



Environmental Protection & Science

The Oil Pollution Act directs our council to review, monitor, and comment on Alyeska's environmental protection capabilities, as well as the actual and potential environmental impacts of terminal and tanker operations. The Act also calls on us to develop recommendations on environmental policies and permits. The council carries out this work through two major programs: Terminal Operations, and Environmental Monitoring. Under the leadership of the Scientific Advisory Committee and the Terminal Operations and Environmental Monitoring Committee, the council commissions scientific studies to determine actual or potential risks, to document levels of pollution and biological effects, and to better understand new technologies and the environmental costs or benefits that might be associated with their use.

TERMINAL OPERATIONS

Besides posing the risk of a major oil spill caused by earthquake or accident, Alyeska's Valdez tanker terminal produces ongoing air and water pollution from routine operations, as allowed by its permits from regulatory agencies. The council oversees terminal operations in an effort to not only minimize the risk of spills, but to make sure that permitted pollution is within or below regulatory limits and that those limits are set at the lowest feasible levels.

The council has monitored oil loading at Alyeska's Valdez tanker terminal since January 2002. At that time, an average of 968,000 barrels of North Slope crude moved onto tankers every day. Since then, oil flow decreased every year, reaching a low in 2008 of about 640,000 barrels per day. The downtrend started in the early 1990s,



when oil flow through the terminal peaked at about two million barrels per day.

In 2002, the oil moving through the terminal was valued at \$700,000,000 per month. As a result of prices rising faster than throughput dropped, the value of the oil increased to a peak of \$2.7 billion per month in June 2008. Then, as prices dropped, the oil values dropped to a low of \$675 million per month in December 2008. Increasing prices and a slight rise in throughput increased the value of oil loaded to approximately \$1.2 billion in May 2009.

Council staff continues to monitor oil storage in tanks installed for that purpose at the Valdez terminal. Average inventories appear to have increased and the tanks are typically 50 percent to 80 percent full. Some excursions above 80 percent have occurred when tanker loading was slowed by extreme weather conditions or maintenance work on the loading berths.



Top: Prince William Sound is dotted with countless small, beautiful islands like this one. Photo by Bill Driskell.

Above: Alyeska Pipeline's Valdez Marine Terminal, where oil tankers load their cargoes of North Slope crude. Photo courtesy of Alyeska Pipeline.



This Anguil incinerator burns vapors collected during the ballast water treatment process. Two such units have been installed at the Ballast Water Treatment Facility. Photo by Tom Kuckertz.



These men participated in a council-sponsored marine firefighting symposium in May 2008. Photo by Billy Jo Gehring.

Air and Water Quality

For many years, the council has been concerned about the emission of hazardous air pollutants from the Ballast Water Treatment Facility.

This facility cleans oily ballast water discharged by tankers arriving in Valdez (The ballast water is contaminated as a result of being carried north in the same tanks used to haul oil south.) The cleaning process in the past has released large quantities of hydrocarbon vapors into the air.

These vapor emissions are in the process of being dramatically reduced by a major, multi-year upgrade that Alyeska is performing at the ballast water facility. The council staff has participated in design review of the project from the start; when complete in 2010 or 2011, it is expected to reduce vapor emissions to near zero.

Firefighting equipment in Port Valdez

The council became concerned in 2007 that the equipment available to fight a fire on a tanker in Port Valdez might not meet contingency plan requirements, which call for a fire-fighting vessel to be present during tanker operations. The council hired a team of contractors to assess firefighting capabilities. The team found that the mainstay of the fire-fighting system—the fleet of escort tugs—were among the best equipped such vessels to be found anywhere in the country and that they met or exceeded all regulations, standards, and best industry practices. The team noted that the individual components of the system—the Valdez Fire Department, Alyeska’s Ship Escort Vessel Response System, the Alyeska Fire Brigade, and the U.S. Coast Guard—fully satisfied regulatory requirements individually. The council’s team recommended training and exercising together in order to be fully prepared for on-water incidents.

The team’s “Final Report — Firefighting in Port Valdez” is available in Portable Document Format at tinyurl.com/pwsffrpt on the council’s website.

