WDFW's Mapping Ecologically Important Areas Project Update

Washington Coastal Marine Advisory Council Meeting

February 25, 2015

Port of Grays Harbor Commissioners Chambers

Outline of Today's Presentation

1. Overview of MSP Project
2. Methods /Approach
3. Wildlife Data/Mapping Progress
4. Fish Data/Mapping Progress
5. Next steps
6. Discussion

(6) The marine management plan must include but not be limited to:

. . .

(c) A series of maps that, at a minimum, summarize available data on: The key ecological aspects of the marine ecosystem, including physical and biological characteristics, as well as areas that are environmentally sensitive or contain unique or sensitive species or biological communities that must be conserved and warrant protective measures; human uses of marine waters, particularly areas with high value for fishing, shellfish aquaculture, recreation, and maritime commerce; and appropriate locations with high potential for renewable energy production with minimal potential for conflicts with other existing uses or sensitive environments;

-RCW 43.372.040

"Base all planning on **best available science.** This includes **identifying gaps** in existing information, **recommend a strategy for acquiring science** needed to strengthen marine spatial plans, and create a process to adjust plans once additional scientific information is available;"

-RCW 43.372.005(3)(b)

WDFW's Approach

Phase 1

- Map key ecological area, emphasizing the biological side, using WDFW surveys and readily available data sets .

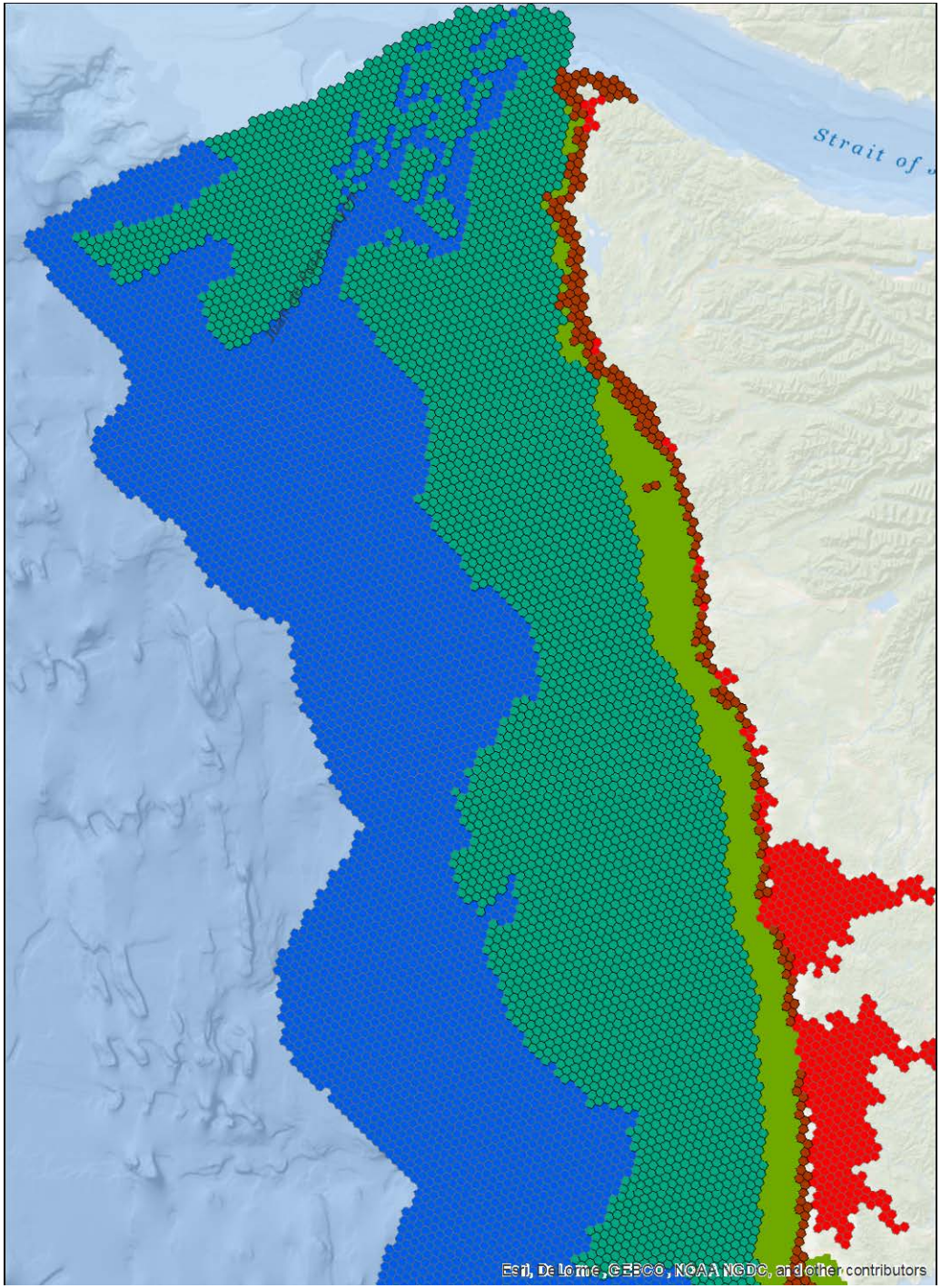
Phase 2

- WDFW will work with scientists from the Pacific Northwest National Laboratory to overlay their energy suitability data with the map of ecologically important areas as a demonstration of how to identify any potential conflicts between areas for renewable energy and the ecologically important areas.

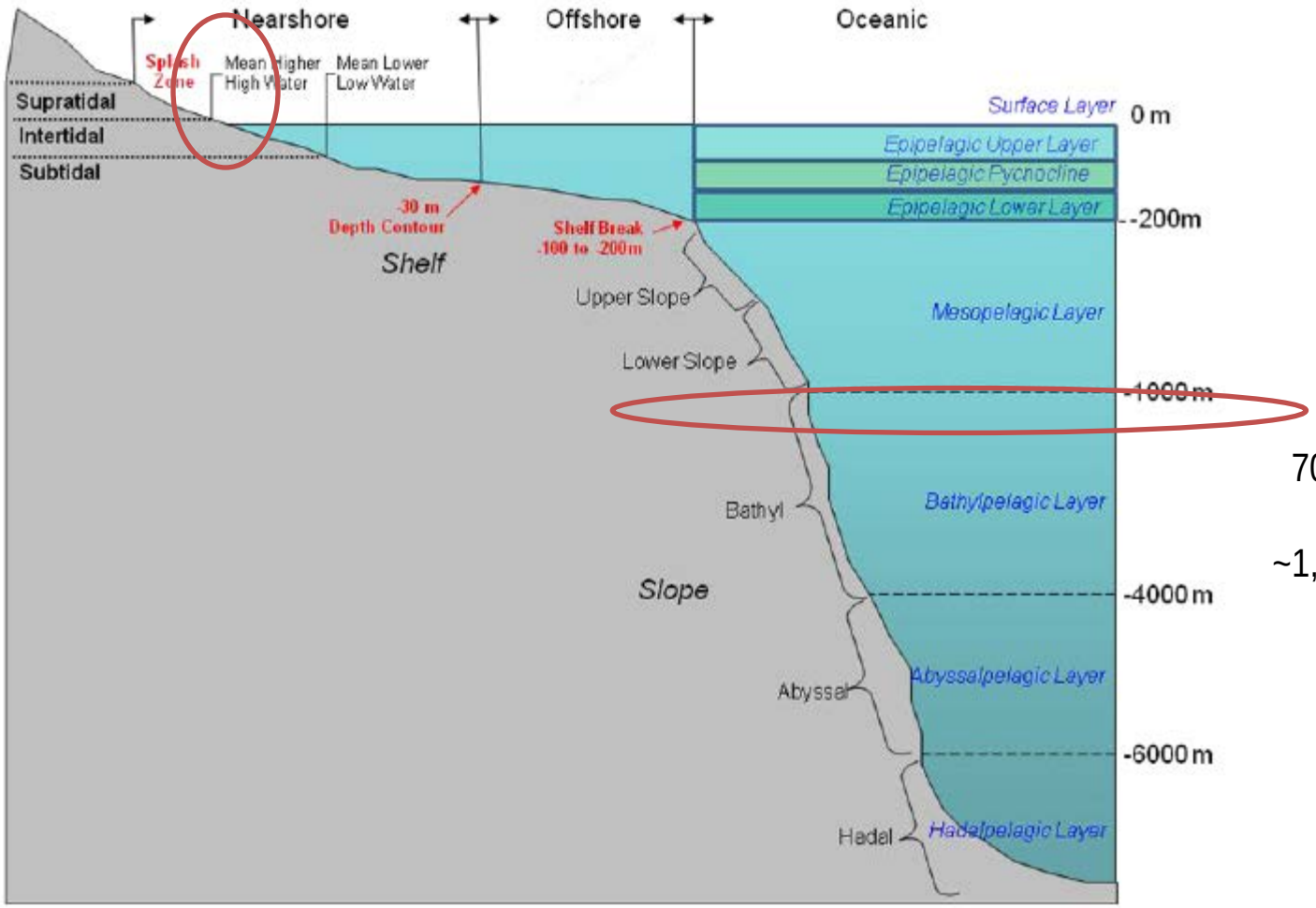
WA MSP Planning Area

Hexagon grid colored by marine strata

- Beach
- Estuary
- Nearshore
- Marine Offshore
- Marine Oceanic



Beneath the Surface: Benthic and Pelagic Habitats

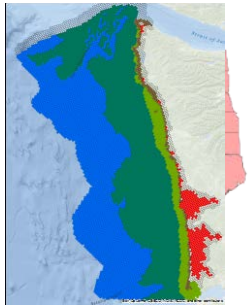


700 fm
=
~1,280 m

Source: NOAA CMECS (2012)

Review Process To Date

- November Tribal Technical Review
- November Science Panel Review
- January Science Panel Review



Mapping Crucial Habitat Across the West

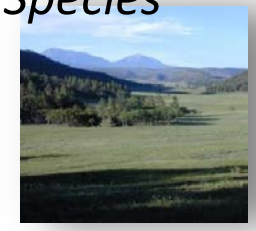
Mapping Ecologically Significant Areas along Washington's Outer Coast

Marine Spatial Planning

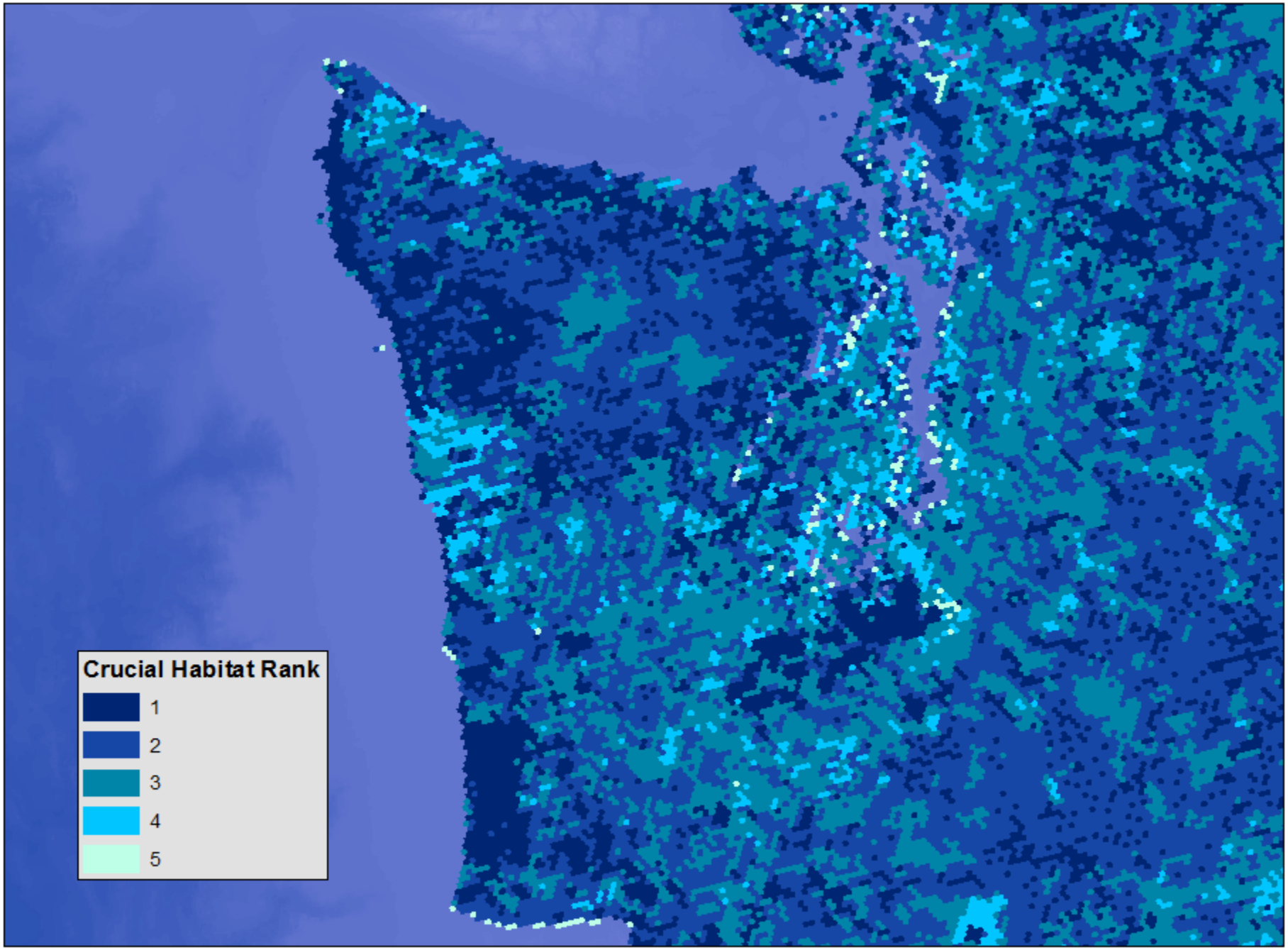
Data layers

- Plant and Animal Species Of Concern
- Habitat / Ecological Systems of Concern
- Recreational / Economically Important Species
- Native Unfragmented Habitat
- Important Connectivity Areas

Crucial Habitat



Crucial Habitat Category Definitions


Crucial Habitat Rank
1
2
3
4
5

Ecologically Important Areas

For the purposes of this project, the EIA Science Team defined "Ecologically Important Areas" as:

- Areas where wildlife or fish are known to inhabit or are consistently abundant as confirmed by surveys or fishing data; and

- For species for which abundance and occupancy is unknown, include areas of suitable habitat that those species of wildlife or fish are likely to inhabit.

