



## **INTERAGENCY AGREEMENT WITH WASHINGTON DEPARTMENT OF ECOLOGY**

### **Agreement No. IAA 13-097**

This Agreement is between the Washington Department of Ecology, referred to as “Ecology” and the Washington State Department of Natural Resources, Aquatics Resources Division, referred to as the DNR.

The DNR is under authority of RCW Chapter 43.30 of Washington State, Department of Natural Resources. DNR and Ecology enter into this agreement under Chapter 39.34, Interlocal Cooperation Act.

The purpose of this Agreement is to conduct high resolution multibeam bathymetric mapping, topographic lidar, and single beam bathymetric mapping in the shallow intertidal and subtidal coastal areas around river mouths to assess sediment stability and natural resource limitations to installation of sustainable coastal energy structures, or energy storage or transport facilities.

## **Attachment A**

### **STATEMENT OF WORK**

#### **Scope of Work**

##### Project 1: Northern outer coast multibeam and topographic lidar

High-resolution multibeam bathymetric and sediment characterization surveys will be collected of priority nearshore subtidal, intertidal, and coastal areas such as around navigable river mouths to assess sediment stability and natural resource limitations to laying power cables. Emphasis will be on the collection of multibeam bathymetric data inshore and shallower than existing bathymetry and extend onshore via collection of high-resolution topographic lidar data of intertidal beaches and bluffs along the coast. Nearshore areas such as Makah Bay, Rialto Beach, and First Beach and river mouths such as the Quillayute and coastal bluffs along the Quinault Indian Reservation will be surveyed as conditions allow and priorities dictate.

These data will represent the first high-resolution mapping of nearshore sand bodies, bedrock outcrops, and beaches and shorefaces composed of a patchwork of mixed sand and gravel substrate in a high-energy shallow nearshore coastal environment devoid of existing physical data. These habitat types support varying and distinct nearshore communities. Efforts will be made to coordinate data collection in locations that complement ecological monitoring sites and auxiliary data sets valuable to coastal resource management. These data will also complement and augment nearshore wave-runner data to be collected in Project 2.

At La Push, these data will be useful for assessment of sediment transport and the suitability of existing and proposed dredged material disposal sites and sediment resource management alternatives, which have received scrutiny following recent erosion and emergency repairs of the Quillayute River jetties.

##### Deliverables:

1. A summary report on all new data collected including multibeam, backscatter, and lidar.
2. Processed data and data products including maps and images.

##### Project 2: Northern outer coast nearshore waverunner and beach profiles

WA Department of Ecology, the US Geological Survey and Oregon State University will collaborate to perform single beam cross-shore transects of intertidal nearshore areas around river mouths and priority nearshore regions. Waverunner (PWC) bathymetric surveys of intertidal nearshore areas complemented by beach topographic profile surveys to obtain profiles across the land/sea interface to approximately 10 m water depth (Figure 1). To perform these surveys, Ecology will collaborate with WA DNR and Washington Sea Grant to establish geodetic control throughout the region so that all surveys may be referenced to the land-based NAVD88 datum.

Existing nearshore bathymetry is limited to the southwest Washington coast at Ocean City and beach topographic data extends to Point Grenville (Figure 2). Priority areas for this project are to extend the current bathymetry survey in Grays Harbor County to the northern extent of the Quinalt Indian Reservation, covering an additional 60 km of coastline. Transects will range in alongshore intervals of 250 m in areas of particular interest to 1-2 km depending on the characteristic of the shoreline and shoreface. In Clallam County around La Push, approximately 16 km of shoreline will be mapped as a priority. Additional areas such as Makah Bay, Kalaloch Beach and the Hoh River mouth will be surveyed topographically and bathymetrically as resources and conditions allow.

All work will be performed in coordination with coastal tribes, NANOOS, U.S. Army Corps of Engineers, Washington Sea Grant, and local counties. Washington Sea Grant will provide in-kind support for beach profiling north of Point Grenville.

Deliverables:

1. Existing nearshore waverunner bathymetry from Ecology/OSU/USGS (most reaches north of Columbia River to Ocean City).
2. Existing beach topography north of Columbia River north to Point Grenville.
3. New nearshore bathymetry and beach topography profiles.
4. A report on data collection and recommendations for future work.

