

Animation of the Holocene Evolution of the Southern Washington and Northern Oregon Shelf and Coast

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What the animation shows:

This animation was developed to help coastal decision-makers, as well as scientists, visualize the coastal evolution of Southern Washington and Northern Oregon during the past 11,000 years. The animation begins by flying over the present day surface, down the Columbia River and out over the Pacific Ocean. The perspective then turns to look eastward, back at the shore, and pauses. While the view remains stationary, the images begin to step back through time in 1,000-year increments. A time bar appears in the lower left corner of the image indicating the time frame being viewed. Present day has a white time bar, 1,000 years before present (BP) is represented by one red rectangle, 2,000 years BP is represented by two red rectangles and so forth through to 11,000 years BP.

Once this oldest time interval is reached, the flight resumes and in this segment takes place through space and time simultaneously. The flight circles to the southern end of the study area and then moves north along the coast. The time frame of the images now goes from the oldest (11,000 years BP) to the present in

1,000-year time steps. Once the present day is reached, the flight pauses, and then zooms out in order to view the entire present day coastline of the area.

How this information was collected and the animation created:

This animation is the culmination of one aspect of the geologic framework task of the Southwest Washington Coastal Erosion Study. This study was initiated to improve our understanding of the coastal processes and shoreline changes along the Southwest Washington coast. The study is co-sponsored by the U.S. Geological Survey and the Washington State Department of Ecology, with participation from local government, several academic institutions, other state and federal agencies as well as private businesses.

The data types integrated to develop the individual surfaces that comprise the animation include offshore seismic-reflection profiles, onshore borehole data, and the subaerial digital elevation model (DEM). Numerous software packages (ranging from seismic processing software, GIS software, and finally to animation software) were used to integrate these data and subsequently create the animation. A complete description of this work is available in the USGS Open-File report 01-76 "Holocene evolution of the Southern Washington and Northern Oregon shelf and coast: Geologic Discussion and GIS data release" by David C. Twichell and VeeAnn A. Cross.

Things of note:

The rapid retreat of the shoreline between 11,000 years BP and 8,000 years BP is primarily due to the rapid rise in sea level during this time. Although sea level has continued to rise from 8,000 years BP to present day it does so at a slower rate. Beginning around 5,000 years BP, the coastline in this area changed from a retreating coastline to an advancing coastline as evident by the formation of the barrier beaches.

Contact Information:

For more questions regarding this animation and the processes used, please contact:

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