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RE: ODFW Comments on OROWindMap Biological, Human (non-fishing) and Physical Data Layers

The Oregon Department of Fish and Wildlife (ODFW) has been following the Bureau of Ocean Energy management (BOEM) and state of Oregon planning effort to gather data and engage stakeholders relevant to potential future offshore wind development. ODFW staff have participated in several informational workshops and webinars in recent months to learn about the development of the data portal, OROWindMap, created to display data relevant to this effort. ODFW provided preliminary recommendations for biological, human, and physical map layers to the Department of Land Conservation and Development (DLCD) on July 19, 2021, which were developed with the understanding that we would be involved in a data review working group proposed to convene summer 2021 to perform a thorough review of the data catalog. During workshops held August 4 and 11, 2021, BOEM and DLCD presented information about OROWindMap and ODFW staff learned that the data review working group would not convene and instead the workshop would be followed by a two-week period to provide written comments. To meet the two-week comment period, ODFW Marine Resources Program staff reviewed of OROWindMap biological, human (non-fishing) and physical layers available in OROWindMap as of August 2, 2021, and developed the comments listed below. We will provide comments on fishing data layers in a separate letter. Our comments build on preliminary recommendations submitted previously and constitute our response to the information presented at the workshops, including an expectation that additional data review and engagement will be ongoing throughout the process as BOEM assesses the study area to identify potential call areas for future offshore wind (OSW) leasing off Oregon. Comments below are divided into general comments that apply to multiple layers, and comments on individual biological, human or physical data layers.

General Comments:

1) Balance of offshore, nearshore, and onshore data - An element of the BOEM Oregon Taskforce approach to planning for offshore wind development is the need to incorporate equal consideration of lands and waters under state jurisdiction. In its current form, OROWindMap provides some but not all relevant data to inform analysis of areas appropriate for transmission cables and onshore facilities. It is important to provide all the best available data to support equal consideration of nearshore and coastal resources and uses in the siting of potential offshore call areas. BOEM expressed on the August 11th workshop that the current focus is offshore for siting of call areas and that the appropriate time to consider cable routing and impacts would be once there is a proposed project. This concerns us this because the siting of call areas will direct where future projects and related infrastructure may be proposed, and careful consideration of cable routes and landing sites must be part of the siting of call areas to ensure that an offshore site best suited for OSW energy development also provides a suitable cable route with minimal impacts. Identifying call areas without considering the nearshore and onshore cable and facility needs could put the state in a position of selecting between undesirable options for nearshore and onshore ecological and human use concerns.

2) Additional Data - multiple additional layers are publicly available that should be added to OROWindMap including:

- Wetlands
- Marbled murrelet critical habitat
- Marbled murrelet at sea use (from Crescent Coastal Research data, see comment #7, below)
- State Park Day Use - bins of relative use pressure
- ORBIC species layers (level of detail dependent on the ability to crop to relevant coastal areas and generalize species representation.)
- Designated state natural areas

Several data layers used in the analysis of rocky habitat for the revision of Territorial Sea Plan Part 3 would be useful to the comparison of shoreline and coastal areas considered for transmission and onshore facility siting. See the Rocky Habitat Web Mapping Tool. These data could be added to OROWindMap, including

- Black oystercatcher (Audubon 2015-2017)
- Key intertidal species present at MARINe sites (2018)
- BIA for cetaceans – Reproduction
- BIA for cetaceans – small and resident
- Intertidal substrate, 2017 (CMECS 2019)
- Hydrography – rivers and waterbodies
- Snowy Plover Critical Habitat
- Snowy Plover Designated Management Areas (SPMAs, RMAs)
- State Park Boundaries

See comments below for additional data suggestions on specific layers.

3) Connectivity to the Oregon Renewable Energy Siting Assessment (ORESA) project - The ORESA tool is under development to facilitate easy access to data to support renewable energy

development. ODFW understands that marine and most coastal data will be housed in OROWindMap and that ORESA will direct users to OROWindMap for those data. Both tools are currently under development and will include a request from tool developers that ODFW perform data review at some point in the near future. When that occurs ODFW will compare the beta versions of both tools and provide input on the effectiveness of connecting users from one tool to the other. For now, we are including this general comment as a place-holder for anticipated future review.

4) Use of OROWindMap layers in offshore wind planning - The process for using map layers and other data in developing offshore wind call areas has not been described. We have a number of questions, such as: which layers will be used in the process, will some data be weighted more than others, will there be some sort of scoring system developed to differentiate degrees of potential conflict, what data in addition to the layers will be brought into the process, will stakeholder advice be brought into the process. Without an understanding of this downstream process, our ability to comment on the appropriateness or completeness of the map layers is limited.

Comments on Individual OROWindMap Biological Layers:

Birds:

1) Important coastal bird areas – This layer appears to match the original data. The original data differentiates Global vs. State Important Bird Areas. That might be important to differentiate in the OROWindMap layer, depending on the differences between the two.

