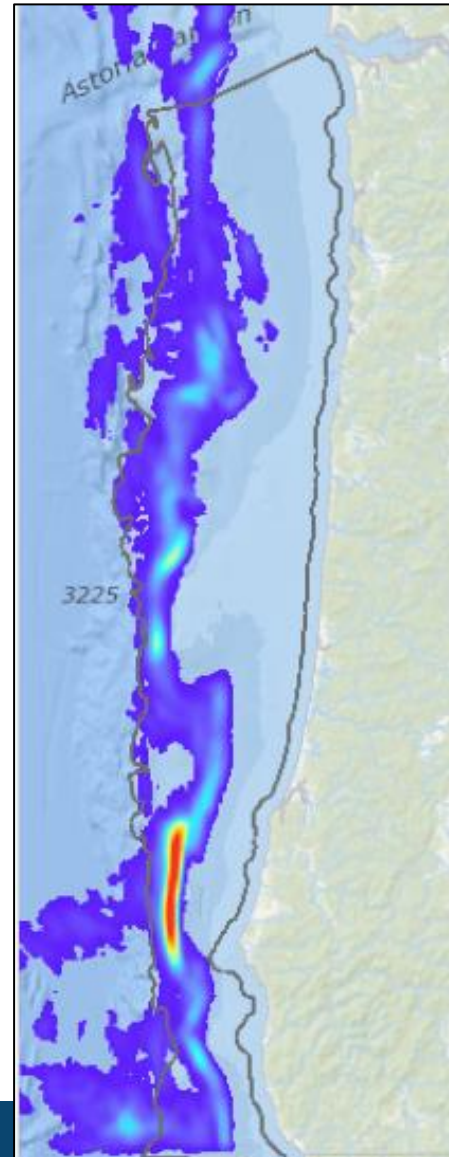
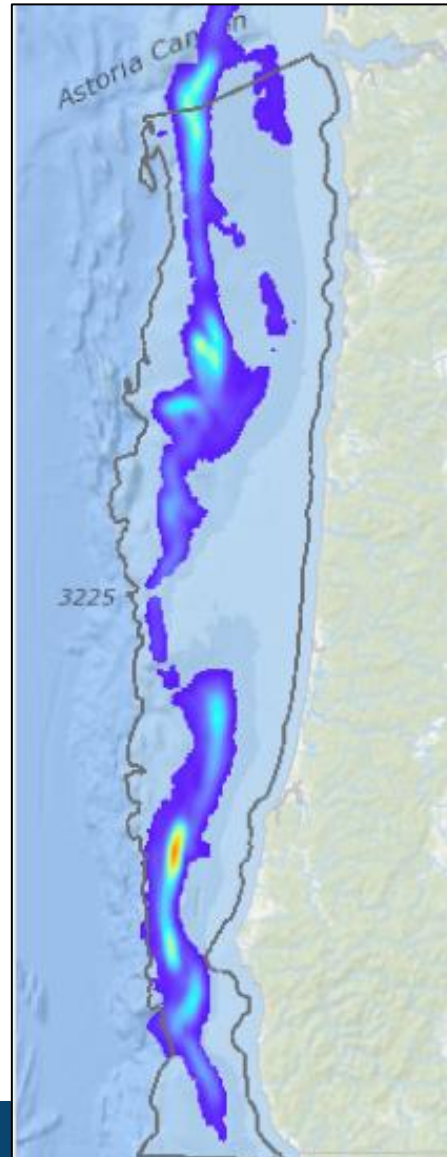
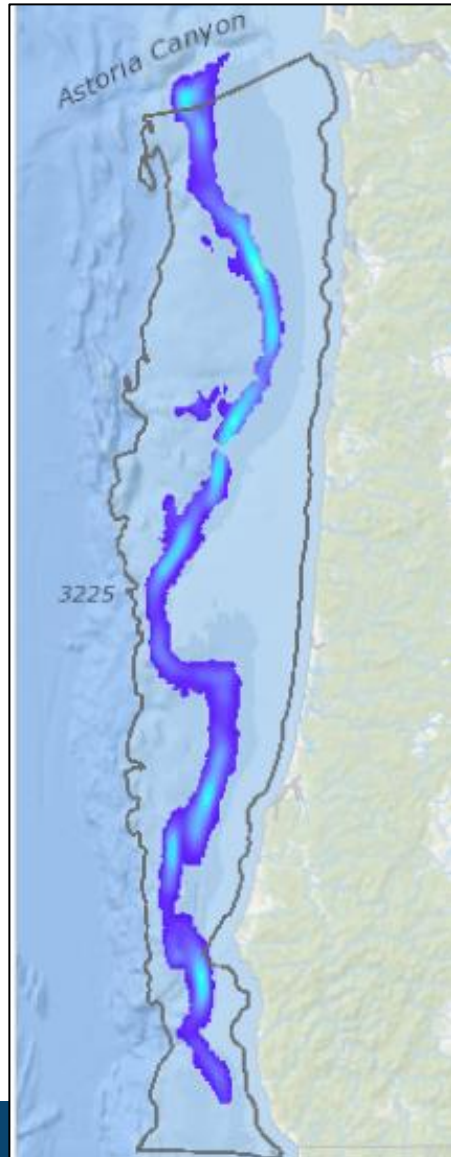
2006-2010

2011-2015

2016-2017

At-Sea Midwater Trawl

Catcher Processor

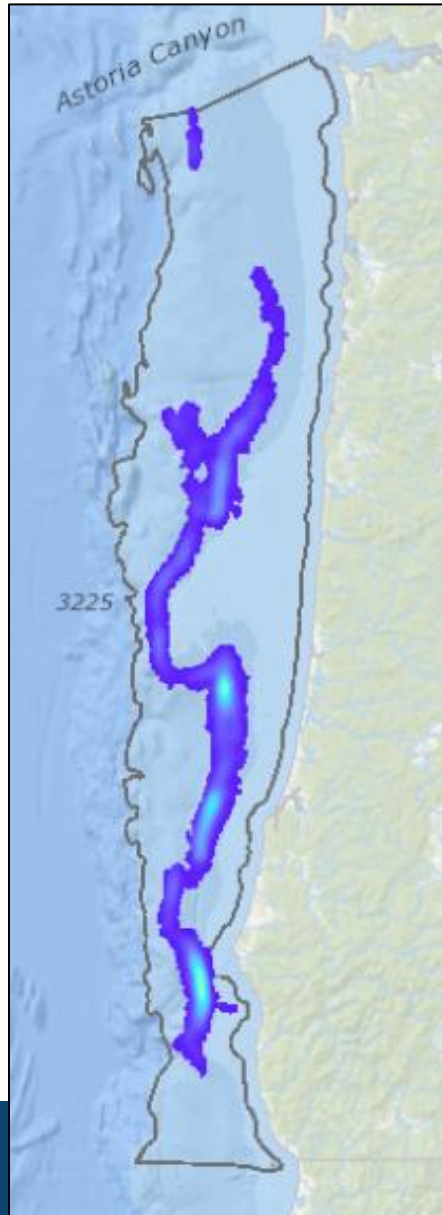


<https://www.webapps.nwfsc.noaa.gov/data/map>

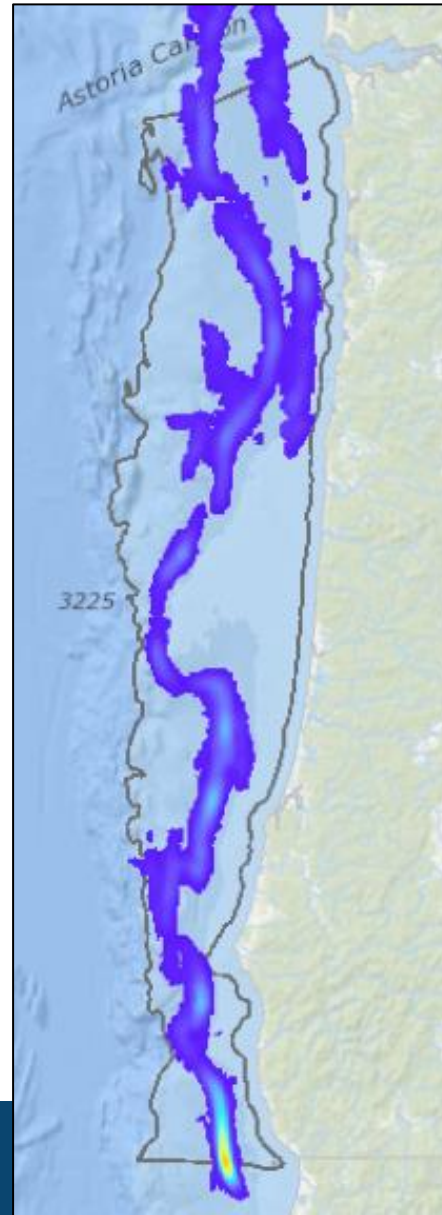
NOAA FRAM

At-Sea Midwater Trawl Mothership

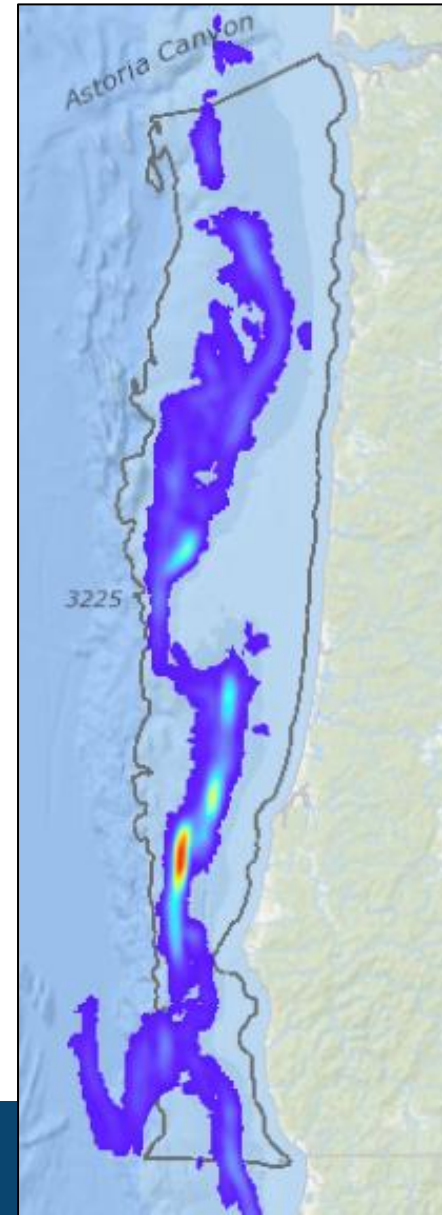
2002-2005



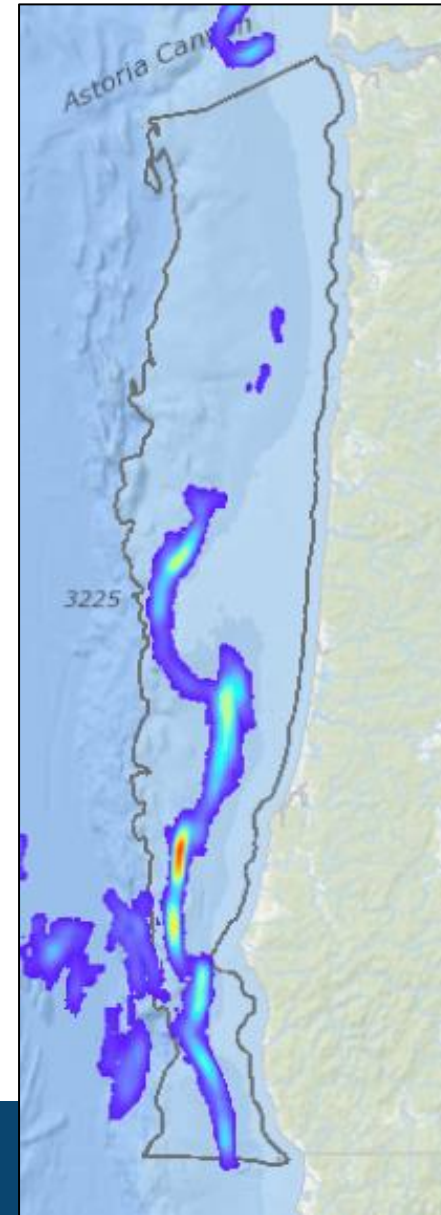
2006-2010



2011-2015



2016-2017



<https://www.webapps.nwfsc.noaa.gov/data/map>

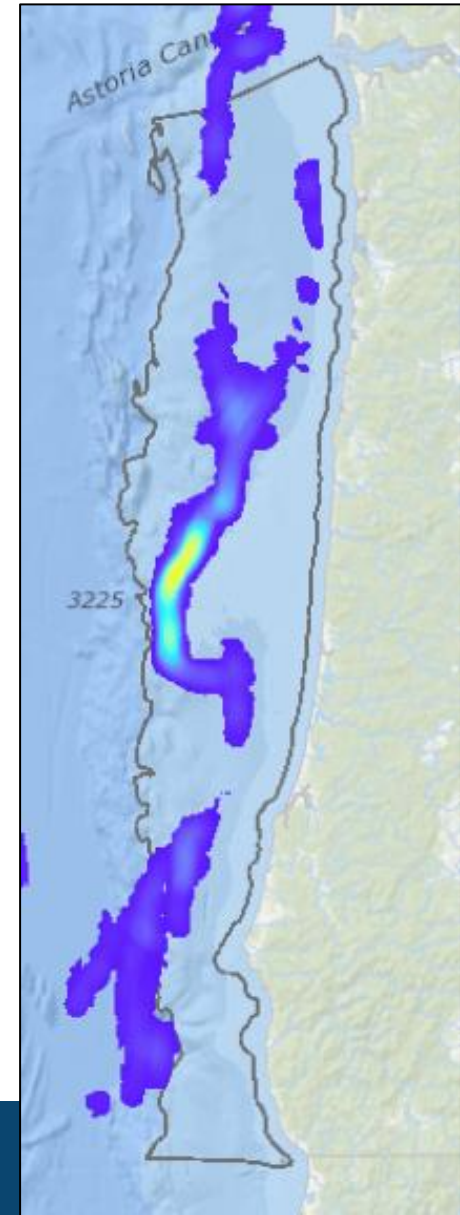
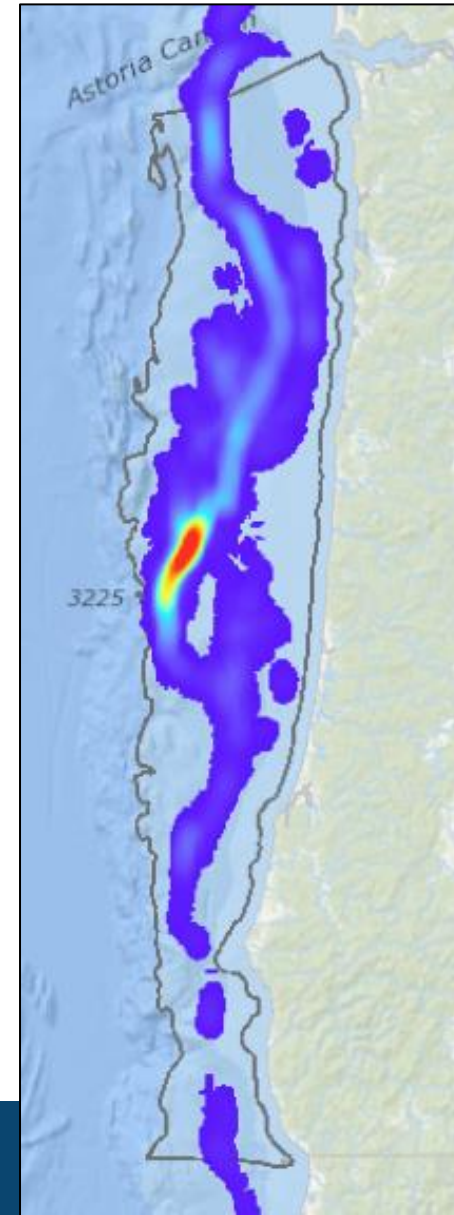
2002-2005

