

# Memorandum

To: Forum Leader, Water Quality Topic Forum  
Puget Sound Partnership

From: Jacqueline Brown Miller, Executive Director  
Washington Oil Spill Advisory Council

Date: May 5, 2008

Subject: Puget Sound Partnership Action Agenda and Oil Spills

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## I. Introduction

This memorandum pertains to the Water Quality Topic Forum being held by the Puget Sound Partnership as part of its process for assembling the Puget Sound Action Agenda. In particular, this memorandum is about why it is important to address oil spill prevention, response, and remediation to prevent oil related toxins from harming water quality in the Sound.

The Washington Oil Spill Advisory Council's mission is to maintain Washington's vigilance in preventing oil spills in marine and navigable waters, by ensuring an emphasis on oil spill prevention while also recognizing the importance of improving spill preparedness and response. The Council was created to help ensure Washington's coastal and marine environments, and navigable waters, continue to be a source of beauty, recreation, health, ecological integrity, food production, and economic betterment for Washington citizens. The Council is a mechanism to foster a long-term partnership and consensus between communities, government, and industry.

The April 14 Initial Discussion Draft for the Water Quality Topic Forum posed several questions relevant to oil spills.

### *Science Questions*

- (S1) *What is the status of water quality in Puget Sound?*
  - *What are the documented threats to fresh and marine water quality, in particular from toxics?*
  - *What are the sources of toxics to Puget Sound water bodies?*
- (S2) *What management approaches are being used to address the sources of toxins entering Puget Sound water bodies?*
  - *What are the main findings relating to management approaches and their documented effectiveness?*
  - *How do we measure and document effectiveness?*
  - *What are the gaps in our understanding?*

## ***Policy Questions***

- (P1) *What are the policy approaches to address toxics in Puget Sound?*
  - *What are the existing regulatory or management programs and their limitations?*
- (P2) *What are strategies to improve water quality and reduce toxics in Puget Sound?*

The Council, through its Public Outreach and Education Committee, has contemplated these questions and how the action agenda could best address the issue of oil spills. Based on the Committee's work and consultation with the Department of Ecology Spills Program and others, I am making the following recommendations set forth in Section III of this memorandum for the Action Agenda regarding oil spills.

## **II. (S1) What is the status of water quality in Puget Sound?**

Qualitatively speaking, water quality in Puget Sound should support:

- Thriving populations of plants and animals that are important for the web of life.
- Human health, wellbeing, and welfare.
- Local industries and economies that depend on well-functioning ecosystems and pristine resources.

Specifically, water quality in Puget Sound should be clean enough to support:

- Flourishing populations of fish, bird, and marine mammal species, none of which are threatened or endangered.
- Maintenance of uncompromised ecosystem services that Puget Sound gives and which support the health of various species, humans, and our local economies.
- Ample opportunity for local people to swim and fish in Puget Sound and to eat Puget Sound's bounty without accumulating toxic body burdens, the long-term affects of which we still do not know.
- An environment in which marine recreation is safe and appealing.
- Shellfish growing, fisheries, tourism, and indigenous population subsistence.
- The psychological and spiritual tranquility that comes from knowing we are living in harmony with our surroundings.
- Future generations, our grandchildren's grandchildren, who can enjoy the same healthful and supportive Puget Sound our grandparents did.

A healthy Puget Sound would contain no more oil-related toxins than our local ecosystem can tolerate and still support the above values. Currently, we can not say oil-related toxins in Puget Sound are low enough to support the above values.

### **A. What are the documented threats to fresh and marine water quality, in particular from toxic oil spills?**

## 1. Risks associated with directly-to-water oil spills.

The Initial Discussion Draft of the Water Quality Topic Forum paper, in science question one, makes the following observations: The total amount of reported oil and petroleum products from reported spills directly to surface waters in Puget Sound was about four percent of the amount estimated to enter via surface runoff. When the relatively rare large spill occurs, it often has a large local impact, including acute toxicity to organisms and plants. Shellfish and other types of marine commercial and recreational harvest are usually curtailed. Thereafter, aside from treating any oil that may be a part of storm water, the paper makes no mention of the need for the Partnership to address oil spills to water.

The paper vastly understates the threat in-water oil spills pose to the Sound-- in terms of how often they can occur, how large they can be, and the potential long-term toxic impact. The Council recognizes that oil as a component of storm water is an important and challenging issue and believes the Partnership should address this issue.<sup>1</sup> However, addressing spills directly to water is equally important.

## 2. How often should we expect serious spills and in what volume?

In 2000, the U.S. Coast Guard commissioned a study to assess the risk of oil spills in the United States. Table 2.2 of the report provides the number and volume of oil spilled by vessel type for the period from 1985-1999 using an overall input from a spilled volume of 42,301,810 gallons. The data in the table shows tankers are the major contributor of spilled oil into U.S. waters in terms of volume spilled, followed closely by barges. Freighters (including bulk carriers and container ships) are the third largest contributor, and fishing vessels are fourth in volume contributed.

**Table 2.2 Volume of Oil and Number of Spills by Vessel Type in U.S. Waters, 1985-1999.**

Vessel Type	% by Volume	Volume (gal)	% by Number	Number
Tanker	55.4	23,435,203	8	4,640
Barge	27.6	11,675,300	17	9,861
Freighter	8.7	3,680,257	10	5,801
Fishing	4.3	1,818,978	23	13,341
Passenger	0.5	211,509	5	2,900
Recreational	0.3	126,905	15	8,701
Other vessel	3.2	1,353,658	22	12,761

Source: ERC data compiled for this study (2001).

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<sup>1</sup> Partly for reasons of resource allocation, and partly for the Council's interpretation of its mandate, the Council has chosen to focus on spills directly to water.

The table shows tankers responsible for over 4,500 spills, barges for over 9,800 spills, and freighters for over 5,800 spills. This is an average of 1,450 spills per year nationwide. Regarding anticipated trends from 2000 to 2010, the report noted the following about the serious risks cited in the table:

- For tanker spills, there is a possible increase of a major spill from what was reported.
- For barges and freighters (cargo vessels) the threat is expected to remain stable.

The amount of oil that could be spilled in one accident ranges between one gallon and 630 million gallons (the biggest tank ships that come into Puget Sound can carry over 1.5 million barrels (630 million gallons) of combined crude oil and fuel oil). The 2007 Cosco Bussan accident and resulting spill to San Francisco Bay -- just over 53,000 gallons-- was widely labeled a “moderate sized spill.” Another thing to consider is that with increasing international commerce, cargo vessels are getting much, much bigger.<sup>2</sup> This means the size of the bunker tanks is growing, increasing the risk of larger spills.

