# Coastal Habitat Mapping Program *Fact Sheet*

**ShoreZone** is a mapping and classification system that specializes in the collection and interpretation of low-altitude aerial imagery of the coastal environment. Its objective is to produce an integrated, searchable inventory of geomorphic and biological features of the intertidal and nearshore zones which can be used as a tool for science, education, management, and environmental hazard planning.

Oblique low-altitude aerial video and digital still imagery of the coastal zone is collected during summer low tides (zero-meter tide level or lower), usually from a helicopter flying at <100 m altitude. The flight trackline is recorded at 1-second intervals using electronic navigation software and is continuously monitored in-flight to ensure the collection of all shorelines (Fig. 1).

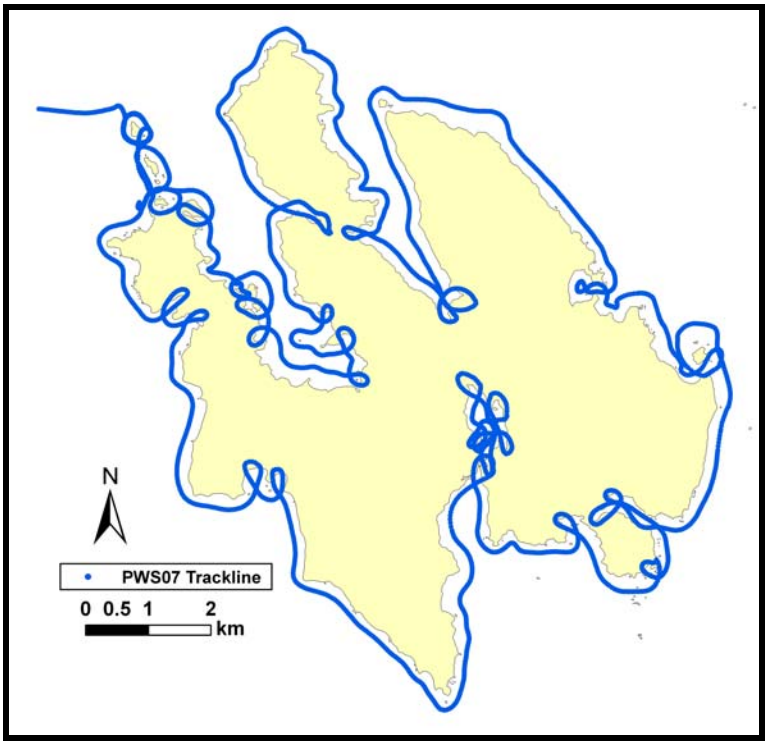


Figure 1. Example of recorded flight trackline, showing 1-second GPS navigational fixes (Perry Island, Prince William Sound, Alaska).

Video and still images are spatially-referenced and time-synchronized (Figs. 2, 3). Video imagery is accompanied by commentary by a geologist and a biologist aboard the aircraft. The imagery and commentary are later used in the definition of discrete along-shore coastal habitat *units*. Geomorphic, sedimentary, and biological features within each unit are mapped into across-shore *zones* with respect to relative tidal elevation. Units are digitized as shoreline segments in ArcGIS software, then integrated with the coastal attribute data in a relational geodatabase. Mapped habitat features include wave exposure, substrate type, geomorphology, sediment texture, and biological assemblages ("biobands") such as marsh grass, algae, kelps, and eelgrass (Fig. 4). Other attributes can be inferred using mapped data, such as the Oil Residence Index, a function of wave exposure and substrate type (Fig. 5).


Figure 2. Example of a frame capture from video imagery in Zaikof Bay, northern Montague Island, Prince William Sound. Note GPS location, time code, and date burned on imagery, information which is also recorded in the navigational trackline.

Figure 3. Example of digital still imagery, showing biobands in Louis Bay, Knight Island, Prince William Sound. Digital still photos are linked to the navigational tracklines by a unique time code, providing a GPS position on the shoreline for each image.