2006-2010

2011-2015

2016-2017

Shoreside Midwater Trawl Hake



<https://www.webapps.nwfsc.noaa.gov/data/map>

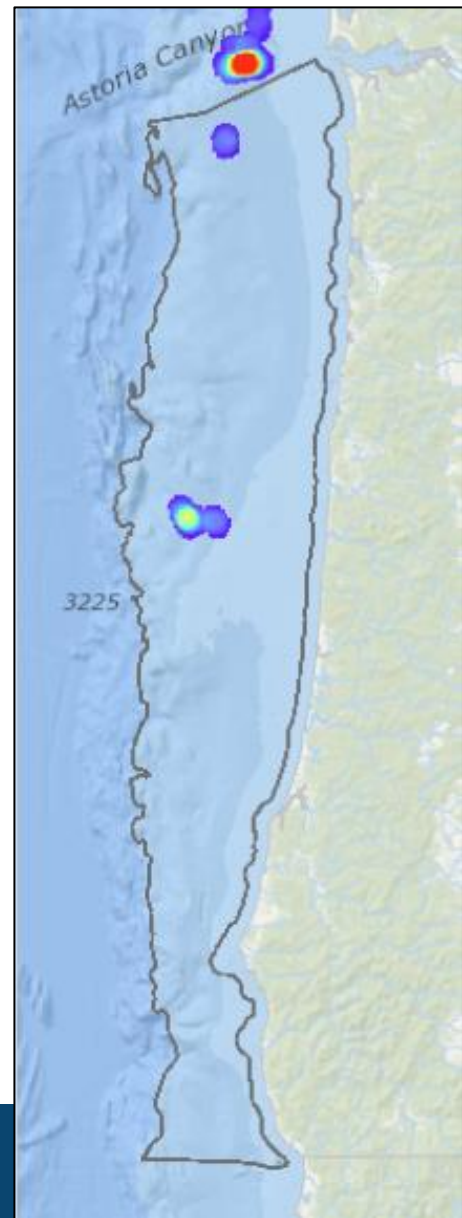
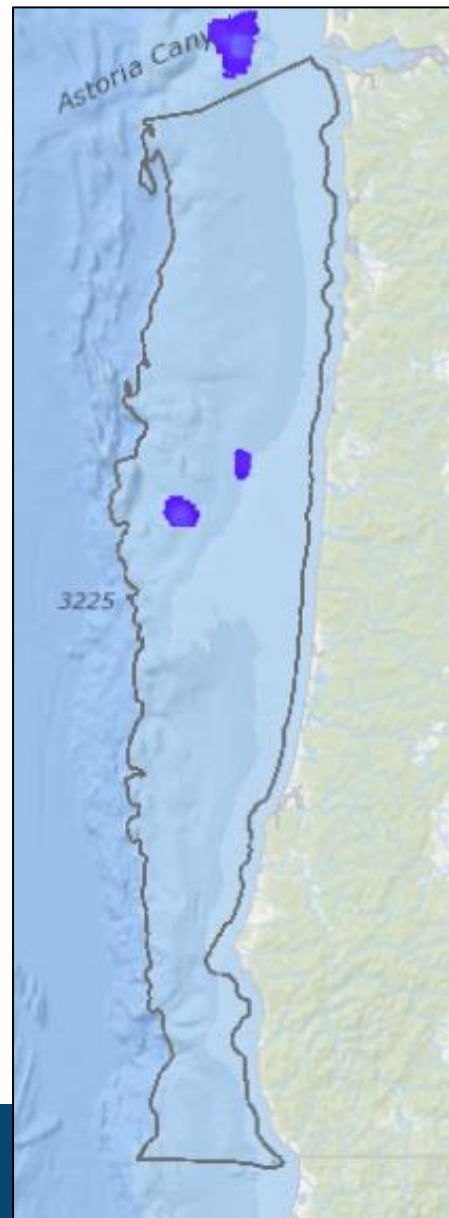
2002-2005

2006-2010

2011-2015

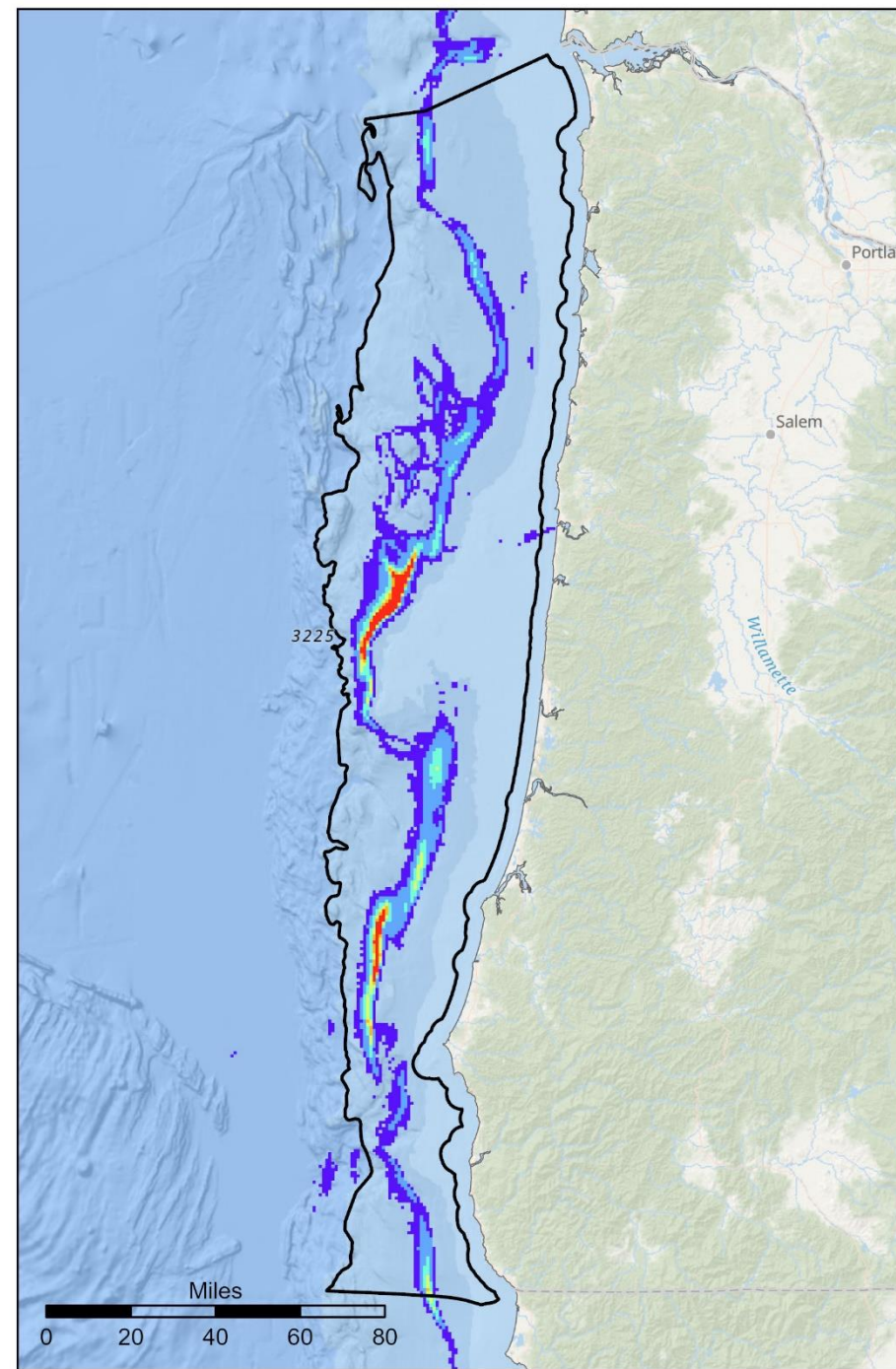
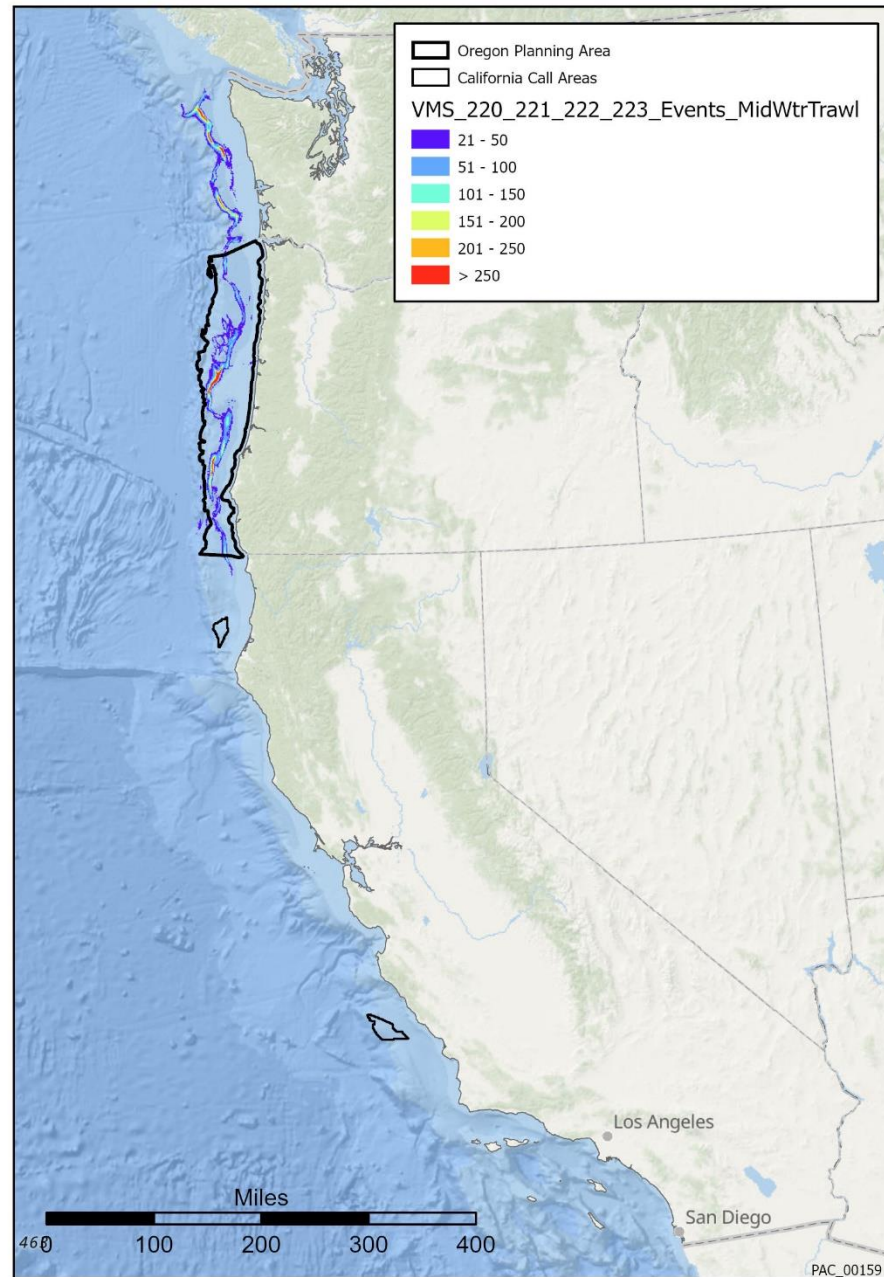
2016-2017

Shoreside Midwater Trawl Rockfish

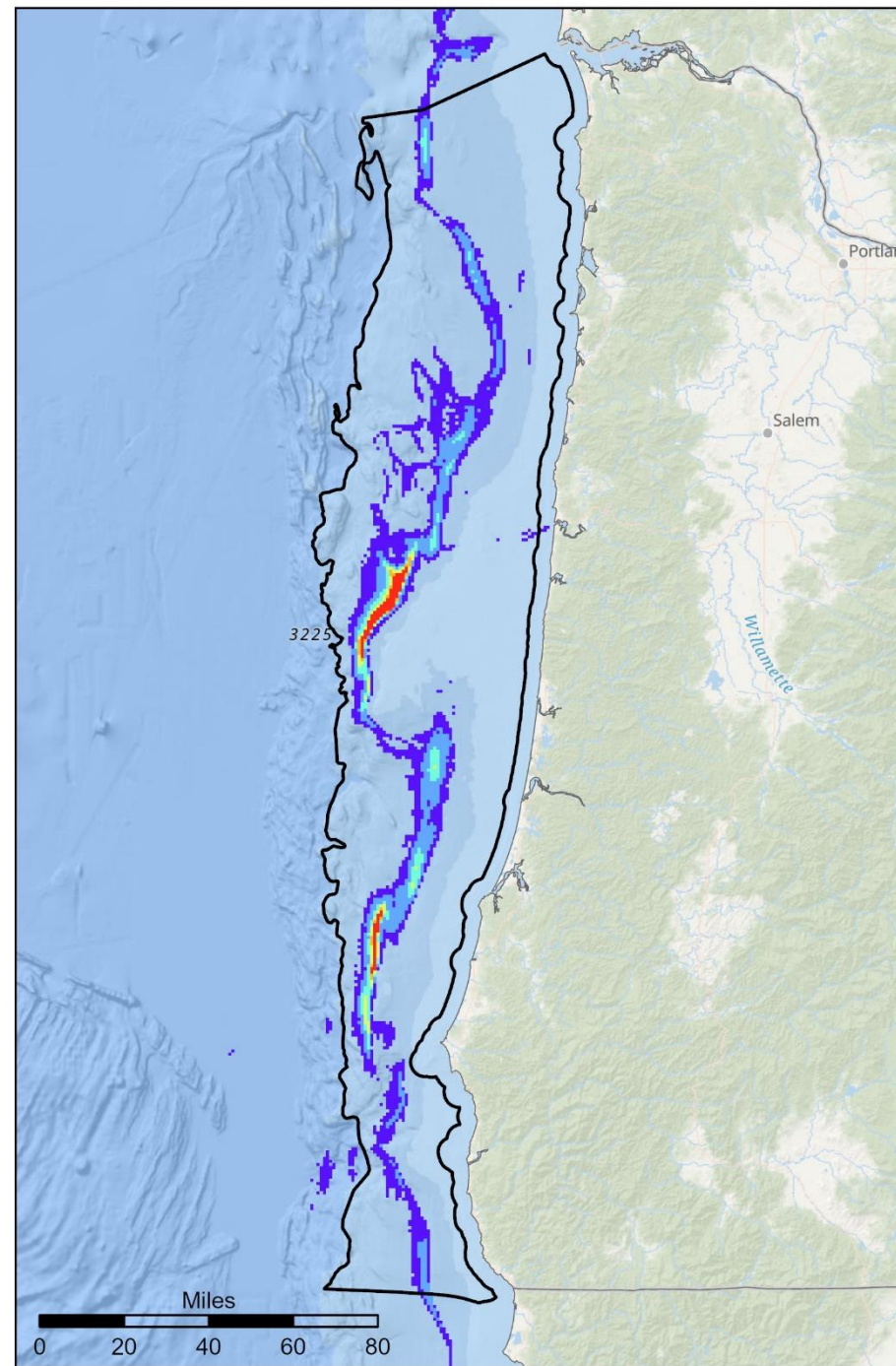
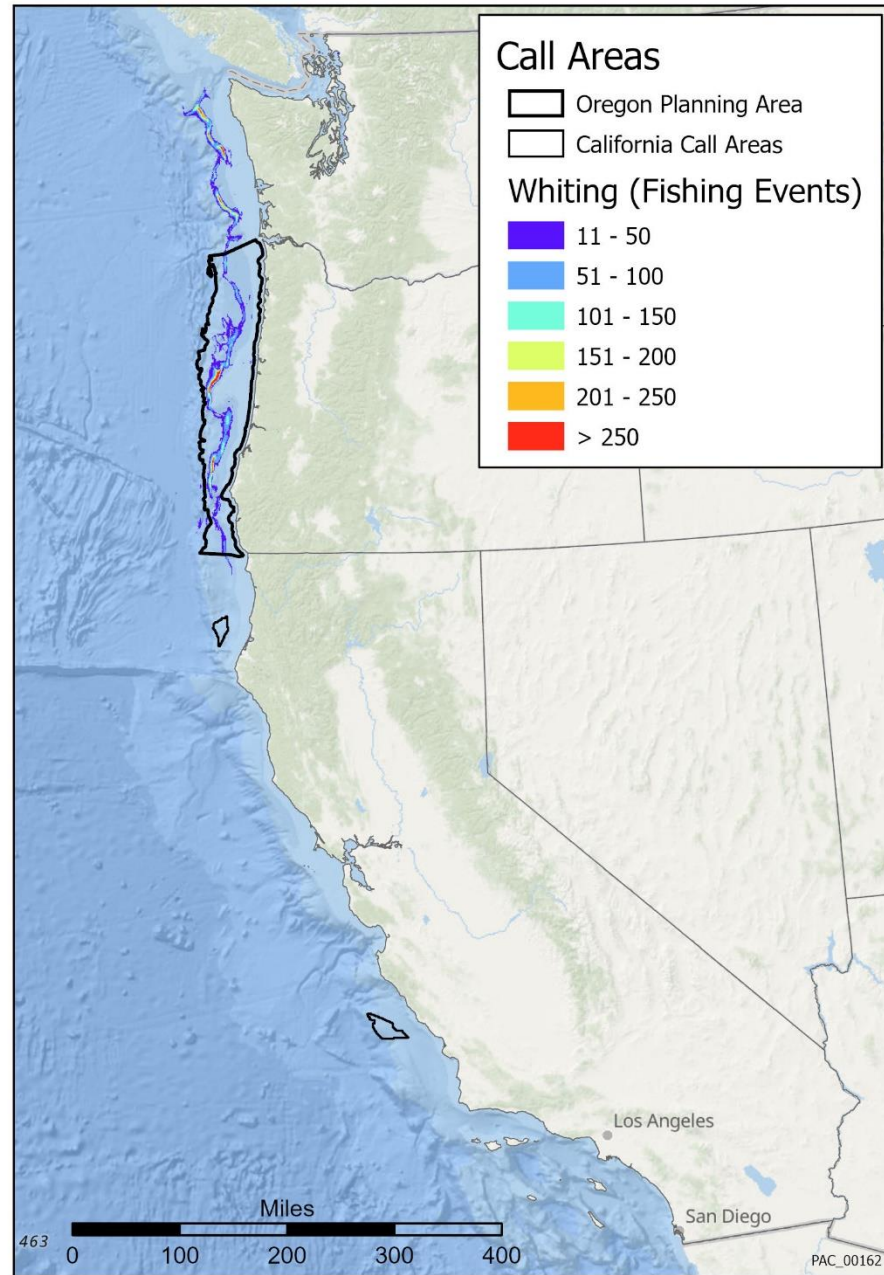