Ecologically Important Area Scoring Criteria

- Each data layer ranked in importance using 5 categories:

  High, Med-High, Med, Med-Low, Low

- Where possible data layers ranked by level of certainty in the information (Considering both quantity and quality of the data):

  High, Medium, Low

Ecologically Important Area Mapping Categories

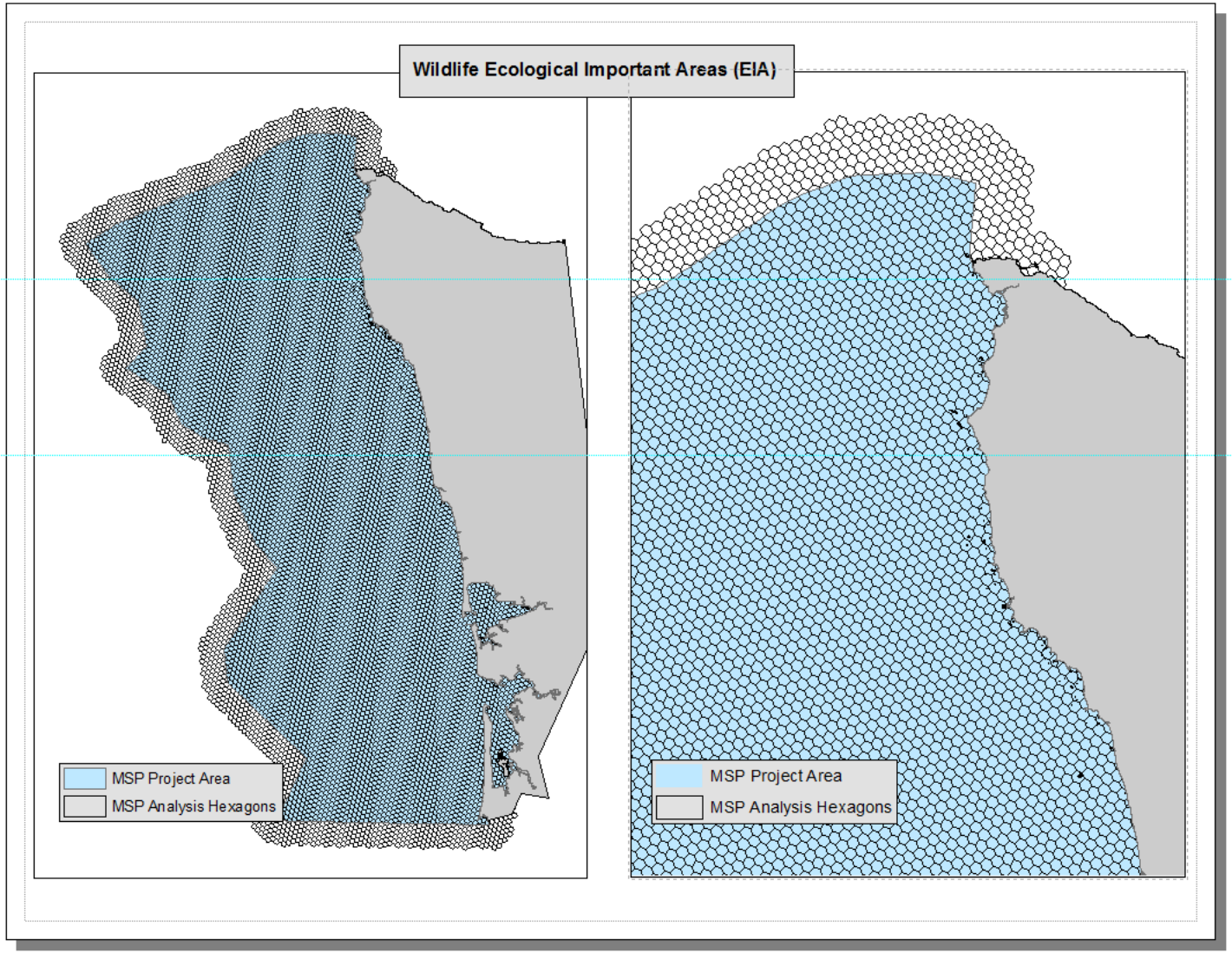
- Aggregate data into common analysis unit (1 sq mi hexagon)
- Use a set of rules that combine data layers into overall ecological important category.
- Ecologically important category in areas with multiple data values will be determined by the maximum ecological value associated with one or more of the data layers.
- Easy to explain to the user the basis (the rule set) for each priority category

Draft Wildlife Scoring Criteria

Wildlife Element	Level of Significance	Level of Certainty
Snowy Plover Breeding areas**	High	High
Streaked Horned Lark Breeding areas**	High	High
Tufted Puffin Breeding Colonies**	High	High
Sea Otter Regular Concentration Areas**	High	High
Seabird Breeding Colonies	High, M-H, Med, M-L, Low	High, Med, Low
Murrelet at sea concentration areas	High, M-H, Med, M-L, Low	High, Med, Low
Tufted Puffin at sea concentration areas	High, M-H, Med, M-L, Low	High, Med, Low
Harbor Porpoise concentration areas	High, M-H, Med, M-L, Low	High, Med, Low
At sea seabird abundance areas	High, M-H, Med, M-L, Low	High, Med, Low
Marine Mammal Pupping haul outs	High, M-H, Med, M-L, Low	High
Marine Mammal Non-pupping haul outs	M-H, Med, ML, Low	Med, Low
Core Kelp Bed Areas	High, M-H, Med	High
Short-tailed Albatross	Med, M-L, Low	Low
Seabird distribution maps	High, M-H, Med, M-L, Low	High, Med, Low
Seabird Hot Spots	Med, M-L, Low	Low

** Scores for Significance were assigned only at sites where these resources were known to occur. Areas that are known to not have these resources and/or suitable habitat for them were not scored.

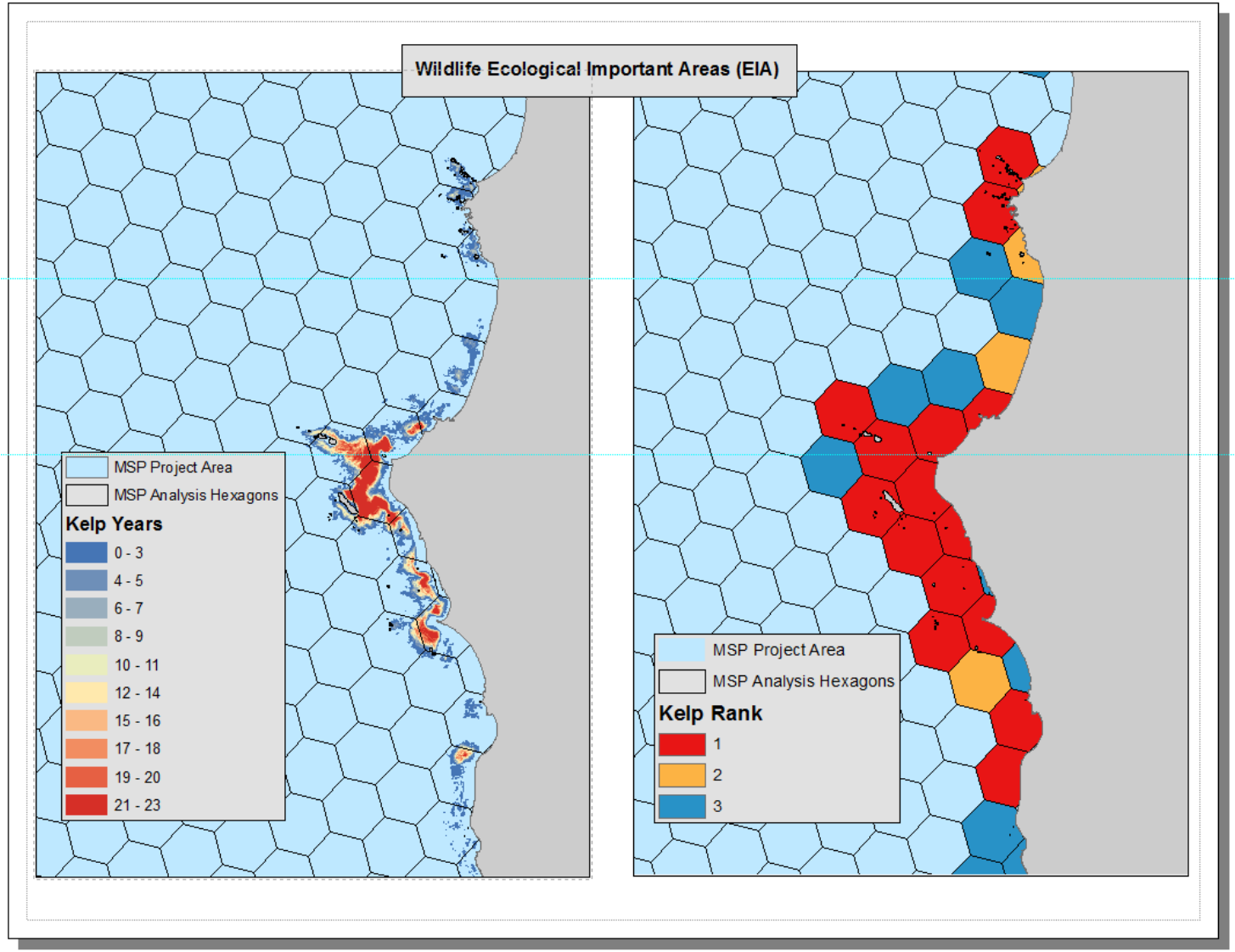
Analysis Unit = 1 Sq Mile Hexagons



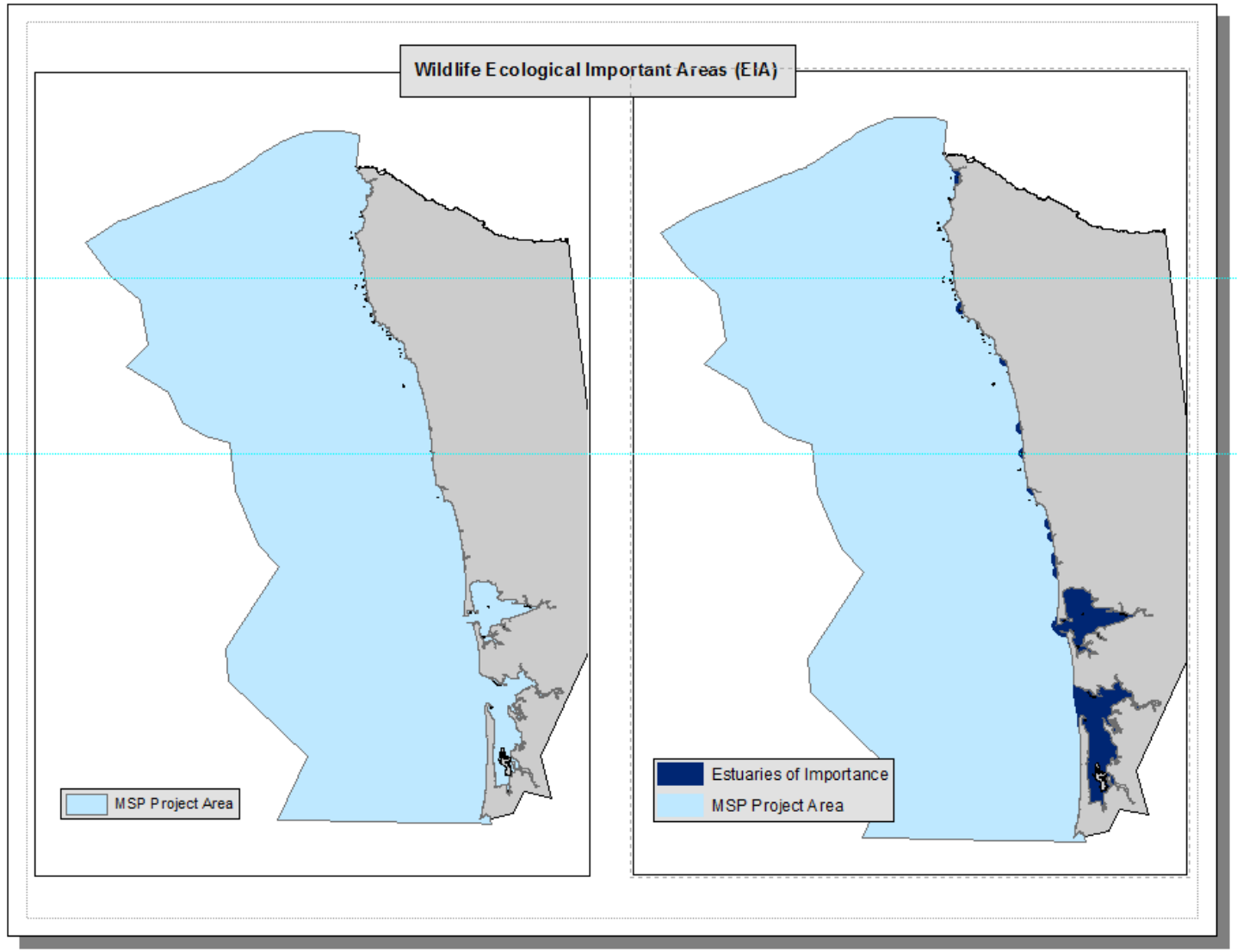
There are 8,272 hexagon cells in the grid within the boundaries of the planning area.

