**Addendum: Detailed information about Washington’s ocean resources and uses**

To help the Bureau of Ocean Energy Management (BOEM) and Interior Secretary Ryan Zinke with the next steps in the developing the five-year DPP, we have provided specific examples of issues of concern for Washington’s coast. These are organized by the Eight OCS Lands Act Section 18(a)(2) Factors for Secretarial Consideration. These highlighted examples are not intended to be a substitute for a complete analysis or a detailed review of the sources. However, we are certain when this information is considered and further evaluated, there will be no rational reason to include Washington’s OCS in the 2019-2024 Oil and Gas Leasing Program.

**Factor: Geographical, Geological, and Ecological Characteristics**

**Recommendation:** BOEM’s review and analysis are insufficient and must include a more comprehensive, accurate characterization of and consideration for the geographical, geological, and ecological characteristics of Washington’s coast ([Ecology 2017](http://www.msp.wa.gov/wp-content/uploads/2017/draft_MSP_and_appendices.pdf)). We have provided examples of important Washington coastal conditions and resources below.

**Physical oceanography**

Washington’s coast has specific oceanographic features that help create and sustain a highly productive marine ecosystem including longshore currents, the Columbia River Plume, Juan de Fuca Eddy, and coastal upwelling ([Skewgar and Pearson 2011](https://wdfw.wa.gov/publications/01198/wdfw01198.pdf); [Ecology 2017](http://www.msp.wa.gov/wp-content/uploads/2017/draft_MSP_and_appendices.pdf)). These currents and oceanographic features also influence how oil spills effect sensitive offshore and nearshore marine resources and coastal estuaries (Skewgar and Pearson 2011). On one hand, these oceanographic features can help spread spilled oil across a larger geographic area while in other cases, they can help concentrate oil in highly productive or environmentally-sensitive areas.

**Ecological features**

Washington’s coast is home to a number of important and sensitive marine and coastal habitats, has high productivity, and supports abundant, diverse marine species. As documented in Washington’s Draft Marine Spatial Plan ([Ecology 2017](http://www.msp.wa.gov/wp-content/uploads/2017/draft_MSP_and_appendices.pdf)):

* Washington’s coast is located along the Pacific Flyway – a major migratory route for millions of birds – shorebirds, seabirds, and waterfowl.
* Washington’s coast has two of the West Coast’s largest estuaries – Grays Harbor and Willapa Bay. These bays provide vital habitat for breeding and rearing a host of different fish and wildlife species. They contain an array of habitats including wetlands, eelgrass beds, mudflats, and oyster reefs. These estuaries are so important for migratory birds that Grays Harbor contains the Grays Harbor National Wildlife Refuge while Willapa Bay is home to the Willapa National Wildlife Refuge.
* The southern portion of Washington’s coast has sandy beaches and dunal systems. These habitats provide critical nesting habitat for the federally-designated threatened snowy plover, which is also on the state’s endangered species list.
* The northern portion of Washington’s coast contains rocky intertidal and mixed gravel beaches as well as many offshore islands. The rocky offshore islands and sea stacks host some of the largest seabird colonies in the nation and provide areas for marine mammals to haul-out and include three more designated national wildlife refuges.
* Massive floating kelp forests support robust populations of sea otters, fish, shellfish, and other invertebrates along Washington’s north coast.
* Cold water, deep-sea corals and sponges are present throughout Washington’s nearshore and offshore waters and help provide a healthy, deep sea ecosystem.
* Areas of Washington’s coast that are ecologically important for many different species of fish and wildlife occur in the estuaries, the nearshore, and the offshore - along the continental shelf break and in submarine canyons.
* Washington’s coast is home to many bird and wildlife species that have special federal or state protection status including:
  + 11 species of marine mammals including sea otters, Stellar sea lions, harbor and northern fur seals, gray, orca and humpback whales, harbor and Dall’s porpoises and Pacific white-sided dolphins.
  + 16 species of birds including the short-tailed albatross, marbled murrelet and snowy plover.
  + Four species of anadromous fish including the green sturgeon and Pacific eulachlon.
  + Three species of sea turtles.
* The entire area is designated Essential Fish Habitat for salmon. In the Pacific Northwest, many Pacific salmon species and stocks are already listed as threatened under the Endangered Species Act.

**Geological considerations**

Washington’s coast includes the Cascadia subduction zone where the North American tectonic plate is colliding with a number of smaller plates. The subduction zone extends about 700 miles, from British Columbia down to northern California. Lying mostly offshore, the fault line has produced some of the largest, most damaging earthquakes in the world including temblors with a magnitude of 9.0 or greater. This Cascadia subduction zone will certainly experience another damaging earthquake.

Scientists have discovered evidence of at least 13 Cascadia subduction zone quakes with magnitudes of 8.0 or greater. These earthquakes have occurred up and down the coastline, on land and the seafloor. Many scientists and emergency planners estimate there is a 10 to 15 percent chance of having a great earthquake with a magnitude of 9.0 or greater in the next 50 years. Any massive Cascadia temblor would be followed by a tsunami. Washington’s coast is also at risk to tsunamis triggered by distant earthquakes. The Washington State Department of Natural Resources has [more details about the Cascadia subduction zone](https://www.dnr.wa.gov/publications/ger_ic116_csz_scenario_update.pdf) and a magnitude 9.0 earthquake scenario. Our partner state agency also has more general information on [earthquakes and faults affecting Washington](https://www.dnr.wa.gov/programs-and-services/geology/geologic-hazards/earthquakes-and-faults).

**Recommendation:** BOEM should evaluate and consider the potential significant impacts a large earthquake and tsunami would have on offshore oil and gas activities off Washington’s coast. In turn, BOEM should evaluate the potential that oil and gas extraction activities might have on triggering additional earthquakes in the region.