<https://www.webapps.nwfsc.noaa.gov/data/map>

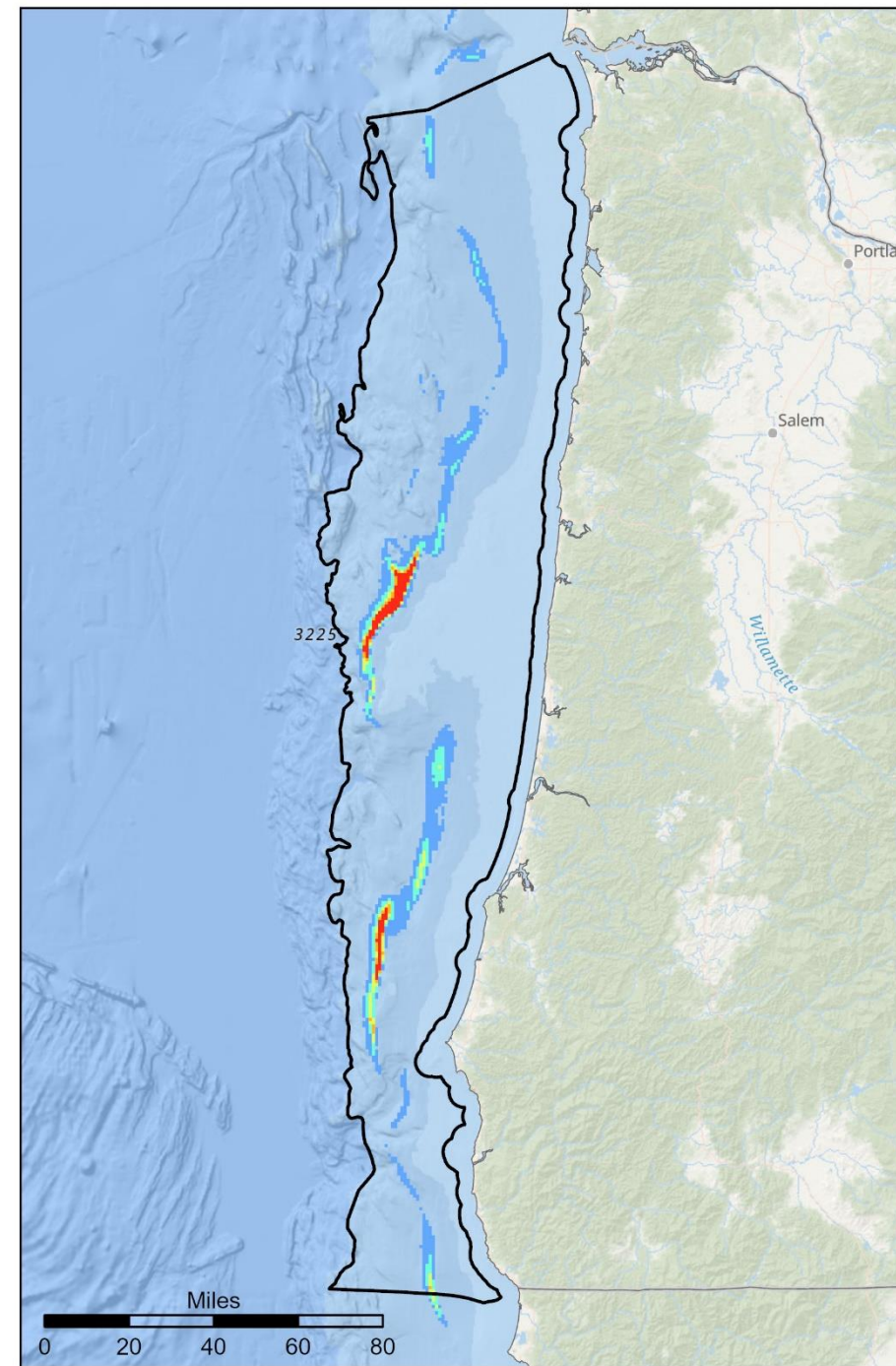
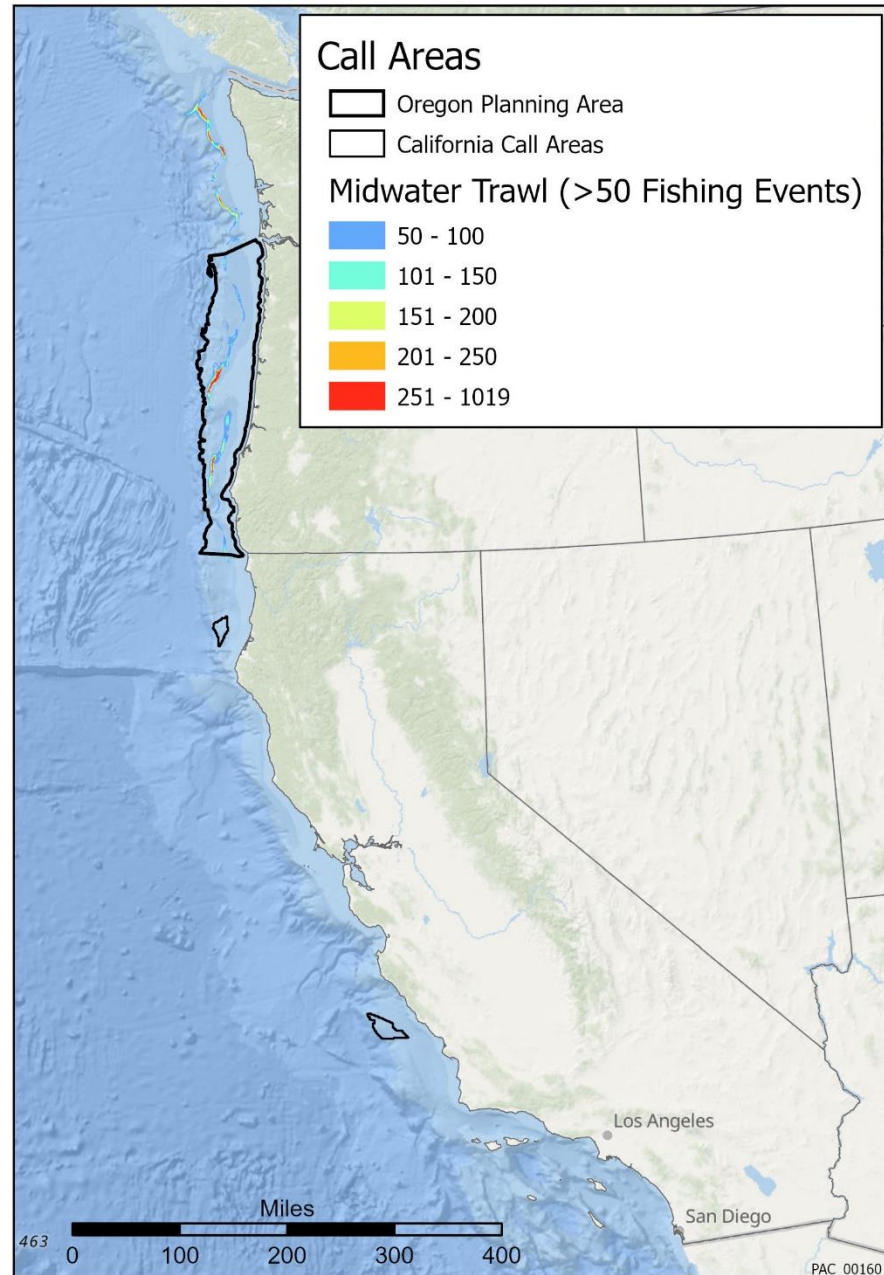
Midwater Trawl 2010-2017



Whiting Trawl 2010-2017

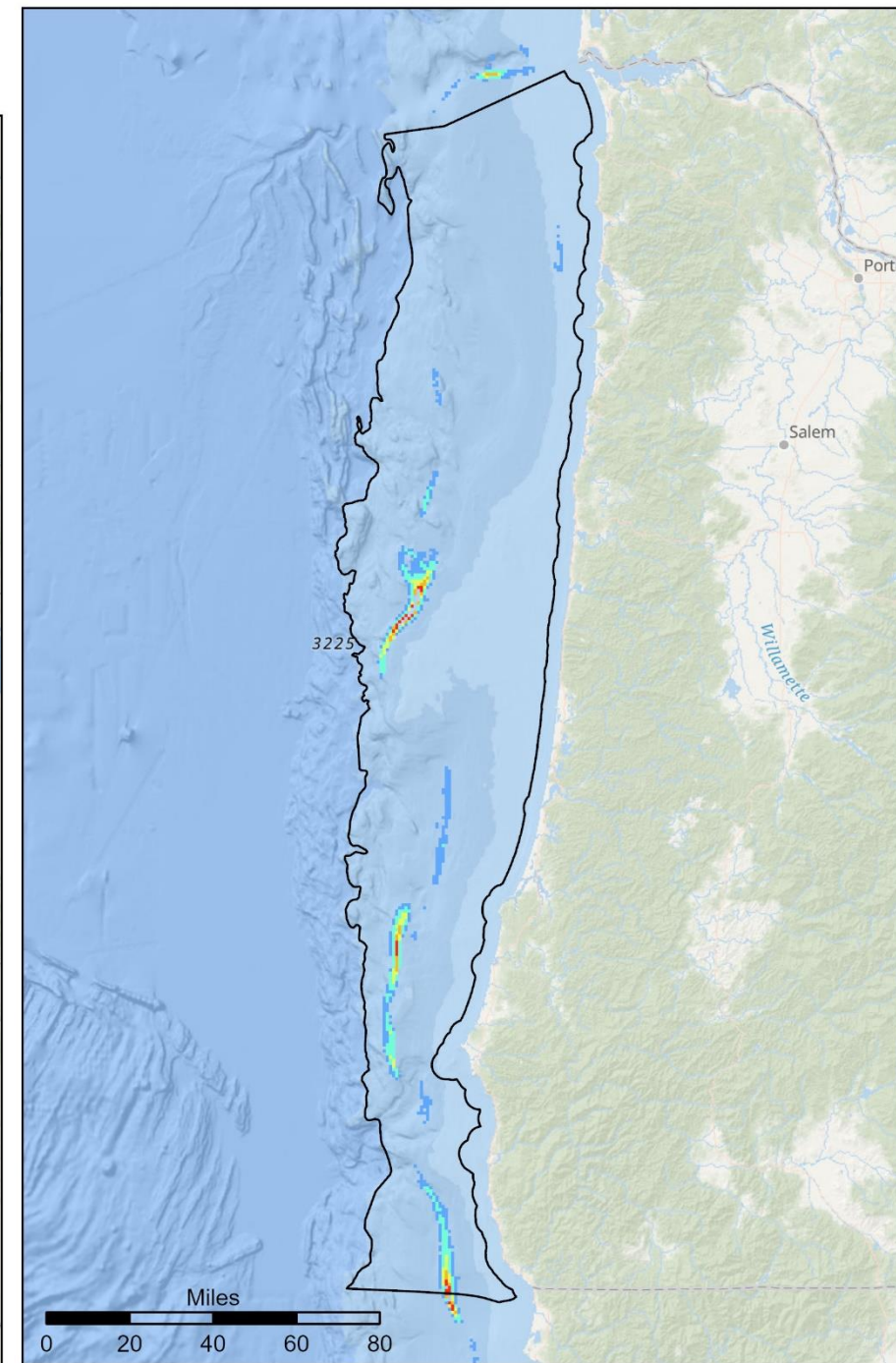
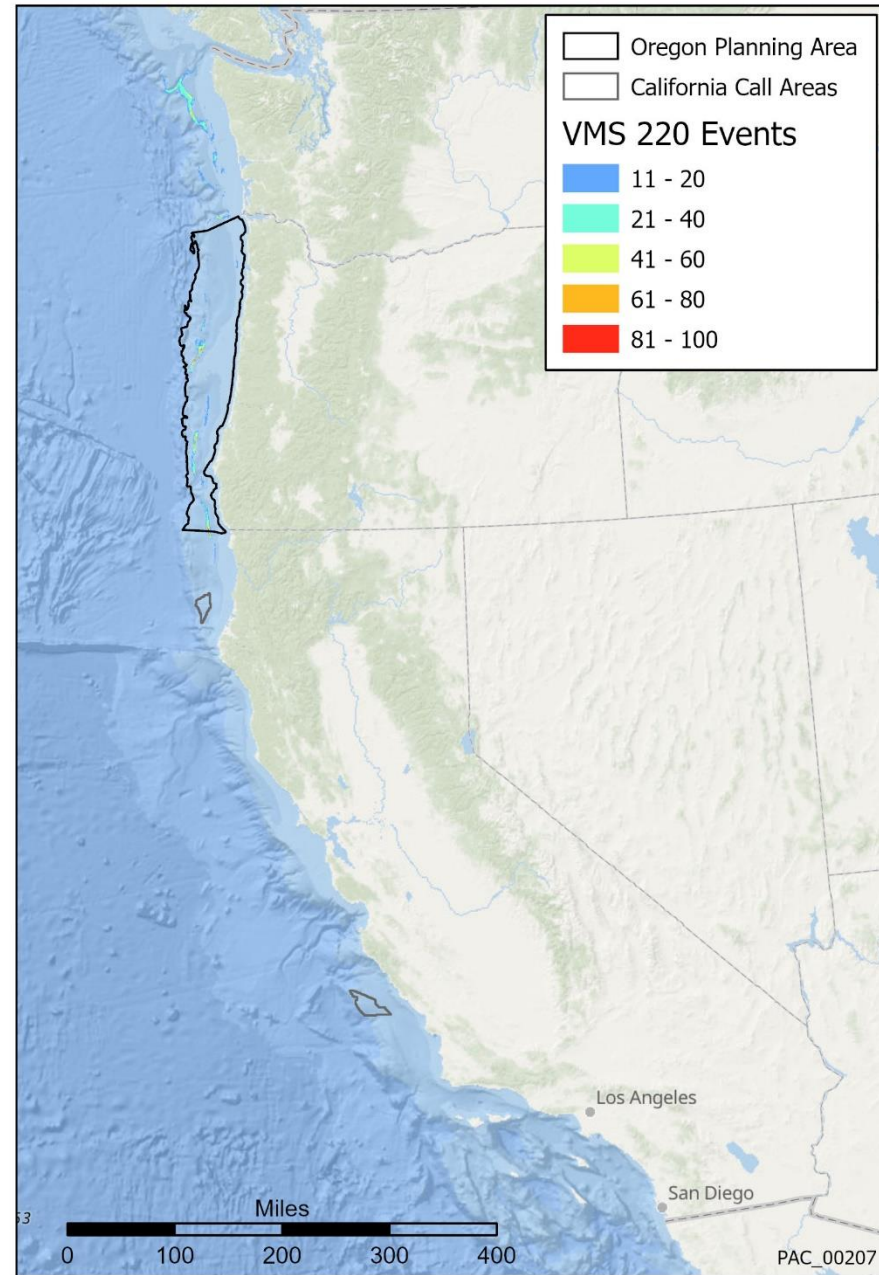