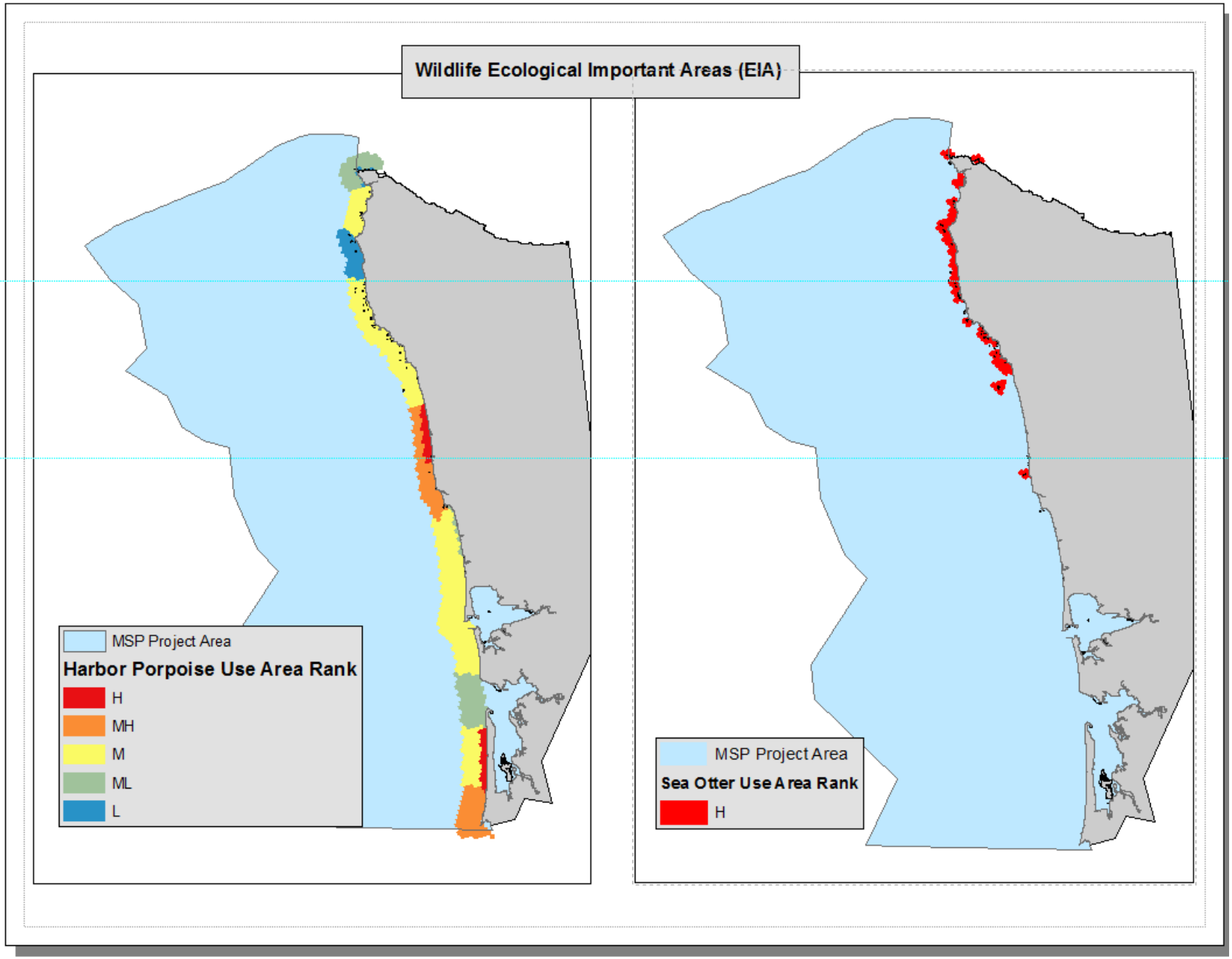
Coast-wide Kelp Priority Areas

23 Years of Kelp Aerial Surveys

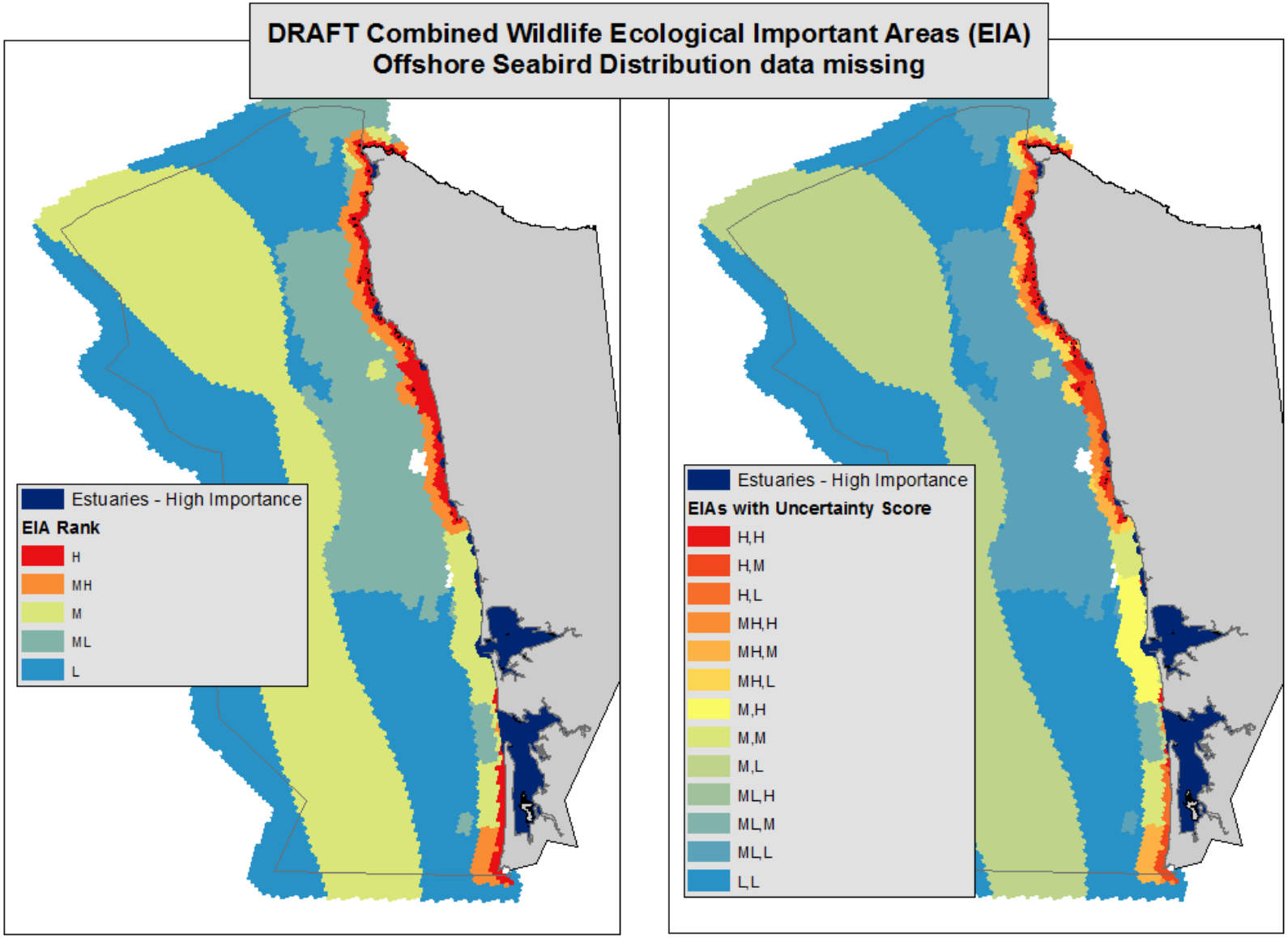


Washington Marine Spatial Planning Project Area




Wildlife Ecological Important Areas (EIA)
MSP Project Area
Harbor Porpoise Use Area Rank
H
MH
M
ML
L
MSP Project Area
Sea Otter Use Area Rank
H

Wildlife Ecological Important Areas



DRAFT Scoring Criteria for NOAA Groundfish Model

Score	Percentiles	Notes
1	> 0.90	The top 10 percent.
2	> 0.75 and <= 0.90	
3	> 0.25 and <= 0.75	A wide middle category that contains half of the values.
4	>= 0.10 and <= 0.25	
5	< 0.10	The bottom 10 percent.
6	“no determination made”	.