**Washington’s coast lacks significant oil and gas reserves**

BOEM’s DPP notes that compared to other regions, the Washington/Oregon planning area has some of the lowest potential for oil and gas production. The Washington/Oregon area makes up less than 1 percent of the total Unleased Economically Recoverable Resources (UERR) in the nation (see Chapter 5, including section 5.2.5). As discussed in section 4.2.1, pages 4-6 in the DPP, in the early 1960s, companies drilled four offshore exploratory oil and gas wells off Washington’s coast. All were abandoned as dry holes ([DNR 1989](http://www.dnr.wa.gov/Publications/ger_reprint13_oil_gas_wa_cont_shelf.pdf)).

**Recommendation:** In revising the DPP, BOEM should consider the limited degree to which the Washington/Oregon planning area will contribute to national oil and gas production.

**Severe weather and storms**

The Pacific Northwest is known for its severe waves, especially during winter storms. Our strongest winter storms can generate hurricane-speed winds. These weather events also create significant deep-water waves that can reach 10 to 15 meters (33 to 49 feet) high. Our winter months (November through February) are characterized by high, long-period waves with a west southwest approach. During our calmer summer conditions, our waves typically reach 1 meter (3 feet) and come from the west northwest (Ruggiero et al., 2013).

However, scientists have observed increases in wave height and storm intensity in the Pacific Northwest during the latter half of the 20th century (Ruggiero et al., 2013). The frequency of strong storms has increased while the frequency of weak to medium-strength storms has decreased (Ruggiero et al., 2013).

**Recommendation:** BOEM’s revised DPP and Draft Environmental Impact Statement (EIS) must consider and evaluate the unique conditions present on Washington’s coast, including weather and severe storms.

**Location with respect to other uses of the sea and seabed**

BOEM’s DPP lacks specific information about the many existing ocean and coastal uses off Washington. There are a number of widespread and dense uses already occurring in the Washington planning area including recreational, tribal and commercial fishing, shellfish aquaculture, recreation, shipping, and military training ([Ecology 2017](http://www.msp.wa.gov/wp-content/uploads/2017/draft_MSP_and_appendices.pdf)). The state’s coastal communities are largely rural and depend heavily on these activities for their economic and social well-being.

**Recommendation:** BOEM’s review and analysis of socio-economic impacts should consider the potential impacts to existing jobs and employment such as potential displacement impacts to fisheries and recreational activities, socio-cultural systems including sense of well-being, and the environmental justice implications of the five-year DPP on Washington’s rural, coastal communities.

**Commercial and recreational fishing**

Due to high reliance on and engagement in commercial fishing, NOAA has classified many of the communities all along Washington’s coast as highly dependent on commercial fishing, including Ilwaco, Westport, Taholah\*, Tokeland\*, Neah Bay\*, Bay Center, South Bend, and La Push\* ([Ecology 2017](http://www.msp.wa.gov/wp-content/uploads/2017/draft_MSP_and_appendices.pdf); asterisks denote tribal communities which intersect with both tribal and non-tribal fishing activities on Washington’s coast). Commercial (non-tribal) fishing and primary seafood processing support 2,830 jobs on Washington’s coast and contribute $117 million in labor income to the state’s economy. As a result, these communities are more vulnerable to potential impacts from oil and gas leasing and development ([Ecology 2017](http://www.msp.wa.gov/wp-content/uploads/2017/draft_MSP_and_appendices.pdf)).

Washington’s [draft Marine Spatial Plan](http://www.msp.wa.gov/wp-content/uploads/2017/draft_MSP_and_appendices.pdf) includes data on the economic value, participation rates, and use patterns off Washington’s coast. These maps demonstrate heavy use by multiple commercial and recreational fisheries throughout the area that would be displaced by oil and gas leasing and adversely affected by the exploration, construction, and operational activities as well as oil spills resulting from those leases.

BOEM’s revised Offshore Environmental Cost Model (OECM) grossly underestimates the potential environmental and social externalities associated with oil and gas development on Washington’s coast. For example, this study claims that:

*“There are other important fisheries on the Pacific Coast including the Dungeness crab, salmon, and shrimp trawl fisheries. Both Dungeness crab and salmon fisheries take place primarily inside State* *waters, are unlikely to be displaced by oil and gas platforms, and therefore have not been included in the CFI model”. (OCS Study BOEM 2015-052, page 70)*

Recent studies and mapping efforts conducted by Washington demonstrate that all these fisheries also operate extensively in federal waters and would likely be displaced by oil and gas platforms ([Ecology 2017](http://www.msp.wa.gov/wp-content/uploads/2017/draft_MSP_and_appendices.pdf)). By excluding economically and socially valuable fisheries such as Dungeness crab and salmon from the Commercial Fisheries Impact model, BOEM failed to adequately assess or consider the potential displacement of and adverse effects on Washington’s fisheries.

Recreational fishing is also an economically and socially important use on Washington’s coast. For the 10-year period from 2003 through 2014, there were an average of 47,000 recreational charter vessel fishing trips annually and another 98,000 fishing trips on private vessels. In 2014, trip-related expenditures for coastal recreational fishing generated more than $30 million and supported 325 jobs in our coastal counties, contributing $17 million in labor income. Furthermore, BOEM’s OECM uses outdated value information to estimate impacts to recreational fishing at $42 per trip. Saltwater anglers in Washington spend nearly double that -- an average of about $70 per day – as indicated by recent data from the U.S. Fish & Wildlife Service ([Taylor et al 2015](http://msp.wa.gov/wp-content/uploads/2014/02/WMSP_2015_small.pdf)).

**Recommendation:** BOEM’s characterization and analysis of socio-economic impacts to Washington’s coast must include comprehensive and accurate data on commercial and recreational fisheries as well as consideration of the disproportionate impacts to highly fishing-dependent communities on Washington’s coast.