Whiting Trawl 2010-2017



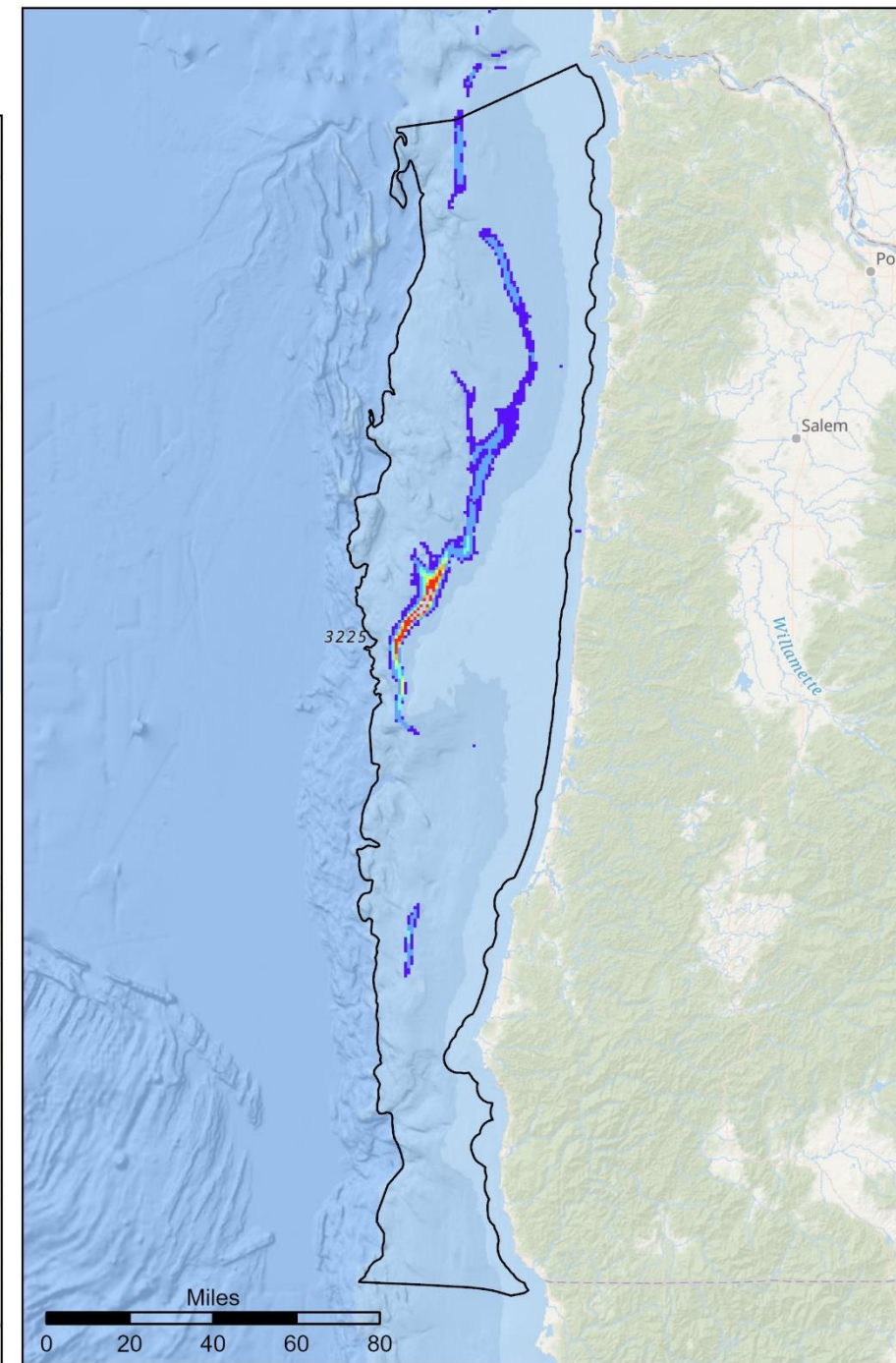
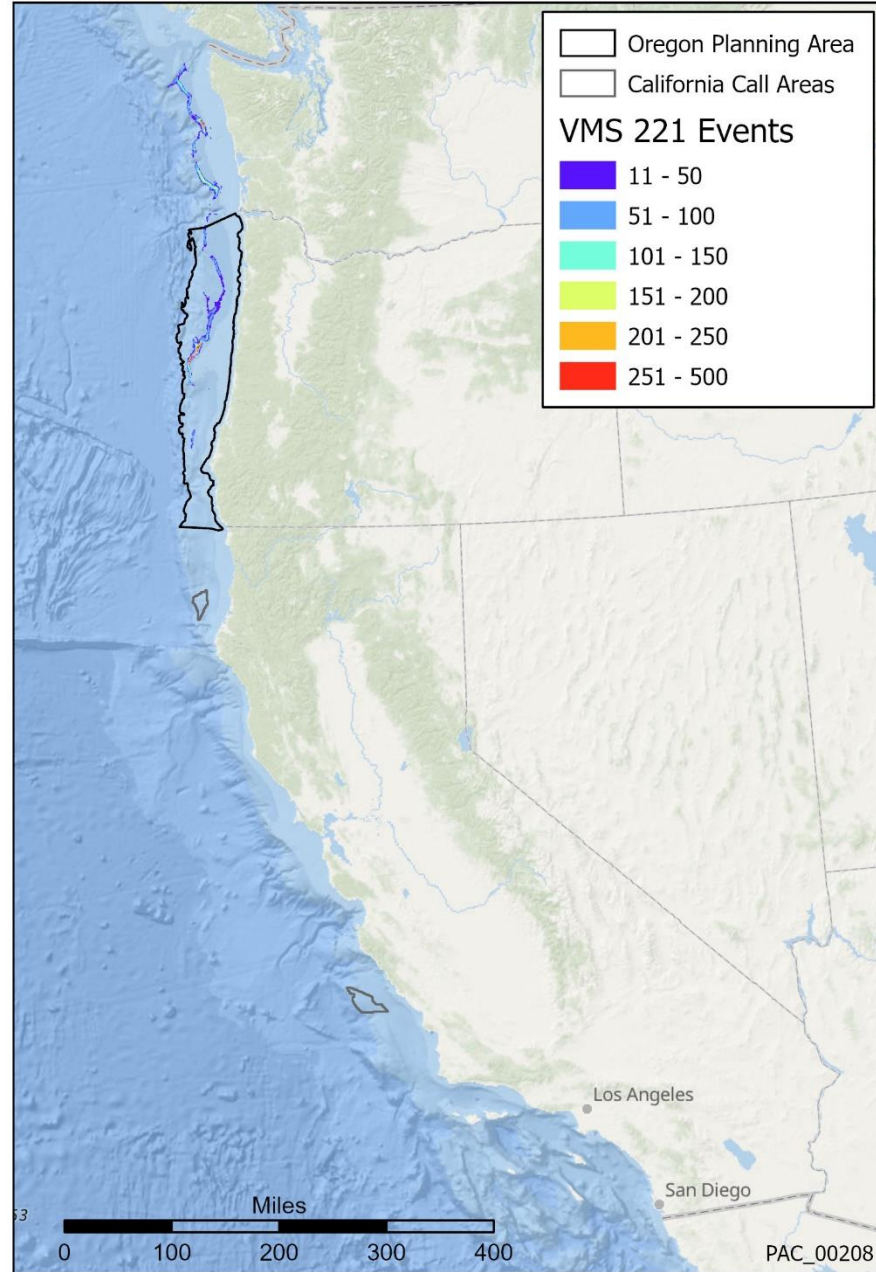
Non-Whiting Shorebased IFQ 2010-2017

220_Limited Entry Midwater Trawl (Non-whiting Shorebased IFQ)



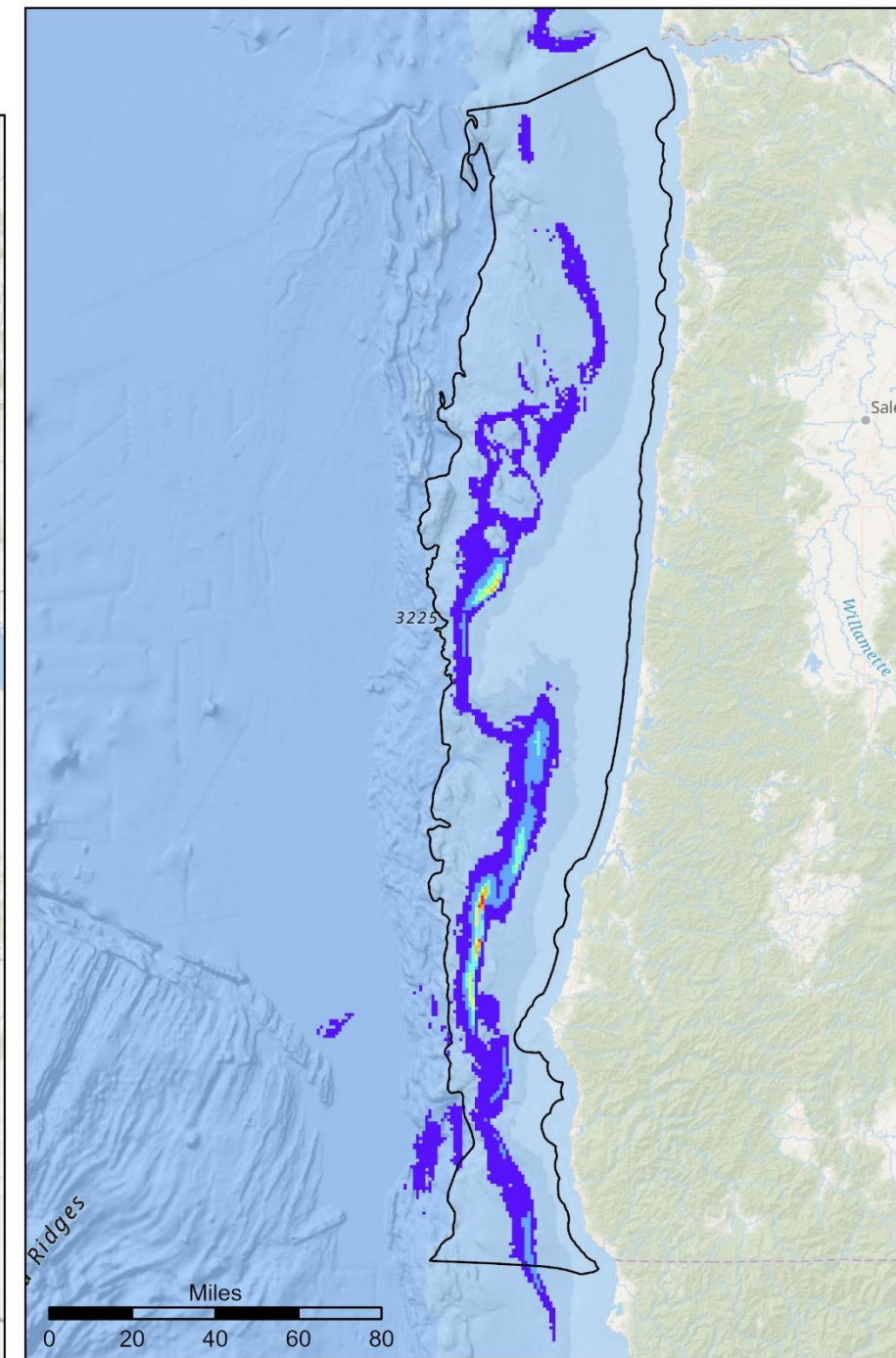
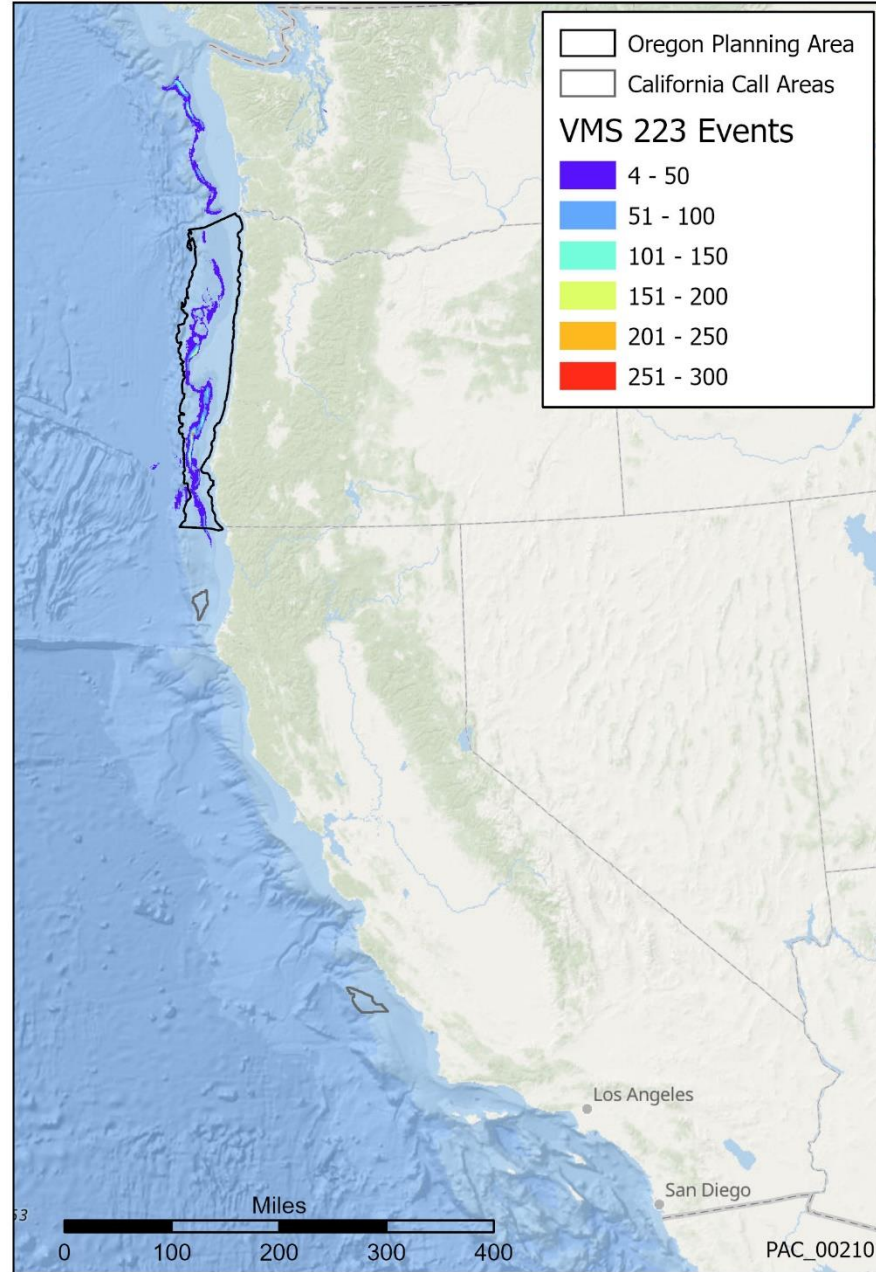
Whiting Shorebased IFQ 2010-2017

221_Limited Entry Midwater Trawl (Pacific Whiting Shorebased IFQ)