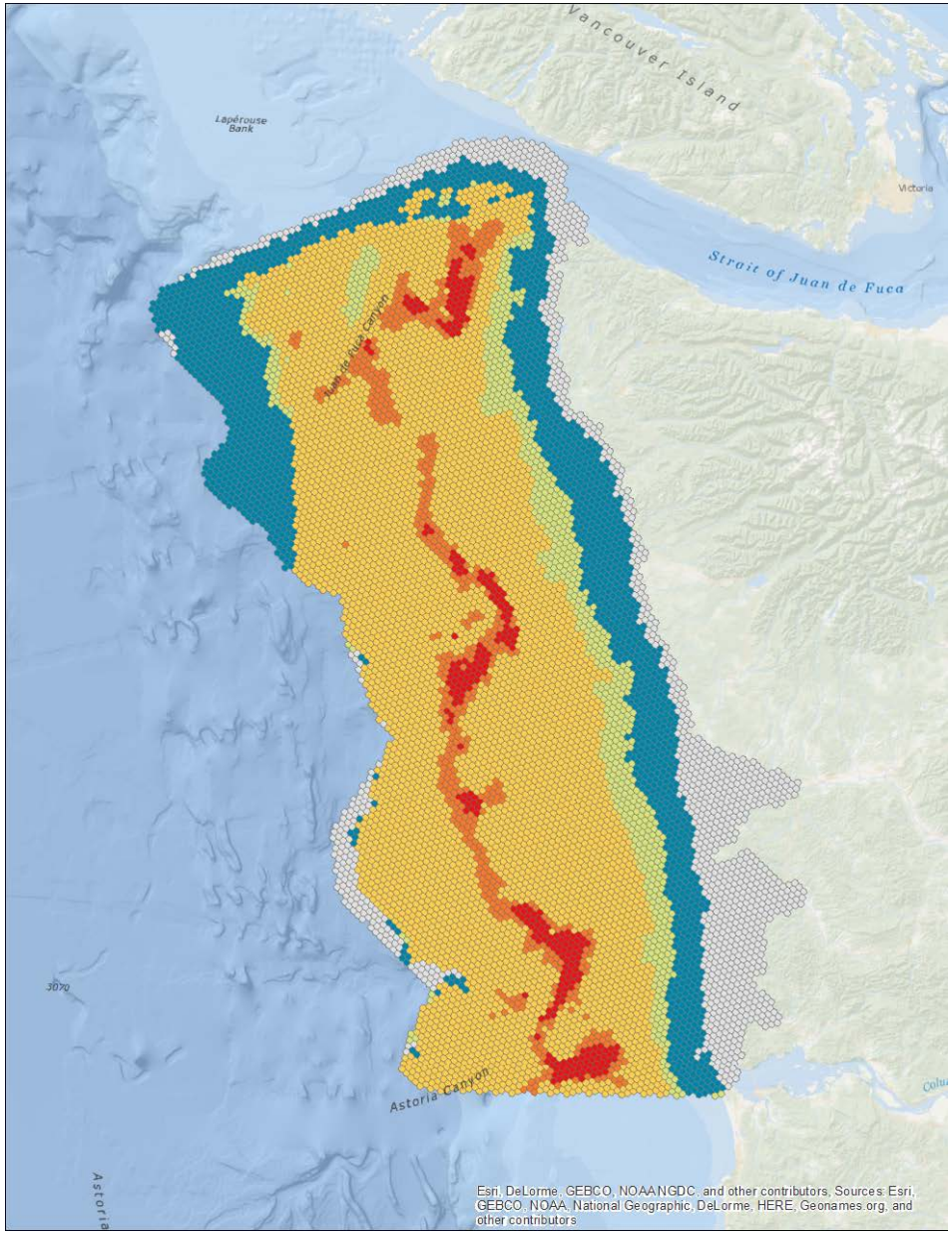
Sablefish

Legend

Sablefish

Importance Score

- 1
- 2
- 3
- 4
- 5
- Not Applicable



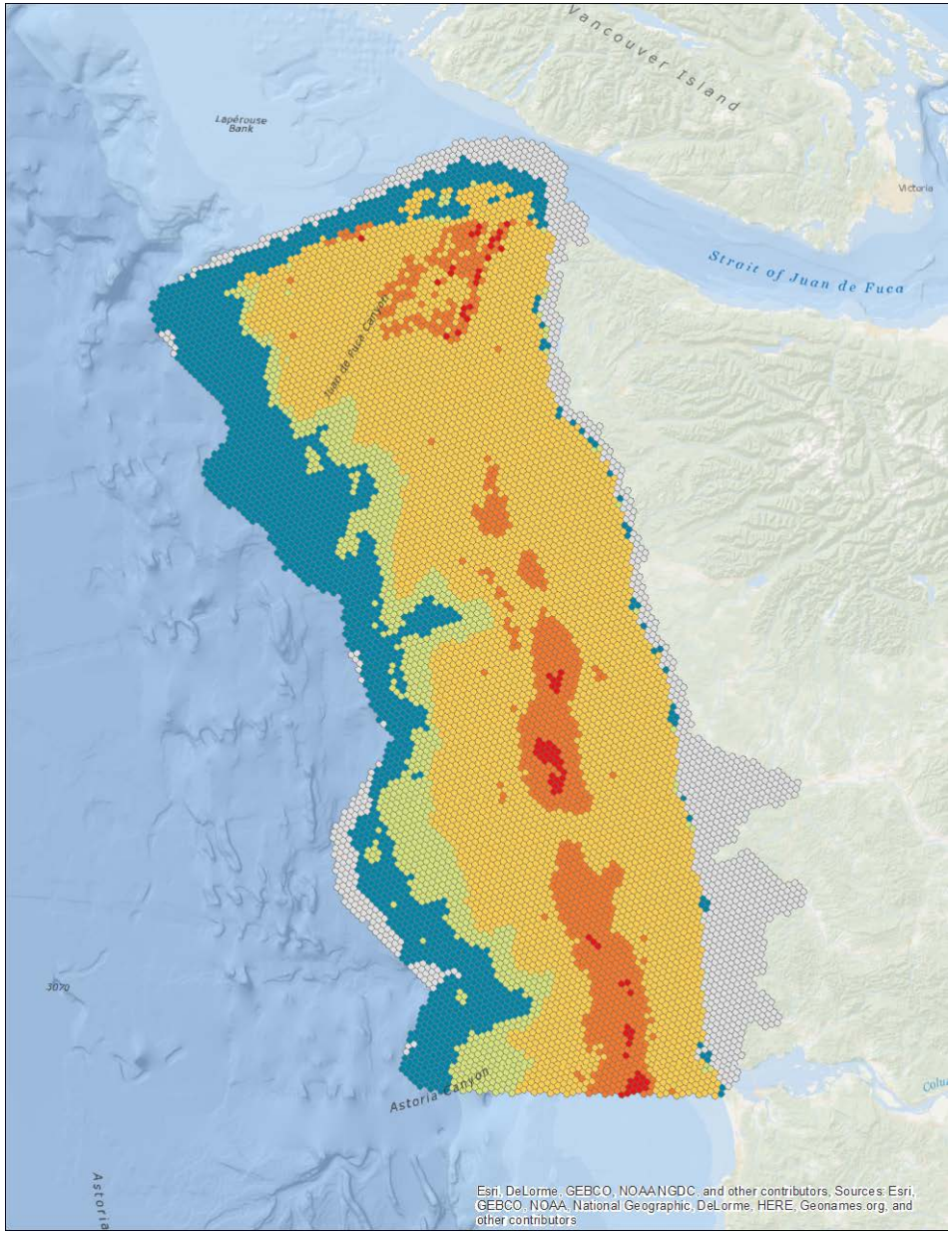
Petrale Sole

Legend

Petrale Sole

Importance Score

- 1
- 2
- 3
- 4
- 5
- Not Applicable



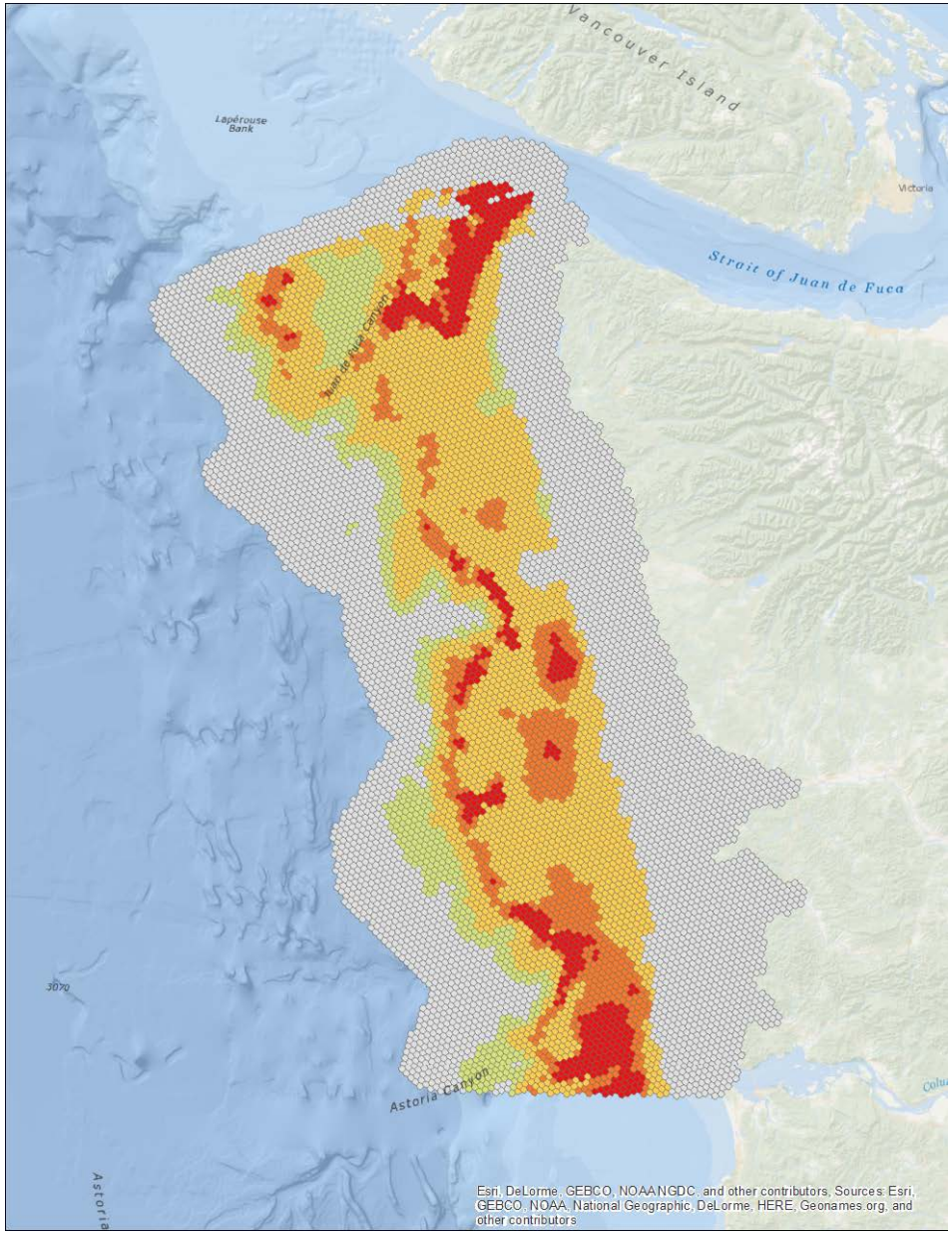
Dover Sole

Legend

Dover Sole

Importance Score

- 1
- 2
- 3
- 4
- 5
- Not Applicable



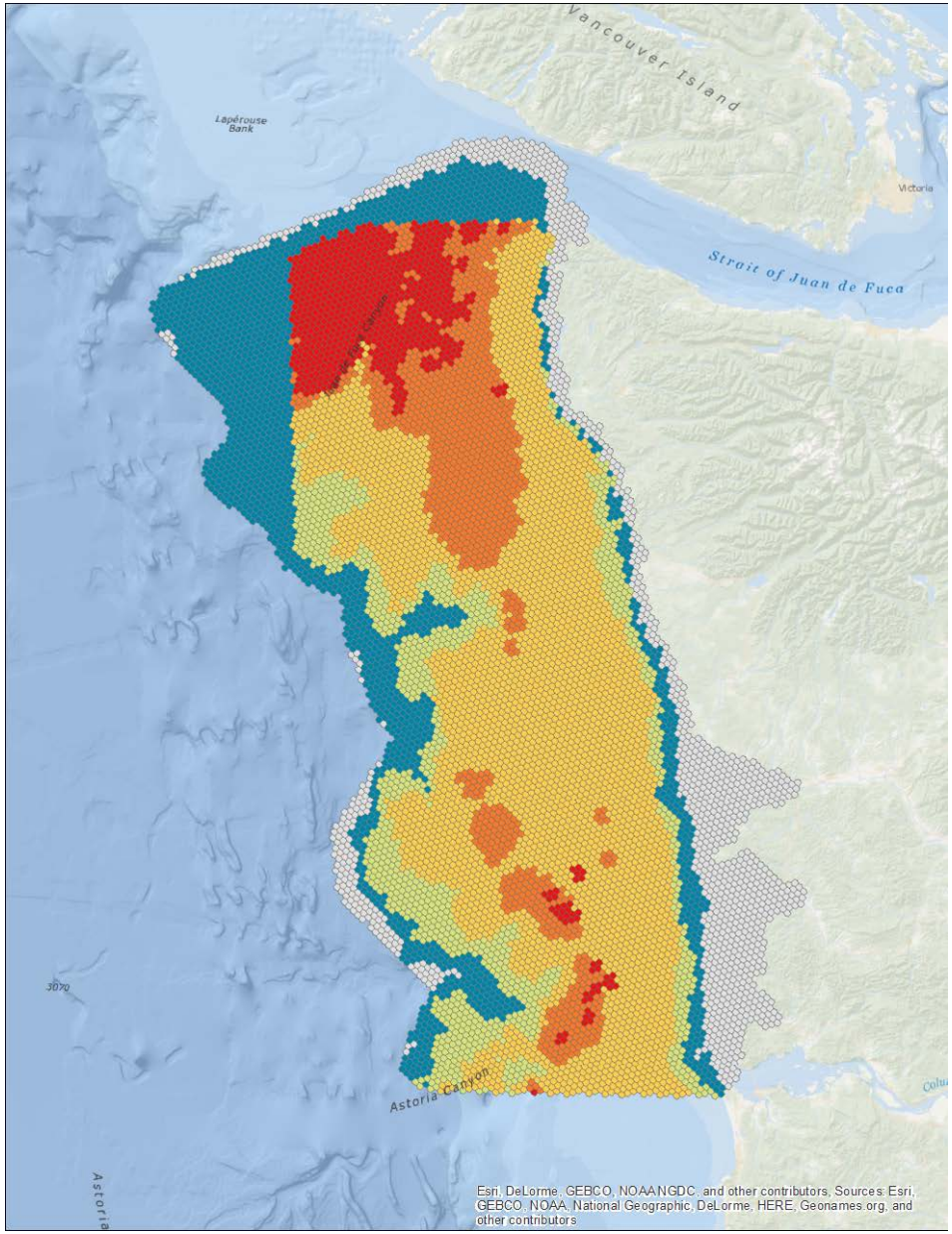
Yelloweye Rockfish

Legend

Yelloweye

Importance Score

- 1
- 2
- 3
- 4
- 5
- Not Applicable



DRAFT

<u>Minimum</u> EIA Scores: Groundfish Combined

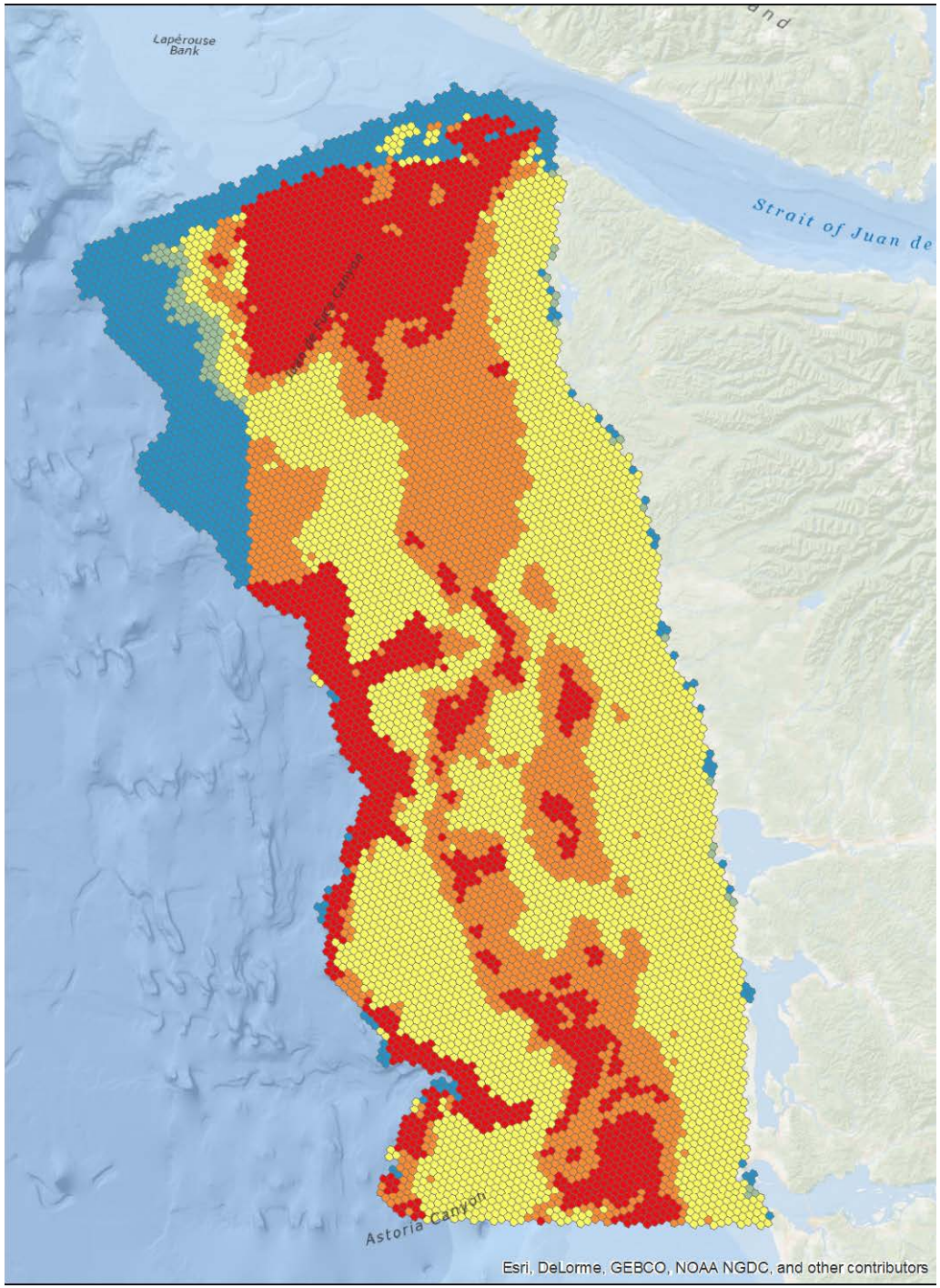
1

2

3

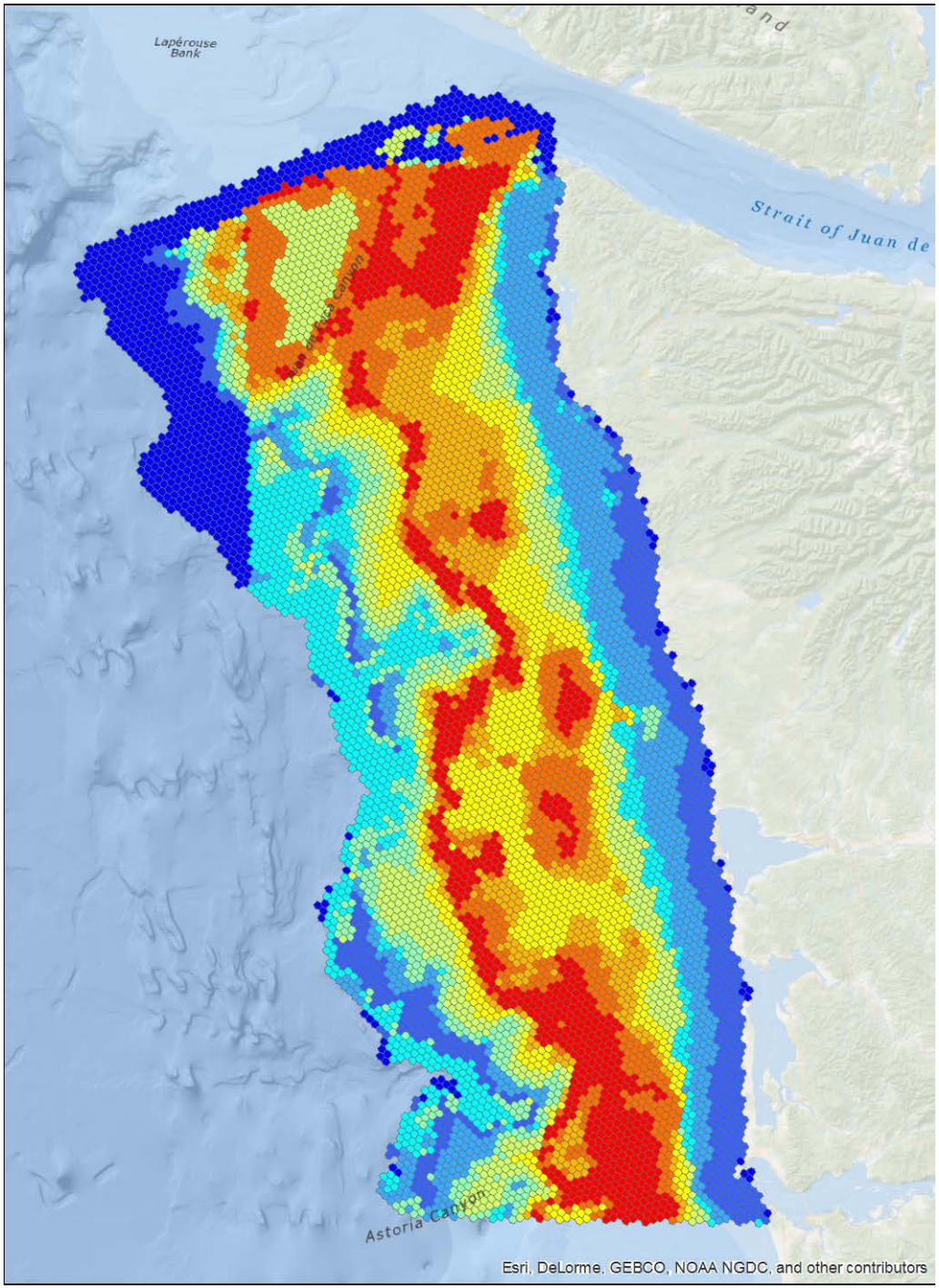
4

5



DRAFT
<u>Average</u> EIA Scores: Groundfish Combined

- 1.333333 - 2.444444
- 2.444445 - 2.777778
- 2.777779 - 2.888889
- 2.888890 - 3.000000
- 3.000001 - 3.555556
- 3.555557 - 3.888889
- 3.888890 - 4.111111
- 4.111112 - 4.333333
- 4.333334 - 4.833333
- 4.833334 - 5.000000