2) PaCSEA all surveys & **PaCSEA seasonal surveys)** – The Pacific Continental Shelf Environmental Assessment (PaCSEA) total bird density provides useful data, but data by species may be more important for offshore wind planning because different species have different susceptibility to turbines. The metadata indicates that the species data can be obtained at: https://www.sciencebase.gov/catalog/item/54d54b8ce4b0f7b2dc9f2ecc. That site refers to a United States Geological Survey (USGS) web map service that may have more data; however, an error message prevented the map service link from loading. We are most interested in individual species data layers, it would be helpful if those layers could be added or at minimum if a reliable link to species data could be identified.

3) PaCSEA seabird transects – This map shows the actual transects without bird density data. The text in the OROWindMap data information window appears to be a copy of the information for the other PaCSEA layers and implies that this layer shows density. The text in the information window should be revised to reflect the actual data in the layer.

4) Seabird colony relative ecological importance – The basic information in this layer, including location and relative ranking of seabird nesting colonies, is important for offshore wind planning. The individual sites can be selected to show detailed data on species, counts, and surveys; however, the arrangement of these data is difficult to use. For example, Parrot Rock (at Heceta Head, north of Florence) has 74 data "features" arranged sequentially with no apparent organization. Those data pasted into a word file cover 25 pages. It is nearly impossible to glean pertinent species data from these

lengthy data listings. If it is possible to arrange the data in a table, it would be much more useable for getting information on abundance of individual species.

5) Predicted seabird abundance (16 species CCS and by season), PRBO 2011 - These are the overall abundance layer for all the modeled seabird species. Point Reyes Bird Observatory (PRBO) also produced an overall seabird importance layer (core areas), a persistence layer, and a hotspot maps. Including these other layers in OROWindMap for combined species would be useful. The seabird abundance and distribution models are based on data from 1997 – 2008. The other major source of seabird data in OROWindMap are from the PaCSEA surveys (2011-2012). The data are becoming outdated and BOEM should pursue analysis of newer seabird data or conduct new surveys in the near future.

6) Predicted average abundance, PRBO 2011 (16 individual layers for black footed albatross, Bonapartes gull, Brandts cormorants, brown pelican, California gull, Cassins auklet, common murre, fork-tailed storm petrel, Glaucous winged gull, herring gull, Leachs storm petrel, red-necked phalarope, Sabines gull, sooty shearwater, western gull) **–**
In addition to the annual averages, PRBO produced the single species data for each of 4 seasons. If those layers are available, please consider including those data with a map slider. PRBO also produced importance and persistence layers for each species. Please consider including those data, if available.

7) Additional seabird data – There is a rich nearshore seabird dataset collected by Crescent Coastal Research (CCR) for the US Fish and Wildlife Service (USFWS) that includes over 20 years of surveys of the area from the shore out about 5 km. While these data may not address offshore planning needs, the would be valuable for nearshore cable and landing site planning. Please consider including these data in OROWindMap. Data up through approximately 2010 were analyzed and map layers were produced for an earlier Oregon territorial sea planning process. Producing layers with more recent data would be valuable but would require additional data processing. Permission to use either the layers currently available or newer data would likely need to be secured from CCR and USFWS.

Fish:

8) Groundfish biodiversity layers (predicted biomass hotspots, predicted species hotspots, predicted nearshore assemblage abundance hotspots, predicted abundance hotspots) –
The data descriptions for these four layers should include the following additional caveats:

- The data used in these models were collected during summer and fall months. Fish distributional patterns during winter months may differ.
- Bottom trawls were used to sample the fish populations; therefore, only demersal fish species susceptible to trawl gear are represented in the models.

9) Pacific hake relative abundance – These data appear to show non-zero hake relative abundance points along transects. There is no indication of the total length and position of each transect other than the non-zero points. It would be helpful if the full transects could be shown in indicate where the vessels surveyed, if these data are available

10) Pacific lamprey distribution – The OROWindMap data represents a record of fish distribution and activity for Pacific lamprey contained in the StreamNet database, extracted on January 12, 2012.

Distribution is based upon the best professional judgement of local fish biologists, in the Pacific Northwest Region. The source data comes from Data Basin, which displays both observation points and stream reach for current and historic observations of lamprey. The data described in Data Basin represent known observations and distribution of Pacific lamprey for Oregon, Washington, and Idaho from a database managed by the USFWS on behalf of the Pacific Lamprey Conservation Initiative and is current as of December 2020. We recommend the more current and robust data for lamprey freshwater distribution from Data Basin be included in OROWindMap instead of from StreamNet.