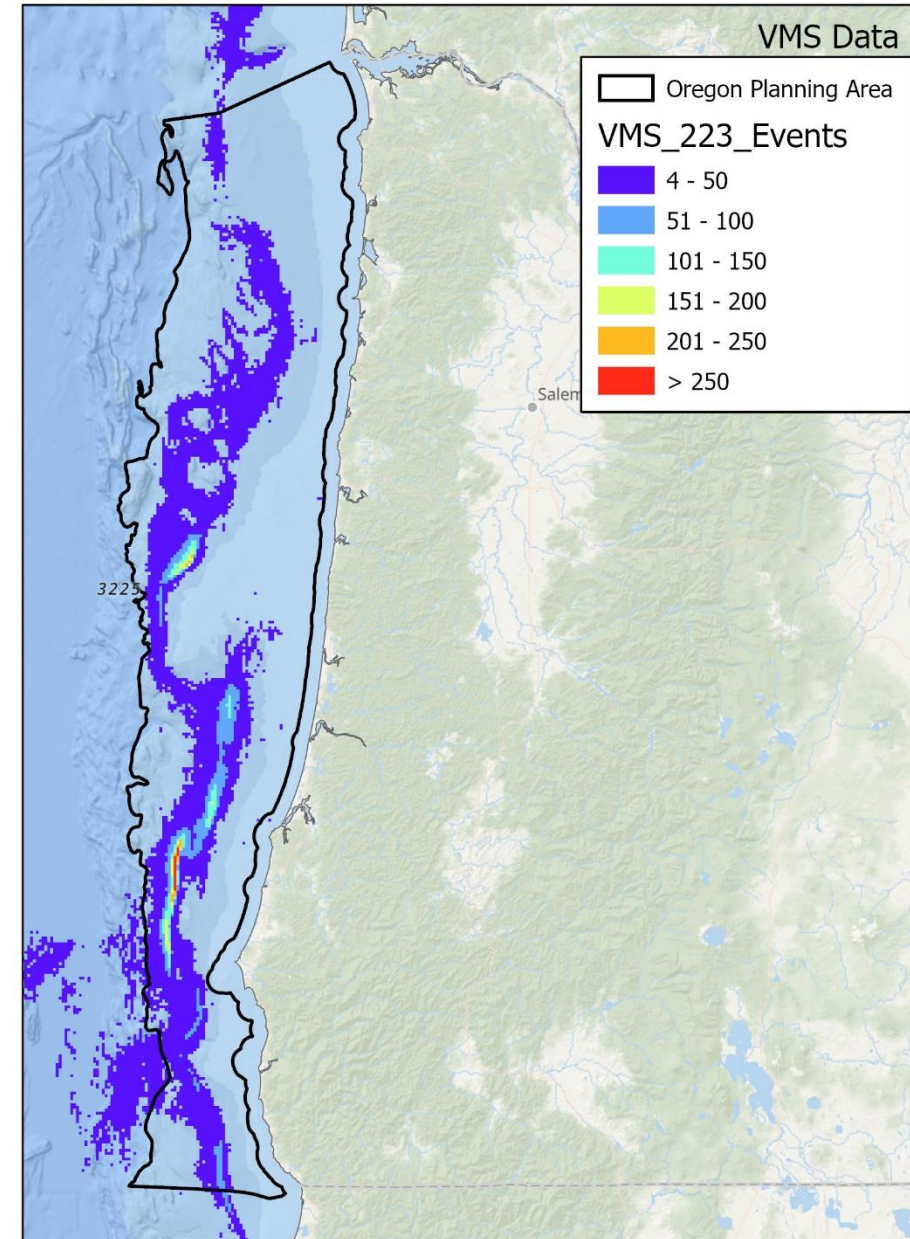
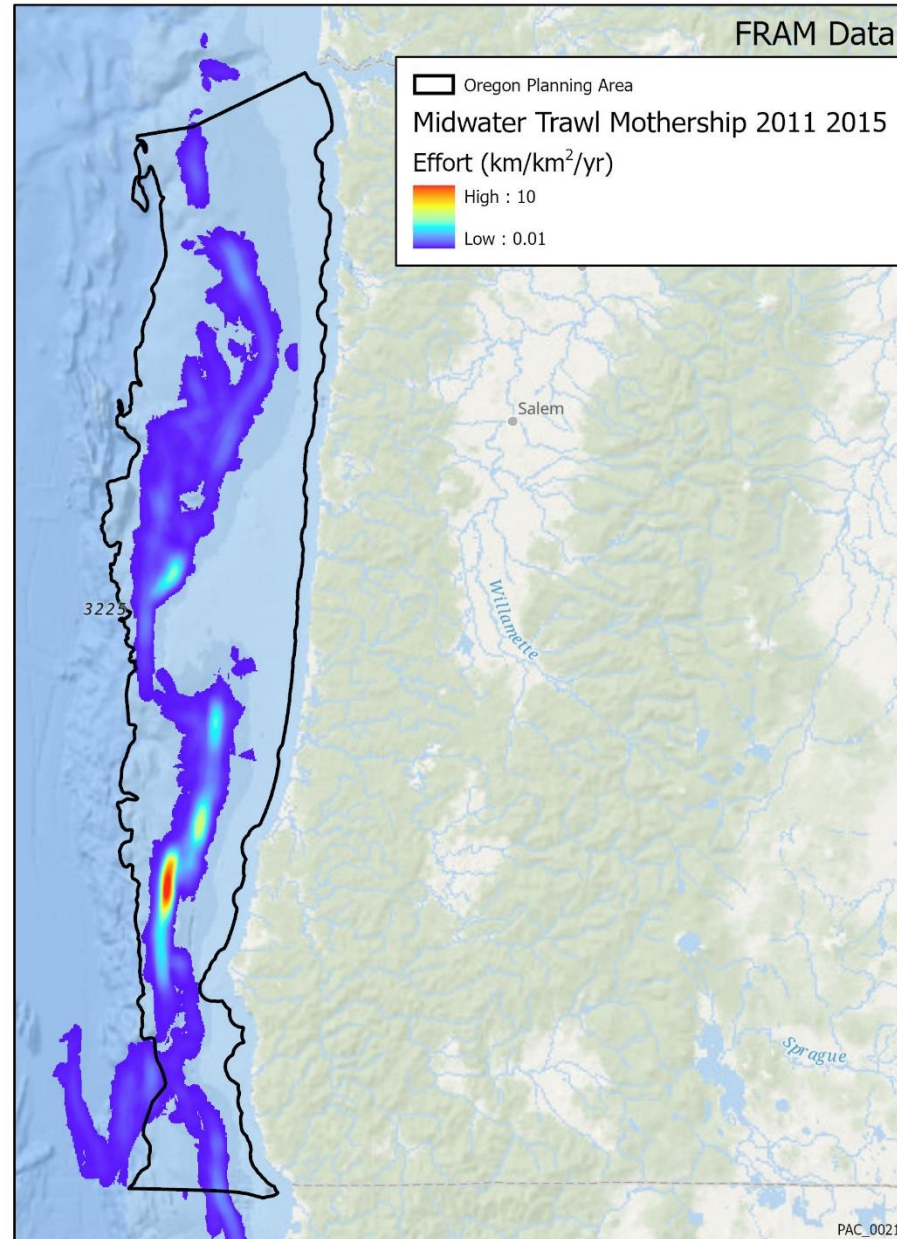


Whiting Mothership 2010-2017

223_Limited Entry Midwater Trawl (Pacific Whiting Mothership Sector)



NOAA Observer / VMS Comparison



Module 2: Crab, Shrimp, and Other Pot or Trap Fisheries

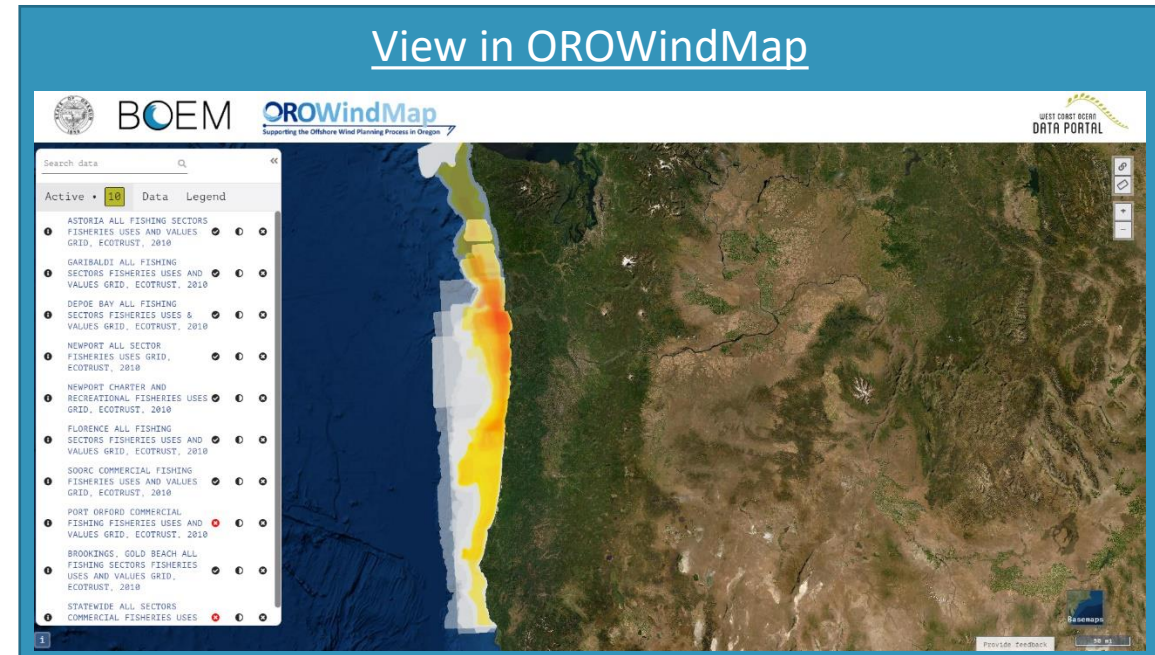


Marine Fishing (Salmon)

Data Layers in the Catalog

Oregon Marine Fisheries Uses and Values Data Products to Support the Territorial Sea Plan, Ecotrust, 2010-2012

- [Astoria All Fishing Sectors](#)
- [Garibaldi All Fishing Sectors](#)
- [Depoe Bay All Fishing Sectors](#)
- [Newport All Sector;](#)
- [Florence All Fishing Sectors](#)
- [SOORC Commercial Fishing](#)
- [Port Orford Commercial Fishing](#)
- [Brookings, Gold Beach All Fishing Sectors](#)
- [Statewide All Fishing Sectors](#)



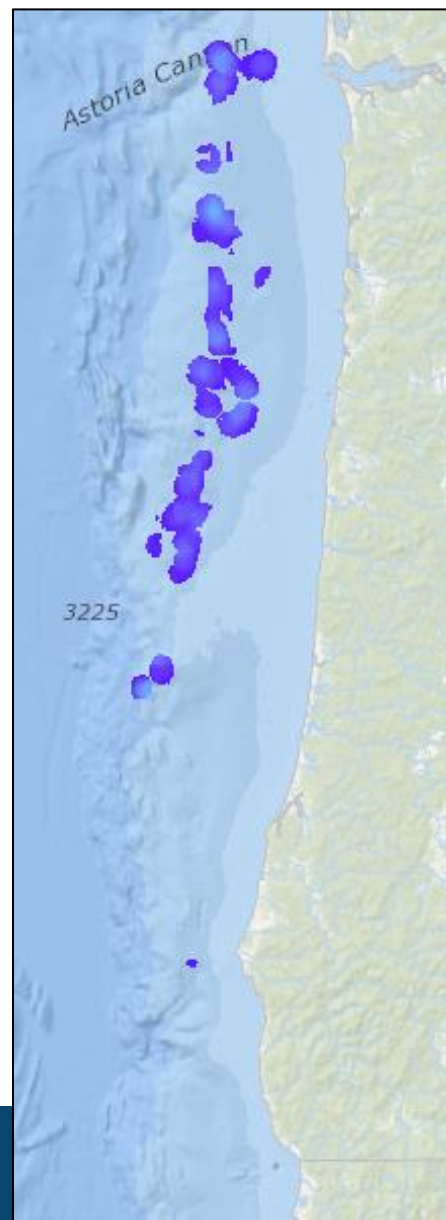
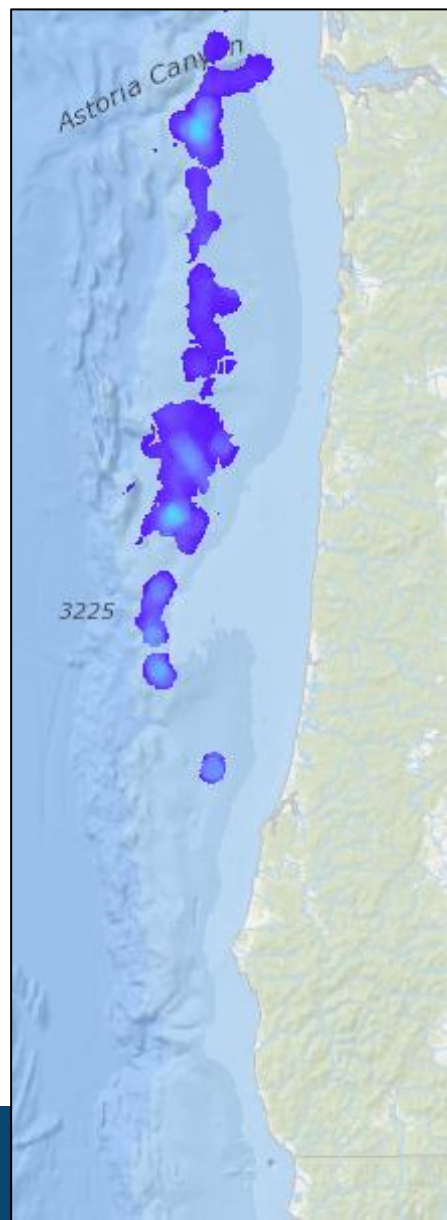
NOAA Fisheries Research Analysis and Monitoring (FRAM)

2002-2010

2011-2015

2016-2017

Non-Catch Shares Pot

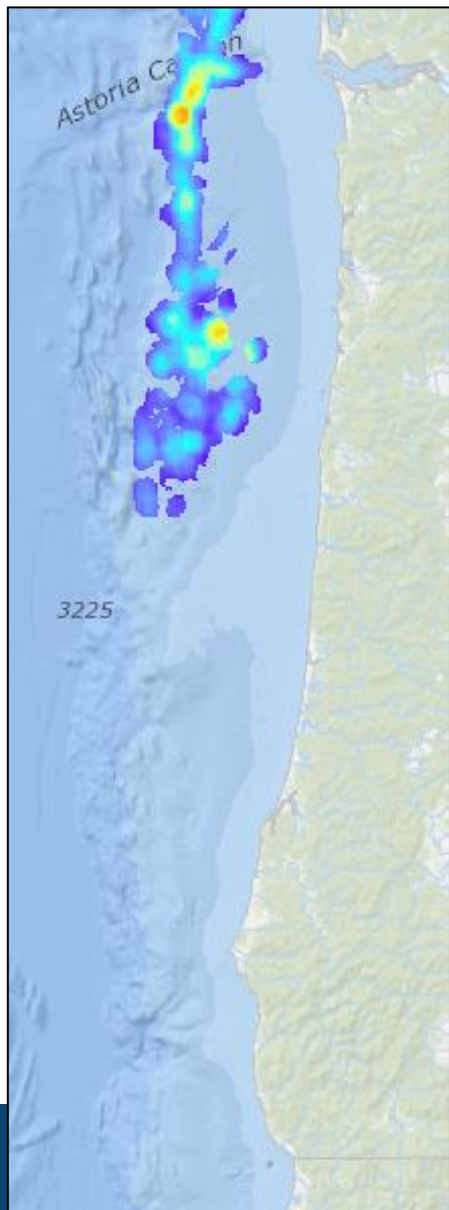
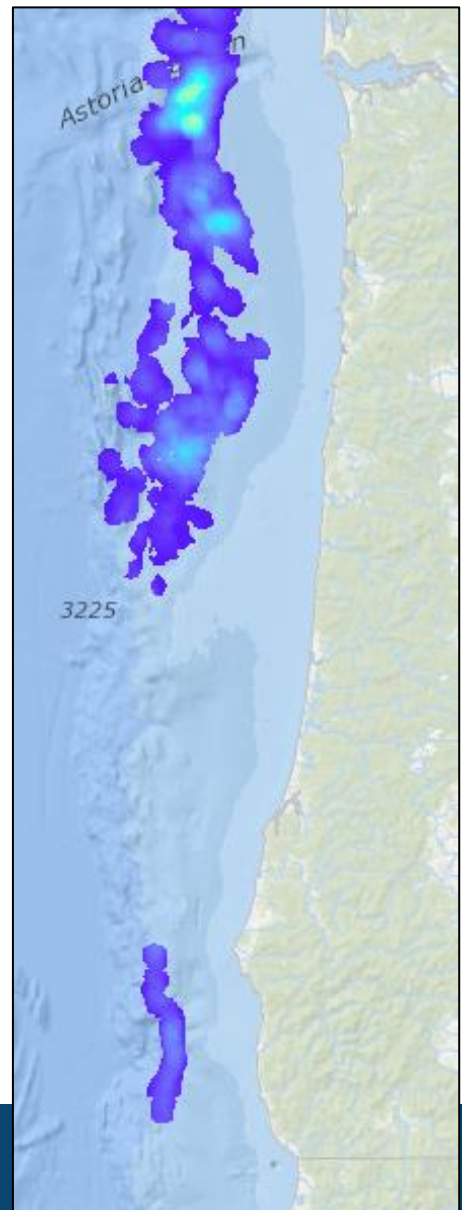