DRAFT EIA Scores for Benthic Habitat Type

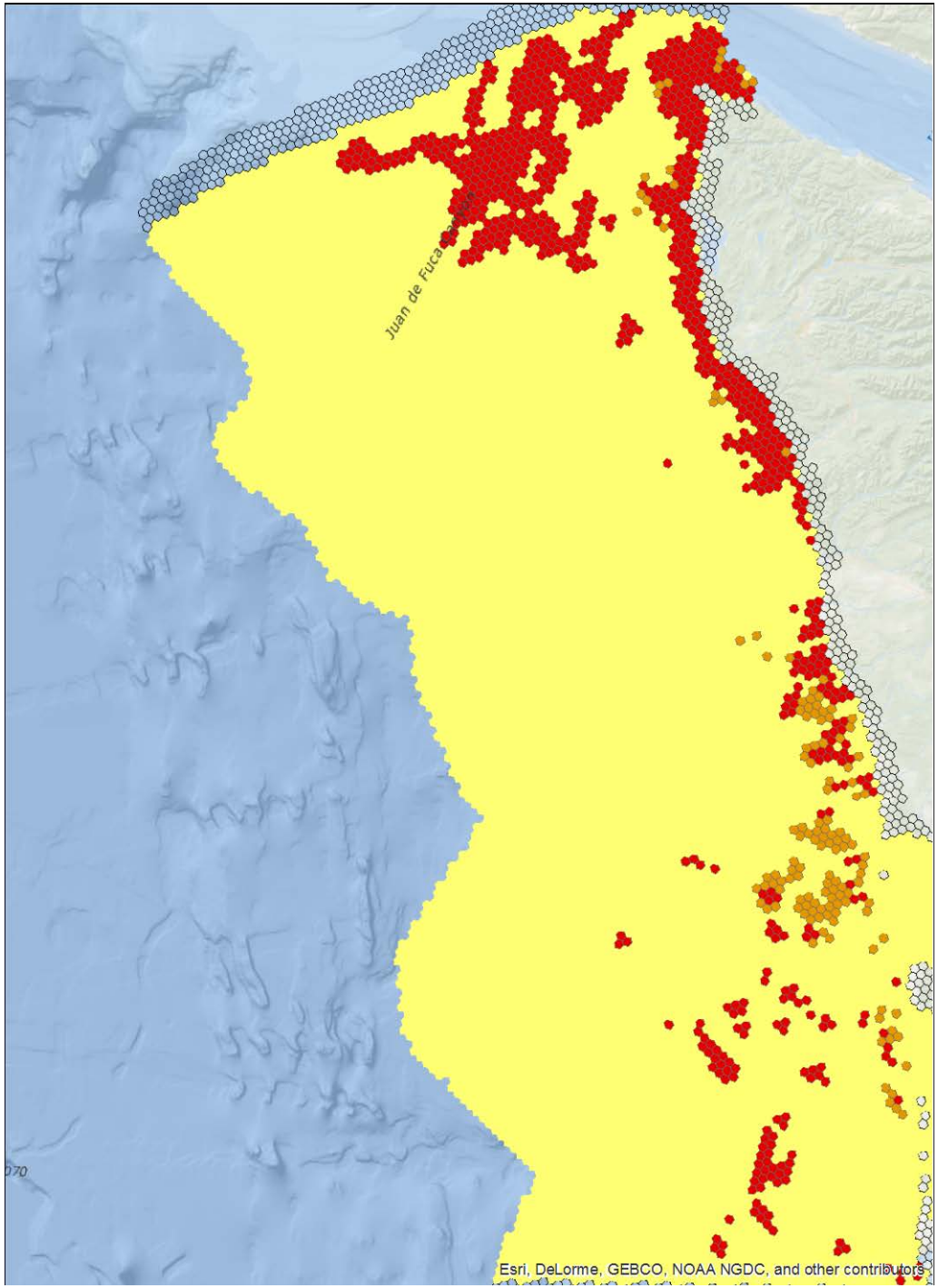
Rocky = 1

Mixed = 2

Sand/Mud = 3

Substrate EIA Score

- <Null>
- Rocky
- Mixed (e.g. cobble)
- Sand or Mud

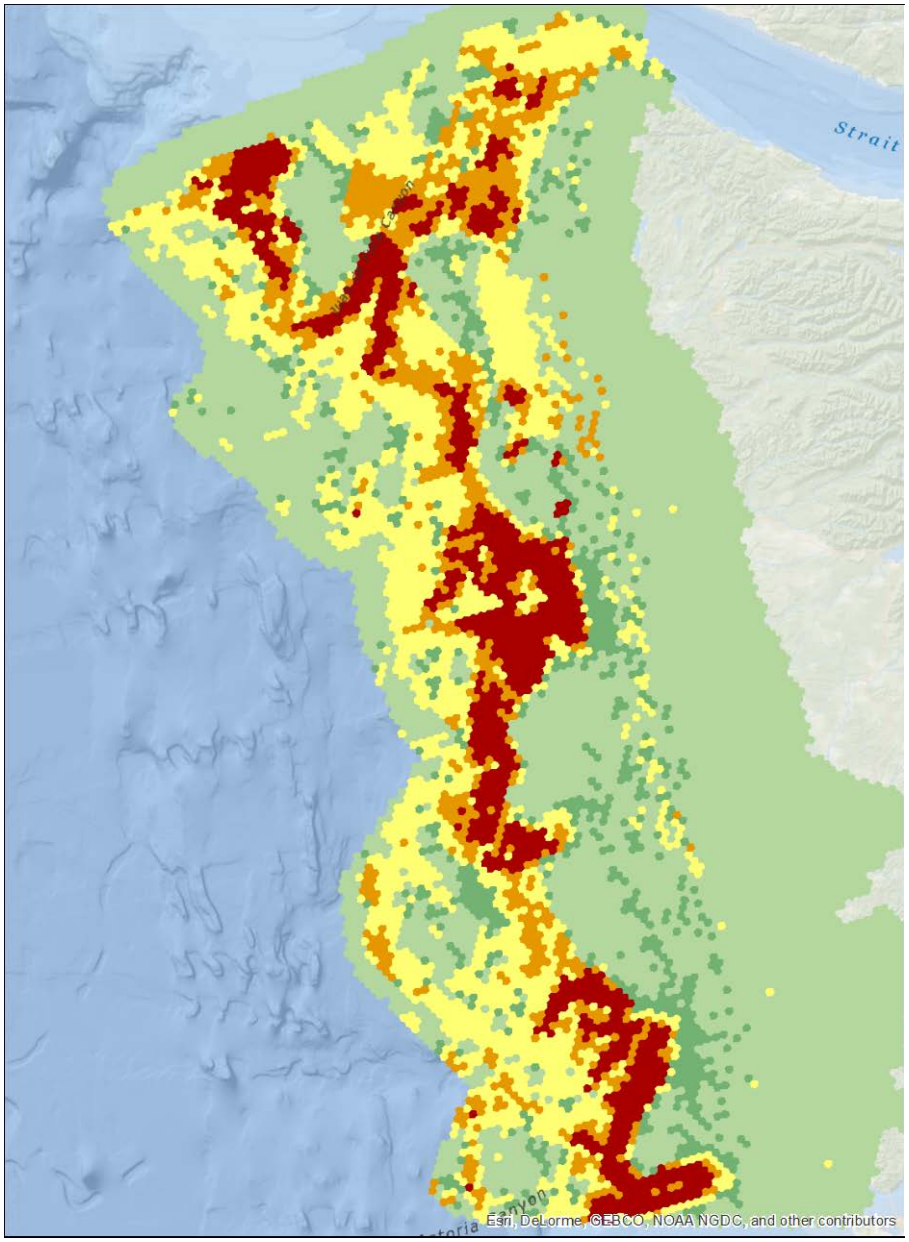


(Source data: Benthic Substrate Habitat Interpretation, Version 3.6 Oregon State University, Active Tectonics & Seafloor Mapping Lab (AT&SML), ODFW, NOAA Biogeography Branch, The Nature Conservancy).

DRAFT EIA Scores for Deep Sea Coral Predicted Habitat

Corals EIA Score

- 1
- 2
- 3
- 4
- 5



Derived from: Guinotte, John M., and Andrew J. Davies. "Predicted deep-sea coral habitat suitability for the US West Coast." *PloS one* 9.4 (2014): e93918.

Next Steps/Timeline

Feb 25	EIA Briefing at WCMAC Work Session
Mid-Mar	State/Tribal EIA Technical Meeting *(if needed)*
Apr 22	EIA Briefing at WCMAC Work Session
Apr 29-May 1	State/Tribal Policy Meeting; EIA Update
~ June 1	Draft EIA Report for Tribal Policy and Technical Review
~ June 15	Comments Due to WDFW
June 30	Provide Final EIA Report and Maps to DNR, Tribes, and WCMAC

Acknowledgements

Tribal Science Representatives

- Joe Gilbertson, Hoh Tribe
- Jennifer Hagen, Quileute Tribe
- Sue Wolf, Makah Tribe
- Steve Joner, Makah Tribe
- Rob Jones, Northwest Indian Fisheries Commission
- Joe Schumacker, Quinault Indian Nation

WDFW EIA Science Team

- Jessi Doerpinghaus, Coastal Marine Policy Analyst
- Corey Niles, Coastal Marine Policy Lead
- John Pierce, Chief Scientist for Wildlife
- Scott Pearson, Wildlife Research Scientist
- Tim Quinn, Chief Scientist for Habitat
- Theresa Tsou, Marine Fish Research Scientist
- George Wilhere, Habitat Research Scientist

WDFW Mapping Team

- Andy Duff, Wildlife IT/Application Specialist
- Dale Gombert, Fish IT Specialist
- Andy Weiss, Fish IT Specialist

QUESTIONS / DISCUSSION

OVERVIEW

WILDLIFE

FISH

PLEASE SEE SPECIES AND DATA SETS HANDOUT

Map Categories

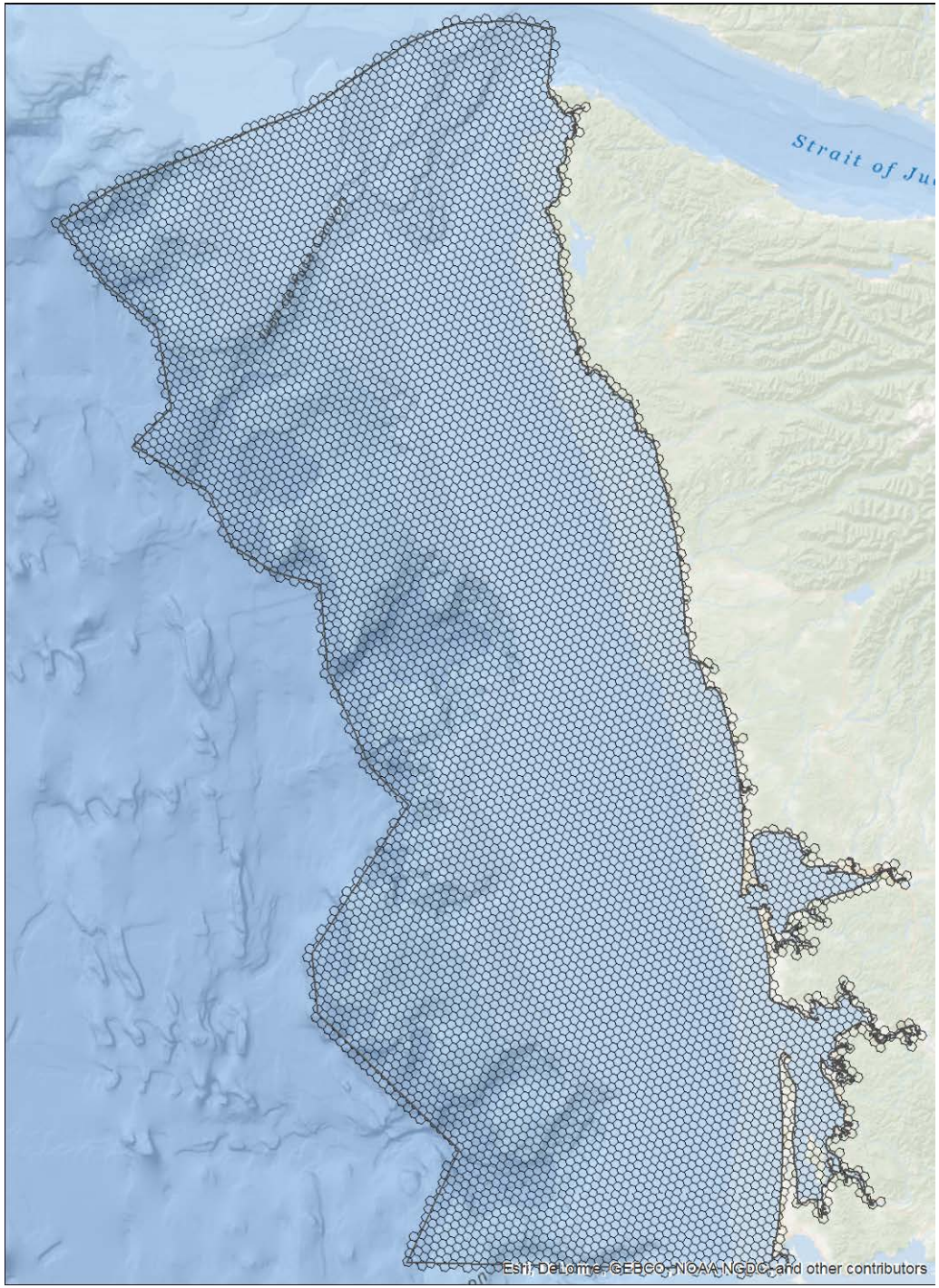
- Each analysis unit (hexagon) was assigned a category (and corresponding color) for each species dataset
- Hexagons with multiple categories were assigned to the higher significance and certainty level (e.g., a hexagon with “A” and “B” areas within it was assigned an “A”)

The Grid

We've divided the MSP planning area into a grid of 1 square mile hexagons to use as our analysis unit.

There are 8,272 hexagon cells in the grid within the boundaries of the planning area..

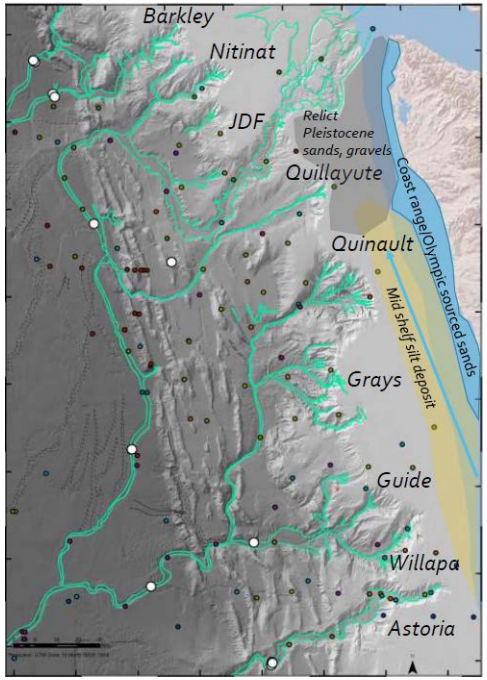
The grid aligns with the grid produced for the Western Governors' Association's Crucial Habitat Project.



Scoring Approach

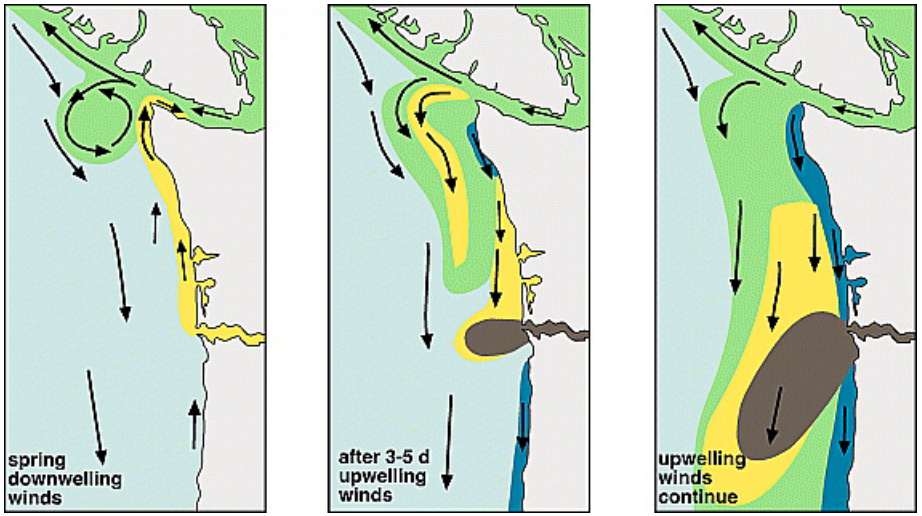
- Challenges with having different kinds of data
- Used a 1-5 categorical scoring system to assign level of significance (analogous to a grading system—A, B, C, D, E used in school), so that comparisons can be made among species at a higher level
- Also scored “uncertainty” in the information at three levels (H,M,L), given differences in the quantity and quality of data available

WDFW's project is not focused on mapping key physical and oceanographic features.