### Project 3: Mouth of the Columbia River multibeam

Portions of mouth of the Columbia River are surveyed annually by the Corps of Engineers, WA Ecology, Oregon State University and USGS. This project would expand and enhance on these existing survey efforts. Multibeam surveys will be conducted in the nearshore, expanding the areas where single beam data collection is already occurring. Because the Columbia River bar area is extremely treacherous, the work window for field collection is limited by wave and current conditions. Priority areas of interest in the nearshore and within the estuary (i.e., limited portions of Baker Bay) will be targeted as conditions permit and resources allow between initiation of the project and June 2013.

Deliverables:

1. Existing nearshore waverunner bathymetry from Ecology/OSU/USGS (most reaches from Columbia River mouth).
2. Existing beach topography from the Columbia littoral cell.
3. New nearshore bathymetry.
4. A report on data collection and recommendations for future work.

Project 4: Wahkiakum river mouths and ports multibeam and topographic lidar

Accretion, erosion and sediment dynamics drive flooding and navigation issues of concern at the river mouths in Wahkiakum County that flow into the Columbia River including , Grays, Skamokawa and the Elochman and in the Wahkiakum County ports. Below is a table listing specific focus areas where collection of updated bathymetry and bank stability data has been a recommended by previous flood management and watershed restoration studies.

Updated, detailed multibeam bathymetric and topographic lidar surveys of up to 5 of the smaller areas suggested from this list, (or other areas if local recommendations indicate them as higher priority), will be collected through the 2012-2013 winter and spring seasons. Additional resources will be required to complete the list and survey the larger areas including Grays river mouth and Cathlamet channel.

Location	Issue
County Sand Pit, Puget Island	Sediment deficit
Brown Slough pump station, Puget Island	Erosion
Grove Slough tide gate, Puget Island	Sedimentation
North Welcome Slough Rd, Puget Island	Bank erosion
Ferry terminal , Puget Island	Deposition and shoaling
Pancake Pt, Puget Island	Point erosion
Cathlamet channel, Wahkiakum Port #1	sedimentation
Cathlamet Marina	sedimentation
Skamokawa river mouth	sedimentation
Grays river mouth	sedimentation

Deliverables:

3. A summary report on all new bathymetric and bank topography data collected.
4. Processed data and data products including maps and images.

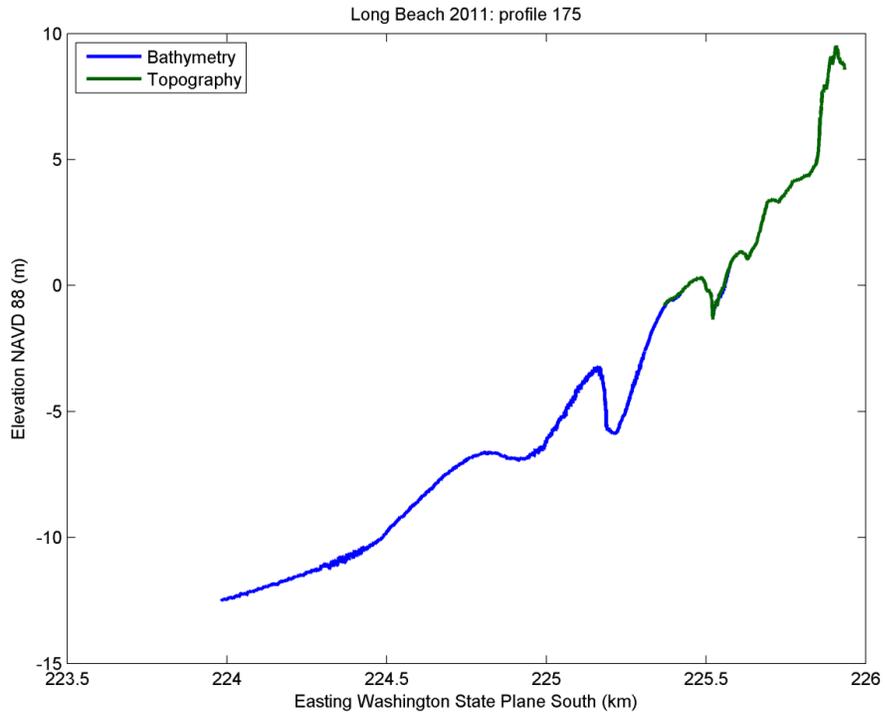


Figure 1. Example of combined beach topography and nearshore bathymetry collected by Ecology, USGS, and OSU in southwest Washington, revealing complex bar and trough morphology. The mean high water shoreline is located at approximately 3.0 m NAVD 88.