For marine distribution, we have not identified existing spatial distribution data but recommend a layer be created based on best professional judgement from ODFW's subject matter expert and lead author of a recent publication *Marine biology of the pacific lamprey Entosphenus tridentatus* (Clemens et al, 2019). As described in this paper, lamprey distribution is highly variable and largely based on the distribution of host animals parasitized by individual lamprey. Some individuals have been caught at depths of 1485 meters, but the largest catches have come from bottom depths 100-800 meters. We therefore recommend that the marine distribution of Pacific lamprey be represented by a new layer extending coastwide from shore to 800 meters depth, bounded by the Oregon state boarders, and with the following title and data description:

> **Pacific Lamprey Marine Distribution off Oregon**
> Pacific lamprey are anadromous and rear as juveniles in seawater where they parasitize fishes and whales (Clemens et al. 2019). Their marine distribution is influenced by the movements and distribution of the host species. Pacific lamprey have been caught from the ocean surface down to 1,485 meters (Orlov et al. 2008). However, the largest catches of Pacific lamprey made in National Oceanic and Atmospheric Administration (NOAA) Fisheries surveys occurred where bottom depths were 100–800 m (AFSC 2019). This data layer is based on the best professional judgement of ODFW and represents the depth band from shore to 800 meters depth where the highest abundance of documented Pacific lamprey observations occurred. This species occurs elsewhere in the marine environment; however, the layer shows this distribution off Oregon only.

11) Average quarterly predictions (2 individual layers for anchovy and sardine), 2019 - There are very limited data layers for Coastal Pelagic Species (CPS) in OROWindMap. There are four finfish species, Pacific sardine, northern anchovy, Pacific mackerel and jack mackerel that are management unit species in the federal CPS Fishery Management Plan (FMP), but there are data layers for only two of those species, Pacific sardine and northern anchovy, in OROWindMap. The invertebrates in the CPS FMP, market squid and krill species, which are also management units in the FMP currently have no data layers in OROWindMap.

The data layers for Pacific sardine and northern anchovy in OROWindMap include quarterly average predictions for 2019, with the time periods January through March, April through June, July through September, and October through December. The legends for these layers lack any type of units which makes interpretation of these layers difficult, and the colors for the units are not consistent for the various quarters even for the same species. We also note the legend for the anchovy quarterly prediction layer for both July-Sept and Oct-Dec 2019 both say, "Albacore Average Quarterly Predictions", so we recommend that you check to confirm that the proper layers are being displayed and the legends match the layers listed as active in the display. We think that the layers actually being displayed are more likely

for albacore than for anchovy for these quarters. We also recommend that units stating what is actually being depicted in the maps be included to allow users to better interpret what these data layers represent. We also examined the metadata for these data layers that is available here: https://gis.lcd.state.or.us/server/rest/services/Projects/OCMP_OceanPlanning_Biological/MapServer. There was no reference or publication provided that would allow a user to understand the methods or data sources utilized to create these layers. We recommend that source information and relevant publications (e.g., Muhling et al. 2019) be added to the metadata for these layers. There may also be other correlative species distribution model data layers available for sardine and anchovy that could potentially be incorporated (see Muhling et al. 2020), and we recommend exploring that possibility.

The Southwest Fishery Science Center (SWFSC) has conducted coastwide acoustic trawl surveys for CPS during the summer months for a number of years that provide information on the distribution and abundance of CPS. Published data (e.g., Zwolinski et al. 2019, Stierhoff et al. 2019, and Stierhoff et al. 2020) provide information on not only the finfish species in the CPS FMP, but also for Pacific herring. Please contact SWFSC for available data from these surveys that could be incorporated into OROWindMap.

12) Average quarterly predictions for albacore, 2019 - First, we recommend that logbook data be used to create effort layers to depict the Oregon albacore fishing effort given the majority of Oregon's fleet does not meet the length requirements for Vessel Monitoring Systems (VMS). Second, the quarterly temporal scale of these layers breaks up the Oregon fishing season (June – October). We recommend a fishery-based temporal break up of season be added. Third, annual layers or layers occurring during abnormal years (i.e. marine heat wave) would be useful to show patterns in distribution in response to different ocean conditions.

13) Habitat suitability (4 individual layers for blue shark, shortfin mako shark, swordfish, thresher shark), 2018 - The habitat suitability layers included for these species are based on drift gillnet (DGN) data. The DGN swordfish fishery has been a California based fishery since 2009 when the Oregon Fish and Wildlife Commission voted to stop issuing fishing permits for drift gillnet gear in waters off the Oregon coast. Therefore, these data layers are useful when representing the California fishery but they lack information for Oregon. Application of these models offshore of Oregon should be interpreted with caution.

14) Additional Dataset - Groundfish Species distribution data - NOAA developed several map layers showing modeled groundfish distribution for representative species to inform the West Coast groundfish essential fish habitat (EFH) process. These include models and other data that show the distribution of various fish species. The geographic information system (GIS) layers have only rudimentary metadata, but the data and analyses are fully documented in a NOAA Synthesis Report (starting on p. 552). We recommend adding these layers to OROWindMap from the link provided to Andy Lanier, DLCD, on July 9. The NOAA report and data layers "Phase2_Species-Habitat_MapPackage.mpk" are also available to BOEM and DLCD for direct download from a NOAA Google Drive account upon request. Contact: Curt Whitmire, curt.whitmire@noaa.gov.