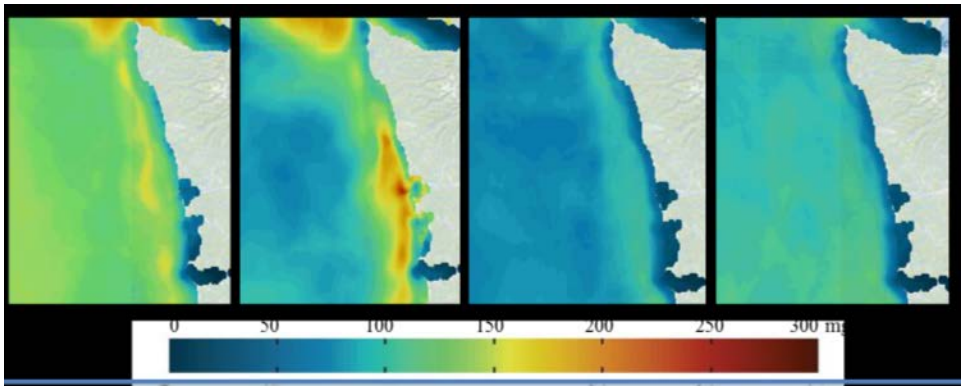


Seafloor Mapping

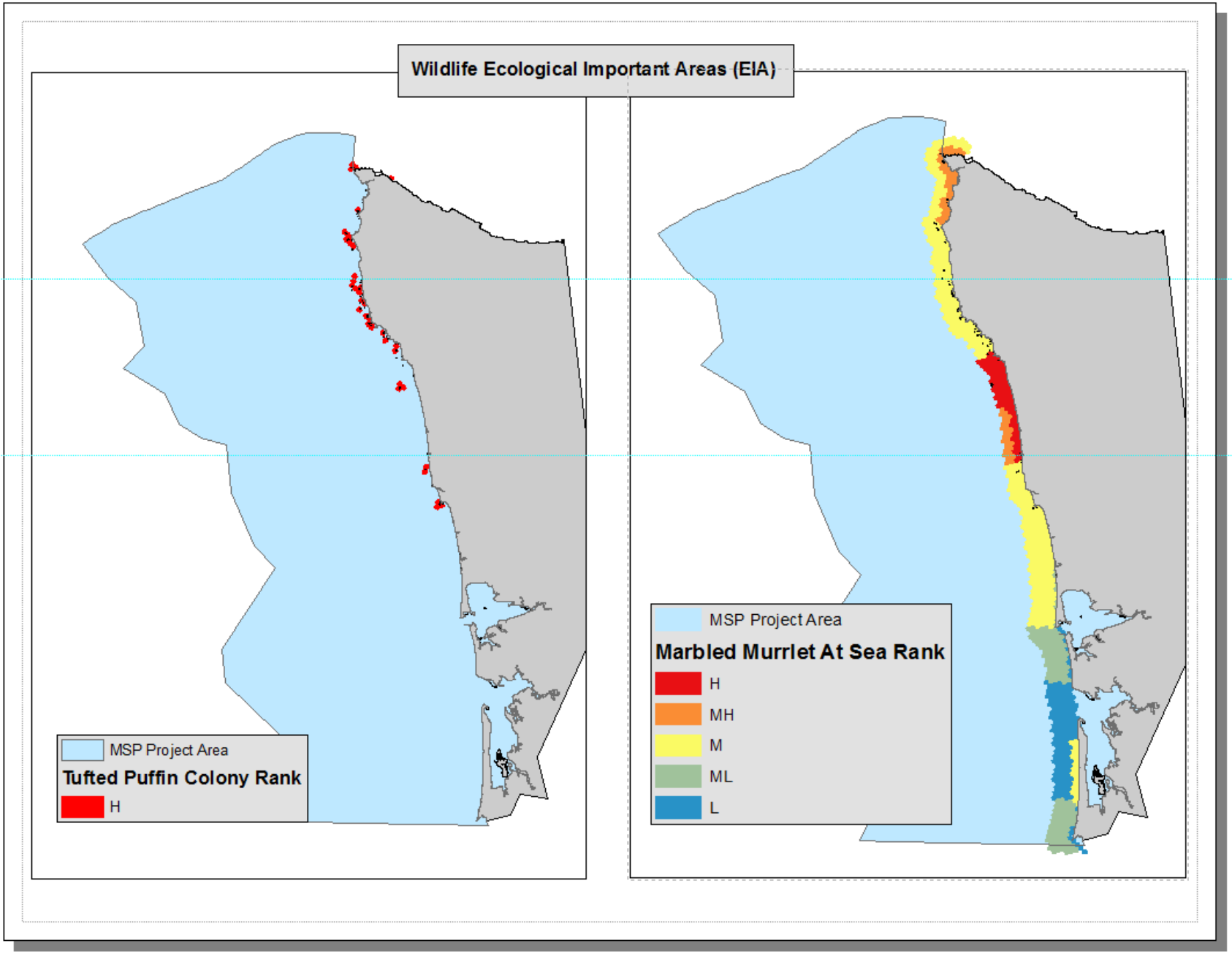
Source: Goldfinger et al. "Mapping the Washington Margin for Multi-Sue" presentation



B. Hickey et al. (2009) Journal of Geophysical Research: Oceans
http://onlinelibrary.wiley.com/doi/10.1029/2008JC004907/full#jgrc11112-fig-0013



Chlorophyll a maps from the WA MSP Ocean Conditions page:
http://msp.wa.gov/msp-projects/ocean-conditions/


Wildlife Ecological Important Areas (EIA)
MSP Project Area
Tufted Puffin Colony Rank
H
MSP Project Area
Marbled Murrlet At Sea Rank
H
MH
M
ML
L

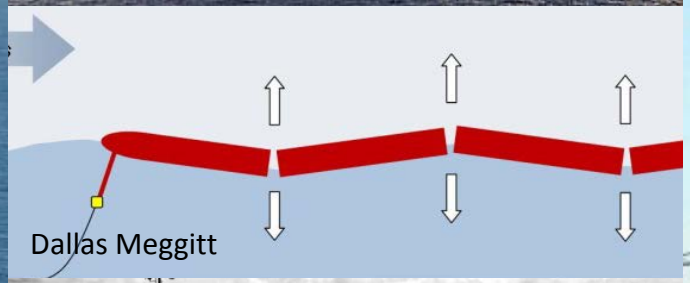
METHODS / APPROACH

Marine Renewable Energy

Marine Spatial Planning

Principle Power

NREL


Dallas Meggitt

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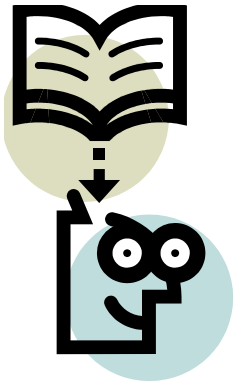
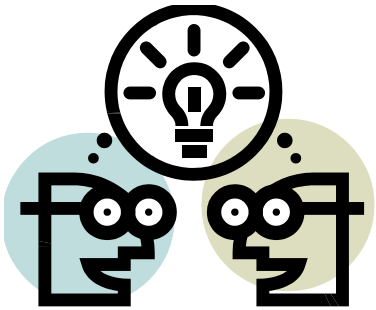
Energy.gov

Goals and Expectations

- Summarize and review information about marine renewable energy for the WCMAC
- Future trends and factors in WA
- Next session: share concerns





Research Methods

- Summarize information from presentations and other sources
  - Technology presentations
  - Environmental presentation
  - PNNL suitability report
  - Sector Analysis
  - WCMAC discussions

- In-depth literature search is underway

What is Marine Renewable Energy?