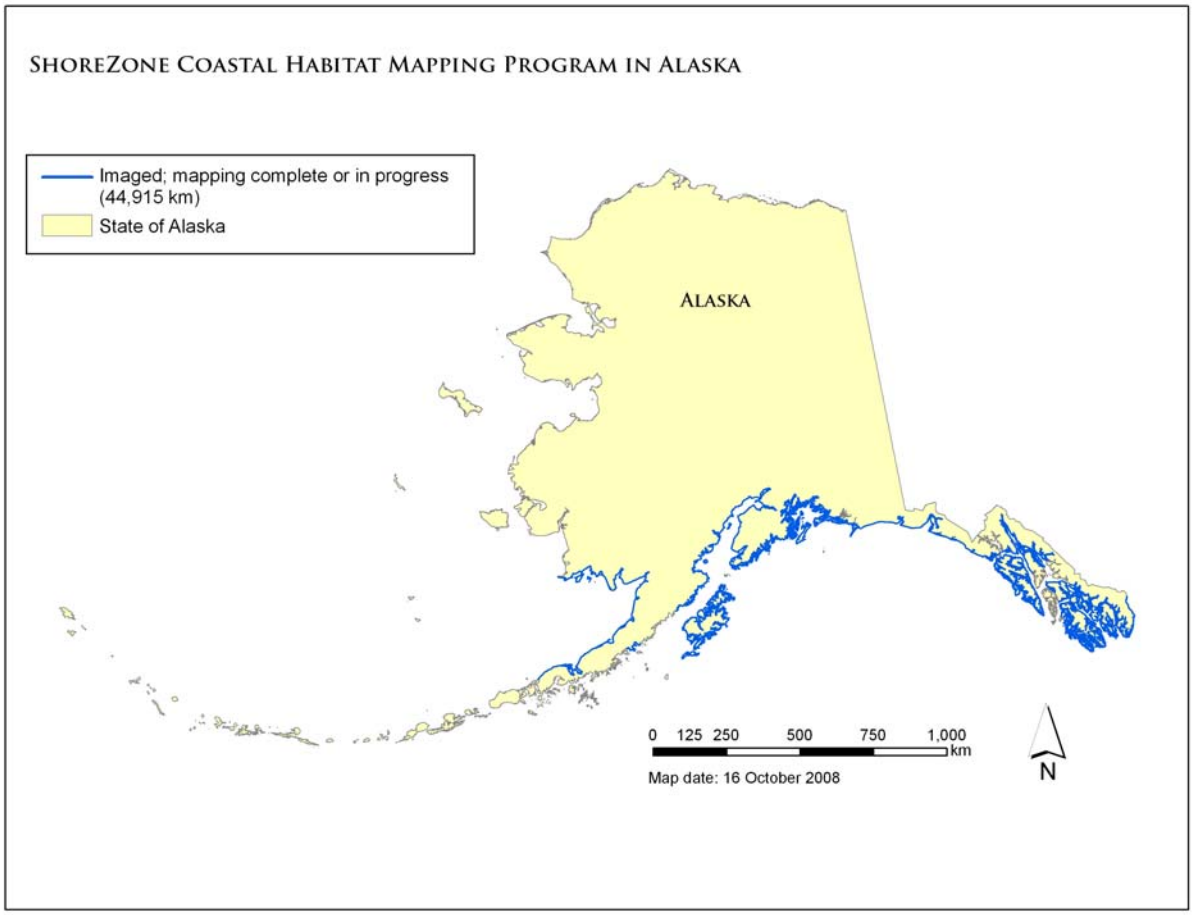


Figure 4. Extent of ShoreZone imagery in Alaska. Imagery and mapped data can be viewed online at the NOAA ShoreZone website (www.alaskafisheries.noaa.gov/maps).

The ShoreZone mapping system provides a spatial framework for coastal habitat assessment on local and regional scales. Imagery now exists for 45,000 km of coastline in the Gulf of Alaska (Fig. 4) and 43,000 km of coastline in British Columbia and Washington state (from the Columbia River mouth to the Alaska/BC border). Applications of ShoreZone coastal mapping data and imagery include resource management, environmental hazard planning, recreation, education, outreach, and desktop reconnaissance. Recent research applications include habitat suitability modeling to predict the spread of invasive species such as the European green crab and the cordgrass *Spartina*.