The above information pertains to a nationwide threat. What about the Sound? What are the chances each year of a mid-level to a catastrophic-level spill in Puget Sound? This question was somewhat answered by the Coast Guard in 1999. In a study relating to Puget Sound, the Coast Guard provided baseline spill analysis for the “probable” case, given the various planned risk mitigations (programs and laws designed to reduce risk) such as double hulled tankers. The study projected risk from the years 1997 to 2025. Table 32 shows this probable estimate per year, for all tankers, tank barges, and cargo vessels combined, as follows.

Year	Total No. of Accidents	Total Accidents with Oil Outflow	Total Outflow in barrels
1997	3.79239	0.20240	1,016.1
2010	4.97091	0.230189	737.0
2025	6.65715	0.28136	725.3

<sup>2</sup> Projections show that cargo vessels will grow not just in number, but also in size. The 1999 Coast Guard report noted that in 1997 27% of containerships were less than 2500 TEU and that 36.7% were 2500 to 4000 TEUs, with 36.1% being greater than 4000 TEUs. The report noted that the first of the large 6000 TEU containerships were delivered in 1996, and more than thirty 4500 plus TEU container ships were delivered through 1999. The study projects that by 2025, vessels under 4000 TEU will comprise only 30% of the container fleet, with 70% of the fleet being comprised of vessels over 4000 TEU. Regulatory Assessment, Use of Tugs to Protect Against Oil Spills in the Puget Sound Area, p. 1-20, U.S. Coast Guard, Report No. 9522-02, November 15, 1999.

Naturally, the bunker fuel carried increases with the size of the ship. Thus, the Coast Guard reported that gallons of oil transported as bunker in cargo vessels (bulk liquid carriers, bulk carriers, container ships, and vehicle carriers) would increase from 78,385,168 gallons in 2000 to over 143,405,063 gallons per year in 2025. This is a transit increase of about 160% and an increase of oil transported by cargo vessels of about 180%. Regulatory Assessment, p. 19-20. This oil transport presents a serious and significant risk.

**Table 32 Baseline—Projected Spill Volumes and Number of Accidents per Year (reference case based on “probable” estimate of spill frequency)<sup>3</sup>**

In essence, the probable case shows the number of collision and grounding accidents increasing by 71% over the study period. This is primarily due to a predicted increase in vessel traffic. The number of collision and ground accidents which result in spills greater than 10,000 gallons increases by 37% over the study period. The more gradual growth in spills as compared to accidents has to do with the transition into double hulls for tank vessels and by the expectation that crude oil receipts will remain flat over the study period.<sup>4</sup>

This indicates the following:

- In 2010 there will be almost five accidents per year, .23 of which will lead to the outflow of 737 barrels of oil—or almost 31,000 gallons.
- In 2025 there will be over six accidents per year, .28 of which will lead to the outflow of 725 barrels of oil—or almost 30,500 gallons.

Certainly, many things will affect these numbers. However, this is an oil spill risk in Puget Sound that should not be ignored.<sup>5</sup>

This is especially true given that oil spills do not necessarily “evaporate” shortly after it occurs. As described below, thick and viscous oils persist in the environment, sometimes for decades—even indefinitely. If Puget Sound saw one thick gooey and toxic oil spill—like thick bunker fuel—each year, or even every decade, it is likely that the Sound would sustain very serious cumulative impacts.

### **3. How long do oil spill toxics persist in the environment?**

Oil released into marine waters may be comprised of various materials, including crude oil, refined petroleum products (such as gasoline or diesel fuel) or by-products, ships' bunkers, oily refuse, or oil mixed in waste.<sup>6</sup> Scientists have made significant progress in determining how oil

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<sup>3</sup> Regulatory Assessment, Use of Tugs to Protect Against Oil Spills in the Puget Sound Area, p. 40, U.S. Coast Guard, Report No. 9522-02, November 15, 1999.

<sup>4</sup> Regulatory Assessment, Use of Tugs to Protect Against Oil Spills in the Puget Sound Area, p. 39, U.S. Coast Guard, Report No. 9522-02, November 15, 1999.

<sup>5</sup> Risk Assessment for the Coast Guard’s Oil Spill Prevention, Preparedness, and Response Program (OSPPR), Phase I: Concept Development, Risk Characterization, and Issue Identification, pages 2-12, 2-14, 2-45, [http://www.environmental-research.com/erc\\_reports/ERC\\_report\\_13.pdf](http://www.environmental-research.com/erc_reports/ERC_report_13.pdf).

<sup>6</sup> Wikipedia, [http://en.wikipedia.org/wiki/Oil\\_spill](http://en.wikipedia.org/wiki/Oil_spill).

impacts the environment. However, the answer depends on the oils chemical composition and where it lands in the marine environment.

Tracking oil's sources, fates, and effects is challenging. First, oil is a complicated mixture of hundreds, or thousands, of chemicals. Every oil source, even among similar types of oil (such as crude or fuel oils, for example), can have distinctive compositions depending on the oil field they are from and how they are refined.<sup>7</sup>

Second, when spilled into marine waters, this varying and complex mixture of chemicals enters a complex chemical stew of seawater, mud, and marine organisms. The oil is stirred by currents, tides, is altered by other physical processes, and changed by chemical reactions and interactions with organisms in the sea.<sup>8</sup>

The lighter fractions of oil, such as benzene and toluene, are highly toxic, but are also volatile and evaporate quickly. Heavier components of crude oil, such as polycyclic aromatic hydrocarbons (PAHs) appear to cause the most damage. While they are less toxic than the lighter volatiles, they persist in the environment much longer. A heavy oil spill can also blanket estuaries and shoreline ecosystems such as salt marshes and tidal pools or lagoons, preventing gas exchange and blocking light. The oil can mix deeply into pebble, shingle or sandy beaches, where it may remain for months or years.<sup>9</sup>

This is a result of the fundamental chemistry of oil compounds. They do not dissolve in water. Therefore, they adhere to particles in the water or get incorporated into biological debris. From there, they settle from the water column and become part of the sediments on the bottom. Once mixed into the sediment, oil and its chemical constituents can persist for decades, depending on the environment. In areas swept by high energy current, the material may be dispersed. But in areas where sediments accumulate, contaminated sediments are an environmental concern—both when lying on the bottom where organisms can expose themselves to it and when dredged.<sup>10</sup>

There are several examples of toxic oil elements persisting indefinitely in the marine environment, even though surface sediments may appear healthy. Still today after nineteen years, oil from the 1989 Exxon Valdez spill persists in an only-slightly weathered form below the surface at some beaches along the Gulf of Alaska. National Oceanic and Atmospheric Administration's scientists analyzed subsurface oil at 10 beaches, selected at random from among

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<sup>7</sup> Wikipedia, [http://en.wikipedia.org/wiki/Oil\\_spill](http://en.wikipedia.org/wiki/Oil_spill).

