

Introduction

Tanker ships have transported Alaskan crude oil through Prince William Sound since 1975. In March of 1989, the Exxon Valdez ran aground on the Bligh Reef, spilling 10.8 million gallons of crude oil into the Prince William Sound (Figure 1). The timing of the spill, remote location, thousands of miles of rugged and wild shoreline, and the abundance of wildlife in the region combined to make it an environmental disaster. Approximately 1,300 miles of Alaskan shoreline was impacted, and effects are still being felt today.

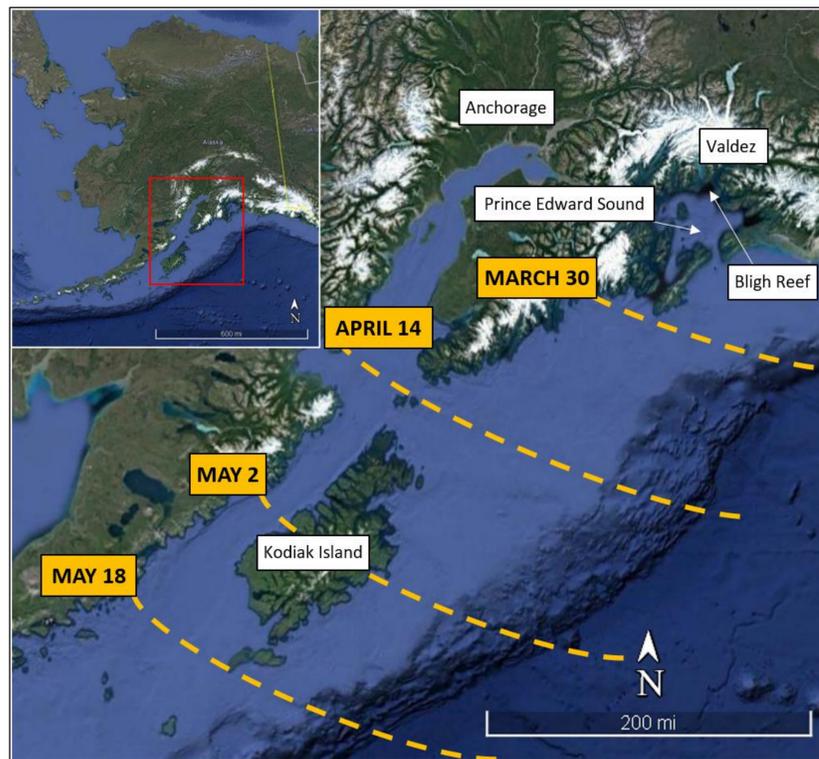


Figure 1 Prince Edward Sound and Kodiak Island in the context of south Alaska. The spill originated in Prince Edward Sound. After 56 days, the spilled oil reached Kodiak Island.

Immediate Effects and Lasting Impact

Floating oil caused acute mortality in species that require contact with the sea surface, like marine mammals and seabirds. In some areas, sea otter populations fell by half. Populations are still struggling to recover- some other communities have only increased by 4% every year. Microalgae and benthic invertebrates also died off as a result of chemical toxicity, smothering, and physical displacement from the habitat by pressurized wash-water applied by after the spill. An important biogenic habitat provider, the rockweed *Fucus gardneri*, almost disappeared from the

Alaskan shoreline, impacting hundreds of species who relied on it as a habitat and food source. A 2001 seashore survey in Prince William Sound revealed 55,600 kg of oil in intertidal subsurface sediments (Figure 2). Oil continues to travel through the food web, trapped below mussel beds and kelp forests.