<https://www.webapps.nwfsc.noaa.gov/data/map>

2011-2015

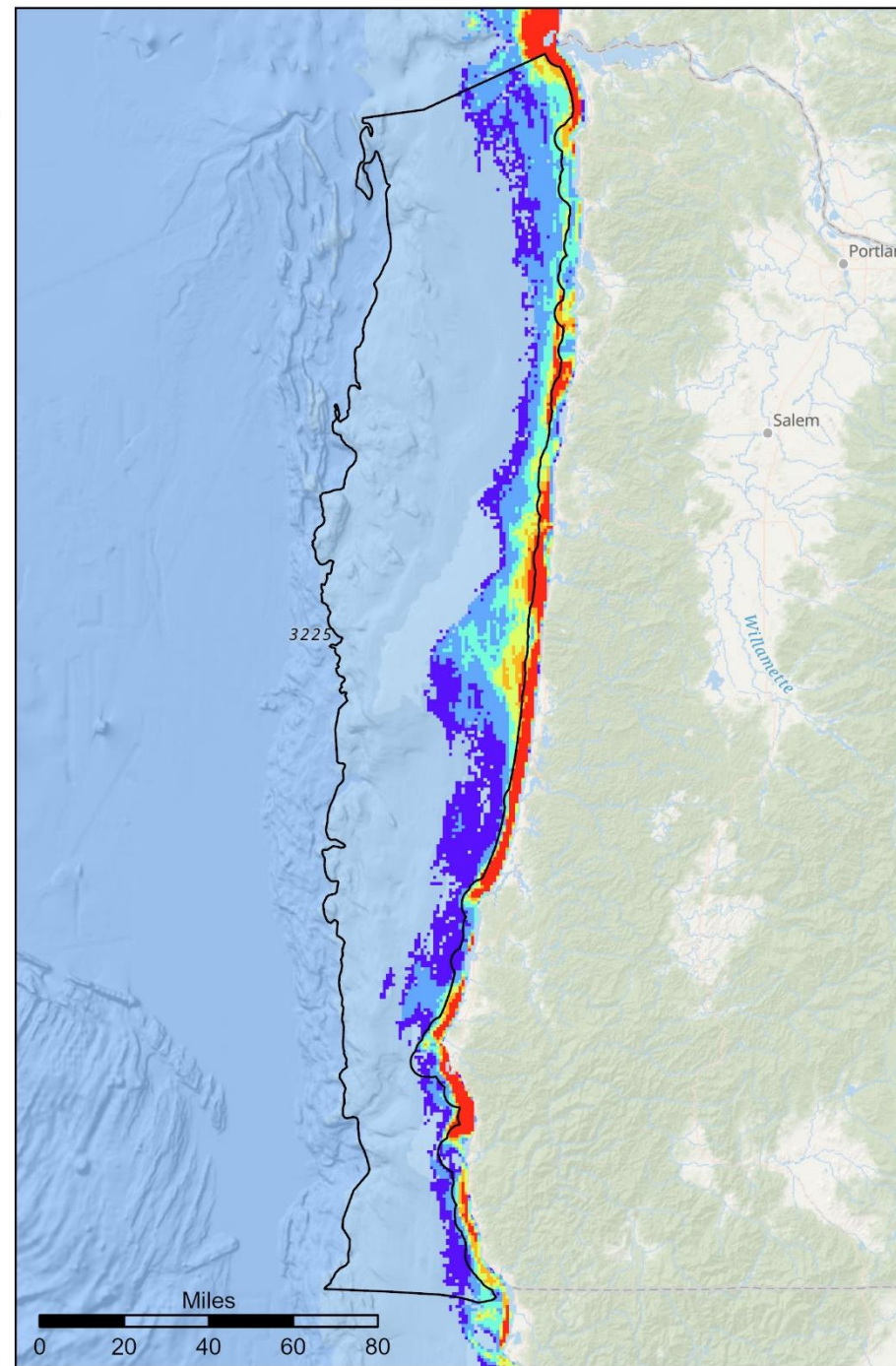
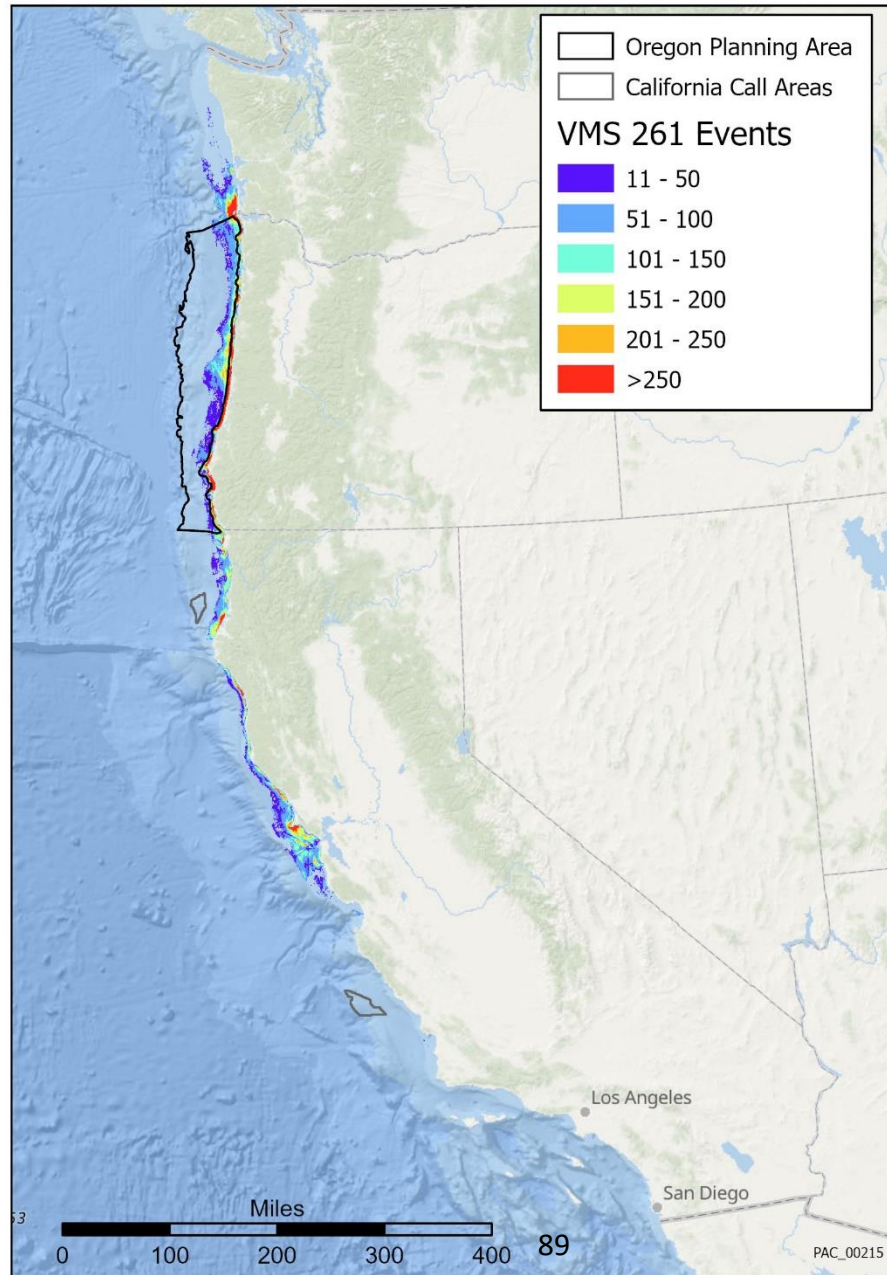
2016-2017

Catch Shares Pot



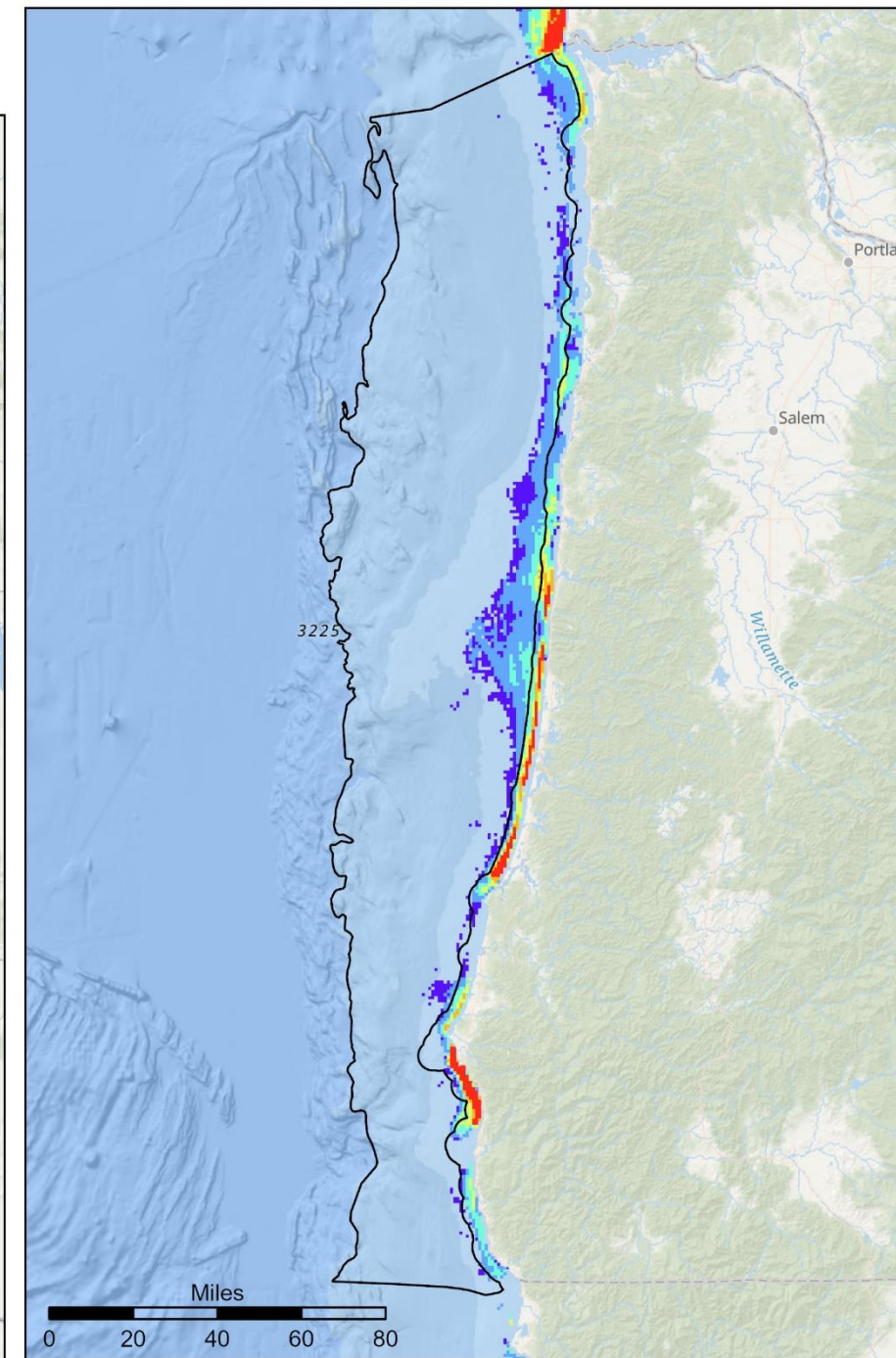
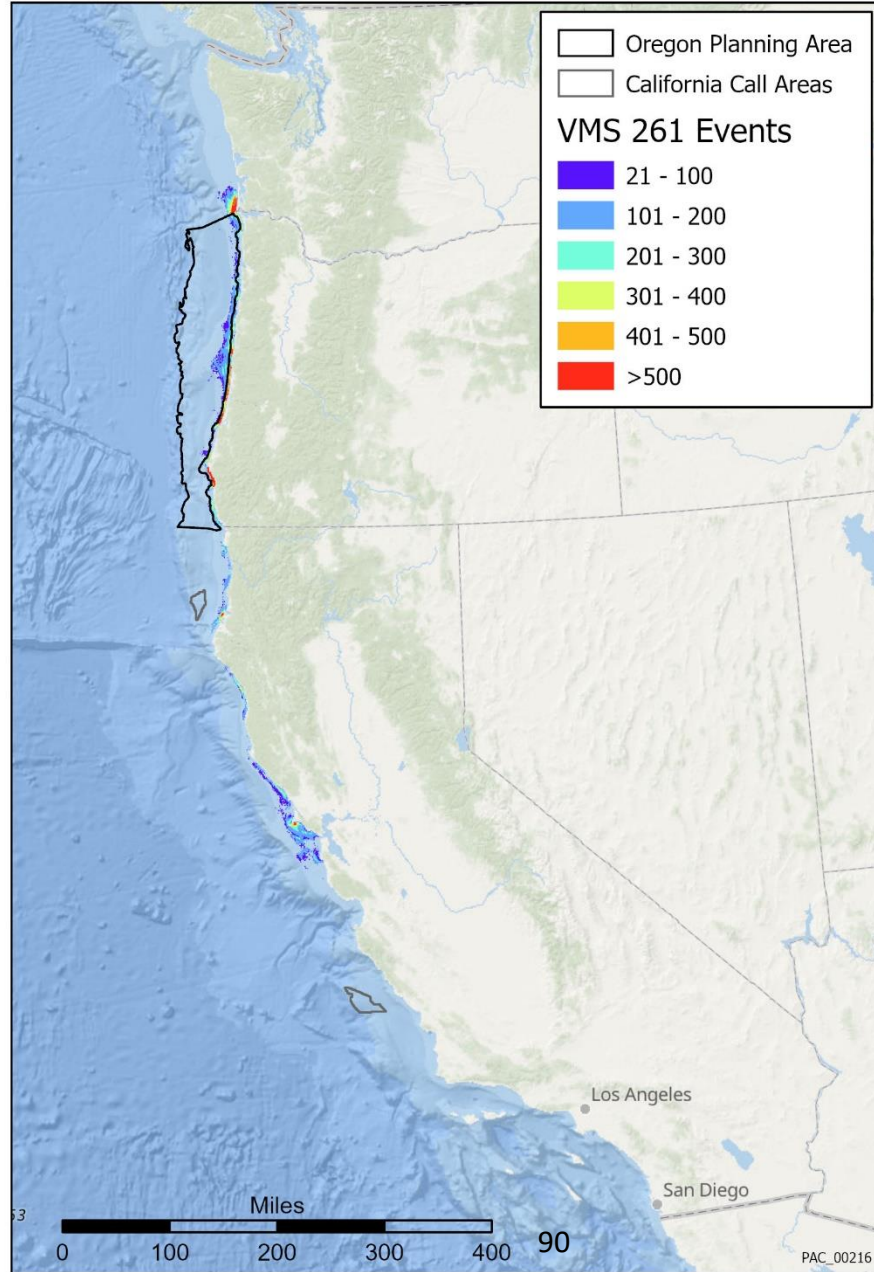
<https://www.webapps.nwfsc.noaa.gov/data/map>

Dungeness Crab 2010-2017



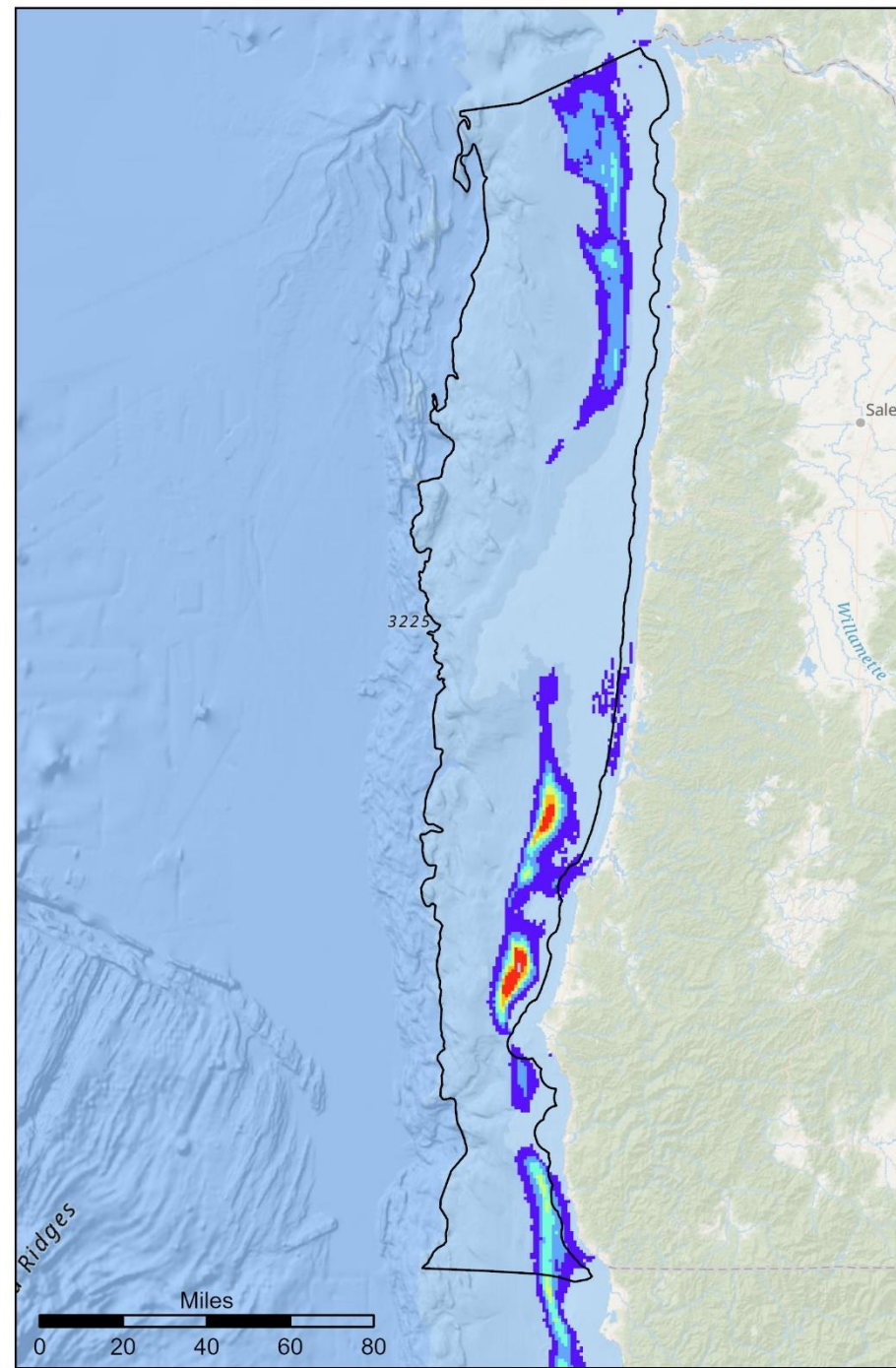
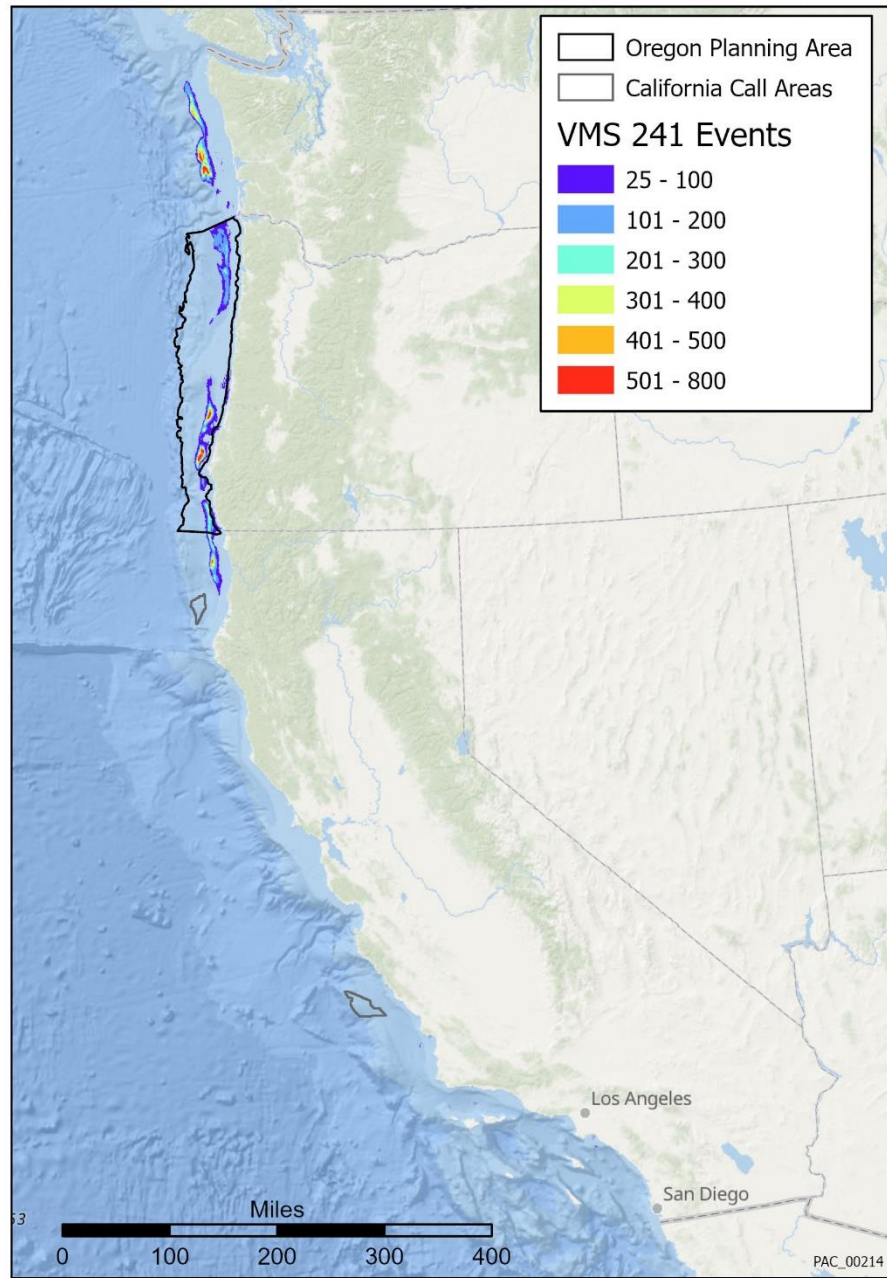
Dungeness Crab 2010-2017

