

THE WASHINGTON COASTAL INFORMATION CLEARINGHOUSE: RESOURCES FOR IMPROVED COASTAL MANAGEMENT

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Introduction

Erosion along the southwest coast of Washington State is a major management issue for state and local agencies. Recent reversals in shoreline change trends at several locations along the coast are resulting in erosion crises threatening a range of local and statewide interests. A coastal management response to erosion in this region has not been well defined and has been based on general policies with little substantive basis. In response to escalating costs of coastal crises and the long-term potential for lost property and infrastructure, coastal communities, the Washington Department of Ecology (Ecology) and the US Geological Survey, Coastal and Marine Geology Program (USGS) sought funding to study the regional coastal sedimentary system (Kaminsky, *et al.*, these proceedings). Ecology established the Coastal Monitoring & Analysis Program (CMAP) to conduct the Southwest Washington Coastal Erosion Study (Study), initiate beach morphology monitoring in the Columbia River littoral cell (CRLC) and provide technical assistance to coastal communities (see Figure 2). A Coastal Information Clearinghouse has been developed as the repository for research and monitoring data and to facilitate the transfer of information and integration of research results with the coastal management and decision-making processes.

The Study is actively examining the coastal system of the Columbia River littoral cell (see Figure 1), spanning nearly 165 km between Tillamook Head, OR and Point Grenville, WA. The installation of jetties in the early 1900s at the entrances to Grays Harbor and the Columbia River was followed by rapid accretion within several kilometers of each of the jetties (Kaminsky, *et al.*, 1999). In stark contrast to the relatively low shoreline change rates over the past 4,000 years, some coastal areas accreted nearly 40 m yr^{-1} during the first half of this century (Woxell, 1998). In response to the anthropogenic influences of the earlier part of the century, the littoral cell is redistributing sediment as the beaches move towards new equilibrium conditions. As a result, some of the highest erosion rates in the littoral cell can be found in areas that were previously accreting the most rapidly.

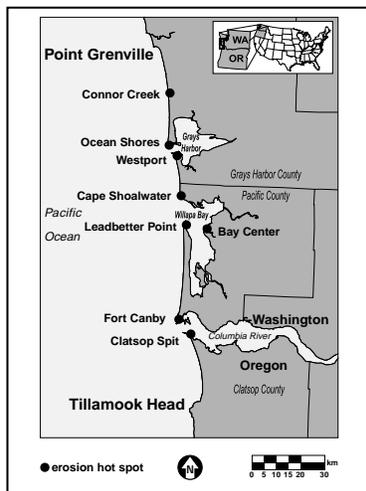


Figure 1. Erosion hot spots in the Columbia River littoral cell.

The communities along the southwest Washington coast feature some of the fastest growth rates in the Pacific and Grays Harbor Counties, yet none has a year-round population in excess of 5,000. In the past, most communities relied heavily on the lumber and fishing industries for income. The recent decline in productivity and increased legislation governing these industries has led to an upsurge in tourism and tourism related development. Recent coastal community growth patterns mark the onset of the transition from fishing villages to tourist destinations, complete with hotels, condominiums and the commercial capacity to support a rapidly increasing part-time population. The combination of a dynamic coastal region and increased development pressure present unique challenges for planners to develop economically feasible and

environmentally sensitive long-term plans that protect existing economic investment while preserving the pristine coastal environment that initially drew residents and tourists to the coast.

The Coastal Information Clearinghouse

Ecology also serves as the liaison between the coastal communities and the USGS and has an integral role in translating Study results and beach monitoring data into coastal management tools to facilitate crisis management and long-term planning. A Coastal Information Clearinghouse collects information and results generated through CMAP activities. The Clearinghouse has several milestones, including:

- Identify coastal hazards and appropriate management response measures,
- Identify barriers to science and management integration, and develop support products to help overcome these barriers,
- Develop a coastal database and information management system to present coastal change at appropriate time/space scales for integration with coastal planning and management,
- Develop a GIS database and facilitate a collaborative GIS access plan to enhance geographically-based management,
- Develop and maintain a project website to highlight ongoing research efforts and assist in the transfer of data products, and
- Facilitate community participation and educational outreach to ensure research efforts and deliverables have local value and provide necessary technical information for decision-making.

These milestones will serve as the foundation and framework for building improved coastal management capacity at the state and local level. The information, products and systems developed in this project will be an important component of coastal zone management along the southwest Washington coast into the future.