Figure 2 A Kodiak resident cleans oil off a beach in Larsen Bay. Photograph: Natalie Fobes/Corbis

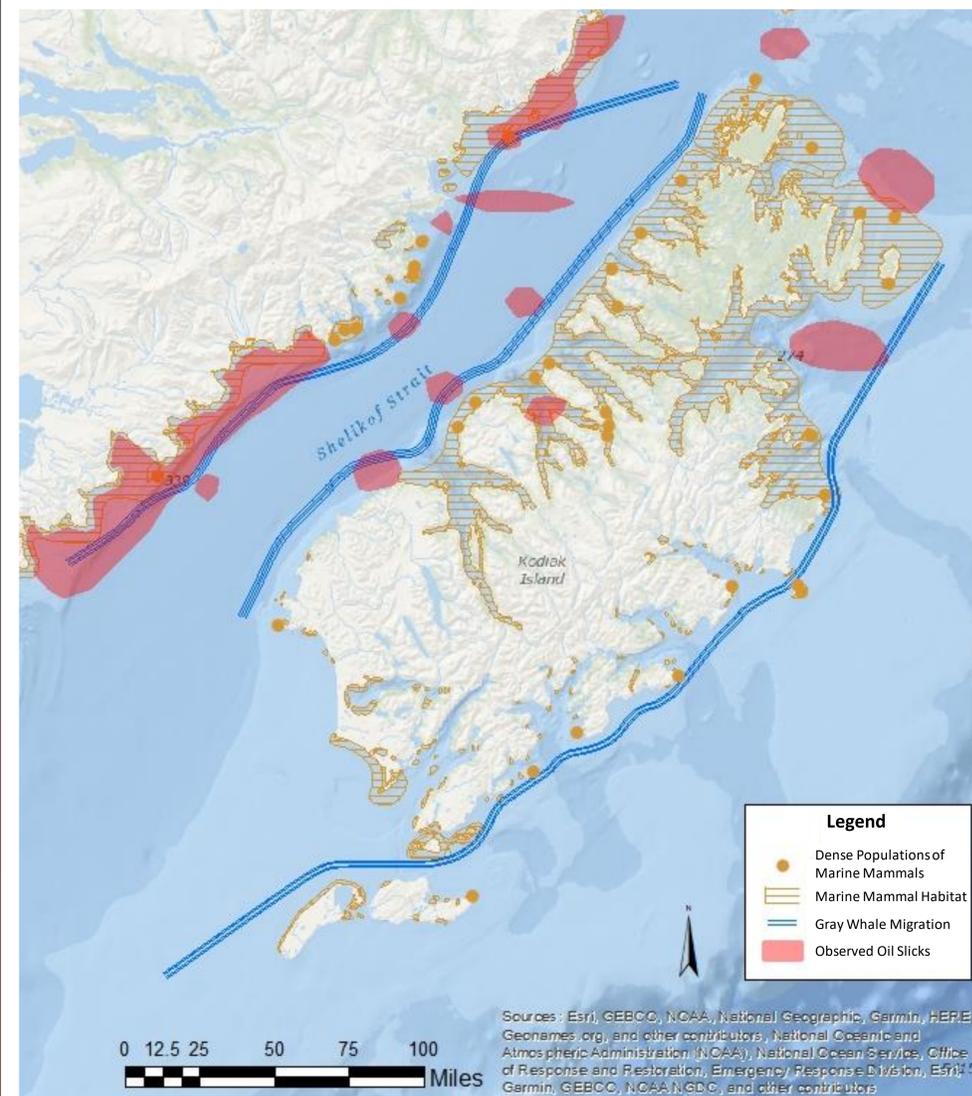


Figure 2 Grey Whale migration, densely populated marine mammal points, and marine mammal habitats of Kodiak Island in relation to reported oil slicks.

Accident Timeline

- March 23 7:48pm** Navigational, mechanical, and safety tests are performed.
- March 23 9:12pm** *Exxon Valdez* departs the Alyeska Pipeline terminal in Valdez, Alaska, with 53,094,510 gallons of crude oil.
- March 23 11:25pm** After traversing the Valdez Narrows safely, the *Exxon Valdez* reaches Prince William Sound and increases speed. The ship's course is set to due south by the captain, Joseph Hazelwood, and is placed on autopilot.
- March 23 11:47pm** The ship crosses out of the shipping lane to avoid sea ice.
- March 23 11:52pm** The speed continues to increase. Cousins, the only officer on the bridge, has been awake and working for approximately 18 hours.
- March 24, 1989 12:00am** Cousins plots a course to return to the shipping lane. Lookout reports the Bligh Reef is off the starboard bow.
- March 24 12:04am** *Exxon Valdez* runs aground on Bligh Reef.
- March 24 6:00am** 9,000,000 gallons of crude oil has been discharged. The Coast Guard confirms the growing oil slick is 1,000 feet wide and four miles long. No measures have been taken to contain the spill.
- March 24 evening** First application of the oil dispersant Corexit 9527 is unsuccessful
- March 28** Five more applications of Coexit 9527 are made with unsatisfactory results. A total of around 45,000 gallons of dispersant was sprayed.
- March 29** Shoreline clean up efforts begin. NOAA reports pools of emulsified oil. Oil has penetrated gravel beaches by 20 cm.