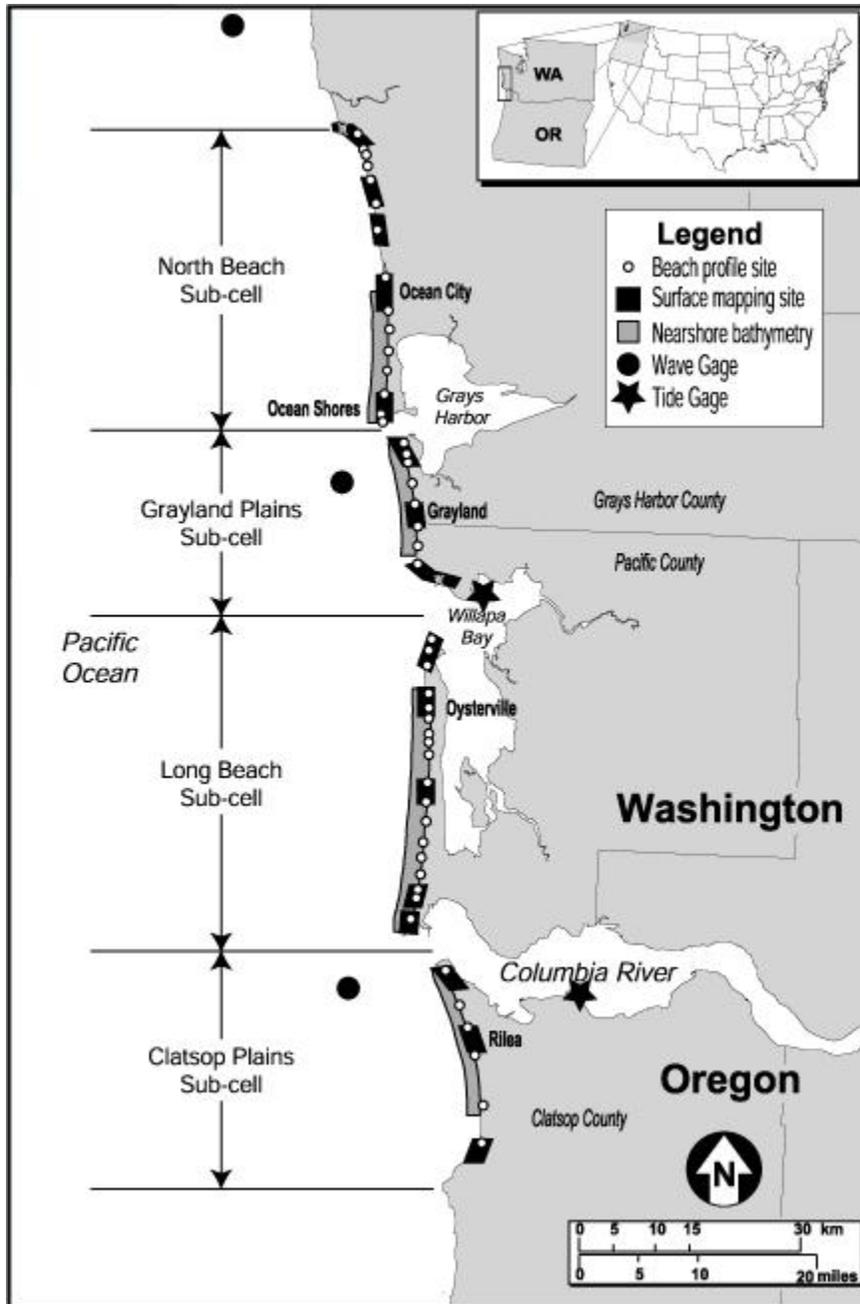


Figure 2. Beach profiles are monitored at 47 sites throughout the littoral cell. Three-dimensional surface maps are collected at 16 sites. Nearshore bathymetry is collected annually along more than half of the littoral cell, nominally at kilometer-spaced transects and in more detail at selected surface map sites. The locations of long-term tide and wave gages are also shown.