<sup>8</sup> *Mixing Oil and Water*, Woods Hole Oceanographic Institution, June 23, 2004, <http://www.whoi.edu/page.do?pid=12467&tid=282&cid=2493>.

<sup>9</sup> Wikipedia, [http://en.wikipedia.org/wiki/Oil\\_spill](http://en.wikipedia.org/wiki/Oil_spill).

<sup>10</sup> *Mixing Oil and Water*, Woods Hole Oceanographic Institution, June 23, 2004, <http://www.whoi.edu/page.do?pid=12467&tid=282&cid=2493>.

oil-contaminated areas included in earlier studies. Earlier research demonstrated buried oil could retain toxic components for years if buried in anoxic (oxygen-depleted) sediments where little decomposition from weathering occurs. The new study identified a newly discovered mechanism that allows oil to be preserved in sediments that do contain oxygen. Oil can persist if it exists in a thick, emulsified "oil mousse" that resists weathering. Their researchers concluded that it can stay there for decades and "pose a contact hazard to inter-tidally foraging sea otters, sea ducks, and shorebirds, create a chronic source of low-level contamination, discourage subsistence in a region where use is heavy[,] and degrade the wilderness character of protected lands."<sup>11</sup>

Toxic oil impacts also persist in Massachusetts, 38 years after a barge ran aground off Cape Cod, rupturing its hull and spilling 189,000 gallons of number two fuel oil that winds and waves pushed onto the beaches and marshes of West Falmouth. As of 2007, oil still persisted in the marshes. Bacteria had degraded the most easily eaten oil compounds soon after the spill, but then moved to their more typical fare. Therefore, the bacteria were no longer eating the oil, leaving it to do continuing damage.

PAHs were found to still be present, indicating life in the marsh is still affected by toxins from the spill. One particular species was quite dramatically affected. The observations of scientists showed that where oil concentrations were present, there were fewer crabs and they moved more slowly as if they were intoxicated from exposure to residual oil. Worse, observations showed that in the areas of the highest concentrations, crabs stopped burrowing downward when they ran into oil and then moved sideways through the sediments. This left them vulnerable to predators and prevented the crabs from tilling the salt marshes so that the marsh grasses could grow better.<sup>12</sup>

We can expect that well over half of every oil spill that has persistent characteristics will remain (with its toxic constituents) in some portion of the environment, just like the Exxon spill and the Cape Cod spill. It is generally accepted that once an oil spill happens, it is almost impossible to completely clean up-- experts generally call it a success when able to recover 36 percent of the spilled oil.<sup>13</sup> Of the 53,500 gallons of bunker fuel spilled into San Francisco Bay, almost 40,000 gallons remained in the environment. Chemical analysis of the oil spilled in San Francisco Bay showed high levels of PAHs and three other carcinogenic chemicals: Pyrene, at 1100 parts per million, phenanthrene, at 2000 parts per million, and another called two-methylnaphthalene, at 1800 parts per million. Along with the heavy bunker fuel, these chemicals could easily remain in

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<sup>11</sup> *Subsurface Oil from 1989 Exxon Valdez Spill in Alaska May Persist for Decades*, *Science Daily*, February 5, 2007, <http://www.sciencedaily.com/releases/2007/02/070205125919.htm>.

<sup>12</sup> *Still Toxic After All These Years*, Woods Hole Oceanographic Institution, April 23, 2007, <http://www.whoi.edu/page.do?pid=7397&tid=282&cid=25568>.

<sup>13</sup> Incident Specific Preparedness Review (ISPR) M/V Cosco Busan Oil Spill in the San Francisco Bay, Report on Initial Response Phase, January 11, 2008.

the ecosystem by finding their way from the water column into the sediments where they will interact within animals and organisms.<sup>14</sup>

Again, if Puget Sound saw one thick gooey and toxic oil spill—like thick bunker fuel—each year, or even every decade, it is likely that the Sound would sustain very serious cumulative impacts.

Below is a discussion of some of the specific ways that oil spills threaten the values we need Puget Sound to support.

#### **4. Toxic impacts to species, including humans.**

A particularly deadly fraction of oil, polycyclic aromatic hydrocarbons or PAHs, cause long-term injury at minute levels of parts per billion. Scientists have linked PAH exposure from lingering oil to long-term injury in a variety of fish, birds, and mammals. A team of scientists summarized decades of oil spill studies in the magazine *Science* in December 2003. The team wrote that PAHs are deadly actors linked to long-term injury, including reproductive failure, disruption of cellular function, and death.<sup>15</sup> Other constituents can include the carcinogenic chemicals Pyrene, phenanthrene, and two-methylnaphthalene.<sup>16</sup> Again, there are thousands of chemicals that can be part of oil.

##### **a) The resident killer whale and other marine life.**

For the Southern Resident killer whale, a huge spill (the size of the 450,000-gallon spill like the *Tenyo Maru* in 1991 or the 11 million-gallon Exxon Valdez spill in 1989) would spell disaster. This population is listed as endangered under the U.S. Endangered Species Act. The proposed Recovery Plan for the whale identifies oil spills as a primary threat for the endangered Southern Residents. Also, available evidence suggests killer whales are unlikely to detect and avoid spilled oil.

We understand, as it was widely reported, that the Valdez spill killed 25 killer whales. Numerical estimates of the Puget Sound resident population range from between 90 and 176. A loss of 25 individuals could cause the elimination of resident population in Puget Sound. Yet, even smaller spills are bad for whales because they irritate eyes and skin, and contaminate prey.

Oil spills are also potentially harmful to other threatened and endangered species, such as salmonids with navigational systems that can be affected by toxics, as well as wild seabirds such as the Marbled Murrelet, which feeds on forage fish.