261_Open Access Dungeness Crab Trap or Pot Gear (>20 events)

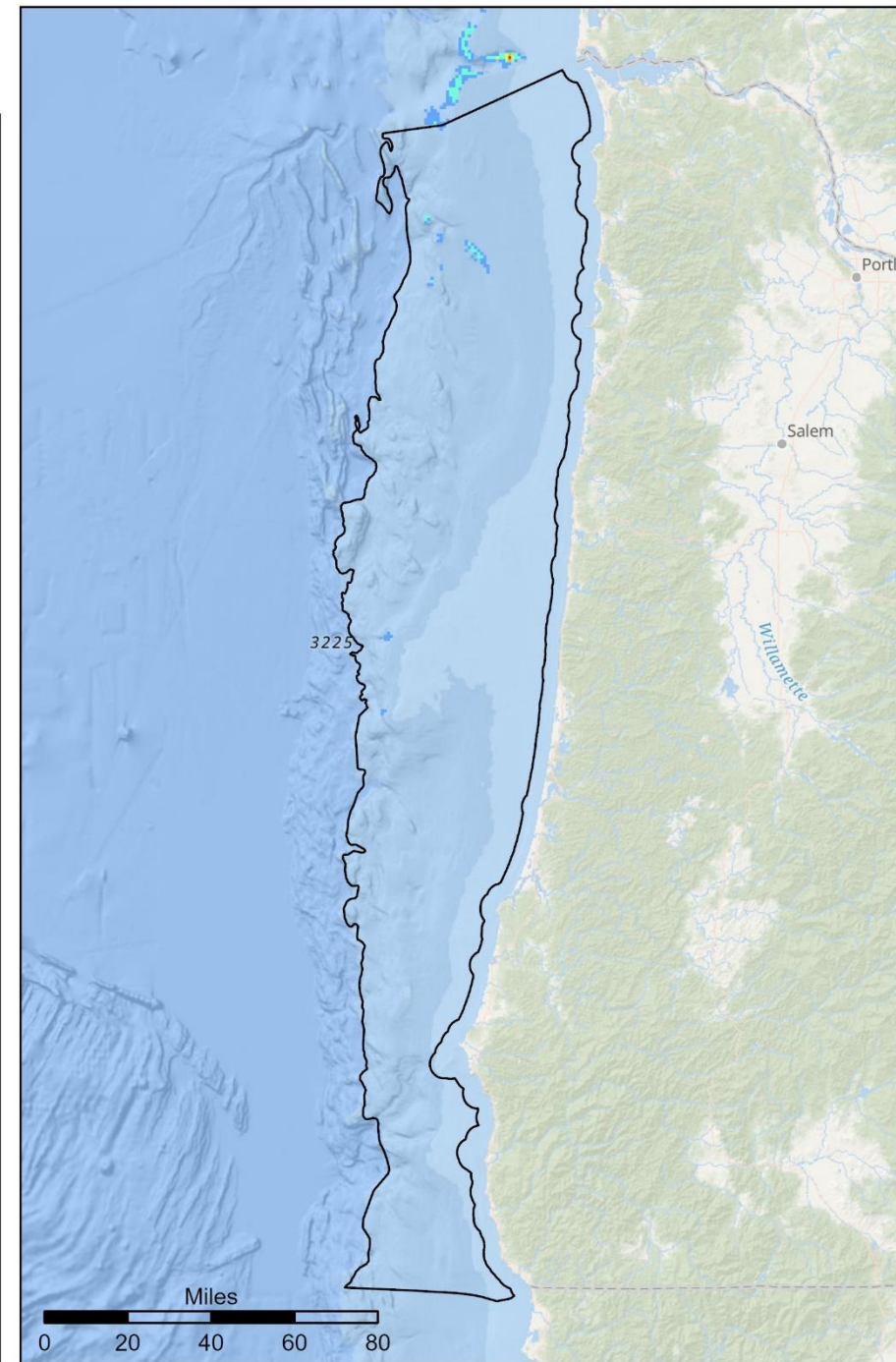
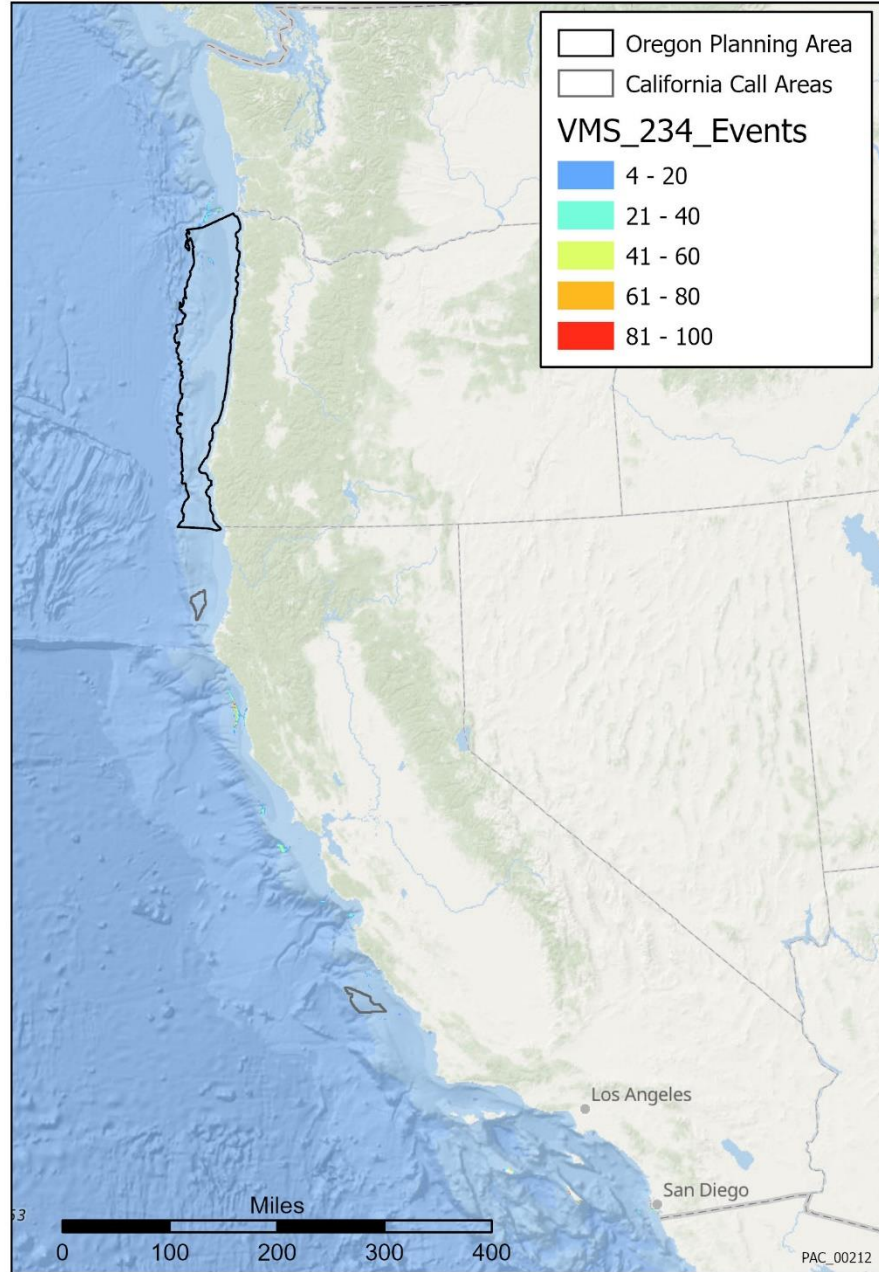


241_Non-Groundfish Trawl Gear for Pink Shrimp

Pink Shrimp 2010-2017



Open Access Groundfish Trap or Pot 2010-2017



Module 3: Pacific Salmon, Highly Migratory Species, and Coastal Pelagic Species



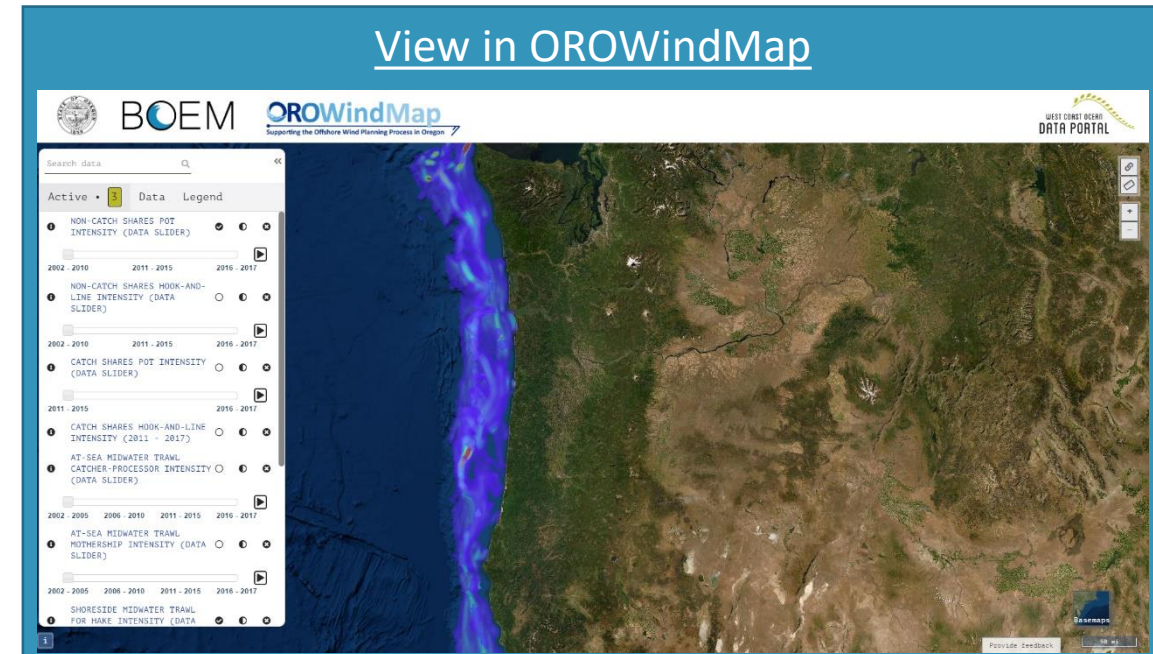
Marine Fishing (Crab, Shrimp, Other Pot or Trap Fisheries)

Data Layers in the Catalog (2)