Potential energy from marine resources into Electricity

- Wind
- Wave
- Tidal

Sound & Sea Technology,

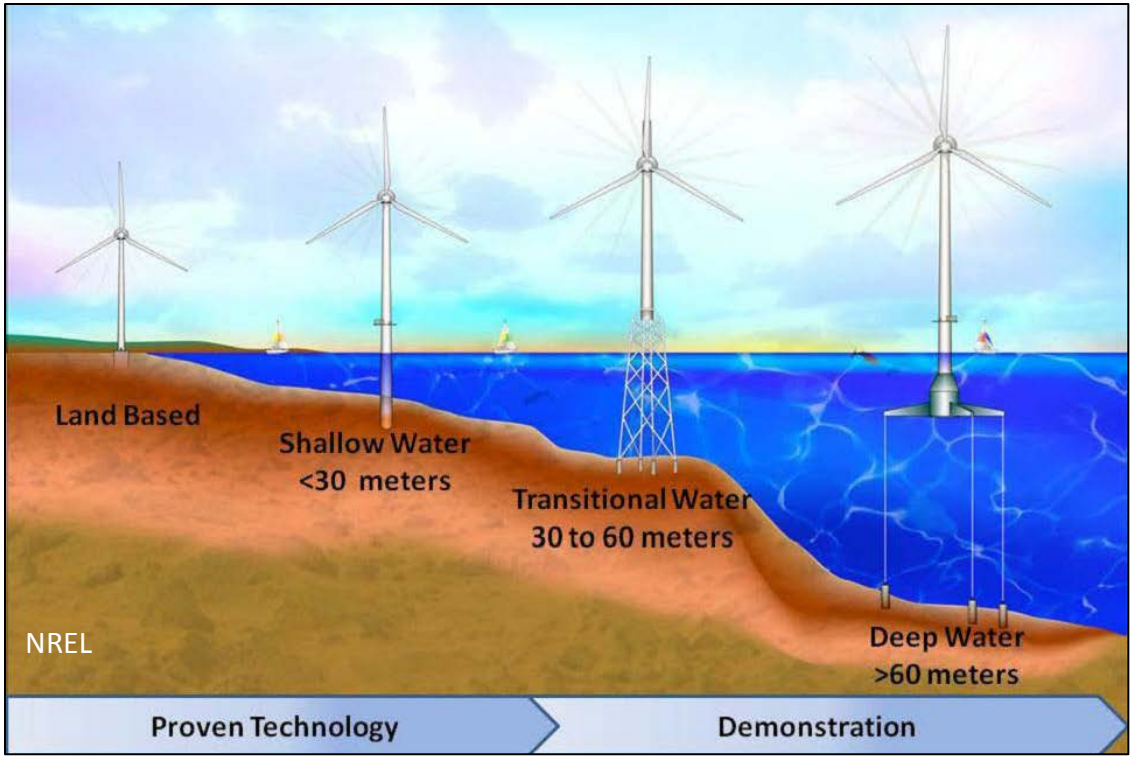
OpenHydro

Principle Power

Offshore Wind Energy

Technology transferred from Land

- Coos Bay WindFloat project



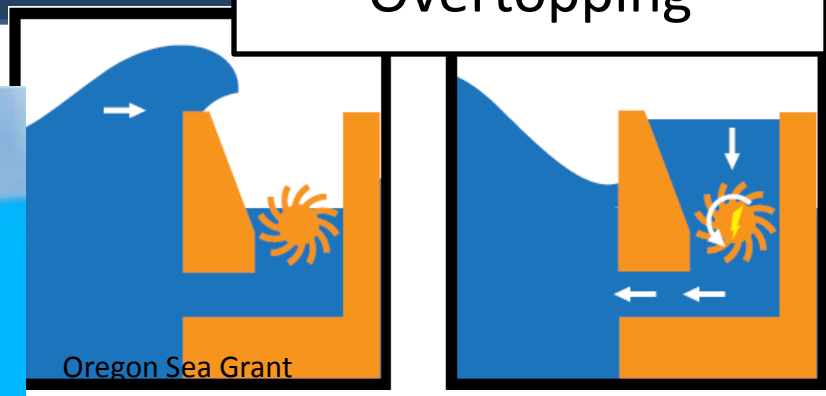
NREL

Principle Power

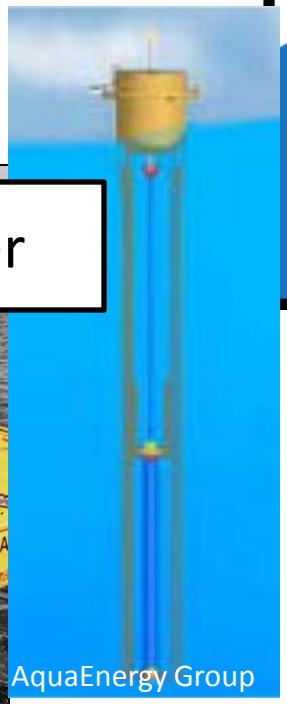
Wave Energy

New technology

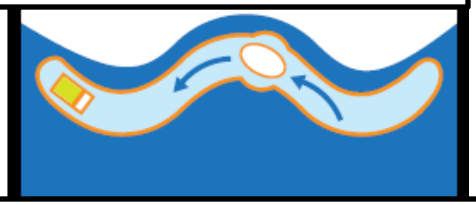
Overtopping



Point Absorber

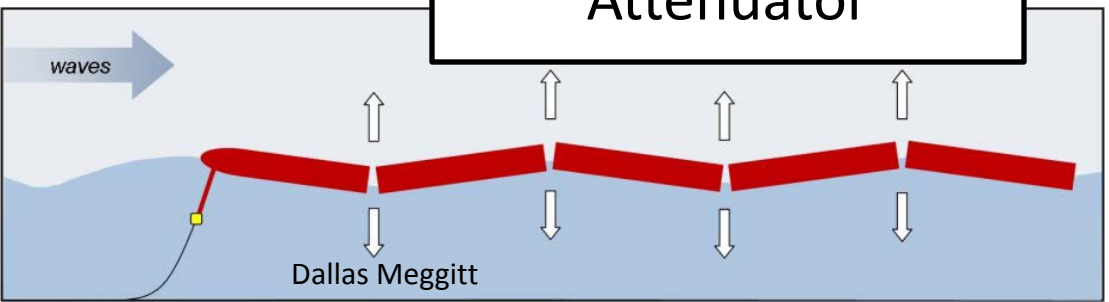


Bulge Wave



Oscillating Wave Surge

Attenuator



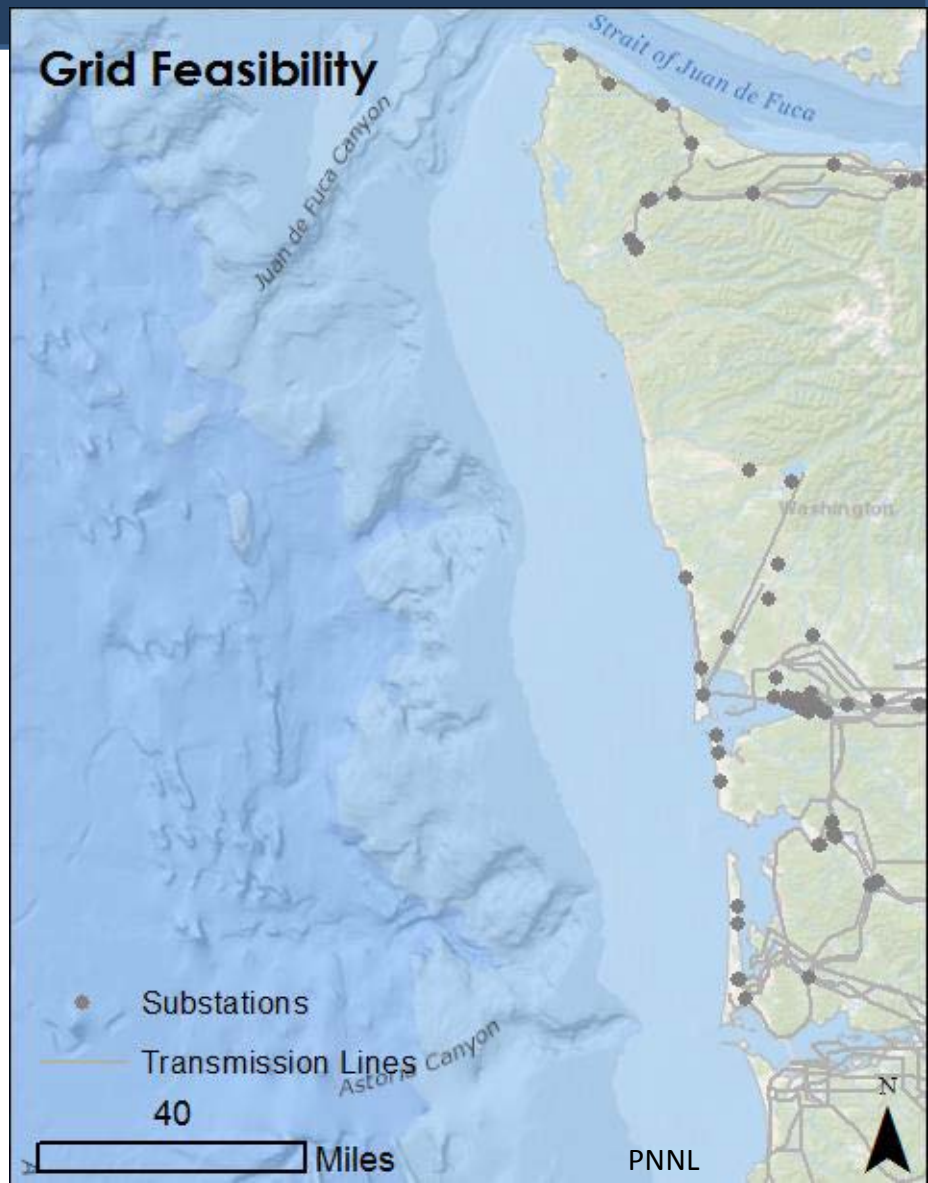
Tidal Energy

Captures energy from the flood and ebb tides

- Limited suitability in Plan area
- SnoPUD Puget Sound Tidal Project

Connection Technology

- Submarine Cables
- Shore landing/Drilling

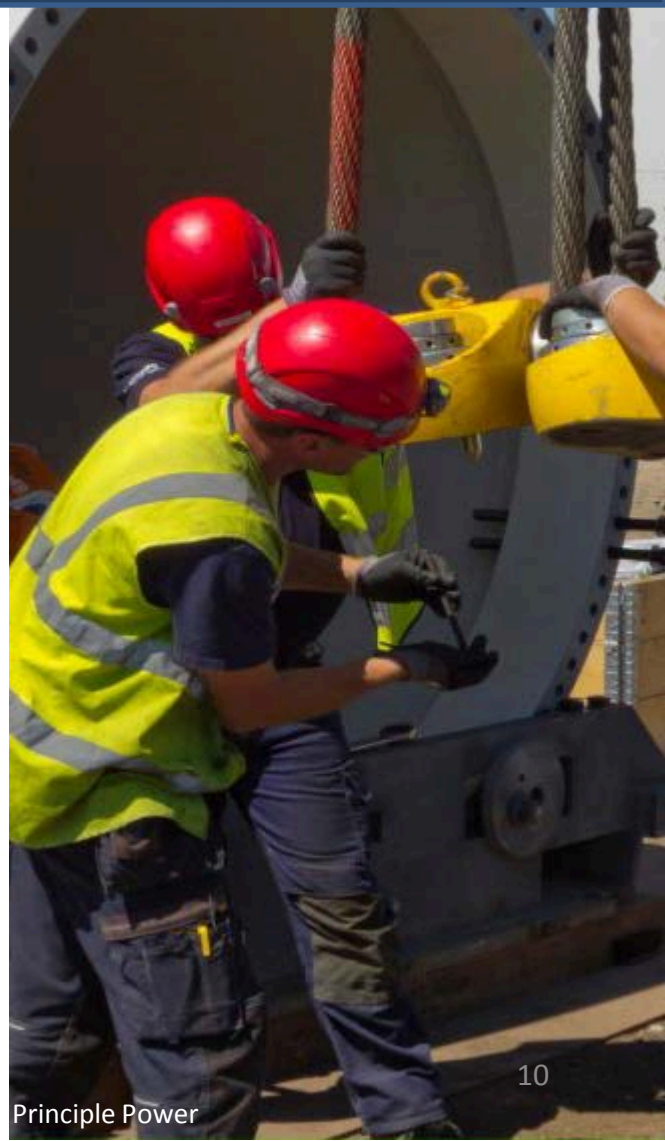


Why Marine Renewable Energy?

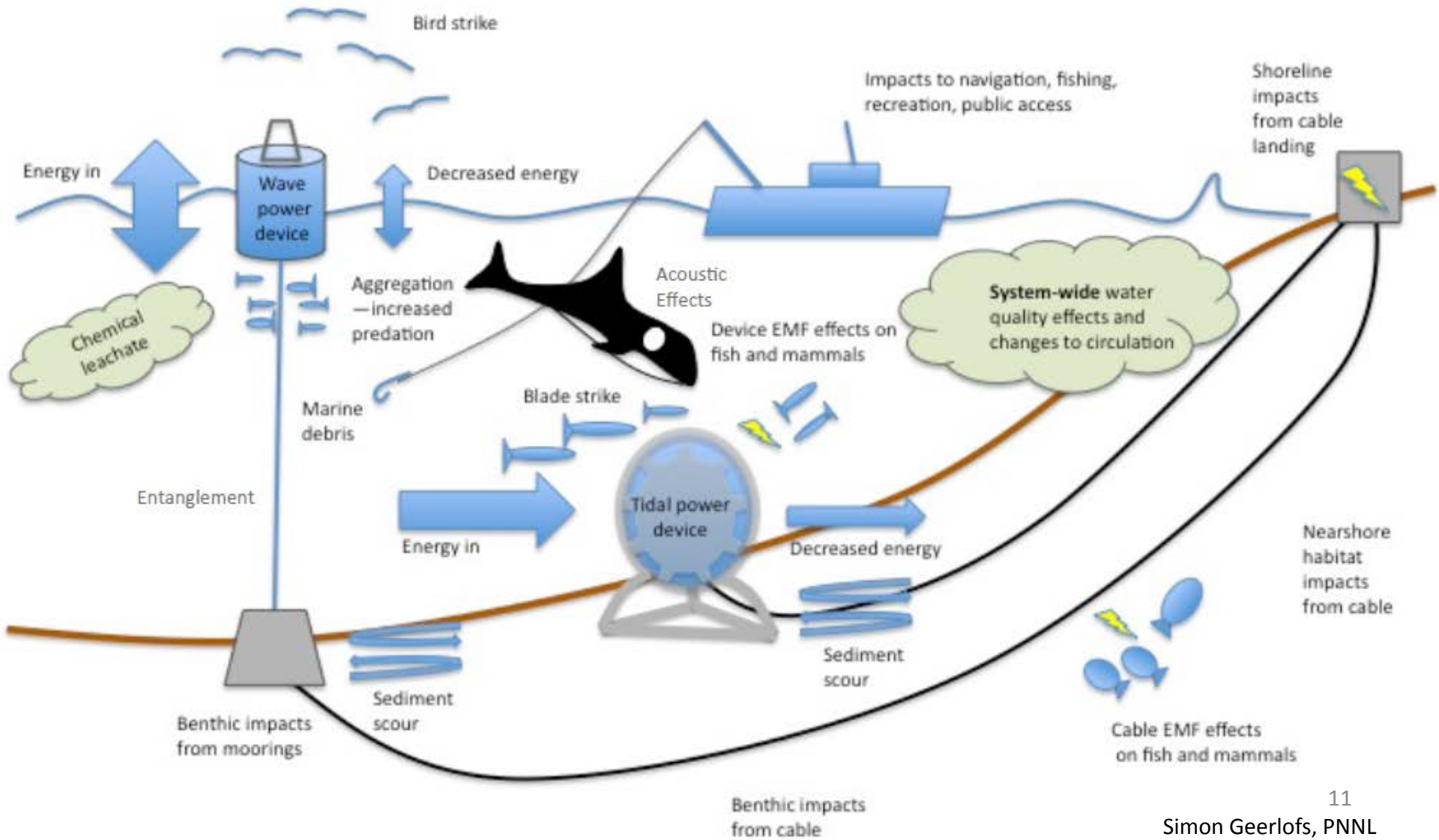
- Decreased reliance on Fossil Fuels
- WA Renewable Energy Portfolio Standards
- WA demand west of the Cascades
- Significant offshore resources potential

Potential Benefits and Compatibilities

- Increased energy independence from the Energy Grid
- Construction and Operation jobs
- Possibly offshore shellfish aquaculture


Principle Power

Environmental Concerns



Simon Geerlofs, PNNL

Potential Use Conflicts

- Shipping
- Fishing
- Aquaculture
- Recreation
- Cultural/Historic Resources

Other Concerns

- Market Influences
- Uncertain local demand
- Infrastructure Updates
- Exclusion Zones
- Unknown mitigation requirements

Future Trends and Factors in WA

- Offshore wind most promising resource
- No current projects under development*
- Significant barriers:
  - Cost
  - Regulatory uncertainty
  - Conflicts with current uses

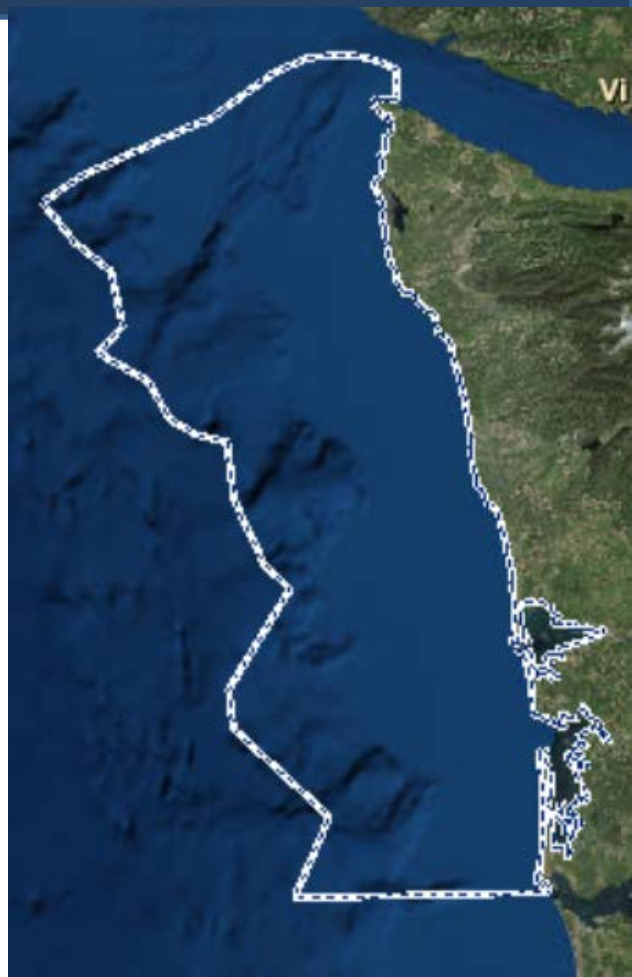
- Development in the next 20 years limited

Principle Power

*In Plan area

Follow-up and Contact

- Further questions?