The Alaska ShoreZone coastal mapping program is a partnership of scientists, GIS specialists, web specialists, nonprofit organizations, and governmental agencies. Field programs, data management, and product distribution are coordinated by coastal geologists Dr. Jodi Harney and Dr. John Harper of Coastal and Ocean Resources Inc. (Sidney, British Columbia) and coastal biologist Mary Morris from Archipelago Marine Research (Victoria, BC). A full protocol of the ShoreZone Coastal Habitat Mapping technique in the Gulf of Alaska is available on the Coastal & Ocean Resources website (www.coastalandoceans.com). Imagery and data in mapped regions of Alaska can be viewed, queried, and downloaded at the NOAA ShoreZone website (www.alaskafisheries.noaa.gov/maps).

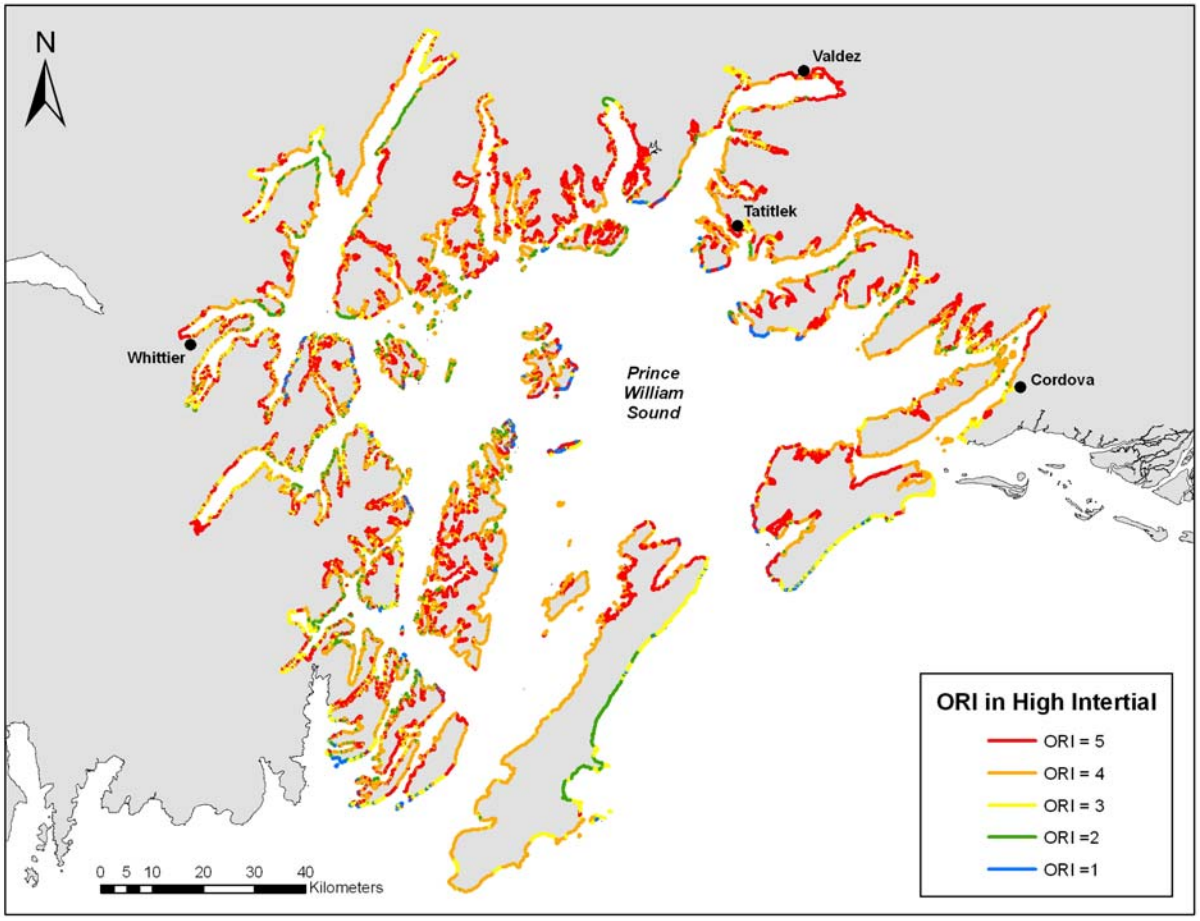


Figure 5. Oil residence index in the high intertidal zone of Prince William Sound. ORI is a function of wave exposure and sediment type. Highest values indicate an oil residence time of months to years.

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