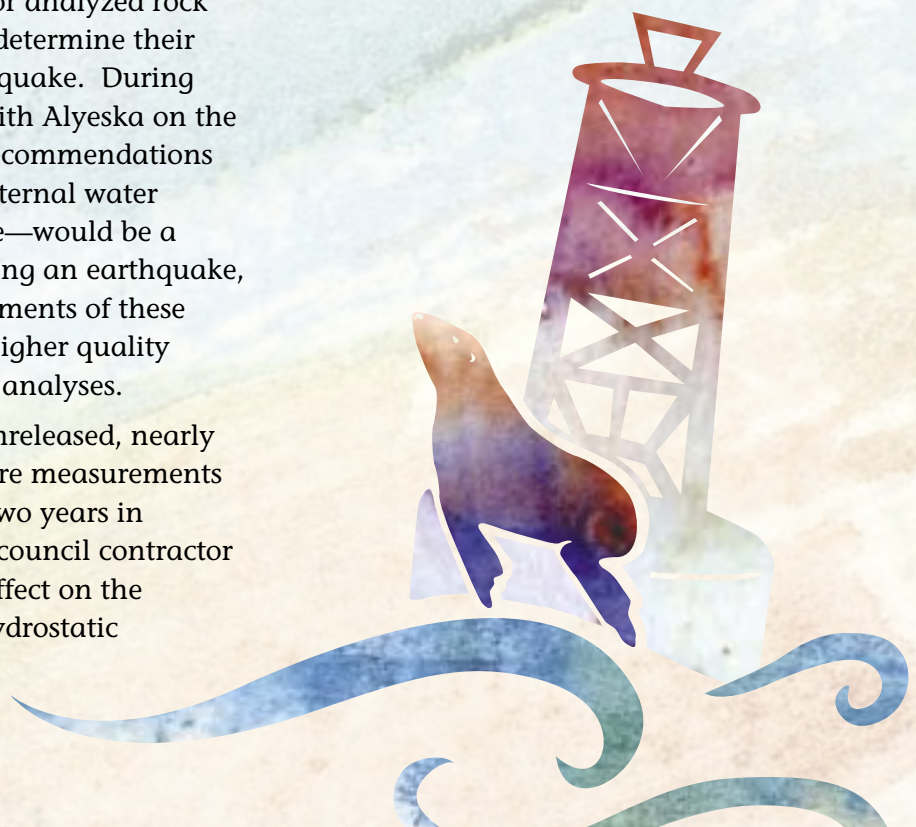


Slope stability at the Valdez Marine Terminal

During 2006, a council contractor analyzed rock slopes at the tanker terminal to determine their stability in the event of an earthquake. During 2008, the contractor conferred with Alyeska on the company's implementation of recommendations from the 2006 study. Because internal water pressure—or hydrostatic pressure—would be a major factor in slope failure during an earthquake, discussions centered on measurements of these pressures and how to integrate higher quality measurements into slope failure analyses.

Alyeska provided a heretofore unreleased, nearly continuous, time-series of pressure measurements by automatic instruments over two years in support of another project. The council contractor assessed the new data for their effect on the validity of assumptions about hydrostatic pressures in the rock slopes.

These incinerators at Alyeska Pipeline's Valdez terminal burn oily vapors that escape from the cargo holds of oil tankers as they take on North Slope crude.



Stability of the slope immediately behind Alyeska's vapor control and electrical generation facility was re-examined in light of the new data, revealing a the occurrence of significant pressure fluctuations not observable in data collected manually a few times per year from measuring devices (called piezometers) installed during construction of the terminal in the late 1970s. The piezometers were installed to provide a warning of increasing hydrostatic pressures behind the slope face, which would increase the probability of slope failure.

The contractor's analysis raised concerns that data from the construction-era piezometers may not accurately indicate the true range of hydrostatic pressures in the slope and hence could fail to detect an increased risk of slope failure due to increasing water pressures in the rock.

The council's contractor also found that drainage holes drilled to relieve pressure in the rock slopes were only partially effective, due to insufficient maintenance to remove clogging, to the impermeability of the rock behind the slope, and to the spacing of the drain holes.

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The contractor's report, "Seismic Re-Engineering of the Valdez Marine Terminal," is available in Portable Document Format at tinyurl.com/pwsseismic on the council website.





Floatplanes are frequently used to reach remote parts of Prince William Sound for council research projects.
Photo by Bill Driskell.

ENVIRONMENTAL MONITORING

Chemical Dispersants

Chemical dispersants are substances designed to disperse spilled oil down into the water column, rather than leaving it floating on top in a slick. The council promotes research and testing to increase knowledge about chemical dispersants and the environmental consequences of their use in Alaska waters.

The council has raised concerns about the efficacy and toxicity of dispersants for years, urging regulatory agencies to be conservative in their use. Because outstanding questions have not been answered and research has not demonstrated that dispersants would work at all in the waters of Prince William Sound, these concerns remain largely unaddressed and the council continues its advocacy for research into dispersant use in cold seawater.