Post Exxon Valdez Disaster Response Plans

Before the 1989 disaster, risk assessment models were limited to short term events. The magnitude of the *Exxon Valdez* disaster forced an evaluation of ecological impacts of unprecedented scope and duration. It is now understood that the slow response to the oil spill increased the intensity of the incident. Today, comprehensive spill prevention and response plans exist for almost 40 environmentally sensitive areas on Kodiak Island. These Geographic Response Strategies (GRS) are map based, site-specific response plans that document tide and wind patterns, wildlife considerations, and other factors. The GRS helps first responders in the critical first few hours of an oil spill response. Figure 3 is taken from the GRS for Larsen Bay.

In 2017, the Natural Resource Damage Assessment and Restoration Program completed its rehabilitation of 1,058 acres of coastal habitat in Termination Point in Marmot Bay, an area heavily impacted by the oil spill. Marmot bay is an area of global importance for marine birds such as cormorants, tufted puffins, and more. It is also the site of continuous kelp beds that provide habitats for sea otters, sea lions, and juvenile fish.

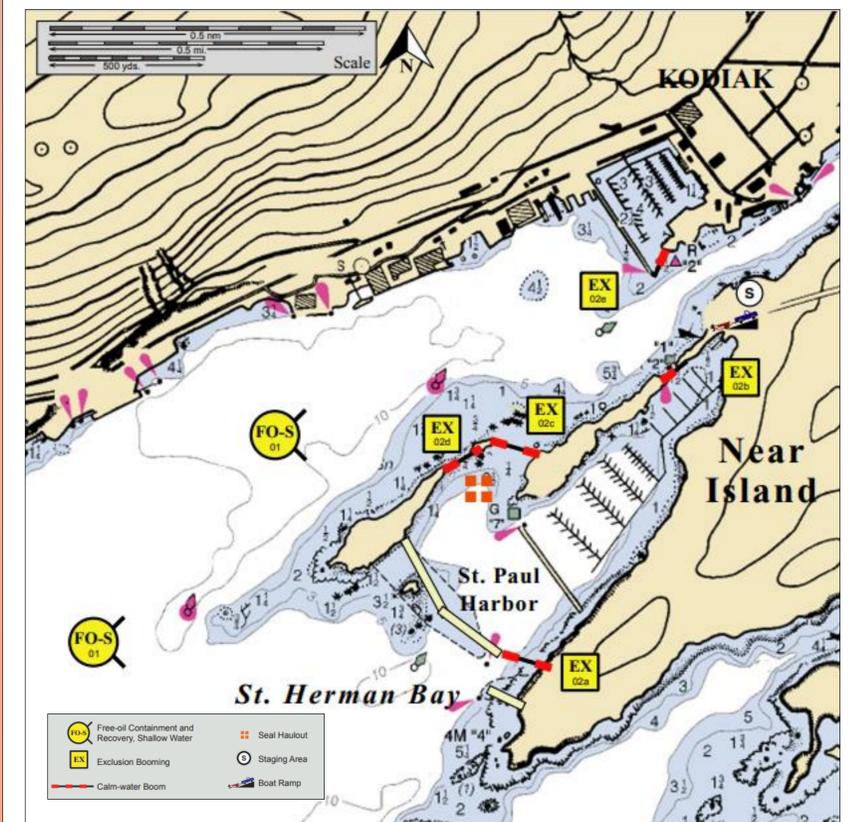


Figure 3 An excerpt from the GRS for Larsen Bay, Kodiak. This map provides essential information for oil spill prevention and recovery plans outlined in the GRS. Adapted from Nuka Research and Planning Group, LLC (2008)

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