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<sup>14</sup> *Oil Spill Testing Shows Toxic Chemicals*, CBS 13, <http://cbs13.com/local/oil.spill.toxic.2.597332.html>.

<sup>15</sup> *Long-Term Ecosystem Response to the Exxon Valdez Oil Spill*, Charles H. Peterson, Stanley D. Rice, Jeffrey W. Short, Daniel Esler, James L. Bodkin, Brenda E. Ballachey, and David B. Irons, *Science*, 19 December 2003.

<sup>16</sup> *Oil Spill Testing Shows Toxic Chemicals*, CBS 13, <http://cbs13.com/local/oil.spill.toxic.2.597332.html>.

## **b) Impacts to humans.**

Humans, of course, are negatively affected by toxics that find their way into our marine environments, including those from oil spills. In recent years, several studies have been done, including several studies by the Center for Disease Control, to track the accumulated body burden of industrial and synthetic chemicals and to study the potentially serious long-term affects of this exposure. It would take a study to determine whether the bio-accumulating chemicals include the chemical constituents found in oil. Needless to say, however, exposure to these chemical constituents, whether from dermal exposure or through ingestion, is not healthy to humans.

## **5. Economic damage.**

Part of the Partnership's mandate is to provide for the economic well being of the Puget Sound population. What would be the economic costs of an oil spill? There is no definitive answer to this question. Experts calculate, however, that significant oil spills in Washington waters could result in *hundreds of millions, if not billions, of dollars* of socioeconomic impacts. This is at a minimum.

Yet, this measure -- socioeconomic damages-- does not incorporate a spill's impact on several other things. These include economic measures of a loss of longer-term quality of life, psychological impacts, and spiritual values. These also include economic measures of the ability of a damaged natural environment to provide us with valuable ecosystem services.

### **a) Socioeconomic costs—damages measure one.**

To the tune of hundreds of millions, if not billions, of dollars, socioeconomic impacts would be felt by the region, local communities, residents, the state, and the federal government. These impacts include damages to real and personal property, loss of use of natural resources (parks and recreation areas), and loss of income and expenses (fishing, tourism, recreation, shipping and other commerce). As a major shipping port and tourist and recreation area, Puget Sound is particularly vulnerable to socioeconomic impacts from oil spills. Reduction in tourism, commercial fishing, and blocking the shipping port could have widespread impacts. There can also be serious impacts on the Tribal Nations, particularly with respect to subsistence fishing. A spill could also disrupt the state's transportation system as ferry traffic could be suspended or rerouted.

Socioeconomic costs are based on the real and perceived impacts, which are related to the degree of oiling, the oil type and persistence, the degree to which cleanup operations can mitigate the oil impacts, and the time of the impact.<sup>17</sup>

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<sup>17</sup> *Oil Spill Response, Socioeconomic, and Environmental Cost-Benefit Analysis* (WA Dept. Ecology): (2003 – ongoing); *Socioeconomic Cost Modeling for Washington State Oil Spill Scenarios: Part II* (2005).

**b) Loss of longer-term quality of life, psychological impacts, and spiritual values—damages measure two.**

How does one place a value on a loss of life's quality for the people of Puget Sound as a result of oil spills? What about a loss of elements within the environment that give us spiritual inspiration? And what of the psychological impacts of a people who no longer are to be connected to nature—no longer able to swim in Puget Sound or eat its bounty without fear of being harmed?

**c) Lost ecosystem services—damages measure three.**

Modern economic thinking is beginning to incorporate the loss of ecosystem services into damages calculations. When portions of the commons that belong to all humanity are lost, the ecosystem services provided by those resources are no longer available to humanity. An oil spill would damage the environment's ability to provide us with valuable ecosystem services.

Generally speaking, ecosystem services include *provisioning*, such as the production of food and water; *regulating*, such as the control of climate and disease; *supporting*, such as nutrient cycles and crop pollination; *cultural*, such as spiritual and recreational benefits; and *preserving*, which includes guarding against uncertainty through the maintenance of diversity.<sup>18</sup> The services of ecological systems and the natural capital stocks that produce them are critical to the way the Earth's life-support systems function. These directly and indirectly contribute to human welfare and represent part of the total economic value of the planet.<sup>19</sup>

Coastal systems, including estuaries, coastal wetlands, river deltas and coastal shelves, are particularly rich in ecosystem goods and services. They provide widely ranging and highly valued resources that include fisheries, open spaces, wildlife habitat, nutrient cycling, and recreational opportunities.<sup>20</sup>

Economists are working to develop better frameworks for assessing and valuing the goods and services provided by coastal systems. If we add the loss of ecosystem services to previous socioeconomic damages assessments, damage amounts exponentially increase.

**B. What are the sources of toxic oil spills to Puget Sound water bodies? Variability between catastrophic and chronic small.**

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<sup>18</sup> Wikipedia. [http://en.wikipedia.org/wiki/Oil\\_spill](http://en.wikipedia.org/wiki/Oil_spill)

<sup>19</sup> *Economic Reasons for Conserving Wild Nature*, Andrew Balmford, et al, *Science Magazine*, Vol. 297, August 9, 2002.

<sup>20</sup> *Integrated Assessment and Valuation of Ecosystem Goods and Services provided by Coastal Systems*, Matthew A. Wilson, et al (attached and incorporated by reference). They also provide climate regulation and soil formation. Balmford, *supra*.

Both large and small spills threaten and have harmed Puget Sound. One major spill from an oil tanker, a refinery, or a pipeline, could significantly impact the accomplishments made toward the 2020 goal. Additionally, the 2020 goal could be thwarted by the fact that Puget Sound is slowly being fowled by small, chronic spills that add up.