**Recommendation (continued):**

BOEM should use several available data sources to develop a more detailed review of the DPP, revising the estimates of social and environmental costs and the OECM, and in developing the draft EIS as it pertains to Washington’s coast. For example:

* Many communities have high fishing dependence and reap large economic benefits to coastal communities from commercial and recreational fishing ([Ecology 2017](http://www.msp.wa.gov/wp-content/uploads/2017/draft_MSP_and_appendices.pdf), [Taylor et al 2015](http://msp.wa.gov/wp-content/uploads/2014/02/WMSP_2015_small.pdf)).
* Commercial salmon trolling data indicates the areas most heavily used off Washington’s coast occur between 20 and 60 fathom depths – an area that extends 20 nautical miles offshore ([Ecology 2017](http://www.msp.wa.gov/wp-content/uploads/2017/draft_MSP_and_appendices.pdf)).
* Log book data about Washington’s Dungeness crab fishery shows a high concentration in the southern portion of Washington’s coast and into federal waters offshore to a water depth of 100 fathoms ([Ecology 2017](http://www.msp.wa.gov/wp-content/uploads/2017/draft_MSP_and_appendices.pdf)). The Dungeness crab fishery is this biggest revenue earner of all the commercial fisheries on Washington’s coast – with an ex-vessel value ranging from $12.5 million to $43.5 million between 2004 and 2014 and typically constituting one-third to one-half of the total value of commercial fisheries landed on Washington’s coast ([Ecology 2017](http://www.msp.wa.gov/wp-content/uploads/2017/draft_MSP_and_appendices.pdf)).
* Saltwater anglers average about 145,000 trips a year to Washington’s coast and spend an average of $28 more per trip than the trip spending rates used in BOEM’s OECM ([Taylor et al 2015](http://msp.wa.gov/wp-content/uploads/2014/02/WMSP_2015_small.pdf)).

**Tribal fishing**

Four coastal treaty tribes are located along Washington’s coast. They all maintain rights to harvest resources in large areas of the Pacific Ocean. The DPP lacks accurate information about these tribal governments, U.S. treaties with these tribes, treaty resources, and harvest activities. While the social valuation models include subsistence harvest impacts for indigenous communities in Alaska, the models do not incorporate the impacts to the significant tribal harvests in Washington by the tribes that maintain treaties with the United States.

**Recommendation:** BOEM must review and include more detailed information about Washington’s coastal Indian tribes, especially tribal governments with U.S. treaty rights. This activity should not be combined with descriptions of cultural or subsistence practices by non-indigenous communities since our treaty tribes have a different legal and management status in regards to marine resources.

**Recreation and tourism**

The entire length of Washington’s coast is a popular place for both state residents and out-of-state visitors to recreate and visit. While the DPP notes the location of national parks and refuges, many state parks are also located along Washington’s coast. State parks are especially concentrated in the southern portion of Washington’s coast and the sandy beaches along the entire south coast are designated as the Seashore Conservation Area – managed by the Washington State Parks and Recreation Commission for recreational use and enjoyment ([Ecology 2017](http://www.msp.wa.gov/wp-content/uploads/2017/draft_MSP_and_appendices.pdf)). In 2013, more than nine million people visited these coastal areas managed by our state parks department ([Ecology 2017](http://www.msp.wa.gov/wp-content/uploads/2017/draft_MSP_and_appendices.pdf)). On the north coast, approximately 750,000 people a year visit the coastal areas of the Olympic National Park ([Ecology 2017](http://www.msp.wa.gov/wp-content/uploads/2017/draft_MSP_and_appendices.pdf)).

State residents took an estimated 4.1 million trips to Washington’s coast in 2014 (Pt 97 and Surfrider 2015). A recreational survey found that Washington residents spent an average of $117.14 per person per coastal trip in 2014-2015, generating an estimated $481 million to the state economy (Pt 97 and Surfrider Foundation, 2015). Data on recreational activities showed people participated in a range of activities including watching wildlife, beach-going, surfing and kayaking, and scuba diving. An estimated 9,309 jobs statewide and $413 million in labor income are supported directly and indirectly by recreation and tourism on Washington’s coast ([Taylor et al 2015](http://msp.wa.gov/wp-content/uploads/2014/02/WMSP_2015_small.pdf)).

In addition, activities such as recreational harvesting, cleaning, cooking, eating, and canning wild razor clams has been an important tradition on Washington’s coast for generations. Between 275,000 and 460,000 seasonal clam digging trips resulted in harvesting up to 6.1 million clams. The razor clam fishery generates between $25 and $40 million in tourist-related income to the economies of our small coastal communities every clamming season ([Ecology 2017](http://www.msp.wa.gov/wp-content/uploads/2017/draft_MSP_and_appendices.pdf)). Razor clams are allowed to be harvested at designated beaches along much of the southern half of the Washington coast, usually from October through April.

**Recommendation:** BOEM’s review and analysis of value and impacts to recreation and tourism should include up-to-date information on visitation and spending for Washington’s coast. This evaluation should include the economic impacts of tourism and recreational activities such as razor clam harvests, wildlife watching, beach-going, water sports, visits to state and federally managed areas including state and national parks and wildlife refuges, and impacts to the quality of the resources (e.g., aesthetics, clean water and beaches, abundant wildlife) and recreational experiences.

**Shellfish aquaculture**

Washington is the nation’s largest producer of farmed shellfish, including oysters and clams, and much of this comes from the coastal estuaries of Willapa Bay and Grays Harbor. Shellfish aquaculture on Washington’s coast provides an estimated 572 direct jobs, supports 847 total jobs, and generates $50 million in total labor income ([Ecology 2017](http://www.msp.wa.gov/wp-content/uploads/2017/draft_MSP_and_appendices.pdf)).

