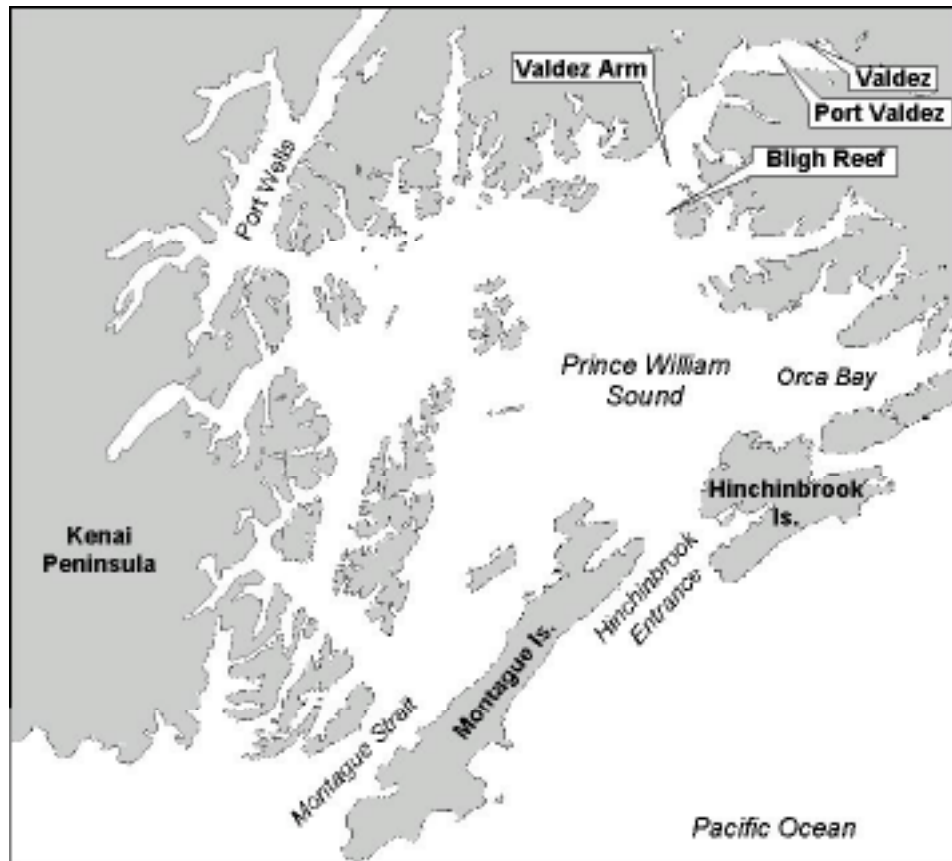


User's Guide

Welcome to the Location File for Prince William Sound, an embayment of the Gulf of Alaska, located in south-central Alaska. Prince William Sound is bordered on the west by the Kenai Peninsula; Montague Island and Hinchinbrook Island lie at the main entrance to the sound. Prince William Sound is well known as the location of the 1989 Exxon Valdez oil spill, which spilled nearly 11 million gallons of oil into its biologically rich waters.



NOAA created Location Files for different U.S. coastal regions to help you use the General NOAA Oil Modeling Environment, GNOME. Each Location File contains information about local oceanographic conditions that GNOME uses to model oil spills in the area covered by that Location File. Each Location File also contains references (both print publications and Internet sites) to help you learn more about the location you are simulating.

As you work with the Location File for Prince William Sound, GNOME will prompt you to:

1. Choose the model settings (start date and time, and run duration).
2. Input the wind conditions.

GNOME will guide you through choosing the model settings and entering the wind conditions. Click the Help button anytime you need help setting up the model. Check the “Finding Wind Data” Help topic to see a list of web sites that publish wind data for this region.

More information about GNOME and Location Files is available at <http://response.restoration.noaa.gov/software/gnome/gnome.html> .

Technical Documentation

Background

Prince William Sound is one of the larger estuaries in North America. Its waters have a surface area of approximately 10,000 square kilometers. Rivers and a significant number of tide-water glaciers supply fresh water to the sound. The circulation is thought to be primarily tidally driven.

Prince William Sound has two main connections to the Gulf of Alaska: Hinchinbrook Entrance and Montague Strait. Three smaller fjords connect to Prince William Sound and can affect the circulation: Port Valdez, Port Wells and Orca Bay.

Current Patterns

The Prince William Sound Location File uses five current patterns to simulate the circulation and tides. The tides at Hinchinbrook Strait, Port Wells, Montague Strait, and Valdez Arm are each simulated with separate current patterns. The tidal circulation of Latouche Passage, Elrington Passage and Prince of Wales Passage are all simulated with two current patterns: (1) a modified portion of the Montague Strait current pattern and (2) a background current pattern. The background current pattern models the net surface currents through each of these passages: Latouche Passage (-0.3 knots); Elrington Passage (0.3 knots), and Prince of Wales Passage (-0.9 knots). The tidal current pattern for Montague Strait was extended to each of these passages with relative amplitudes that approximate the residual tides. Since the phase differences between these areas were on the order of an hour, this approximation was considered acceptable.

Winds

The winds in Prince William Sound can be influenced by cold air drainage through the fjord areas. In the Standard Mode of GNOME, a single wind vector is used for the modeling domain. You should be aware that under certain

conditions, particularly for spills near the entrances of the passages, model uncertainties will increase.

References

You can get more information about Prince William Sound from these publications and web sites.

Oceanographic

Johnson, W.R., T.C. Royer, and J.L. Luick (1988). On the Seasonal Variability of the Alaska Coastal Current. *Journal of Geophysical Research* 93(C10): 12,423-12,437.

Niebauer, H.J., T.C. Royer, and T.J. Weingartner (1994). Circulation of Prince William Sound, Alaska. *Journal of Geophysical Research* 99(C7): 14,113-14,126.

Royer, T.C. (1979). On the effect of precipitation and runoff on the coastal circulation in the Gulf of Alaska. *Journal of Physical Oceanography* 9: 555-563.

Royer, T.C. (1981). Baroclinic transport in the Gulf of Alaska II: A fresh water driven coastal current. *Journal of Marine Research* 39: 251-266.

Royer, T.C. (1982). Coastal fresh water discharge in the northeast Pacific. *Journal of Geophysical Research* 87: 2017-2021.

Wind and Weather

NOAA National Weather Service, Alaska Region
<http://www.alaska.net:80/~nwsar>

Marine forecasts for Alaska in text form. Marine weather images, satellite images, and links to other Alaska weather web sites.

Prince William Sound Weather Data and related links
<http://www.pwssc.gen.ak.us/sea/weather/weather.html>

Links to Prince William Sound and Alaska weather data.

NOAA National Weather Service (NWS)
<http://www.nws.noaa.gov>

Current weather observations, forecasts, and warnings for the entire U.S.

Oil Spill Response

NOAA Hazardous Materials Response Division (HAZMAT)
<http://response.restoration.noaa.gov>

Tools and information for emergency responders and planners, and others concerned about the effects of oil and hazardous chemicals in our waters and along our coasts.