

Data Management Plan: Washington State Department of Ecology Coastal Monitoring and Analysis Program (CMAP)

(Taken from NOAA Data Sharing Template and adapted for IOOS Certification)

I. Type of data and information created

1. What data will you collect or create in the research?

Contextual statement describing what data are collected and relevant URL (IOOS Certification, f 2)

Beach topography data has been collected at least annually along the northwest Oregon and southwest Washington coasts since summer 1997. These data are collected by the Washington State Department of Ecology (Ecology) in collaboration with Oregon State University (OSU), the Oregon Department of Geology and Mineral Industries (DOGAMI), and the United States Geological Survey (USGS) comprising a beach and nearshore monitoring program partially funded by NANOOS. The monitoring program was initiated in summer of 1997 to “fill the coastal processes knowledge gap,” in an effort to better understand causes and possible responses to coastal change (Ruggiero et al., 2005). Data are typically collected using Real Time Kinematic Differential Global Positioning System (RTK-DGPS) at seasonal and annual timescales, and are later post-processed, quality controlled, and archived.

2. What data types will you be creating or capturing?

1. 2-dimensional, cross-shore oriented elevation profiles are collected at multiple discrete transect locations along the coast. These transects show the degree of change (horizontal and vertical) taking place across the sub-aerial beach down into the inter-tidal zone, and can also be used to determine changes in sediment volume and shoreline contours.
2. 3-dimensional beach surface elevation maps are also collected in order to better understand the alongshore variations in the beach, which may be the product of rip current embayments, hotspot erosion due to storms, or changes due to climate phenomena such as El Niños and La Niñas.

3. How will you capture or create the data?

Describe how the data are ingested (IOOS Certification, f 2)

Beach topography data are collected using RTK-DGPS antennas that are either mounted to a backpack (for cross-shore profiles collected on foot) or an ATV (for beach surface maps) and stored locally to the survey controllers. Data are downloaded manually after each survey and backed up on Ecology’s server.

Describe how data are managed (IOOS Certification, f 2)

After a survey, the data are backed up and stored on Ecology’s server in Trimble® proprietary formats. Raw GPS data are stored as well to be used for post-processing, if

Data Management Plan: Washington State Department of Ecology Coastal Monitoring and Analysis Program (CMAP)

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needed. The data are managed and processed by Ecology. Final data are stored in ASCII format on Ecology's server and backed up nightly.

Describe the data quality control procedures that have been applied to the data. (IOOS Certification, f 3)

We use Trimble® R7, R8, R8-3, & R10 GPS receivers, powered by Trimble Maxwell 6 chips and an unparalleled 440 GNSS channels, capable of tracking carrier signals from a wide range of satellite systems, including GPS and GLONASS. This system consists of a GPS base station (R7), Zephyr Geodetic antenna (model 2), ADL Vantage Pro radio modems, and R8, R8-3, and R10 "rover" GPS. Trimble reports that the R7, R8, R8-3, and R10 GPS systems have horizontal errors of approximately $\pm 1\text{-cm} + 1\text{ppm}$ (parts per million * the baseline length) and $\pm 2\text{-cm}$ in the vertical or less when operated in real-time kinetic (RTK) mode. When operated in static GNSS mode, Trimble reports these receivers having errors of $\pm 0.3\text{-cm} + 0.1\text{ppm}$ (parts per million * the baseline length) in the horizontal and $\pm 0.35\text{-cm}$ in the vertical. Baseline length (distance from base station) is typically kept at less than 10 km to minimize error.

During processing, the data are subject to both quantitative and qualitative QA/QC procedures after they are collected. These include:

Removal of spurious elevation data. Data spikes that are clearly erroneous relative to adjacent points are also removed.

Antenna height comparison between surveyors and the ATV to ensure all measurements are consistent. If a statistically significant offset is found, adjustments to the antenna heights are made.

As a NANOOS Observing System provider, we follow industry best practices and manufacturer guidance where applicable, to calibrate, operate, and maintain the equipment used in this effort, and will provide documentation of this upon request.

Further, we maintain equipment inventories, shipping logs, and instrument maintenance history logs, as appropriate, that are available upon request.

If you will be using existing data, state that fact and include where you got it.