**Recommendation:** BOEM must consider and assess the potential impacts to the shellfish aquaculture industry in Washington from potential oil and gas activities, particularly impacts to water quality, which are especially damaging to shellfish production and harvest.

**Shipping and military uses**

Washington’s coast is also a busy area for shipping and trade as well as military operations. The area is home to some of the busiest maritime shipping lanes in the world, with vessels making transits between ports on the U.S. West Coast and Asia. Marine cargo activities at the Port of Grays Harbor support 1,524 total jobs (including 574 direct jobs) and generate more than $130 million in total income. Washington’s coast provides a major gateway for shipping and trade through the Strait of Juan de Fuca to ports in Puget Sound and British Columbia as well as over the Columbia River bar to upriver ports in Washington and Oregon.

There are more than 46,000 active duty military personnel in Washington, including 10,000 active duty Navy personnel (2016). Due to the large military installations in nearby Puget Sound, the U.S. Navy conducts active training and testing throughout the federal waters off Washington’s coast. Unlike other U.S. regions, the DPP lacks a list of these active military bases and installations in Washington.

**Recommendation:** BOEM must consider and assess the potential impacts from potential oil and gas activities on shipping and military uses in Washington. This includes economic impacts to maritime shipping if an oil spill were to occur and affect ship traffic and lanes at high-volume entrance areas such as the Strait of Juan de Fuca, Columbia River and Grays Harbor.

**Other uses**

Washington’s marine spatial plan discusses many other potential ocean uses but it is unclear how likely or when these other uses might be pursued by applicants ([Ecology 2017](http://www.msp.wa.gov/wp-content/uploads/2017/draft_MSP_and_appendices.pdf)). Relevant to BOEM’s other authorities, the state marine spatial plan includes information on renewable marine energy and descriptions about sediment management, beneficial use of dredged material, and possible future sand and gravel mining to assist with beach restoration.

**Factor: Environmental Sensitivity and Marine Productivity**

**Environmental sensitivity**

BOEM’s sensitivity analysis contains several limitations in its methods, resulting in an inaccurate characterization of the high sensitivity of Washington’s coastal resources to offshore oil and gas development. The parameter selection process intentionally limits the number of threatened and endangered species included in the model to a “representative sample.” Thus, the results are highly affected by which parameters are selected to be included in the model.

Using a fixed “representative” listed species means BOEM’s new sensitivity model undervalues the sensitivity and need for conservation in regions with greater numbers of ESA-listed species. In BOEM’s comparison of the results and methods, they reason that due to this change the “Pacific OCS Planning areas were scored high by the original BOEM method, but only scored moderate by the new RESA method” (OCS Study BOEM 2014-616, pg. 56).

In addition, the new methods excluded species that are critical to understanding the sensitivity and vulnerability of Washington’s coast. For example, sea otters were not selected as part of the “representative” marine mammals for the model in the Washington area. Our coast has a large population of reintroduced sea otters residing in the area year-round that play an important role in kelp forest habitats and are listed on the state’s endangered species list.

Yet, BOEM’s DPP acknowledges: “The relatively small differences among the environmental sensitivity scores suggest that differentiation among the BOEM ecoregions based on the total score alone would be difficult.” And that: “OCS regions should be individually considered with a full understanding of the species present, their distributions, and habitat needs, and therefore, the individual sensitivity to potential oil and gas activities.” (DPP 7-51)

**Recommendation:** In light of the issues with BOEM’s current sensitivity models and scores, BOEM’s draft programmatic EIS and review of the DPP should include an individual consideration of the environmental sensitivity and vulnerability of Washington’s coast. This analysis should consider the species present and their distribution and habitat needs, particularly sensitive species and habitats on Washington’s coast – including all endangered and threatened species and their sensitivity to potential oil and gas activities such as seismic exploration, construction (drilling), operation, and oil spills.

For example, seabirds and shorebirds with oiled feathers and marine mammals such as sea otters (*Enhydra lutris*) and river otters (*Lontra canadensis*) with oiled pelage may die from toxic effects of ingested oil ingested when preening, or from hypothermia from loss of waterproofing and thermal insulation ([Skewgar and Pearson 2011](https://wdfw.wa.gov/publications/01198/wdfw01198.pdf)). The *Tenyo Maru* oil spill on Washington’s coast in 1991 killed thousands of common murres (*Uria aalge*) and 7‐11 percent of all federally-threatened marbled murrelets (*Brachyramphus marmoratus*) on Washington’s coast. The 400,000-gallon spill is suspected to have damaged the giant kelp beds in the area of Tatoosh Island ([Skewgar and Pearson 2011](https://wdfw.wa.gov/publications/01198/wdfw01198.pdf)).

Several data sources are available which BOEM should use to develop a more detailed analysis for Washington’s coast. In particular:

* Washington performed an Ecologically Important Areas (EIA) analysis as part of its marine spatial planning process ([Ecology 2017](http://www.msp.wa.gov/wp-content/uploads/2017/draft_MSP_and_appendices.pdf) – see Chapter 3). This broad-scale analysis assessed aggregate areas of high importance to fish and wildlife and habitats. The EIA analysis shows ecologically-important areas occur throughout Washington’s coast – particularly along the nearshore, shelf break, submarine canyons, and in large estuaries.
* Washington’s [draft marine spatial plan](http://www.msp.wa.gov/wp-content/uploads/2017/draft_MSP_and_appendices.pdf) designates Important, Sensitive, and Unique Areas (ISUs) to protect particularly sensitive habitat resources from adverse effects of offshore development and provides maps of the best available data on the locations of these resources ([Ecology 2017](http://www.msp.wa.gov/wp-content/uploads/2017/draft_MSP_and_appendices.pdf)). Proposed ISUs include rocky reefs (including offshore islands), biogenetic habitats (e.g. coral, kelp, and deep water corals), and historic and archaeological resources ([Ecology 2017](http://www.msp.wa.gov/wp-content/uploads/2017/draft_MSP_and_appendices.pdf) – see maps 59-74).
* Information on impacts to resources from previous catastrophic oils spills on Washington’s coast ([Skewgar and Pearson 2011](https://wdfw.wa.gov/publications/01198/wdfw01198.pdf)). In addition, see the oil spill cost studies provided at the end of this addendum.