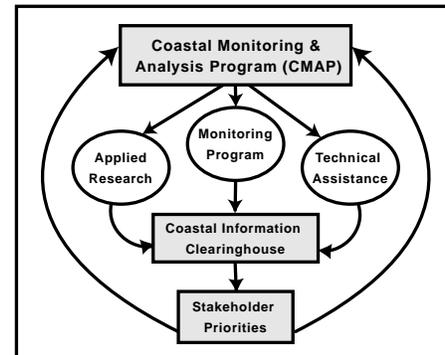


Figure 2. Coastal Monitoring & Analysis Program information-flow schematic.

Information and products contained in the Clearinghouse are distributed to a number of stakeholder groups, including local planners, state resource managers, environmental organizations, developers and interested public citizens. A list of contacts has been established through public meetings, personal communication and mail-in registration forms which can be found at a variety of locations along the coast, including state parks, city offices, libraries, hotels and restaurants. Although many of the publications that result from the research are scientific in nature, the primary purpose of other products such as maps, the Study web site, brochures and progress reports is to communicate research results to lay audiences.

Product Development and Educational Outreach

The Clearinghouse draws from a multi-disciplinary data set that includes physical beach parameters, wave and water level data, subsurface stratigraphic profiles, shoreline change rates, topographic and bathymetric surveys, sediment budget estimates, a GIS database of more than 150 coverages, and a library of more than 2000 references. Individual products are diverse in nature with product types ranging from publications or posters to GIS data or ArcView projects. One of the first accomplishments of the Study was the development of a geodetic control network. Recognized as a critical component of the coastal research for spatially referencing data, the geodetic control network has also been utilized by state and local agencies. The control network coordinates have been published on the Internet by the National Geodetic Survey and an Ecology publication describing the project, survey techniques, maps and monument locations is currently in review.

Efforts to overcome barriers to the integration of science and management focused on developing a common language for all user groups and defining the appropriate time scales of interest for both the research and management communities. The research activities attempt to bridge time and space scales ranging from days to millennia and meters to 100 km, respectively, and modeling efforts will develop scenarios of future coastal conditions that will feed into the planning horizon. *A Glossary of Coastal Terminology* (Ecology Publication # 98-105) was released as a tool to help support the communication between the science and end-user communities. This publication is intended to serve as a companion reference for Study reports and coastal literature.

The beach monitoring program has combined a variety of global positioning system (GPS) and remote sensing techniques to document short- to medium-term coastal variability throughout the CRLC at a scale relevant to coastal managers and planners (Ruggiero, *et al.*, 1999). *The State of the Beaches 1998 – Columbia River littoral cell* (in press) is the first in an annual series of reports that summarize physical beach parameters as recorded by beach monitoring data. Over time, this report will quantify coastal change trends on annual and decadal scales and be one component of a coastal classification scheme that will merge the physical and socio-economic characteristics of the

littoral cell. The information will be developed to guide the use of the coastal zone based on reasonable scenarios of future shoreline conditions and has a number of potential applications, including Shoreline Master Program updates and comprehensive and growth management planning.

A majority of the products are developed as maps or publications, but alternative formats are also sought to capture the interest of a larger public audience, including the Internet, television, museums and interpretive centers. An Internet site has been developed to provide improved access to Study findings, data and information products (<http://www.wa.gov/sea/swces/index.htm>). As metadata is completed for the GIS data layers, geographic data and maps will also be available on-line in a variety of formats. In autumn 1998, the Study released *At Ocean's Edge: Coastal Change in Southwest Washington* (Ecology Publication #98-116), a 20 minute video that presents the research activities of the Study. The video is currently being broadcast on 17 cable access television stations throughout Washington and is available from the Department of Ecology Publication's Office for a nominal fee. Finally, Study displays at the Ocean Shores Interpretive Center and the Pacific County Historical Society Museum attracted several thousand visitors over the past year. These displays offer current Study information in the form of maps, posters, brochures and reports, and are an invaluable way to solicit public input and enhance outreach and communication to interested parties. Currently, the displays are being updated with new maps and graphics in preparation for the summer tourism season, and arrangements with a third location are underway.

Summary

Anthropogenic influences such as dams and jetties have significantly altered the recent evolution of the Columbia River littoral cell, increasing the difficulty of and importance for developing coastal management plans based on sound scientific research. Research and data collection for CMAP is being synthesized in a Coastal Information Clearinghouse for distribution and integration with state and local coastal zone management efforts. The development of future change scenarios will facilitate improved coastal management options to accommodate shoreline change by encouraging appropriate land use commensurate with acceptable public risk and environmental stewardship ideals. These scenarios can be utilized to develop long-term coastal management strategies that are economically feasible, represent statewide interests and are based on the best available science.

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