What is the relationship between the data you are collecting and the existing data?

N/A

**Data Management Plan: Washington State Department of Ecology Coastal
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II. Expected schedule for data sharing

Adheres to the NOAA Data Sharing Procedural Directive. The System is an operational system; therefore the RICE should strive to provide as much data as possible, in real-time or near real-time, to support the operation of the System. (IOOS Certification, f 4)

After data is collected, processed, and quality controlled, Ecology generates PNG images of the profiles and change data. Typically, data is made available approximately 1-2 months after they have been collected. Access to the ASCII files is currently available upon request. The PNG images are disseminated via the NVS Beaches and Shoreline Changes web portal at least once per year (<http://nvs.nanoos.org/BeachMapping>).

- 1. How long will the original data collector/creator/principal investigator retain the right to use the data before opening it up to wider use?**

N/A

- 2. How long do you expect to keep the data private before making it available? Explain if different data products will become available on different schedules (Ex: raw data vs processed data, observations vs models, etc.)**

All data is available immediately after post-processing and archiving upon request.

- 3. Explain details of any embargo periods for political/commercial/patent reasons? When will you make the data available?**

N/A

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III. Standards for format and content

1. Which file formats will you use for your data, and why?

How can the information be accessed? (IOOS Certification, f 2)

Ecology archives data in these ways:

ASCII - Text files (.xyz or .out) that are easily read and parsed by people and programs. Available from Ecology upon request.

EXCEL - Used for archiving survey dates. Available from Ecology upon request.

MAT - Gridded surface map data in files that may be read by people operating MATLAB. Available from Ecology upon request.

2. What file formats will be used for data sharing?

All of the above mentioned files are available to all upon email request to the PI.

3. What metadata/ documentation will be submitted alongside the data or created on deposit/ transformation in order to make the data reusable?

While formal metadata is readily available for datasets prior to 2006, all data sharing includes a description of the spatial reference information needed to best interpret the data that describe the horizontal and vertical datums and units used. Primarily, Washington State Plane (meters) coordinate system 4602 (South) is used. The vertical datum is referenced to the North American Vertical Datum of 1988 (NAVD88, meters). All positional and elevation data are measured and provided in metric units (meters).

4. What contextual details (metadata) are needed to make the data you capture or collect meaningful?

Spatial reference information regarding the horizontal and vertical datums and units used.

5. How will you create or capture these details?

For recent data (post-2006), metadata information is manually entered into an Excel spreadsheet used as an internal reference.

6. What form will the metadata describing/documenting your data take?

Ecology's datasets for 2006 & earlier are described by detailed metadata in the form of HTML files. Metadata for more recent surveys can be provided upon request.

7. Which metadata standards will you use and why have you chosen them? (e.g. accepted domain-local standards, widespread usage)

Metadata for datasets 2006 & earlier were created using FGDC standards, an accepted standard mandated by the US Federal Government.

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IV. Polices for stewardship and preservation

1. What is the long-term strategy for maintaining, curating and archiving the data?

Points of contact- Individuals responsible for the data management and coordination across the region (CV's attached); (IOOS Certification f 1.i)

George Kaminsky - Employee 26 years, Coastal Engineer, Principal Investigator
360-407-6797

gkam461@ecy.wa.gov

Identify the procedures used to evaluate the capability of the individual (s) identified in subsection 997.23(f)(1) to conduct the assigned duties responsibly. (IOOS Certification, f 1.iii)

The Washington State Department of Ecology has a process in place for personnel evaluation. These evaluations are on file with Ecology Human Resources. All personnel listed have received excellent evaluations.

2. Which archive/repository/database have you identified as a place to deposit data?

Documents of the RICE's data archiving process or describes how the RICE intends to archive data at the national archive center (e.g., NODC, NGDC, NCDC) in a manner that follows guidelines outlined by that center. Documentation shall be in the form of a Submission Agreement, Submission Information Form (SIF) or other, similar data producer-archive agreement (IOOS Certification, f 6).

Collected data are stored on agency servers at the Washington State Department of Ecology.

3. What procedures does your intended long-term data storage facility have in place for preservation and backup?

Data on all Ecology servers are regularly backed up each evening.