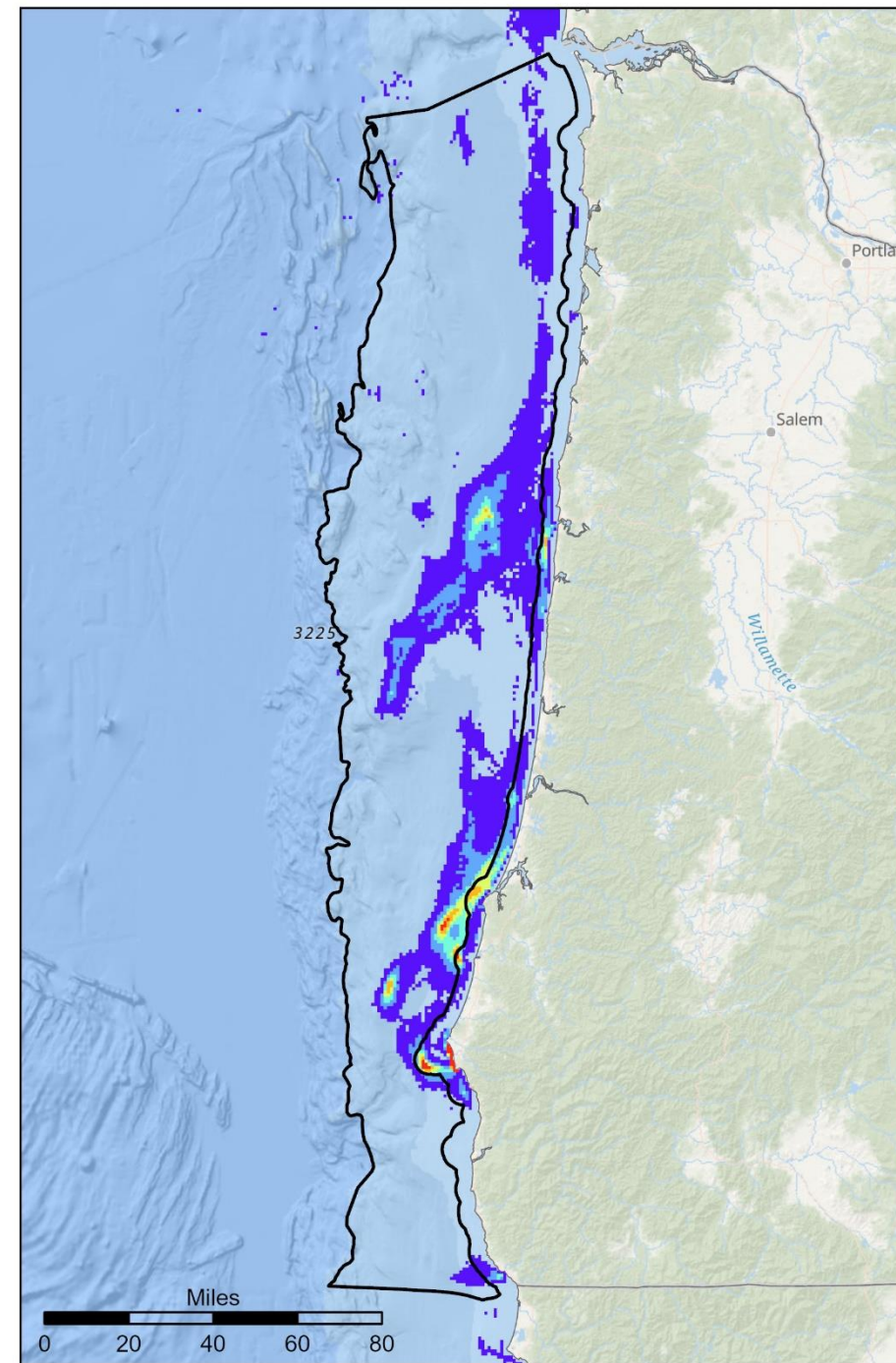
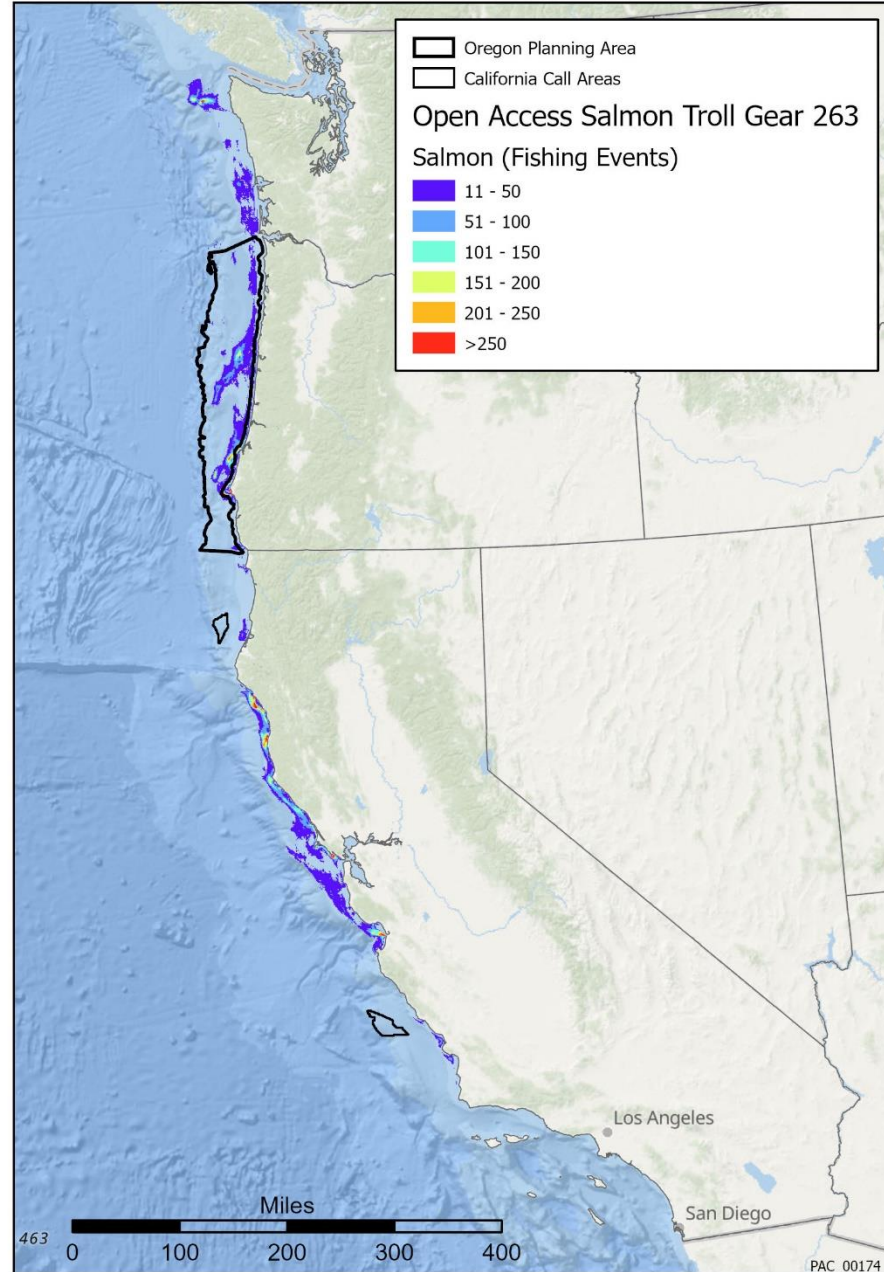
Fishing Effort in the 2002-2017 U.S. Pacific Coast Groundfish Fishery, NOAA

This set of map services depicts the relative intensity and proportion of commercial fishing effort for several gear types used off the U.S. West Coast from 2002-2017 (Somers et al. 2020).

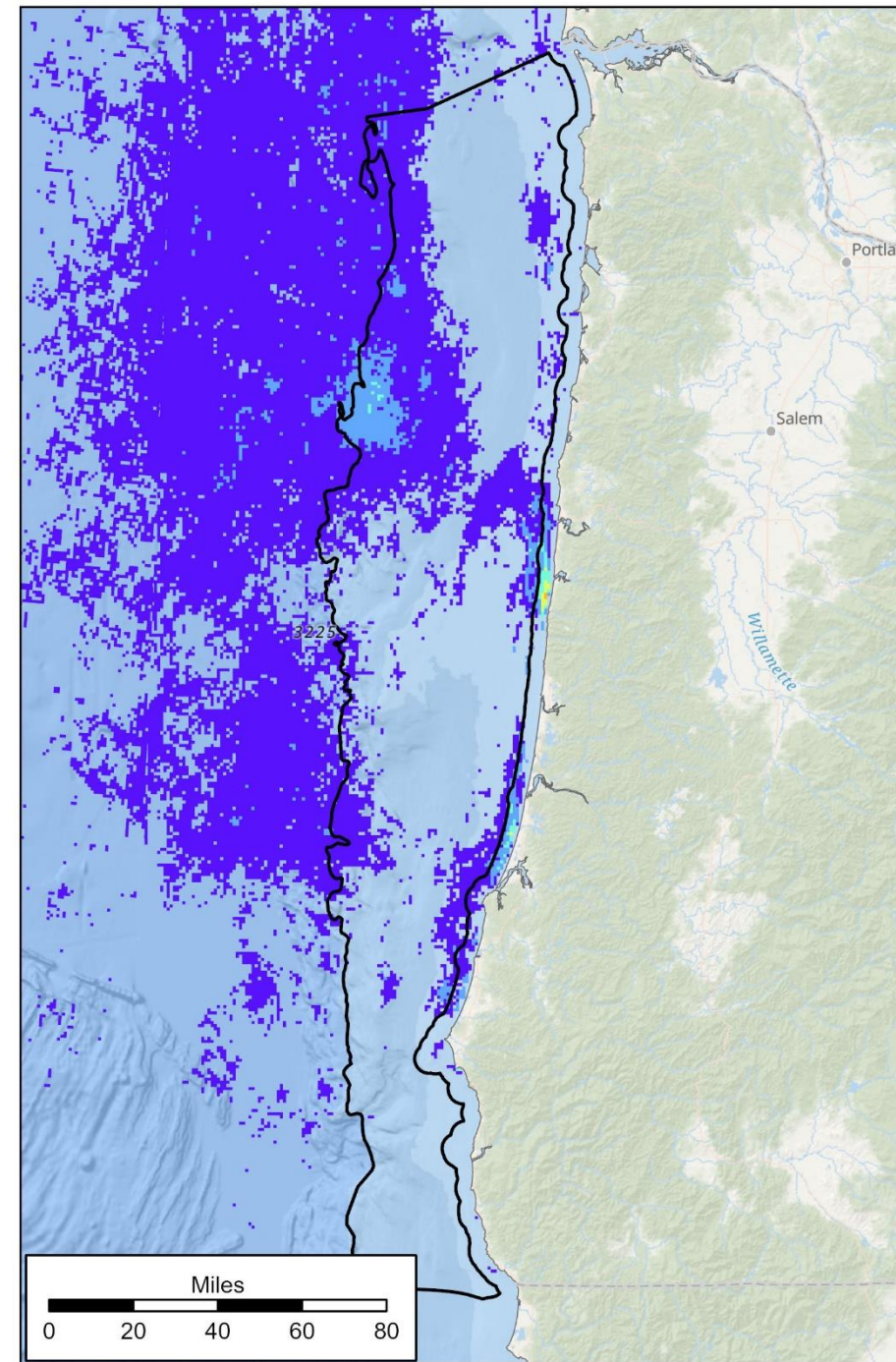
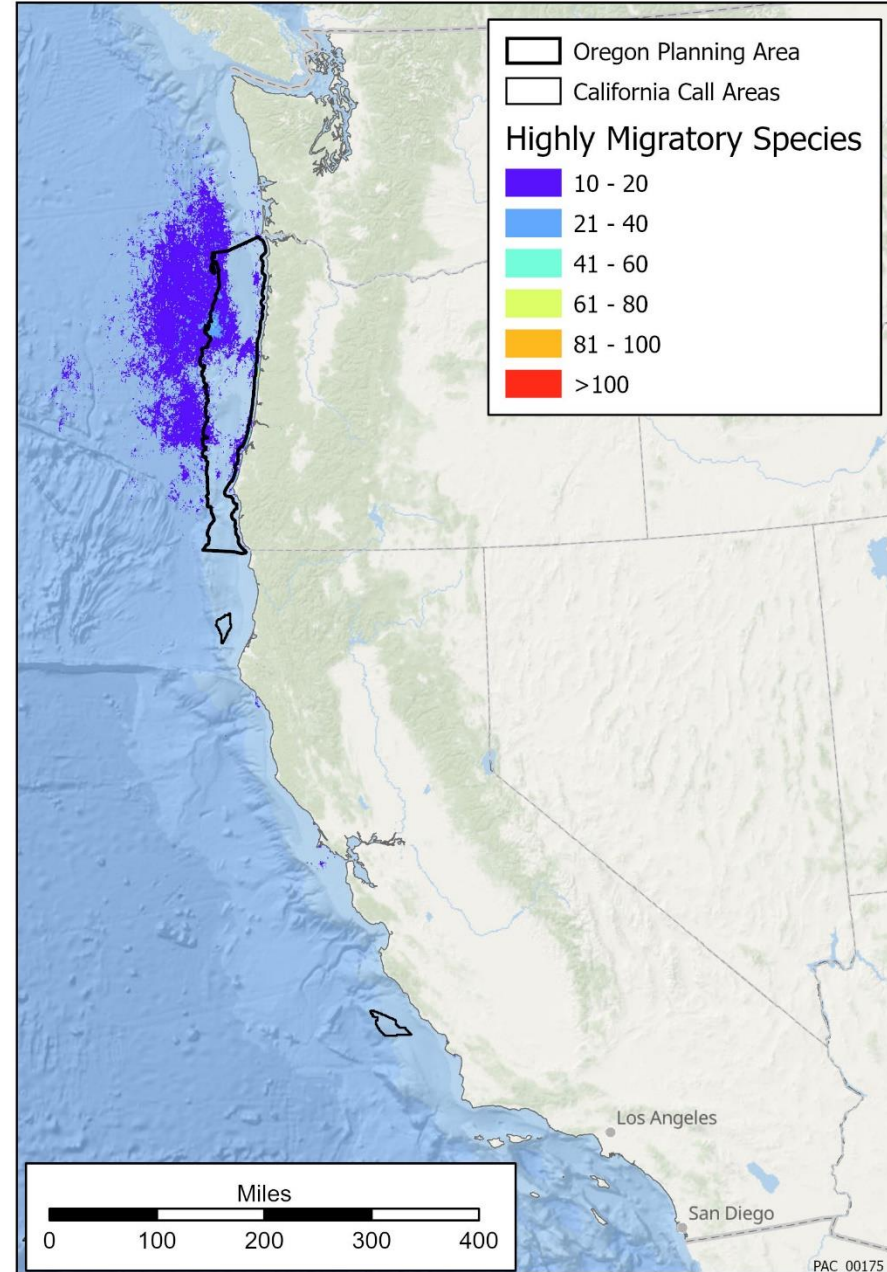
- Non-Catch Shares Pot Intensity (2002-2010), (2011-2015), (2016-2017)
- Catch Shares Pot Intensity (2011-2015), (2016-2017)
- Non-Catch Shares Pot Intensity (2002-2010), (2011-2015), (2016-2017)
- Catch Shares Hook-and-Line Intensity (2011 - 2017)
- Catch Shares Bottom Trawl Intensity (2011-2015), (2016-2017)
- Limited Entry Bottom Trawl Intensity (2002-2006); (2006-2010)



Salmon 2010-2017



Highly Migratory Species 2010-2017



Coastal Pelagic Species

2010-2017

No VMS data due to
“Rule of 3”

Advanced symbology options

- Format labels
- Sample size
 - Maximum sample size: 500000
- Data exclusion
 - Load Save Remove

SQL

Where VMS_267_Vessels is less than 2

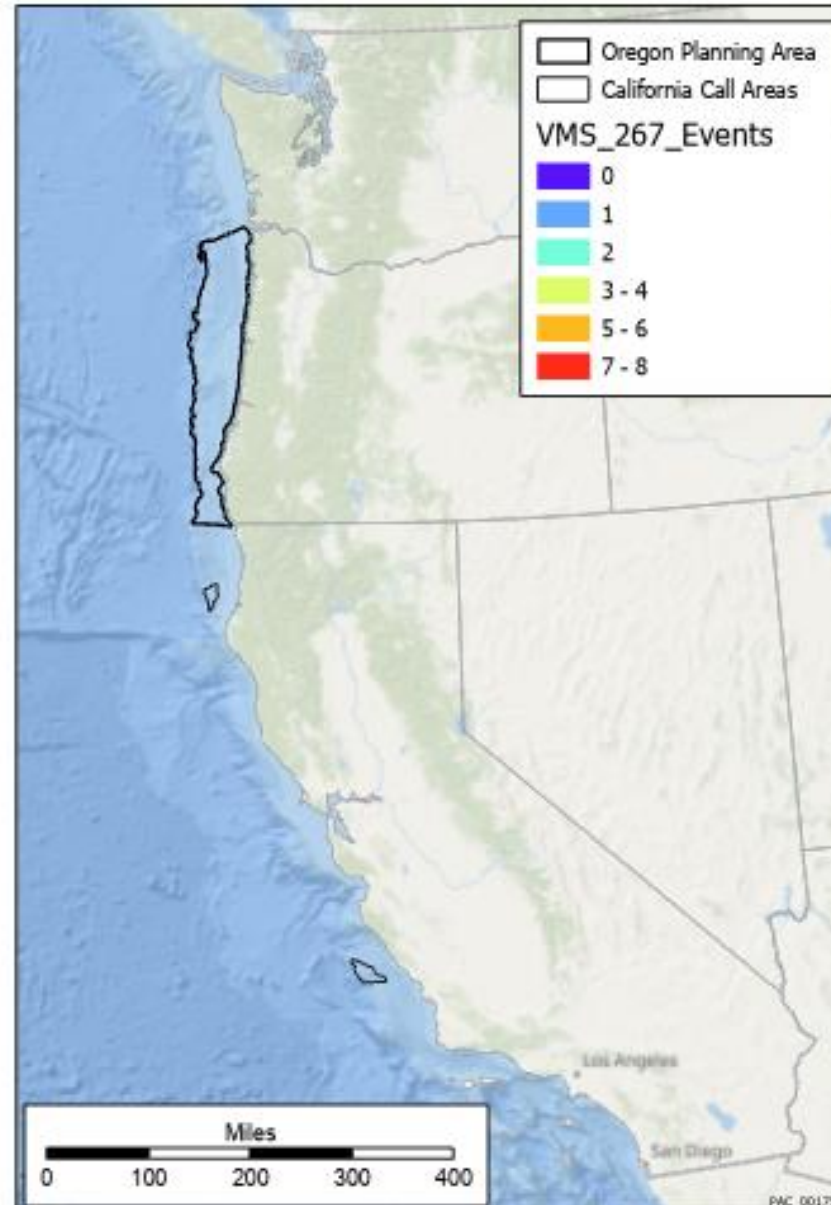
+ Add Clause

- 0
- 1
- 2

Values Fields

Feature level masking

266_Open Access Highly Migratory Species Line Gear



Summary and Next Steps

Whitney Hauer, BOEM



Summary

Explore OROWindMap (offshorewind.westcoastoceans.org) and OROWindMap Catalog (portal.westcoastoceans.org/OROWindMap-data-themes)

- Provide written feedback on the content of the data review workshop, email renewableenergypocs@boem.gov by Aug 25, 2021
 - Include “Oregon Data Review Feedback Aug 11” in the subject line
- Share relevant data (see www.boem.gov/OROWindMapInfo)

Stay informed and connected about Oregon offshore wind activities and any scheduled Task Force meetings at www.boem.gov/Oregon

- Sign up for announcements at www.boem.gov/OregonUpdates

Contact Whitney Hauer (whitney.hauer@boem.gov) and Andy Lanier (andy.lanier@dlcd.Oregon.gov) with names of other organizations, groups, or members of the public that should engage in offshore wind energy planning

Anticipated Next Steps

Continue data gathering and engagement throughout BOEM's authorization process

Fall 2021: BOEM Oregon Task Force Meeting

- Present the results of the 12-month effort
- Seek input from the Task Force

Winter 2021-2022: BOEM Oregon Task Force Meeting

- Review draft Call Area(s) with the Task Force

Following the Task Force Meetings

- BOEM to publish Call for Information and Nominations (Call) in the *Federal Register*
 - Describes geographically distinct areas (Call Area(s))
 - Requests comments and information relevant to BOEM's review to identify Wind Energy Areas which are subject to environmental review prior to leasing
 - Invites submission of nominations of interest for commercial wind leases

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