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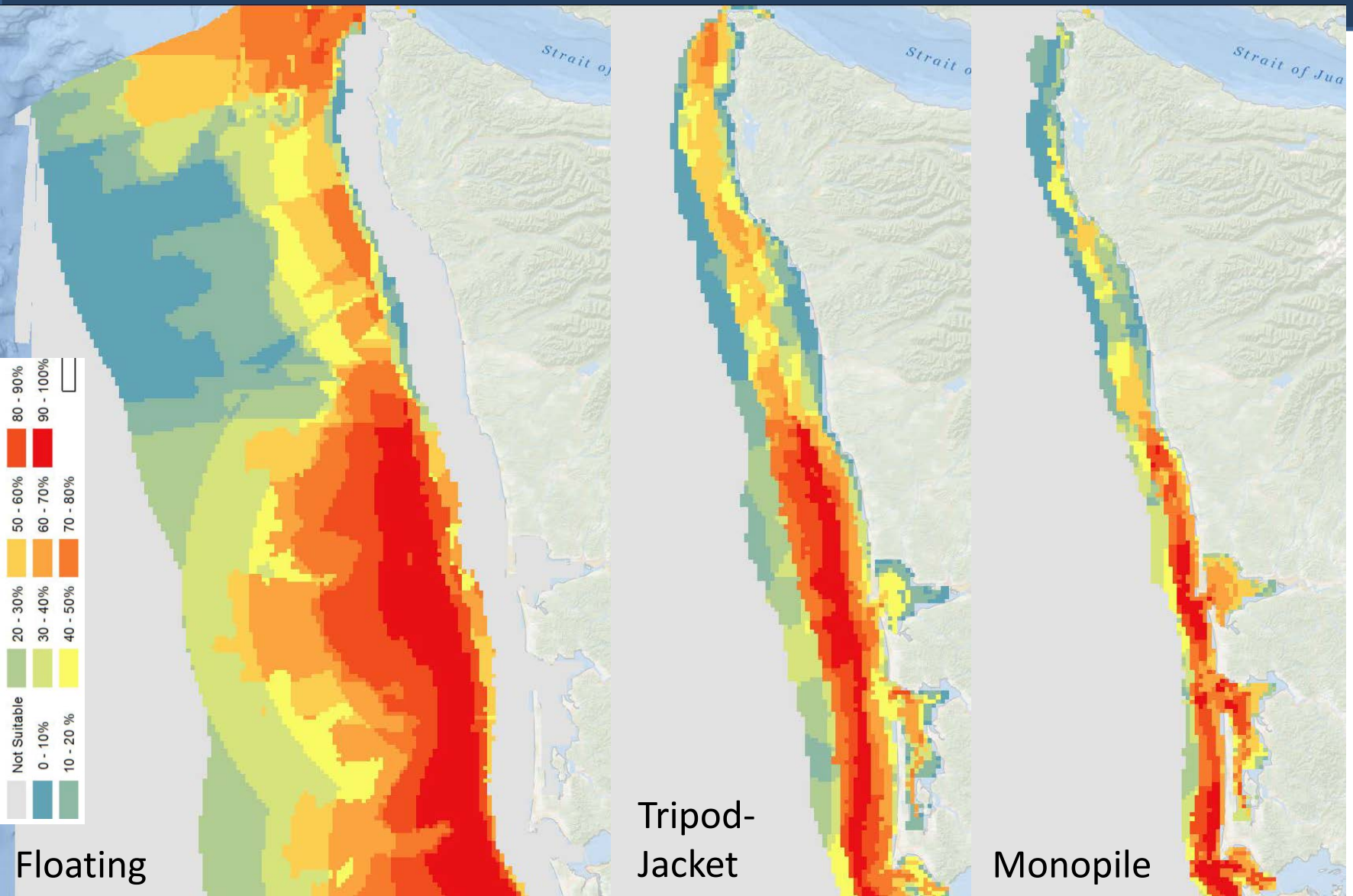
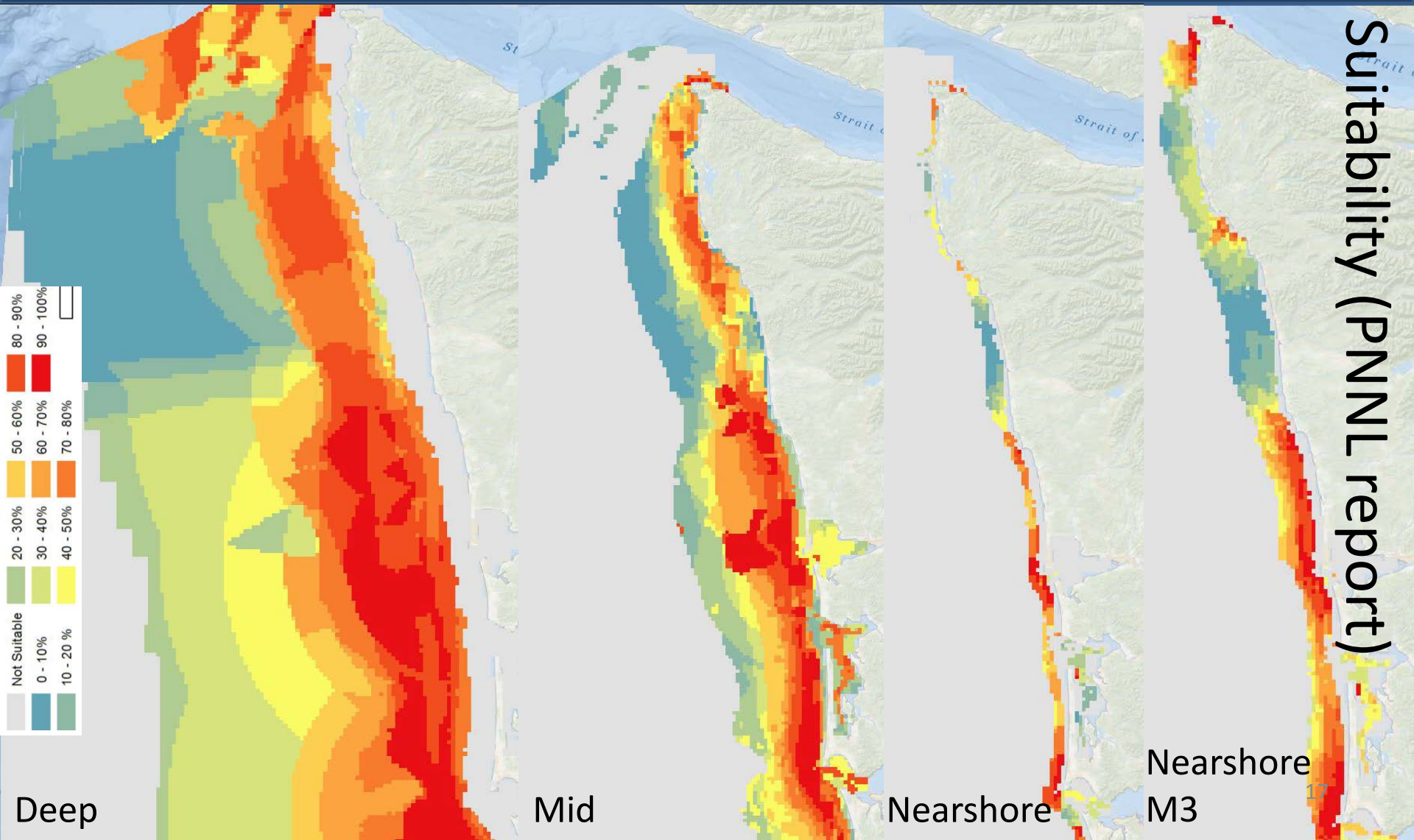
Offshore Wind Energy



Suitability (PNNL report)

Wave Energy


Suitability (PNNL report)
Not Suitable
0 - 10%
10 - 20 %
20 - 30%
30 - 40%
40 - 50%
50 - 60%
60 - 70%
70 - 80%
80 - 90%
90 - 100%
Deep
Mid
Nearshore
Nearshore
M3

Use Analysis Process & Use Matrix Exercise

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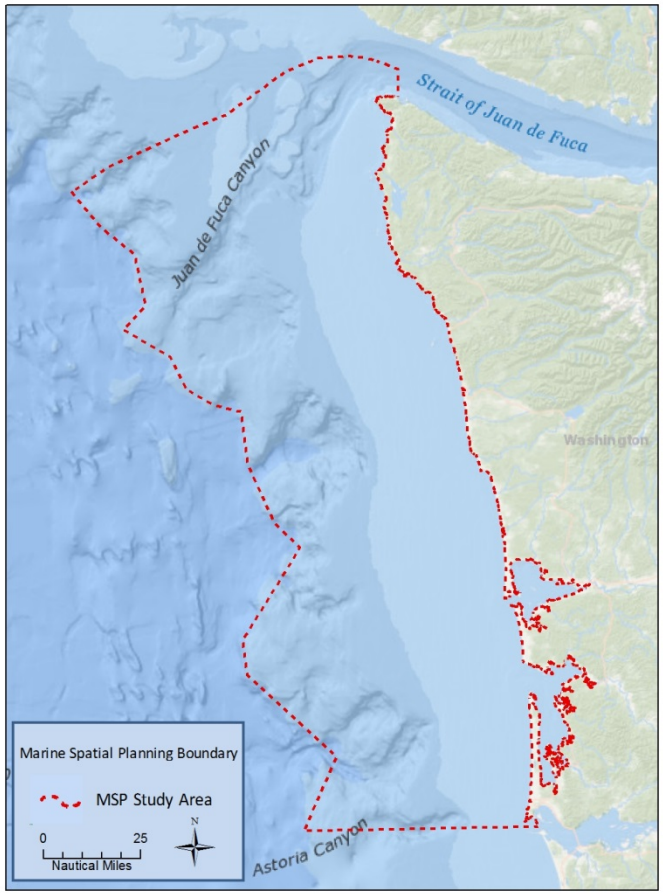
Use Analysis Process

- Today:
  - Review Use Analysis Process steps and connection to overall Marine Spatial Plan
  - Introduce Use Matrix concept & exercise
- Next Meeting (April 22):
  - Agencies provide list of use data for spatial analysis.
  - WCMAC reviews draft Use Matrix.
  - WCMAC provides recommendations on Use Matrix.

Scope of MSP



The study area is 700 fathoms offshore and includes federal waters and estuaries.

INTENT:
Address location of potential new marine uses.

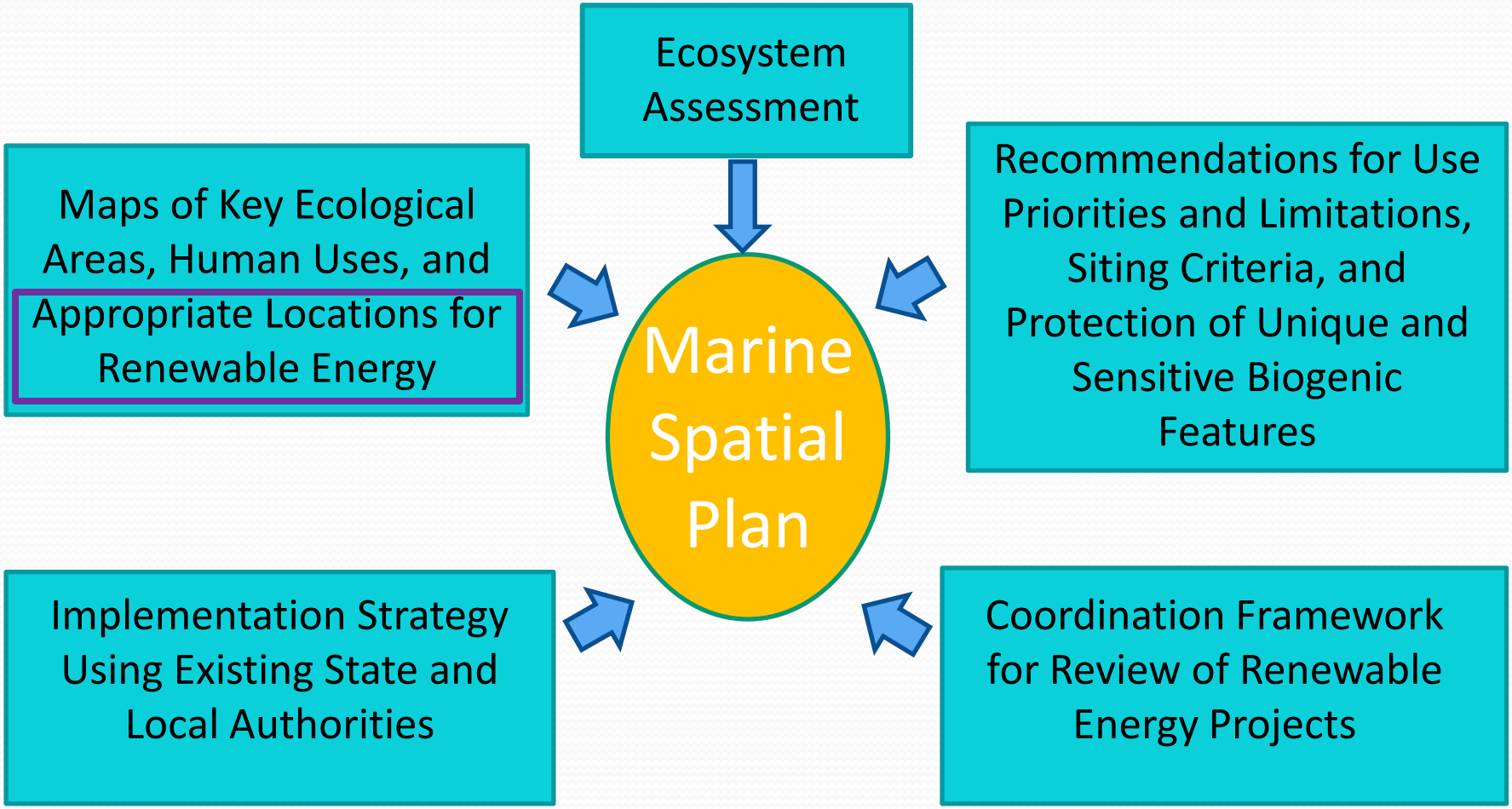
PLAN GOALS/OBJECTIVES:

- Protect existing uses
- Protect cultural uses/resources
- Preserve environment
- Integrate decision-making
- Provide new economic opportunities

NON-REGULATORY PLAN

MSP Context

The marine management plan must include but not be limited to…



RCW 43.372.040(6)

Marine Spatial Planning – Requirements (RCW 43.372.040)

Legend:
- ● Complete by June '15
- ⊠ Underway before June '15
- ○ Not underway
- ⦿ Extends past June '15

Goal 1: Protect & Preserve Existing Uses	● Maps of existing uses ● Sector Analyses ● Economic analyses ● Economic indicators	⊠ **Use Analysis**
Goal 2: Protect Cultural Resources & Uses	● Social indicators ● Coastal hazards ⊠ Cultural & historical resource maps	○ Assess social indicators ○ Visual Resource Inventory (aesthetics)
Goal 3: Preserve Environment	● Maps of ecology (biology, habitat, etc.) ● **Ecologically Important Areas Analysis**	● Ecological indicators & assessment ⦿ Marine mammal models
Goal 4: Integrate Decision-making	⦿ Involve WCMAC & Stakeholders ⦿ Coordination (gov't) ● Science review	● Climate Change information
Goal 5: Provide new economic opportunities	● Maps of renewable energy suitability ● Sector analysis	● Research: other potential new uses ⊠ **Use Analysis**

→ **Marine Spatial Plan**

Pre-planning & scoping
Completed January 2014

Data & Analyses
Through June 2015

Plan development
September 2014 & beyond

Use Analysis Process

Assess Use Data (Fall 2014)

- Agencies develop list of data for each use category.
- For uses with little to no data, agencies contact appropriate source and experts and verify user/sector data. If needed, refine use data or adjust display of data.

Spatial Use Analysis (Spring-Dec. 2015)

- WCMAC input on use assessment matrix and spatial analysis process.
- DNR performs GIS analysis: using standardized grid & evaluating existing use data against areas for potential new uses (PNNL data for renewable energy) - categorize use data (unknown; low, medium, or high use)
- Output categorizes areas: most existing uses/fewer uses, fixed infrastructure, with no conflicts, etc.

Identify Alternatives & Recommendations (Spring 2015 – Winter 2015)

- Agencies identify, for each existing use category, the recommended actions if a project were proposed for that area.
- WCMAC members review and provide their recommended actions for each of the new uses (alternatives).
- Agencies identify pros/cons for alternatives and next steps – get feedback from WCMAC.

Spatial Use Data

- Existing Uses
  - Shipping, Fishing, Aquaculture, Recreation, Military, etc.
  - <u>Includes</u> Ecologically Important Areas

- Potential New Uses data
  - PNNL renewable energy layers
  - Spatial data on other potential new uses, *if available*.

List of data for spatial analysis

- List of data sources for existing uses.
- Categorize, for each category of existing uses, the level of activity (high use, medium use, low use).
- Agencies describe how data was analyzed to develop level of activity.

What is the Use Matrix?

- Tool to assess spatial interaction between existing and new uses.
- Provide basis for the inputs to the analysis of GIS data on existing and new uses.
- Builds toward WCMAC <u>spatial</u> recommendations for potential new uses (summer/fall).

- Not intended to address <u>non-spatial</u> concerns – these can be focus of other plan recommendations such as data needs, analyses, or potential mitigation for specific types of impacts/use types.

Matrix Template Draft Definitions

- **High Conflict:**
  - High frequency or intensity of interaction
  - Permanent displacement of high use area
  - Potential for high impacts to highly sensitive area
- **Moderate Conflict:**
  - Moderate frequency or intensity of interaction
  - Permanent displacement of moderately used area
  - Temporary displacement at critical time or place
- **Low Conflict:**
  - Low frequency or intensity of interaction
  - Permanent displacement of less used area
  - Temporary displacement of less used area
- **Unknown:**
  - Data does not allow assessment of level of conflicts or compatibility

DRAFT Use Matrix Template

	Existing Use X High Use	Existing Use X Medium Use	Existing Use X Low Use
Potential use W High potential	**H**		
Medium potential		**M**	
Low potential			**L**
Potential Use Y	**M**	**L**	**L**
Potential Use Z	**U**	**U**	**U**

Recommended Actions

Draft table for identifying WCMAC recommendations based on the use matrix and spatial analysis outputs.

	Areas with most conflict	Areas with less conflict	Areas with unknown conflict	Areas with no conflict	Areas with fixed infrastructure
Potential Use Y					
Potential Use Z					
Potential Use W					

Questions?