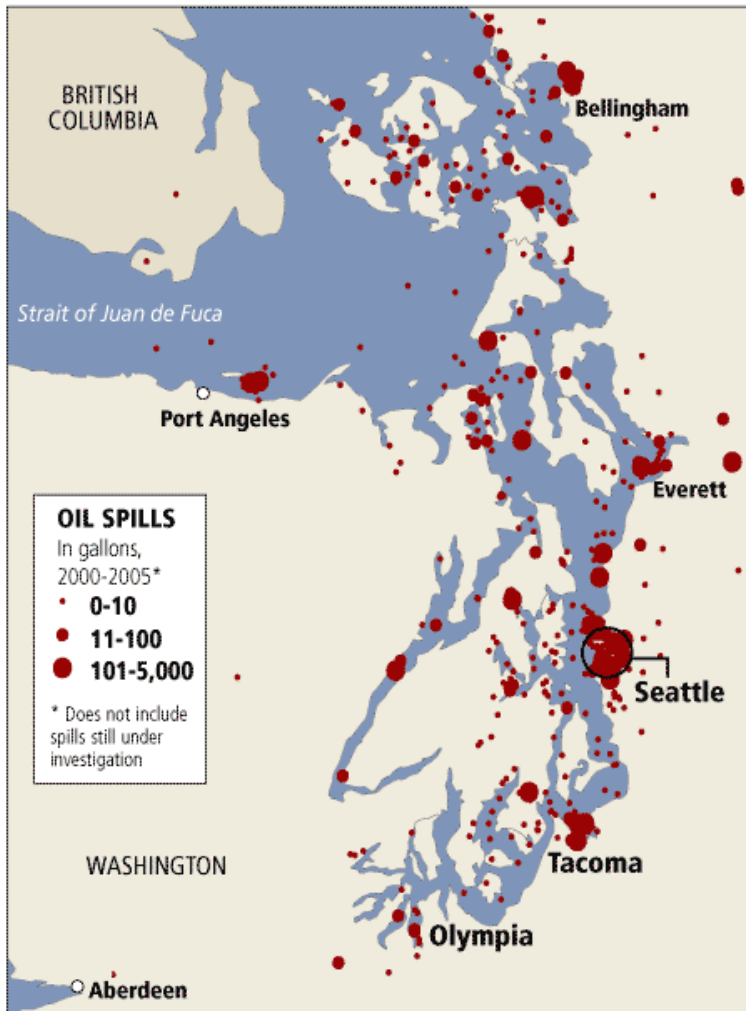
The threat of large oil spills come principally from high-volume commercial activities. An oil spill large enough to cause catastrophic impacts to our natural resources and economy could happen at any time. A very large oil spill, such as one from an oil tanker or a refinery, would be devastating to almost every value mentioned above that we want the Sound to support.

Yet, small, chronic spills continue in Puget Sound with an unknown number of spills releasing an unknown number of gallons of oil into Puget Sound each year. Experts agree that these spills add up over time to be a big problem, and they are very damaging to the Sound's ecology. Sources of these include point source pollution from near-water activities (above ground storage tanks, gas stations, railroads) and sources associated with small scale water related activities (marinas, recreational boaters, fishing vessels, small work boats, two-stroke engines, and derelict vessels).

On October 12, 2006, the Seattle Post Intelligencer ran a story on oil spills and published the map below to show how the many small spills in Puget Sound accumulate to represent a major problem. The map was based on data provided by the United States Coast Guard.

## OIL SPILLS AROUND THE SOUND

Large oil spills in Puget Sound have been rare, but countless small spills add up, putting marine life at risk.



Source: U.S. Coast Guard

SEATTLE P-I

In general, oil spill threats include, but are not limited to:

- Ship collisions and groundings.
- Oil processing, storage, and transfer facility failures.
- Failures of shipboard equipment, often due to the failure to do proper maintenance.
- Failure to implement proper procedures.
- Intentional disregard of regulations.
- Sinking of derelict or abandoned vessels.
- Small spills from recreational boaters and fishing boats on which navigation and fuel bunkering are ancillary to recreation and fishing.

**III. (P2) What strategies and actions must be taken to improve water quality and reduce oil-related toxics in Puget Sound?**

In general, to achieve a healthy Puget Sound we must eliminate enough oil spills to assure toxic concentrations do not exceed what a healthy ecosystem can support. There are numerous areas of Puget Sound that can tolerate *no* level of oil pollution—such as shellfish beds, eel grass, and herring spawning areas. Some areas of Puget Sound – industrial areas and areas with considerable flushing-- may be able to withstand some level of oil pollution. However, even for these areas, we are beyond the time when dilution can be the solution to pollution. This will become even truer as populations around Puget Sound increase. We must get a handle on this problem now by taking effective steps to better prevent large catastrophic spills, moderate sized spills, as well as the smaller chronic spills that add up. Also, when spills do occur, we must have a system in place to rapidly assess and clean up spills, particularly moderate to large spills.

Oil spill prevention, response, and remediation programs are in place already—both at the federal and state levels. Many describe these systems as being very good. But there is room to improve and there is much to learn.<sup>21</sup>

Washington State agencies and entities with oil spill responsibilities include:

- The Spills Program within the Washington Department of Ecology.
- The Oil Spill Team within the Washington Department of Fish and Wildlife.
- The Derelict Vessel Program within the Washington Department of Natural Resources.
- The Oil Spill Advisory Council.
- The University of Washington Sea Grant Funded Boater and Marina Education program.

The Council finds it to be critical that the Partnership do the following:

1. Include in the Action Agenda the goal of preventing all oil spills, small and large.
2. Include in the Action Agenda the goal of rapidly and effectively responding to oil spills.
3. Bring the state agencies with responsibility for preventing spills and/or effectively responding to spills into the Partnership’s accountability structure. This should also include state agencies’ cooperative interactions with other entities, including federal agencies, facility operators, oil industries, and transportation industries.

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<sup>21</sup> The Council’s hope is that the Department of Ecology Spills Program will provide additional information useful in answering the following questions posed by the Partnership in the Initial Discussion Draft for the Water Quality Topic Forum Paper. These questions were:

- (S2) What management approaches are being used to address the sources of toxins entering Puget Sound water bodies?
  - What are the main findings relating to management approaches and their documented effectiveness?
  - How do we measure and document effectiveness?
  - What are the gaps in our understanding?
- (P1) What are the policy approaches to address toxics in Puget Sound?
  - What are the existing regulatory or management programs and their limitations?

More specifically, the Council recommends considering adopting the following items into the action agenda. These recommendations should result in better prevention of both large and small oil spills.

**A. Generally agreed upon additions to state's oil spill program.**

In a 2006 report, the Council made the following recommendations for programmatic changes to the oil spill program.