Habitat:

15) West coast surficial geologic habitats – see comments on same layer under Physical, below.

16) CMECS ecological marine units, 2019 - The data in this layer are difficult to interpret in the map because it is difficult to match legend colors with map colors, especially if any semi-transparency is applied. This layer has donut holes, and it is unclear when other layers, or the background map, are showing through the holes. A query tool that allows the user to identify a Coastal and Marine Ecological Classification Standard (CMECS) polygon is necessary to interpret the layer. In general, we recommend that the "West coast surficial geologic habitats" (SGH) layer, categorized as recommended below (see comment 61 in the Physical section), be the primary reference layer for information about the structure of the seafloor.

17) Layers reviewed, no comment at this time–

- Current and historical estuary extent
- Estuarine biotic habitat
- Physiographic habitat

Invertebrates:

18) Deep sea corals and sponges – This OROWindMap layer represents individual observations from numerous survey sources, compiled by NOAA's Deep Sea Coral Research and Technology Program. As presented, the single observational data are not very informative to the spatial analysis of areas for potential siting of future OSW development. More informative data are available that summarize the observational data as presence and use as a proxy for abundance (i.e., mean sum count of observations) by 1x1 or 2x2 kilometer grid cells, respectively. National Marine Fisheries Service (NMFS), Northwest Fisheries Science Center, Fishery Resource Analysis and Monitoring Division prepared these data to inform the Pacific Fisheries Management Council's (PFMC)'s Groundfish EFH Review (2013). However, it is important to note that no systematic regional survey of biogenic species and abundance has been conducted. Differences in how data were collected among the contributing survey sources make it difficult to estimate relative abundance. It should be understood that the data are "presence only" data, and that there are insufficient data where biogenic animals were not observed. The data and analysis are fully documented in a NOAA Synthesis Report. We recommend adding these layers to OROWindMap from the link provided to Andy Lanier, DLCD, on July 9. The NOAA report and data layers "Phase2_Species-Habitat_MapPackage.mpk" are also available to BOEM and DLCD for direct download from a NOAA Google Drive account upon request. Contact: Curt Whitmire, curt.whitmire@noaa.gov.

19) Clubhook squid average quarterly predictions, SFSC 2019 – While there is no fishery targeting clubhook squid (*Moroteuthis robusta*), they have been caught as bycatch off of Newport since 2010. In 2008, there was a large influx of Humboldt squid (*Dosidicus gigas*) off the Oregon Coast caught in the hake fishery but not since. By 2010, clubhook squid became the predominant squid bycatch species based on weight. Clubhook squid remains very common in the hake bycatch. Hake appear to be a major prey of the squid. The seasonal timing depicted in OROWindMap reflects squid association with the hake school movement north to south as the early hake season usually begins in May off the northern California coast. Clubhook squid are common on the central Oregon coast but only occasional on the north coast and Washington. The OROWindMap layer shows distribution well offshore of Oregon but,

based on literature and best professional judgement, we believe clubhook squid occur closer to shore, both on the slope and shelf off the central Oregon coast. There is no information or metadata for the clubhook squid quarterly predictions, but we would be interested to review these data again once information and metadata for this layer is provided.

20) Additional Data: NMFS standardized catch data on corals, sponges, seapens and seawhips (in the commercial groundfish fishery) - Biogenic species distribution data were prepared for the PFMC's Groundfish EFH review process in 2012-2013 using bycatch data from two fishery datasets; the NMFS annual West Coast Groundfish Bottom Trawl Survey (WCGBTS) and the West Coast Groundfish Observer Program (WCGOP). These data provide additional important information on biogenic habitat presence, depicting the spatial distribution of corals, sponges, sea pens and sea whips from standardized catch data. The WCGBTS covers the continental shelf (i.e., 30-100 ftm) and slope (i.e., 100-700 ftm) from the Canadian to Mexican maritime borders. The WCGOP covers the spatial extent of commercial groundfish fishing vessels. Data are summarized as catch density and effort density in a raster grid (500 m x 500 m cell size). Note that the downloadable data are pre-symbolized to be standardized for the for two time periods (2002-06 and 2006-10) for the EFH review but can be symbolized differently. We recommend downloading these layers to OROWindMap from the NOAA/NWFSC data portal: https://www.webapps.nwfsc.noaa.gov/data/efh-catalog/Biogenic.html

Marine Mammals and Turtles:

21) Biologically Important Areas (BIAs) for cetaceans – feeding & migration, gray whale, harbor porpoise, humpback whale, CetMap, 2015 – BIAs were designated by subject matter experts and represent the most relevant data available for habitat use off Oregon by cetaceans. BIAs account for migration and movement corridors for feeding cetaceans. They are fairly comprehensive in identifying areas of importance and are likely a very good resource for wind energy or spatial planning applications. As expressed by Marine Mammal Institute during the August 4 workshop, BIAs are being revised by NOAA to include best available data and additional species. Please include all the available cetacean BIAs that have areas off Oregon, and update BIAs with revised layers when available. Data are available at https://coast.noaa.gov/digitalcoast/data/biologicallyimportantareas.html