4. How long will/should data be kept beyond the life of the project?

Data are indefinitely stored.

5. What data will be preserved for the long-term?

All data are publicly available and preserved.

6. What transformations will be necessary to prepare data for preservation / data sharing?

Raw data are processed and formatted, analyzed, and quality controlled.

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7. What metadata/ documentation will be submitted alongside the data or created on deposit/ transformation in order to make the data reusable?

FGDC standard metadata are available for data prior to 2006. Metadata for data after 2006 will be available upon request.

8. What related information will be deposited? Trimble® JOB and DC files from individual surveys and raw GPS files when collected.

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V. Procedures for providing access

1. What are your plans for providing access to your data? (on your website, available via ftp download, via e-mail, or another way)

Describe how data are distributed including a description of the flow of data through the RICE data assembly center from the source to the public dissemination/access mechanism. (IOOS Certification, f 2 and 4)

Access to raw and processed beach profile and surface map data is available upon request by email to the PI. Additionally, basic analysis of the data, such as contour or surface map change plots, can also be made available upon request. Recent beach profile data and contour change plots can be accessed via the NVS Beach and Shoreline Changes portal (<http://nvs.nanoos.org/BeachMapping>).

2. Will any permission restrictions need to be placed on the data?

Ecology data and products are freely available for public use. When referenced, please provide a link to the Ecology homepage*.

Examples:

1) Standard html:

Data courtesy of < <http://www.ecy.wa.gov> > *NOTE: Our website is changing July 1, 2017, and the new web address is not currently known.

2) Offline references, choose the appropriate form from the recommended acknowledgements below.

• Short form (figure captions, etc.)

"... data from the Washington State Department of Ecology."

• Longer form (in text)

"...data were furnished by the Washington State Department of Ecology Coastal Monitoring & Analysis Program (CMAP)."

• Full form (acknowledgements at conclusion of papers, etc.)

"...data were furnished by the Washington State Department of Ecology Coastal Monitoring & Analysis Program, under the sponsorship of the Northwest Association of Networked Ocean Observing System and the U.S. Army Corps of Engineers."

3. With whom will you share the data, and under what conditions?

Data are publicly available.

4. Will a data sharing agreement be required?

**Data Management Plan: Washington State Department of Ecology Coastal
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In general, a data sharing agreement will not be required. However, data should be properly acknowledged.

5. Are there ethical and privacy issues? If so, how will these be resolved?

N/A

6. Who will hold the intellectual property rights to the data and how might this affect data access?

The funding agency and the Washington State Department of Ecology through a contractual agreement.

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VI. Previous published data

- Barnard, P.L., Hoover D., Hubbard D.M., Snyder A., Ludka B.C., Allan, J., **Kaminsky G.M.**, Ruggiero P., Gallien T., Gabel L., McCandless D., Weiner H.M., Cohn N., Anderson D.L., Serafin K.A. 2017. Extreme oceanographic forcing and coastal response due to the 2015-2016 El Niño. *Nature Communications*. doi: 10.1038/ncomms14365.
- Ruggiero, P., **Kaminsky, G.**, Gelfenbaum, G., Cohn, N. 2016. Morphodynamics of prograding beaches: A synthesis of seasonal- to century-scale observations of the Columbia River littoral cell, *Marine Geology*, 376, 51-68, 10.1016/j.margeo.2016.03.012.
- Barnard, P., Allan, J., Hansen, J., **Kaminsky, G.M.**, Ruggiero, P., and Doria, A., 2011. The impact of the 2009-10 El Niño on U.S. West Coast beaches. *Geophys. Res. Lett.*, doi:10.1029/2011GL047707.
- Ruggiero, P., **Kaminsky, G.M.**, Gelfenbaum, G., and Voigt, B., 2005. Seasonal to interannual morphodynamics along a high-energy dissipative littoral cell, *Journal of Coastal Research*, 21(3), 553-578.
- Kaminsky, G.M.**, Ruggiero, P., and Gelfenbaum, G.R. 1998. Monitoring coastal change in southwest Washington and northwest Oregon during the 1997/98 El Niño, *Shore & Beach*, Vol. 66, 3, pp. 42-51.