**Ecosystem change vulnerability scoring**

BOEM’s attempt to assess ecosystem change vulnerability through the ecosystem change index does not appear to adequately account for the vulnerability of Washington to changing ocean conditions such as temperature and ocean acidification. The same report detailing BOEM’s new method for analyzing environmental sensitivity claimed “little observed effects of ocean acidification on ecological resources and, therefore, environmental sensitivity.” (OCS Study BOEM 2014-616 - page 72). It further ranked the Washington/Oregon planning region as low in terms of climate change effects, despite a mounting volume of scientific evidence to the contrary.

Climate change, especially increased ocean temperatures and acidification, are already affecting West Coast ocean resources. Washington has observed failures in shellfish hatchery production linked to corrosive conditions in seawater. Scientists studying ocean acidification have already observed impacts and note the West Coast is among the most vulnerable regions in the nation. As a result, Washington has initiated several actions to address ocean acidification including establishing a research center, forming a gubernatorial advisory council to provide recommendations, developing regional partnerships to better monitor ocean acidification, and launching the International Ocean Acidification Alliance to address impacts.

**Recommendation:** BOEM’s revised DPP and draft EIS must reflect and recognize scientific information regarding the high vulnerability Washington and entire West Coast has to changing ocean conditions, including ocean acidification and ocean temperatures. Additional scientific information and documents on the impacts of ocean acidification to Washington and the West Coast are available at [www.oainwa.org](http://www.oainwa.org) and <http://westcoastoah.org/executivesummary/>.

**Marine productivity**

The DPP notes that Pacific Region has the highest marine productivity of all four BOEM regions. Average net primary productivity for Washington/Oregon planning area is ranked sixth highest of all 22 planning regions (see page 7-55). This supports the general scientific understanding that, due to strong upwelling and other oceanographic factors, the Pacific Coast is highly productive and supports abundant marine species at higher tropic levels throughout this marine ecosystem ([Ecology 2017](http://www.msp.wa.gov/wp-content/uploads/2017/draft_MSP_and_appendices.pdf)).

**Recommendation:** The Secretary of the Department of Interior should reassess the Eight OCS Lands Act Section 18(a)(2) Factors for Secretarial Consideration as they apply to Washington’s coast. As noted earlier, BOEM’s revised DPP and Draft EIS should remove Washington’s coast from the leasing program.

**Factor: Environmental and Predictive Information**

By including Washington’s outer continental shelf in the DPP, the DPP presents a variety of potential and severe adverse effects on Washington’s coastal resources and uses. The DPP does not fully consider existing stressors present on Washington’s coast such as ocean acidification, increasing water temperatures, and harmful algal blooms.

**Recommendation:**

BOEM’s Draft EIS must fully and completely evaluate potential direct, indirect and induced impacts of offshore oil and gas leasing, the severity and likelihood of impacts, and identify any significant adverse impacts to Washington’s coastal resources and uses. The draft EIS needs to evaluate the impacts from all stages of oil and gas exploration, construction, production, and development on the outer continental shelf.

Options for reducing these impacts in the revised DPP should include avoidance by removing Washington’s offshore waters from the five-year leasing program. Any analysis of mitigation options should identify remaining potential adverse impacts that cannot be mitigated.

**Recommendation (continued):**

Issues of particular concern for any type development are identified in Washington’s draft marine spatial plan and covers a broad range of social, economic, and environmental concerns ([Ecology 2017](http://www.msp.wa.gov/wp-content/uploads/2017/draft_MSP_and_appendices.pdf) – see Chapter 4). As noted earlier, this analysis needs to consider unique conditions and the sensitive environmental resources and high density of uses in the Washington’s coastal region. It should also assess how specific conditions on Washington’s coast relate to risk such as weather, geologic, and oceanographic conditions.

Washington also has specific resources that will assist BOEM in evaluating potential impacts and risks in the Washington/Oregon planning area. This includes an [updated vessel traffic safety assessment for Puget Sound,](http://www2.seas.gwu.edu/~dorpjr/VTRA_2015/VTRA_2015_Reports.html) including evaluating spill risks from vessels.

**Accidental small and large oil spills**

The Draft Proposed Program (DPP) lacks spill rate data and assumptions for accidental small and large spills.

**Recommendation:** The DPP and Draft EIS should include data and assumptions for assumed spill rates for accidental small and large spills for operations involving platforms, pipelines, service vessels, barges, and tankers.

The provided reference material does not address potential spills involving more than 1,000 barrels (42,000 gallons) from oil tankers and fuel barges. The DPP states that: “Accidental, small, and large spills could result from outer continental shelf exploration, development, or production operations involving drilling rigs, production facilities, barge, tankers, pipelines, and/or support vessels. BOEM estimates the source and number of accidental spills (small and large) based on the estimated volume of oil production for each planning area along with the assumed mode of transportation (Anderson et al. 2012, ABS 2016).”

No information is provided about how BOEM will estimate spill sizes and rates for small oil spills involving less than 1,000 barrels (42,000 gallons) from oil tankers and fuel barges. Neither reference cited (Anderson et al. 2012 or ABS 2016) includes data or spill rates for tankers and barges for spills greater than 1,000 barrels. Anderson et al. 2012 states that “The focus of this report is on large spills that are ≥1,000 barrels, because spills smaller than that may not persist long enough to be simulated by trajectory modeling.” This claim appears to be subjective, and is counter to the statement in the DPP that BOEM will estimate the source and number of potential oil spills, regardless of size.