22) Blue whale core areas of use, MMI 2019, Blue whale home ranges MMI 2019 - We know relatively little about blue whale distribution along the West Coast, beyond key foraging areas in California. Individuals range widely and not always with well-understood migratory paths. Layers are based on short-term bio-logging data of individuals and marine mammal telemetry tags and often these data don't account for inter-seasonal or inter-annual differences. Strengths are with good sample sizes, it is a good way to highlight individual areas of importance for high use and foraging. The downfall is that these are extrapolated models that lack full population representation and may either under or over represent areas of use. Home Range usually represents the 95% confidence interval of estimated locations. However, 'core area' isn't always biologically informative and often has a cut off of 50% use. This core area isn't always representative of key habitat and also doesn't represent whether the areas are high use due to foraging, resting, or both. Layers are as accurate as can be given the limited data.

23) Density maps and distribution models, 17 layers SFSC 2020 (Fin Whale summer/fall density, Fin whale winter/spring density, Pacific white-sided dolphin summer/fall density, Long beaked common dolphin summer/fall, Northern right whale dolphin summer/fall, Striped dolphin summer/fall density,

Small beaked whale guild summer/fall density, Short beaked common dolphin summer/fall density, Bairds beaked whale summer/fall, Blue whale winter/spring density, Blue whale summer/fall density, Rissos dolphin summer/fall density, Bottlenose dolphin summer/fall density, Dalls porpoise summer/fall density, Sperm whale summer/fall density, Humpback whale summer/fall density, Humpback whale winter/spring density) –
These density maps and distribution models are generally based upon observations on a transect or sampling regiment. This data was input into generalized additive models that were retrospectively tested with a subset of data to predict distributions. Visual observations are the basis for these models, and overall are good to estimate general population prevalence, but are dependent upon sampling design and actually sighting individuals, which is why they are more often used for smaller cetaceans that spend more time at the surface. Based on the fact that these models were tested for predictive capacity they are fairly reliable and possibly one of the most comprehensive spatial assessments. Habitat use is broadly modeled, and this layer is as accurate as it can be given the limited data. The Oregon State University (OSU) Whale Habitat, Ecology, and Telemetry (WHET) Lab may have additional useful information.

24) Gray whale migration corridor – This layer is accurate and provides a good representation of the migratory corridor. It would be helpful to note in the information for the layer that mothers and calves may also enter bays and estuaries on the northward migration to avoid predation.

25) Humpback whale proposed CH NMFS 2019, Humpback whale proposed CH exclusions NMFS 2020 - Based on the critical habitat (CH) listing assessment for humpbacks by NMFS in 2019, critical habitat encompasses physical or biological features in specific areas that are essential to supporting the life-history needs of the species and that may require special management considerations or protection. Note that the final rule designating CH https://www.federalregister.gov/documents/2021/04/21/2021-08175/endangered-and-threatened-wildlife-and-plants-designating-critical-habitat-for-the-central-america was published by NMFS on April 21, 2021 and went into effect May 21, 2021. This final rule describes the critical habitats for the CAM and MX distinct population segments (DPS) of humpback whales off of Oregon and the basis for the designations. For both the endangered CAM and threatened MX DPSs, "*The areas being designated are seasonal feeding habitat that … contain the biological prey feature that is essential to their conservation and that may require special management considerations or protection*." Another key concern is that since humpbacks are a highly migratory species, areas of biological importance are key for obtaining enough energy for reproduction and completion of annual migrations over thousands of miles, and the threshold for adaptability is very low. In the siting of call areas, BOEM should give strong consideration to potential effects on prey and physical barriers to migration or foraging in these areas, any of which could be highly detrimental.

26) California sea lion haulout counts – This layer is largely accurate. It would be helpful to note in the information for the layer that haulout abundance fluctuates seasonally/monthly as animals migrate for breeding, foraging, or move upriver to follow seasonal resources.

27) Northern elephant seal haulouts – This layer is accurate as the main haulout in Oregon is at Shell Island, Cape Arago. It would be helpful to note in the information for the layer that juvenile elephant seals will rest on beaches during molting and have been seen at various locations along the coast.

28) Pacific harbor seal haulout counts - These data are from 2011. More recent finalized data are available from 2014; as of 2021, our Marine Mammal Program is currently working on conducting and evaluating coastwide aerial surveys to update these counts, as well as creating a data layer that uses polygons to represent haulouts rather than line/point data. This work will take several months and should be completed by early 2022. It would be helpful to note in the information for the layer that these data are recorded during breeding/pupping season for harbor seals and represent peak abundance, with a correction factor for animals in the water.