Council representatives continue to participate in the Alaska Regional Response Team's Science and Technology Committee as it prepares to update the

Alaska dispersant use guidelines. This committee is making use of the council's comprehensive literature review, completed last year, to aid in determining the state of dispersants science and any changes in research results.

September 2008 saw a significant policy shift on dispersants when the U.S. Department of the Interior adopted a new requirement for more intensive review before the chemicals can be used on oil spills in large areas of Prince William Sound and Cook Inlet.

The policy shift withdrew Interior Department approval for what is called 'preauthorized' dispersant use in substantial parts of the two water bodies. Instead spill managers will need to decide about dispersant use on a case-by-case basis.

Preauthorization means dispersants can be used by oil-spill response managers without consulting Interior or the other agencies with responsibilities in the affected area. The areas at issue are in what was called Zone 1 under dispersant use guidelines adopted for Cook Inlet in 1986 and for Prince William Sound in March 1989, shortly before the Exxon Valdez spill.



The green crab is a potential invasive species for Prince William Sound, though it hasn't arrived yet. Shown here are a male and female of the species, which has already invaded waters as far north as Vancouver Island, British Columbia, where this photo was taken. Photo by Dan Gilson.

Invasive Species

Invasive species, long a major concern for the citizens' council, refers to the problem of non-indigenous plants, animals, or microorganisms reaching Alaska and establishing themselves here. Such invasions can harm native species, including commercially valuable ones like salmon. For the citizens' council, the primary concern is non-indigenous organisms arriving via oil tankers—either attached to hulls or riding in the ballast water that the tankers discharge into Prince William Sound before loading North Slope crude at the Alyeska terminal in Valdez.

The ballast water problem arises from the fact that some tankers employ segregated ballast tanks where “clean” sea water is used for stability.

This “clean” ballast, taken in at the port of origin, is filled with living organisms that are discharged with it into Prince William Sound and Port Valdez as the tankers approach the Alyeska terminal for loading. Because of the potential for invasions by harmful species, the council has made this issue a high priority since 1996.

The council supported an effort in the state legislature to create the Alaska Council on Invasive Species to serve as a statewide clearinghouse and coordinating body. The bill would create a

14-member council. Five seats would be held by commissioners of state departments. The rest would represent soil and water conservation districts, conservation organizations, farmers, landscapers, commercial fishermen, commercial shippers, the University of Alaska agricultural program, Native corporations, and the public at large. Although the bill did not make it out of committee during the 2009 session, it will remain “alive” through the end of the 2010 session.

On the federal side of the invasive species issue, council staff member Lisa Ka’aihue continued to serve on the national Invasive Species Advisory Committee, which provides input to the National Invasive Advisory Council on matters of interest to the council such as ballast water management.

The council continued to provide leadership to citizen monitoring efforts, particularly looking out for green crab. The green crab, a known ballast water invader, is an efficient and voracious predator that has invaded the coastline from San Francisco up to Vancouver Island. It is expected that this crab will find its way to Alaska waters. During the past year, the citizen monitoring network was expanded to include Seward.

The council, in partnership with the U.S. Fish and Wildlife Service, continued to work on a project to describe biofouling communities on large vessels that operate in Prince William Sound, including oil tankers, barges, ferries and cruise ships. Biofouling occurs when organisms, like barnacles or mussels, attach themselves to vessel hulls. The study will provide important information on which vessels pose the greatest risk of introducing invasive species via fouling. Results are expected to be available in the fall 2009.

Regional Environmental Monitoring

In 1993, the council established a Long-Term Environmental Monitoring Program, called LTEMP. The program assesses the status of hydrocarbon levels in the Sound, as well as long-term trends and any new developments that could have an effect on those levels.

Samples are collected at 10 intertidal sites in Prince William Sound and the Gulf of Alaska. Mussel tissues and sediments from the sites are analyzed in a laboratory to determine whether hydrocarbons are accumulating and, if so, their source. The result is the largest chronological data set ever compiled for hydrocarbons in Prince William Sound.

LTEMP sampling will be conducted less frequently in the future, as laid out in a new sampling plan developed after an independent review accepted by the board in January 2009. The new plan requires one sampling session per year at the two Port Valdez sites and the Knowles Head site. Every fifth year, all 10 sites will be sampled. In the past, the sampling frequency was as high as three times annually at all ten sites.

LTEMP reports, along with additional information on the program, are available at www.tinyurl.com/ltemp on the council website.



Scientist Bill Driskell collects mussels for the citizens' council's Long-Term Environmental Monitoring Program. Photo by Lisa Ka'aihue.



Expedition leader Howard Feder sifts Prince William Sound bottom sediments during a sampling trip as part of an Alyeska research project. Photo by Jacquelyn Olson.