Research sponsored by the Washington Department of Ecology indicates that for vessel traffic within the study area (portions of the Washington’s coast, the Strait of Juan de Fuca, and the approaches to and passages through the San Juan Islands, Puget Sound, and Haro-Strait/Boundary Pass), the probability of at least one accident in one year with a spill size covering between 1 cubic meter and 1,000 cubic meters of water is 7.5 percent (1,000 cubic meters of crude oil is approximately 8,522 barrels or 358,000 gallons of spilled oil) for the 2015 base case, with an average spill size of 46.9 cubic meters (approximately 400 barrels or 16,800 gallons). Over a 10 year period, the probability of at least one accident resulting in a spill between covering between 1 and 1,000 cubic meters of water is 54.2 percent ([Van Dorp, 2017](https://fortress.wa.gov/ecy/publications/SummaryPages/1708009.html)). This suggests the likelihood of an oil spill from an oil tanker or fuel barge spill involving 1,000 barrels or less (42,000 gallons) is great enough to be of concern to regional Indian tribes and stakeholders.

**Recommendation:** The DPP and Draft EIS should include information about how small (less than 1,000 barrels) oil spill rates from tankers and barges were determined and considered in analysis.

Reference material does not include causal analysis for tanker and barge spills, as it does for platform and pipeline spills. The DPP cites two papers for estimating the source and number of accidental spills, Anderson et al. 2012 and ABS 2016. Anderson et al. 2012 does not include causal analysis for spills. ABS does provide causal analysis for platforms and pipelines, but specifically excludes causal analysis of tanker and barge spills.

**Recommendation:** The DPP and Draft EIS should include causal analysis for tanker and barge oil spills to better inform tribes, stakeholders, and decision-makers’ understanding of spill risks.

The DPP does not address how accidental spill risks will be determined at a regional or program area level, it states: “Historical OCS spill data provide the most relevant basis for use in analyzing the likelihood of future oil spills on a programmatic level. BOEM’s analyses, which currently rely on an aggregated characterization of historical data (where available), provides a conservative outcome when compared to other methods such as quantitative risk assessment.” BOEM fails to address how it will analyze the likelihood of future oil spills specific to a region or planning area. In particular, it is not clear how spill risks will be determined for the proposed Washington/Oregon program area, since there is no historic outer continental shelf development in the area.

**Recommendation:** DPP and Draft EIS should identify how spill risks will be determined for each region and program area, particularly for those with no previous outer continental shelf and gas activities.

**Catastrophic oil spill incidents**

The DPP aggregates outer continental shelf historical data and provides a single table for spill sizes, return periods, and frequencies of Catastrophic Discharge Events, which does not address differences in regions or proposed program areas. The DPP states, “A quantitative approach has been developed to demonstrate the relative unlikelihood of these low to very low probability spill incidents, wherein spill size is one of many factors that could determine the severity of effects (BOEM 2012). First, BOEM defined a reasonable range of potentially catastrophic outer continental shelf spill sizes by applying extreme value statistics to historical outer continental shelf spill data (Ji et al. 2014). Then, extreme value statistical methods and complementary risk assessment methods (Bercha Group 2014) were used to characterize the potential frequency of different size spills.”

In describing extreme value theory (EVT), Ji et al. notes that “EVT is based on the assumption that outer continental shelf spill data used are independently and identically distributed (abbreviated i.i.d.) which requires that no systematical change of oil spill patterns occurs within the observation period. Therefore, to have an accurate and relevant risk analysis, it is essential that i.i.d. oil spill data are used.”

Further, Ji et al. states, “Factors influencing oil spill may include (1) technology used in oil exploration, production, and transportation, (2) regulations, (3) climatological conditions, (4) response and mitigation measures, and (5) accuracy of oil accidents reported (including bias introduced by underreporting). These factors vary greatly from country to country and from region to region. For instance, among the 347 outer continental shelf oil spills with volume over 50 barrels in the past 49 years, 32 percent happened in the two months of August and September. This is primarily due to hurricanes, a climatological phenomenon unique in the GOM.”

The requirement that EVT use independently and identically distributed data; the regional differences in climatological conditions and response and mitigation measures between, for example the Gulf of Mexico and the Washington/Oregon coast; and the lack of historic data for the Washington/Oregon proposed program area suggest that combining outer continental shelf historical data to determine catastrophic discharge event return period and frequency is not justified at a regional and proposed program area level.

Hurricane-force winds are not unique to the Gulf of Mexico. Winter storms that travel unabated across the Pacific frequently bring extreme high winds and seas to the Washington and Oregon coast. Additionally, the Washington/Oregon proposed program area is at risk for seismic events which include the threat of a 9.0+ magnitude Cascadia subduction zone earthquake and subsequent tsunamis. These events could occur at any time, with little to no warning or time to prepare.

The Bercha Group 2014 report provides some evidence of regional differences in risk statistics. The reported regional loss of well control (LOWC) frequency data from 1980-2000 shows that total LOWC drilling incidents were three times as likely in the Norway region as they were in the Gulf of Mexico, and about 15 percent more likely in the North Sea region as in the Gulf of Mexico. LOWC drilling incidents were about twice as likely in the Gulf of Mexico as in the UK region. Since 98 percent of the LOWC events cited in the DPP are in the Gulf of Mexico region, it is relevant to consider the differences that may occur in the other outer continental shelf regions.