29) Steller sea lion haulout counts - These data are from 2011. More recent finalized data are available from 2017; our Marine Mammal Program is currently (2021) working on conducting and evaluating coastwide aerial surveys to update these counts, as well as creating a data layer that uses polygons to represent haulouts rather than line/point data (see comment on Pacific Harbor seal haulout counts).

30) Steller sea lion haulout use – This layer is likely still accurate even though this is 2011 data; we will have updated information (see comment above) but this dataset is largely accurate as animals tend to predictably use the same haulouts and rocks over time.

31) Steller sea lion CH - It would be helpful to note in the information for the layer that the critical habitat areas surround key rookeries with peak abundance/breeding and pupping seasons in early summer. They do not represent foraging habitat as very little is known on that end.

32) Leatherback sea turtle CH – The layer appears accurate.

33) Additional Data - Please add the Southern Resident Killer Whale critical habitat layer, available at: https://www.fisheries.noaa.gov/resources/maps?title=&tid%5B1000001126%5D=1000001126&term_node_tid_depth%5B54%5D=54&field_species_vocab_target_id=&sort_by=created

Marine Plants and Algae:

34) Canopy-forming kelp, 1989-2014 - This layer contains two different data features - one feature is the dissolved kelp canopy layer from all the surveys, shown in green, and the other feature is the survey area, shown in in varying grey shades. The grey shading occupies the entire state waters and is distracting when viewing other layers at the same time. The kelp should be viewable separately from the survey area so that other layers can be seen more clearly (without the grey survey area). The metadata should list the surveys (years and sources) included in this layer. The metadata in the OROWindMap information window is cut off mid-sentence at the end of the statement. It appears the data do not show at zoomed-in scales; we recommend that the data be visible at all scales.

35) Kelp surveys, ODFW, 1990, 1996-1999, 2021 – This layer appears accurate.

36) Seagrasses - There are no data visible in this layer. Once it's repaired, it should differentiate eelgrass from other vascular plant species in the display and in the legend. Also, info/metadata does not indicate the time periods of the data or the data sources so it's not clear if this layer would include recent mapping efforts conducted in Oregon state waters by the Environmental Protection Agency (2004-2007) and ODFW (2010-present). We recommend including the Pacific Marine and Estuarine Fish Habitat

Partnership (PMEP) eelgrass data; see https://www.pacificfishhabitat.org/wp-content/uploads/2017/09/EelGrass_Report_Final_ForPrint_web.pdf

Comments on Individual OROWindMap Human (non-fishing) Layers:

Conservation:

37) Coastal Critical Habitat Designations – This layer combines critical habitat of many species. It would be more informative for understanding siting concerns and spatial planning for specific species to display the CH designations for each listed species.

38) EFH areas protected from fishing – It appears this layer was represented on OROWindMap in May, 2021, but may have since been removed. We recommend retaining this layer (with modifications) to represent past fishery restrictions. This layer represents EFH Conservation Areas (EFHCAs) designated in 2006 under amendment 19 of the Groundfish Fishery Management Plan (FMP). EFHCAs were revised in 2020 under FMP Amendment 28, which resulted in the addition, elimination, or boundary modification of EFHCAs. Retaining the (2006) EFHCA layer in OROWindMap explains the past two decades of fishing effort and fishing distribution in these areas and will inform spatial planning off Oregon (i.e., the lack of fishing activity in areas [due to regulation] is not a surrogate for low fish abundance or low ecological value). In addition, this layer is labeled incorrectly; only groundfish bottom trawl was prohibited in the EFHCAs. We suggest this layer be retained and relabeled as follows: "Groundfish EFH Conservation Areas (Historic) PFMC 2006". This would create consistency in the naming convention used for the current EFHCA layers included in OROWindMap. Note that, although EFHCAs contain the word “conservation”, EFHCAs are a fisheries management measure, not a conservation designation in the strictest sense (such as Marine Reserve, Sanctuary, or critical habitat). A more logical organization would be to group layers representing fishery-specific regulations with fishing data or a new sub-heading. This would better support review of fishery uses and conflicts as the public and BOEM consider the effects of OSW development on fishing.

39) EFH rockfish conservation area lines - The layer name and the info/metadata do not accurately describe the data in this layer. The metadata describes this layer as the depth lines used for the commercial bottom trawl rockfish conservation area (RCA), however for nearly two decades, the groundfish bottom trawl RCA has been defined by only three of the fourteen depth contour lines in this layer. The suite of management lines are sometimes used as management tools for regulating other fisheries (e.g., non-trawl RCA (longline, pots, traps), bottom area closures, sport groundfish, halibut, salmon); however, these other fisheries are not mentioned in the layer's info/metadata. This should be noted in the metadata for this layer. PFMC or NMFS might provide more content for the info/metadata statement. A more accurate layer name would be "Depth-based fishery management lines". Lastly, EFH and RCA are separate fishery management measures. "EFH" should be removed from this layer name.