**1. Fully fund a year-round dedicated rescue tug at Neah Bay.**

The Council recommended permanently stationing a year-round rescue tug at Neah Bay. Rescue tugs are designed to prevent large oil spills from happening when ships find themselves drifting to shore with no power or steering. Since 2006, Washington has made a great deal of progress toward getting a year-round tug at Neah Bay. With Governor Gregoire's support, the Legislature provided year-round funding for the 2008-2009 fiscal year. The funding source is not permanent, however. The State is hoping Congress will create a permanent federal tug funding plan. The Council is hopeful that Congress will come through and that if it does not, the Legislature will find a permanent source of funding for the year-round Neah Bay tug.

**2. Identify locations where we may need other rescue tugs and fund them.**

The Council recommended creating an Ecology-managed tug fund to place rescue/response tugs in other critical locations on an as-needed basis, such as in a storm. Again, this would be to prevent large spills due to drift groundings. The Legislature has not acted on this recommendation.

**3. Better deal with issue of derelict vessels that leak oil.**

The Council recommended eliminating the backlog of abandoned and derelict vessels in Washington. This backlog resulted largely from funding to the derelict vessel program being inadequate to handle large, previously commercial, vessels. The goal in eliminating this backlog, and figuring out ways to stop the pipeline of small and large derelict vessels alike, is to reduce the amount of smaller oil spills being dumped into Puget Sound.

The Legislature took critical first steps in 2007 by providing a temporary revenue stream to assist Department of Natural Resources (DNR) with moving through the backlog of derelict vessels, as well as making it easier for local governments and marinas to participate in derelict vessel removal. The Legislature also directed DNR to convene a working group to, among other things, examine new revenue stream options for managing large, previously commercial, vessels. DNR has made considerable progress in this work. The Council is hopeful that the Legislature will act on DNR's recommendations in the 2008 session.

#### 4. Adequately fund the Oil Spill Advisory Council.

The Council serves as a nexus between “oil spill insiders” and the outside citizen world. As Governor Gregoire said, “It's so important. Only if public engagement continues are we going to make sure we don't have complacency [;] The public has to be engaged and involved...” To this end, the Legislature tasked the Council with numerous interrelated objectives that include early consultation with government decision makers and providing independent advice, expertise, research, monitoring, and assessment in relation to oil spill prevention, preparedness, and response.<sup>22</sup>

In 2006, one year after its creation, the Council hired an independent consultant to evaluate what the Council would need in order to achieve its mandate. This consultant made the conservative recommendation that the Legislature should fund the Council at \$1.75 million per biennium. The Legislature has not yet acted on this recommendation.

Nonetheless, the Council has proven that it adds considerable value to the state's level of oil spill prevention and preparedness. Through its continued conversation with Ecology over the

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<sup>22</sup> RCW 90.56.130 sets forth the Council's duties. These duties are broad and encompass a wide range of activities that can support improved oil spill prevention, response, and preparedness in Washington.

The Legislature charged the Council with approximately ten duties, including the following:

1. Hire professional staff and expert consultants.
2. Early consultation with government decision makers in relation to the state's oil spill program, analyses, rule making, and related oil spill activities.
3. Provide independent advice, expertise, research, monitoring, and assessment for review of and necessary improvements to the state's oil spill program, analyses, rule making, and other decisions, including those of the Northwest Area Committee, as well as the adequacy of funding for these programs.
4. Monitor and provide information to the public, as well as state and federal agencies regarding state of the art oil spill prevention, preparedness, and response programs.
5. Actively seek public comments on proposals for specific measures to improve the state's oil spill prevention, preparedness, and response program, including measures to improve the effectiveness of the Northwest Area Committee.
6. Evaluate incident response reports and make recommendations to the Department of Ecology regarding improvements.
7. Consult with the Department of Ecology on lessons learned and agency progress on necessary actions in response to lessons learned.
8. Promote opportunities for the public to become involved in oil spill response activities, and provide assistance to community groups with an interest in oil spill prevention and response, and coordinate with the Department of Ecology on the development and implementation of a citizens' involvement plan.
9. Serve as an advisory body to the Department of Ecology on matters relating to international, national, and regional issues concerning oil spill prevention, preparedness, and response, and provide a mechanism for stakeholder and public consideration of federal actions relating to oil spill preparedness, prevention, and response in or near the waters of the state, with recommended changes or improvements in federal policies on these matters.
10. Each year, make recommendations for the continuing improvement of the state's oil spill prevention, preparedness, and response activities through a report to the Governor, the Director, and the appropriate committees of the Senate and House of Representatives.

implementation of the oil transfer and oil spill contingency planning rules, the Council has gained several incremental improvements to oil spill prevention and preparedness. The Council is proud of its work in moving the state to the point where it now funds a year-round tug at Neah Bay. Similarly, the Council is pleased that its work on derelict vessels lead to statutory changes to improve the derelict vessel program.

Additionally, the Council is in the process of conducting several very important studies that could lead to significant improvements. First, the Council is conducting a study to find out if there are ways to improve Washington's ability to respond to a large-scale spill. Second, the Council is initiating a study to find out if there are programmatic improvements that can be made to intervene early in the error chain before incidents that lead to spills can occur on cargo and tank vessels while they are underway. Doing just these things, however, has stretched the Council's budget and staff to their limits.

Other advisory bodies similar to the Council are funded well beyond the Council's current level of funding. For example, the Prince William Sound Regional Citizens Advisory Council (RCAC) receives biennial funding above \$6 million and the Cook Inlet RCAC is funded at over \$1.6 million biennially. This funding allows them to reach their full capacity as citizen advisory bodies.

Until Washington's Council is funded beyond its current biennial budget of \$715,000, it will be difficult for the Council to effectively conduct the long list of important duties set forth by the Legislature in RCW 90.56.130. For example, the Council has set forth modest goals in its 2007 work plan, but may not be able to achieve all of them due to resource issues. Also, the Council is limited in how much it can expend to conduct important education and outreach, to participate in several key working groups, and in developing expertise and capacity to monitor drills and other important activities.

#### **B. Move forward on a much-needed overhaul to funding for oil spill programs.**

In addition, the Council made recommendations for funding that were specific about the source of the revenue collection and the amounts needing to be collected. These are important given the dire straights in which oil spill programs have been placed due to the way Washington funds its oil spill programs.

All oil spill programs in Washington are funded from two taxes charged on crude oil brought to Washington's refineries via vessels. The first tax is a one-cent per barrel tax that feeds the Oil Spill Response Account. When that account reaches \$9 million, the tax turns off. The second tax is a four-cent per barrel tax that feeds the Oil Spill Prevention Account. This account feeds oil spill related programs run by the following entities:

- The Spills Program within the Washington Department of Ecology.