The DPP cites the 2017-2022 outer continental shelf Oil and Gas Leasing Program Final Programmatic EIS (BOEM 2016) regarding extreme value results for 90 and 95 percent “annual maximum” spills, however this analysis did not include all outer continental shelf regions, and specifically did not include the proposed Washington/Oregon program area.

**Recommendation:** Catastrophic discharge event data should not be aggregated for the entire outer continental shelf. Where sufficient historical data does not exist, the DPP and Draft EIS should develop quantitative analysis to provide estimates of worst case spill sizes, and likelihoods for each proposed program area. Analysis should consider all hazards within proposed program areas, including extreme weather and seismic events.

**Factor: Low Interest of Potential Oil and Gas Producers in Washington**

Washington’s coast has very low or no interest from potential oil and gas producers. BOEM’s DPP summarized the ten industry responses to the initial phase. Of these responses, only four mentioned Pacific Region generally, without a specific reference to a particular planning area. None of the industry responses specifically mentioned Washington’s coast. Therefore, removing the Washington/Oregon planning area would not significantly impact the oil and gas industry, since they have not indicated specific interest in this region.

**Recommendation:** The Secretary of the Department of Interior should reassess the Eight OCS Lands Act Section 18(a)(2) Factors for Secretarial Consideration as they apply to Washington’s coast. As noted earlier, BOEM’s revised DPP and Draft EIS should remove Washington’s coast from the leasing program.

**Factor: Laws, Goals and Policies of Affected States**

BOEM’s DPP noted the opposition by Washington Governor Jay Inslee and other West Coast governors and summarized the comments about conflicts with various state laws, goals and policies from comment letters. However, BOEM has not satisfactorily explained why including Washington’s outer coast in the five-year DPP is still justified when this activity lacks support from Washington and contradicts many of Washington state’s laws, goals and policies for energy, greenhouse gas emissions, and management of ocean and coastal resources (e.g. Revised Code of Washington 70.235 and 43.143).

**Recommendation:** The Secretary of the Department of Interior should reassess the eight OCS Lands Act Section 18(a)(2) Factors for Secretarial Consideration as they apply to Washington’s coast. Since the proposed activity contradicts Washington State’s laws, goals, and policies, BOEM should remove Washington’s coast from the leasing program.

**Factor: Equitable Sharing of Developmental Benefits and Environmental Risks**

The potential benefits described by BOEM of providing jobs, taxes, and revenue sharing by including Washington in the leasing program are far outweighed by the environmental and socio-economic risks to our coastal zone, including adverse impacts to existing jobs like fishing, shellfish aquaculture, and recreation. Despite the previously discussed issues with BOEM’s models undervaluing the economic and social impacts to Washington, the DPP indicates the Oregon/Washington area generates very little net economic value and is ranked near the bottom – fifteenth out of 16 planning areas (Figure 5-13).

**Recommendation:** BOEM should reevaluate the benefits and risks of oil and gas development in the Washington/Oregon planning region. Risks and issues of concern specific to Washington’s coast need further consideration in BOEM’s revised DPP and Draft EIS, including the information described earlier. In addition, issues of concern that require further detailed consideration for potential oil and gas development on Washington’s coast include construction

**Recommendation (continued):**

and infrastructure impacts, vulnerability of and disproportionate burden to rural coastal communities, oil spill risks, impacts of increased greenhouse gas emissions to the state and region, proximity of energy, and elimination of leases in Washington’s OCS.

**Construction and infrastructure impacts to rural communities**

Given the generally rural nature of Washington’s coast and lack of existing oil and gas industry, establishing oil and gas activity would require significant onshore and offshore infrastructure investments and development that would impose new, significant costs to the natural and human environments.

The DPP suggests that: “The level of impacts depends also on the level of activities proposed for any given planning area under the National OCS Program.” However, this does not adequately account for imposing impacts in regions, such as on Washington’s coast, that have no existing oil and gas development, nor the infrastructure to facilitate it. In these cases, any level of oil and gas development would result in disproportionately large negative impacts. The incremental costs would be much less in areas of the nation that already have existing infrastructure for oil and gas development.

**Unsustainable and disproportionate burden to vulnerable coastal communities**

The DPP states that: “Impacts could be more evident where there is a higher coastal population density.” While human population affected may be larger in more populous regions, this statement negates the importance of considering how the impacts affect particularly vulnerable or dependent coastal communities. Sensitivity and vulnerability matter a great deal, particularly for Washington’s coastal communities and resources.

The Washington/Oregon planning region has low potential to contribute significantly to oil and gas in the nation. This means any benefits in terms of jobs to the local or regional economy would be short-lived and would not contribute to the long-term socio-economic health of communities, nor would new oil and gas jobs offset the significant risks and impacts to the environment, existing jobs, and culture of these communities.

**Oil spills**

An oil spill would have significant impacts to the environment and to coastal uses. Massive oil spills like the *Deepwater Horizon* incident demonstrate a continuing and catastrophic risk posted by offshore oil and gas development. Furthermore, extremely rough oceanographic conditions present off Washington’s coast during much of the year would make the ability to respond to and contain a spill of any size very difficult.

**Increased regional greenhouse gas emissions**

Washington’s policies are aimed at reducing greenhouse gas emissions to combat effects of climate change. Washington adopted goals for reducing greenhouse gas emissions to 1990 levels by 2020, 25 percent below 1990 levels by 2035 and has been working to lower carbon pollution in a number of ways. The DPP estimates that exploration and development in the Washington/Oregon Area would release an extra 2.4 to 6.8 million tons of CO2 Equivalent (see Table B-2), which would be counter to Washington’s policies, goals, and laws.

While the DPP emphasizes the national and international nature of greenhouse gas emissions, regional marine ecosystems are also affected by increases in local and regional greenhouse gas emissions as carbon dioxide is absorbed by marine waters, which further exacerbates ocean acidification.