40) Habitat areas of particular concern - This layer appears to be a compilation of all groundfish habitat areas of particular concern (HAPCs), except that the Daisy Bank HAPC "areas of interest" is missing from this layer. Salmon HAPC for marine and estuarine habitats should also be included, either as a separate layer or combined with Groundfish HAPC and differentiated in the legend. Also, the HAPC layer(s) should be named for the species group (groundfish and/or salmon) it represents, such as: "Groundfish HAPC" and "Salmon HAPC". As written, the metadata does not describe the HAPC

content of this layer but instead describes EFH generally. HAPC is a subset of EFH, defined by specific criteria and constitutes specific habitat features that are high priority areas for conservation - this should be noted in the metadata. Additionally, the EFH text in the metadata has inaccuracies and is misleading. For example, it fails to mention that substrate and water (not just vegetation) are also EFH. Additionally, the term "Areas Protected from Fishing" is not applicable to west coast EFH designations. It seems this text comes from the EFH Mapper site, which has a nationwide context and does not provide west coast designations. Consider rewriting the metadata to discuss west coast HAPC. The HAPC criteria are as follows: important ecological function, sensitive to human-induced degradation, stressed, or rare. Include that HAPC designations for groundfish FMP species include seagrass, canopy kelp, estuaries, rocky reefs and "areas of interest" (for Oregon these are: Daisy Bank, Thompson Seamount, President Jackson Seamount). The legend in the map should show these different HAPC designations. HAPC for salmon are more complicated and include channels and floodplains, mapped spawning habitats, submerged aquatic vegetation (including canopy kelps and eelgrass) and thermal refugia (identified as specific tributaries, streams, etc.). The metadata should also explain that HAPC are designated for federally managed species only (not state-managed), and currently designated for particular species groups (groundfish and salmon species). Please note, the PFMC is currently conducting the required periodic EFH review for CPS. If HAPC should be designated for CPS species, the layer should be updated. More information on West Coast HAPC is at https://www.fisheries.noaa.gov/west-coast/habitat-conservation/habitat-areas-particular-concern-west-coast.

41) Marine reserves and protected areas – This layer appears accurate.

42) Rocky shore managed areas – This layer appears accurate. A description of the layer should be added to the information box.

43) Trawl rockfish conservation area - The info/metadata for this layer is the same as for "RCA conservation lines" layer and does not explain this layer. This layer is the "Core RCA" for the commercial groundfish bottom trawl fishery. It has been the same configuration for nearly two decades. In 2020, the PFMC eliminated this RCA regulation under Amendment 28 of the Groundfish Fishery Management Plan. The info/metadata should describe this layer. Contact NOAA GIS Specialist, Renee Eaton renee.eaton@noaa.gov. Also, the layer name has duplicate text.

44) Offshore islands and rocks, USFWS 2019 - This layer appears accurate.

45) Layers reviewed, no comment at this time -

- EFH 700 fathom bottom trawl closure
- EFH conservation areas
- EFH deep-sea ecosystem conservation area
- PFMC landmarks and areas

Infrastructure:

46) Telecommunication subsea cables, OFCC 2020 – This layer correctly reflects that the ATT cable segments E1 and N9, landing in Bandon, Oregon, were decommissioned and removed in 2020. There is an additional new fiber optic cable currently being installed by Edge Cable Holdings / Facebook (the

"Jupiter" cable), landing just north of Pacific City, Oregon. Route information can be obtained from Oregon Dept of State Lands and should be added to OROWindMap. Along with "**Research subsea cables, OFCC 2020**", these two layers appear to represent all known subsea cables. The other cable layers, while incomplete and inaccurate, can be referenced to identify cable names.

47) Research subsea cables, OFCC 2020 - Along with "telecommunication subsea cables OFCC 2020", these two layers appear to be complete and currently accurate.

48) NASCA submarine cables - This layer is missing the two most recently installed cables and includes two cable segments that have been decommissioned and removed.

49) NOAA charted submarine cables - This layer is missing the two most recently installed cables and includes two cable segments that have been decommissioned and removed.

50) Layers reviewed, no comment at this time–

- Electric power substations
- Electric power transmission lines

Research:

51) Marine reserve comparison study areas - This layer appears accurate.

52) Nearshore research inventory (4 individual layers depict areas, lines, points, transects, stations), OCMP 2012 - In general, the inventory layers provide a good representation of fixed or repeated research sites in 2012. However, they are becoming outdated and consideration should be given to updating them. The "areas" layer includes marine reserve comparison areas as they were defined in 2012. There have been several changes to these areas since 2012. The Marine Reserves Comparison Study Areas layer accurately depicts the current comparison areas. The 2012 comparison area polygons in the nearshore research inventory should be replaced with the current ones.

Comments on Individual OROWindMap Physical Layers:

Bathymetry:

53) US bathymetric contours - Contours that are shallower than 100 meters are not labeled on the map, but they should be. Also, the information/metadata tab lists only some of the contours that are visible on the map and this differs from the list of contours that are provided in the legend, which is confusing.