- The Oil Spill Team within the Washington Department of Fish and Wildlife.
- The Derelict Vessel Program within the Washington Department of Natural Resources.
- The Washington Oil Spill Advisory Council.
- The Oil Spill Prevention Education program at Washington Sea Grant, University of Washington.

Exclusive of any programmatic additions recommended by the Council in its 2006 report, the Council predicted in 2006 that Ecology would have a revenue shortfall of \$1.6 million in the 09-11 biennium. In 2007, Ecology affirmed this shortfall, citing that current level expenditures have risen to exceed revenue. Ecology wrote that the Oil Spill Prevention Account is insolvent and that we are currently mining fund balance carried forward from previous years. The barrel tax that funds the program was not tied to inflation and has not kept pace.

It gets worse. By adding the programmatic additions recommended by the Council in 2006, this revenue shortfall would be about \$6.2 million after 07-09 biennium. With proposed additions for DNR's derelict vessel program, the deficit would grow to \$9.6 million after 07-09 biennium.

To make matters even worse, each year the barrel tax paid on oil exported from the state is refunded. This year, the refund resulted in a hole bigger than \$2 million in the Oil Spill Prevention Account. The Council understands Ecology was faced with having to lay off nineteen people from its oil spill prevention program. Additionally, other agencies funded from the Oil Spill Prevention Account were also threatened—WDFW and the Oil Spill Advisory Council.

Luckily, the Legislature patched the hole. But next year, this problem will be back as oil companies are refunded the barrel tax paid on oil that is ultimately shipped out of state after being refined. This is a refund for oil that will often be transported by water out of the state—a refund for a second risk being posed to state waters.

There is a clear need for the Legislature to fundamentally change the tax structure—to significantly increase the amount of revenue raised, to assure that the revenue is designed to automatically keep pace with inflation and necessary programmatic augmentation over time, to assure that the system is set up so that refunds from the revenue stream do not continually disrupt programmatic continuity, and to assure that the amount charged (and kept by the state) reflects the risk that is posed to state waters.

In addition, many have argued that the state should consider:

- Increasing the cap on the Oil Spill Response Account (OSRA) to adequately reflect resources needed by the state when a spill occurs.
- Allowing the OSRA fund to be more easily opened to pay for small oil spill events.

The Council's 2006 recommendations were in line with these goals. However, the Legislature did not act on the Council's recommended funding sources and amounts. Rather, it asked the Joint Legislative Audit and Review Committee (JLARC) to study the issue further and release a report this fall. In particular, JLARC is to examine funding mechanisms for oil spill prevention and response programs and compare sources of oil spill risk with the funding mechanisms. The Council is hopeful that the Legislature will act in 2008 to fix the quite dire funding situation.

**C. Other important elements to spill prevention and rapid assessment and response.**

**1. Council studies and activities to explore needed improvements.**

In addition to the suggestions above in Section III A 4, the Council can play the following role in enhancing Washington's ability to prevent spills, both large and small, and to quickly clean them up when they do happen. The Council is hopeful that the Partnership will support the following work that is geared primarily toward preventing and responding to medium to large spills from mostly industrial sources. More information is available about each of these in the attached two-page handout.

1. Study whether there are ways to make programmatic improvements to address underlying root causes of mishaps that lead to oil spill pollution events.
2. Study whether Washington is ready to effectively and rapidly respond to a large-scale oil spill.
3. Review the use of escort tugs and review manning issues relating to articulated tug and barge systems and integrated tug and barge systems.
4. Determine if current escort tug regulations are sufficient in light of human and other factors that cause oil spills.
5. Study additional rescue/response tugs as risk interventions in key locations.
6. Track and evaluate Ecology's implementation of its new Contingency Planning rule.
7. Track and evaluate Ecology's implementation of its new Oil Transfer rule.
8. Work in conjunction with other relevant groups, in addition to other state agencies, such as the Puget Sound Harbor Safety Committee, the Regional Response Team and Northwest Area Committee, and the Pacific States/ British Columbia Oil Spill Task Force.
9. Examine whether there are ways to improve the oiled wildlife program.
10. Evaluate methods of calculating natural resources damages assessments.
11. Conduct public education around oil spill issues.

## **2. Education and outreach about oil spill issues to prevent small, chronic spills from recreational and fishing activities.**

With the advent of the Puget Sound Partnership, saving Puget Sound is the topic of the day, year, and decade. The Partnership has a huge educational mandate, which includes public education about oil spills—preventing big spills and small spills, reporting spills, and rapidly assessing and cleaning up spills.

As indicated earlier, we must focus not only on large oil spills, but on small, chronic spills that add up, such as those from fishing vessels, recreational boats, small work boats, and other small vessels. Indeed, for spills of 25 gallons or more, spills from these vessels make up one third of the total volume of oil spilled directly into Washington waters. Yet, this does not include a significant amount of oil that is likely released daily from boats that leak fluids and pump their bilges into the water.

It is likely that many citizens allow oil to enter Washington waters because either they do not understand the cumulative impacts of small oil spills, or they have not been given basic tools and assistance to prevent spills. Additionally, there is perhaps a culture of “it is not my fault and there is nothing I can do to fix it.” If success is in its future, the Partnership must work toward changing this culture. The first step is embarking upon a massive educational effort.

There are several organizations that partner to conduct public education around preventing small spills. This was done under the premise that small oil spills can add up to significant environmental and economic harm, and are a regional problem that can be remedied more effectively through collaborative projects drawing from existing talent and resources. The main focal point of this partnership is the Pacific Oil Spill Prevention Education Team, or POSPET, which operates under the sponsorship of the Pacific States/ British Columbia Oil Spill Task Force. Learn more about POSPET at <http://www.oilspilltaskforce.org/pospet.htm>. Local (Washington) participants include the Department of Ecology, Washington Sea Grant, the Puget Sound Keeper Alliance, the Coast Guard Auxiliary, the Oil Spill Advisory Council, city marinas, and more. There are also POSPET participants from British Columbia, Oregon, and California.

A centerpiece of POSPET’s effort is the “Spills Aren’t Slick” campaign which produces and distributes materials to marinas and other partners across Washington, Oregon, California and British Columbia.