Washington’s shellfish industry has already been adversely impacted by ocean acidification and the West Coast is more vulnerable than other regions ([West Coast Ocean Acidification and Hypoxia Science Panel, 2016](http://westcoastoah.org/recommendations-and-actions/)). As a result, our state and region has been a leader in understanding and addressing impacts caused by ocean acidification. OCS development would pose additional regional environmental impacts to our marine environment by increasing regional greenhouse gas emissions through new offshore oil and gas activity in our planning area.

**Recommendation:** BOEM’s review and analysis should include impact to regional and local marine systems from increased regional greenhouse gas emissions. BOEM’s review of social and environmental values should address how well the DPP aligns with the greenhouse gas policies of the adjacent state, which are a reflection of the values of that state.

**Proximity of Energy**

Washington is already home to major refineries for petroleum products and associated transportation. The West Coast system of refineries (PADD 5) has an annual utilization rate of about 85 percent (U.S. Energy Information Administration). Availability of crude supply is not a limiting factor for the existing refining capacity on the West Coast. Therefore, having a local coastal supply of petroleum will not have capacity benefit to West Coast refineries.

**Elimination from the five-year Program**

Eliminating the Washington/Oregon planning area from lease consideration would best eliminate the environmental and socio-economic risks from outer continental shelf production and would allow Washington to continue maximizing the benefit of these resources for the state and coastal communities.

**Resources, literature, GIS/maps, or other data for BOEM to consider**

A number of existing documents provide specific, localized data and rich information on the marine ecosystem, species, and habitats off Washington’s coast and the existing human uses of these areas.

**Recommendation:** BOEM’s draft programmatic environmental impact statement and decisions regarding revising the 2019-2024 Oil and Gas Leasing Program (5-year Program) must provide more detailed consideration of the information and resources in this addendum. Specific sources include:

* Washington Departments of Ecology, Fish and Wildlife, and Natural Resources. October 2017. *Draft Marine Spatial Plan for Washington’s Pacific Coast*. Washington Department of Ecology. Publication 17-06-027. Olympia, WA. Draft plan available at: <http://www.msp.wa.gov/wp-content/uploads/2017/draft_MSP_and_appendices.pdf>.
* GIS data from Washington’s Marine Spatial Plan, including through an online mapping tool, available at: [www.msp.wa.gov](http://www.msp.wa.gov)
* Taylor, M., Baker, J., Waters, E., Wegge, T., and K. Wellman. June 2015. *An Economic Analysis to Support Marine Spatial Planning in Washington*. Prepared by Cascade Economics in association with TCW Economics and Northern Economics, Inc. Available at: <http://msp.wa.gov/wp-content/uploads/2014/02/WMSP_2015_small.pdf>
* Point 97, and Surfrider Foundation. 2015. *An economic and spatial baseline of coastal recreation in Washington.* Prepared for Washington Department of Natural Resources. Available at: <http://publicfiles.surfrider.org/P97SurfriderWACoastalRecreationReport.pdf>
* Skewgar, E. and S.F. Pearson (Eds.). 2011. *State of the Washington Coast: Ecology, Management, and Research Priorities*. Washington Department of Fish and Wildlife, Olympia, Washington. Available at: <https://wdfw.wa.gov/publications/01198/wdfw01198.pdf>
* Olympic Coast National Marine Sanctuary. (2011). *Olympic Coast National Marine Sanctuary final management plan and environmental assessment.* Office of National Marine Sanctuaries, National Oceanic and Atmospheric Administration. Document available at:

<https://olympiccoast.noaa.gov/management/managementplan/managementplanwelcome.html#downloadmanagmentplan>

* United States Department of the Navy. (2015). Northwest training and testing activities final Environmental Impact Statement/Overseas Environmental Impact Statement. Silverdale, WA: United States Department of the Navy, Naval Facilities Engineering Command, Northwest. Document available at: <http://nwtteis.com/default.aspx>

**Cost-Benefit Analyses for previous Ecology rulemakings.** These reports estimate expected costs and benefits of proposed rulemakings. They contain some spill cost information and references that could be helpful for BOEM.

* Final Cost Benefit Analysis for Oil Spill Contingency Planning rules (2006) – Publication number 06-08-020.
* Final Cost Benefit Analysis for Oil Spill Contingency Planning rules (2012) – Publication number 12-08-014.
* Final Cost Benefit Analysis for 173-186 WAC (Oil Spill Contingency Plan – Rail) (2016) – Publication number 16-08-023.
* Final Cost Benefit Analysis for 173-182 WAC (Oil Spill Contingency Plan – Pipeline rule update) (2016) – Publication number 16-08-027.

**Other reports related to oil spill modeling, risks and impacts in Washington**

* Department of Ecology Washington State 2014 Marine and Rail Oil Transportation Study (2016) – Publication number 15-08-010.
* Department of Ecology and Puget Sound Partnership, Improving Oil Spill Prevention and Response in WA State (2011) – Publication number 11-08-002
* Tulane Maritime Law Journal, Liability, Compensation, and Financial Responsibility Under the Oil Pollution ACT of 1990: A Review of the Second Decade (2011)
* Environmental Research Consulting and Applied Science Associates, Modeling of Response, Socioeconomic, and Natural Resource Damage Costs for Hypothetical Oil Spill Scenarios in SF Bay (2002)
* Environmental Research Consulting, Socioeconomic Cost Modeling for WA State Oil Spill Scenario Part II (2005)
* Environmental Research Consulting and Applied Science Associates, Evaluation of the Consequences of Various Response Options Using Modeling of Fate, Effects and NRDA Costs for Oil Spills into Washington Waters (2006), ASA 2003-111
* Abt Associates, Potential Fishing Impacts and Natural Resource Damages from Worst-Cast Discharges of Oil on the Columbia River (2016)