54) Multibeam echosounder surveys - This layer is missing almost all the footprints for the multibeam surveys conducted by OSU, USGS and ODFW in state waters, Stonewall Bank, Heceta Bank, and possibly other sites. Data layers in state waters are relevant to the BOEM process and important to include in OROWindMap because cable routes and supporting shore-based infrastructure will cross state waters. DLCD may already have the survey area boundaries in state waters but if not, ODFW can provide bounding boxes or you may contact the Active Tectonics and Seafloor Mapping Lab (ATSML) at OSU for missing data.

55) Bathymetry trackline surveys - This layer is missing almost all the footprints for the multibeam surveys conducted by OSU, USGS and ODFW in state waters and at Stonewall Bank and Heceta Bank. DLCD may already have the trackline footprints in state waters but if not, please contact the ATSML at OSU for the most accurate footprint layer.

56) West coast bathymetric slope, BOEM 2021 - The layer currently has no metadata. Metadata should indicate at what spatial scale and by what method the slope was calculated. There is no legend. The layer appears and disappears at different zoom scales. On August 11, BOEM indicated that this layer was derived from bathymetry to demonstrate where slopes are too steep to be technically feasible for OSW development. Metadata should be created and include a description of the purpose and origin of the data, ideally with the information used to determine the slope at which OSW installations would be deemed not feasible.

57) Global hillshade with natural earth colors - This layer is appropriate for visualization only at very broad (e.g., state) scales. It should have a view scale threshold imposed, because at fine scales it obscures bathymetric relief details visible in the underlying background map, and actually introduces artifacts in some places when viewed close-up.

57) Undersea feature place names – Regardless what zoom scale is applied, the place names are too small and seem to get smaller when zooming in. Missing features include Garabaldi Reef, Arago Reef, Bandon High Spot, Orford Reef, Rogue Canyon.

Circulation:

59) Upwelling – This layer appears accurate; however, there have been advances in upwelling indices since this layer was originally produced (e.g., https://mjacox.com/upwelling-indices/). It is unclear if detailed spatial data are available for the newer indices.
60) Ocean currents magnitude and direction - This layer shows the annual average current magnitude and direction. The metadata states that monthly climatology is also available. Monthly average currents would be more useful than an annual average. Please consider including the monthly averages in OROWindMap.

Marine Substrates:

61) West coast surficial geologic habitats – Note this layer appears twice in OROWindMap, in both the Physical and Biological menus. Comments apply to the layer in both places.
The source data for the OROWindMap layer is OSU's surficial geologic habitat data (version 4), for Washington, Oregon, and northern California ("V4_0_SGH_WA_OR_NCA"). This source data contains the best available information for seafloor habitat; however, using the IND classification (hard,soft,mixed) field to describe seafloor substrate does not incorporate the best available information for seafloor substrate/habitat off Oregon. The IND classification was originally created to provide a consistent lithology layer for the entire U.S. West Coast, applying the coarsest scale classification scheme (IND) available coastwide at that time. The IND classification is an older classification system that does not provide the ecological relevance that is now readily available for Oregon in the SGH Lithology classification system, nor is the IND classification the best science available to assess, minimize or avoid the adverse impacts of ocean energy development on marine habitats. The SGH classification field, "Lith 3" (i.e., primary+secondary lithology) has numerous (~42) classes that can be

collapsed into a manageable subset of ecologically relevant categories that also serve to better inform the assessment and minimization/avoidance of adverse effects on seafloor habitats. ODFW recommends that the substrates in the SGH data be based on the "Lith3" field and binned into six substrate categories: rock (i.e., bedrock), boulder, gravel, sand, sand mud mix, and mud. Development of this revised classification is in progress and ODFW can provide further explanation and the data queries that create the proposed classification scheme as well as the resulting GIS layer.

62) Surficial sediment classification – It's not clear if this layer includes sediment sample sites from the OSU-ATSML collected during the state waters seafloor mapping project and other OSU-lead mapping surveys in state and federal waters. Contact the ATSML at OSU.

63) Layers reviewed, no comment at this time–

- Seafloor induration data quality
- Sediment thickness
- Sediment thickness contours
- Physiographic habitat
- National seafloor sediment classification
- Gloria national seafloor geology

We wish to continue to partner with you to improve the data in OROWindMap based on these recommendations, to engage in opportunities to provide input in this process throughout fall and winter, and to participate in the BOEM Oregon Taskforce to express ways in which to minimize potential impacts during appropriate siting of OSW call areas and related nearshore and onshore infrastructure. We request that these comments be given serious consideration and that if any of the recommendations will not be applied that BOEM and DLCD contact us to discuss and determine if an alternative recommendation could be developed to accomplish our objectives of representing resources and uses with the best available data, responsible siting of areas for potential future OSW development, and minimizing potential impacts. Thank you for the opportunity to comment, and please contact me with questions or follow up discussion at David.s.fox@odfw.oregon.gov or 541.857.2533.

Sincerely,

David Fox
Resource Assessment and Management Section Leader
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