Additionally, those entities that partner in POSPET conduct their own independent education. For example, the Washington Sea Grant is funded to support an outreach position that addresses the recreational boating community and commercial fisherman. Program staff also participates on a steering committee focused on the development and outreach of Washington’s new Clean Marina Program. Additionally, Ecology distributes public news releases identifying the causes

and preventive measures that can be taken to avoid oil spills from recreational and commercial boaters.

The Puget Sound Partnership, with the huge amount of public focus it enjoys, could play a crucial part in this educational partnership by coordinating with and supporting their efforts in Washington.

In addition, Ecology has posited that there are additional tools needing to be developed or funded and provided to state entities that are funded by the Oil Spill Prevention Account. These could enhance POSPET's work. These items include:

- A small vessel program geared toward recreational and commercial vessels under 300 gross tons. This would include public education/outreach to small vessels and fishing vessels and the recreational boating community. The emphasis would be on preventing spills when refueling, bilge pumping and routine engine maintenance.
- Develop and implement an educational and outreach strategy to prevent spills similar to the anti-litter or the click-it or ticket programs. This would be geared toward educating industry, commercial fisherman, recreational boaters, and citizens about spills and their impacts to Washington waters.
- Work to increase participation in the Clean Marina program that was created in 2005 as an expansion of the EnviroStars program.
- Expand the oil transfer inspection program to Class 4 facilities that transfer fuel and oils to non-recreational vessels that do not hold more than 10,500 gallons.

### **3. Work with Recreation and Conservation Office and the Washington State Parks to pursue small vessel objectives.**

Ecology came up with the idea of coupling educational programs, like those of POSPET, with additional recreational boater education and resources. This would be done through the Washington State Recreation and Conservation Office and Washington State Parks and Recreation Commission. Additional resources geared toward assisting recreational boaters with oil spill prevention could include:

- Head pump-out stations.
- Waste oil and bilge water receptacles.
- New and efficient engine incentives.
- Business rebates.
- Exhaust incentives.
- Fuel filling port design changes.
- Fuel tank vent design changes.
- Derelict vessel removal.

**4. Increase number of oil and bilge receptacles at ports and marinas; petition for Puget Sound to be a federal “no discharge zone.”**

Ecology also came up with the idea of working with ports and marinas to establish bilge water and oil reception facilities around Puget Sound. This will likely require grant funds to assist ports and marinas with this work.

In addition to providing these resources, so that boaters have alternatives to polluting Puget Sound, it would be possible for Washington agencies to petition the US Environmental Protection Agency to designate Puget Sound as a “no discharge zone” under 33 USC Sec. 1322 B(2)-(4).

**5. Storm water pollution and local point source pollution.**

Oil products are part of storm water. The Council supports the Partnership addressing storm water management systems as a whole, rather than peeling off individual groups of toxics to be addressed separately. Of course, the Council recognizes that public education on how to keep oil out of storm drains, along with other toxics, could be enormously beneficial.

It would also be helpful to develop methods that make it easier for emergency responders and law enforcement to track spills back to the source through the storm water collection systems. Ecology came up with the idea to add GIS layers for all storm drain systems that empty to Puget Sound available for responders. It would be necessary to partner with local governments to accomplish this.

In addition, Washington must strengthen efforts to engage those in the community that have the potential to spill oil from point sources when that oil has the potential to be transported to marine waters. Members of the community that meet this description include hydro-electric projects, rail roads, and tanker trucks. This would be something that could be coordinated in conjunction with Ecology’s Spills Program and its water quality program.

Ecology has indicated it would like to develop an expanded program to perform spill prevention inspections for oil handling facilities that do not transfer over water, but pose a risk of contaminating waters of the state when spills occur. Apparently, there are almost 5,000 oil handling facilities in Washington that are not regulated by Ecology, but could be.

**6. Increase investigations of small spills.**

Spills are less likely to occur if there are thorough investigations for those that do happen. This is particularly true if those investigations lead to lessons learned and also lead to penalties that deter future spills. Investigations also serve to educate government and the public about the impacts of spills and, thus, have a preventative future effect.

## **7. Department of Ecology's oil spill program.**

Key to preventing oil spills in Washington waters are the following Ecology programs (this is not an exhaustive list). Assuring that these programs are well-funded and effectively administered is important to assuring the health of Puget Sound. Additionally, however, as indicated below, there are ways to augment these programs.

### **a) Prevention from vessels and oil-handling facilities**

Prevention activities include:

- Implementing the new oil transfer rule.
- Boarding vessels to educate and monitor compliance with federal law.
- Requiring, reviewing and granting approval of operation manuals, prevention plans, and training and certification programs.
- Maintaining the Neah Bay tug.
- Implementing protocols from the Memorandum of Agreement with the U.S. Coast Guard.
- Administering voluntary programs for vessels: Voluntary Best Achievable Practices (VBAP) and Exceptional Compliance Program (ECOPRO).

### **b) Response preparedness.**

Preparedness for rapid spill assessment and response is done through the following:

- Implementing the new oil spill contingency plans rule.
- Administration of drills.
- Distribute spill response equipment to communities.

### **c) Rapid response.**

Assistance with rapid spill assessment and response is done through the following:

- Maintaining constant spill response capability.
- Responding to all oil spills from vessels and facilities.
- Working with Incident Command in the event of a spill.

### **d) Areas needing further development.**

The following items represent areas where support from the Puget Sound Partnership could be vital to achieving augmentations to Ecology's oil spill prevention, preparedness, and response program. These augmentations would enhance prevention and containment of medium to large sized spills:

- Federal delegation -- Support delegated authority from the U.S. Coast Guard to conduct vessel and facility inspections and conduct reviews of federal oil spill contingency plans.
- Vessels of opportunity – Assist with identification and designation of vessels (such as fishing vessels) that could be designated to assist with deployment of spill response equipment in the event of a spill. This is in addition to assuring that appropriate industry-funded work boats are designated under the oil spill contingency planning rule.
- Volunteer responders – Assisting Ecology (and WDFW) with programs to bring pre-trained volunteers into spill response and to more effectively handle convergent volunteers in spill events.
- Developing green ports – Support Ecology’s coordination with public ports to create incentives to discharge waste oil in port.
- Local response equipment – Help to enhance grant programs for communities and marinas to have spill response equipment on hand.

#### **IV. Conclusion**

By incorporating the above oil spill issues into its Action Agenda, the Puget Sound Partnership can go a long way toward restoring and protecting the health of Puget Sound.

Please do not hesitate to contact me or the Council staff to discuss ways to collaborate on this issue.

Thank you.