Appendix D: Notes on Tidal-Related Shore Lines

Most ocean shore boundaries are determined by tidal definition, such as Mean Low Water. These boundaries are not fixed, visible marks on the ground; rather, they result from the location of the water's edge during a particular time in the tidal cycle or the average of that location at the designated time as measured over a given time period. A somewhat technical process is used to standardize these tidal levels and determine where they might be located at any particular place. The continual variability of the tidal level on an hourly, daily, monthly, seasonal and even longer time cycles and the interplay of this level with the seabed and shoreline of any given location all complicate the discussion.

Many state and federal laws refer to such terms as "mean sea level," "ordinary high water," "mean low water" and others. The lines or boundaries created along the shore by these tidal levels are rarely shown in detail on maps or charts and instead are shown in more general terms on large scale maps. Even more rarely are they marked or surveyed in the field. Should the need arise, it will be an expensive and time-consuming undertaking for Oregon and the appropriate federal agencies to actually map and locate these boundaries on the ground. For now, however, the tidal level definitions create conceptual and jurisdictional boundaries to guide ocean planning.

The following definitions and explanations are taken from the publication Tide and Current Glossary, 1989, published by the National Ocean Service and other references.

Extreme Low Water (ELW): The lowest elevation reached by the sea as recorded by a tide gauge during a given period. The National Ocean Service routinely documents monthly and yearly extreme low water for its control stations.

Mean High Water (MHW): A tidal datum. The average height of all high water heights observed over the National Tidal Datum Epoch.

Mean High Water Line (MHHL): The line on a chart or map representing the intersection of the land (shore) with the water surface at the elevation of mean high water.

Mean Higher High Water (MHHW): A tidal datum. The average of the higher high water height of each tidal day observed over the National Tidal Datum Epoch.

Mean Higher High Water Line: The line on a chart or map representing the intersection of the land (shore) with the water surface at the elevation of mean higher high water.

Mean Low Water (MLW): A tidal datum. The average of all the low water heights observed over the National Tidal Datum Epoch.

Mean low Water Line (MLWL): The line on a chart or map representing the intersection of the land (shore) with the water surface at the elevation of mean low water.

Mean Lower Low Water (MLLW): A tidal datum. The average of the lower low water height of each tidal day observed over the National Tidal Datum Epoch.

Mean Lower Low Water Line (MLLWL): The line on a chart or map representing the intersection of the land (shore) with the water surface at the elevation of mean lower low water.

Mean Sea Level (MSL): This commonly used term really refers to local mean sea level and is defined as the arithmetic mean of hourly heights observed over the National Tidal Datum Epoch. Shorter series are specified in the name; e.g., monthly mean sea level and yearly mean sea level. MSL is not the standardized plane of reference adopted by the United States and Canada (see next term).

National Geodetic Vertical Datum of 1929 (NGVD 1929): A fixed reference adopted as a standard geodetic datum for elevations determined by leveling. Observations at twenty one stations in the U.S. and five in Canada were used to establish a "first-order" leveling net that is fixed and does not take into account the changing stands of sea level. This NGVD is fixed over a broad area and thus does not correlate to local sea level and should not, therefore, be confused with mean sea level. The U.S. Geological Survey uses this datum as the reference for land elevations on topographic maps. Oregon law (ORS 390.755 et seq) establishing the "vegetation line" as the landward edge of the "ocean shore" refers to NGVD 1929.

National Tidal Datum Epoch: Specific 19-year periods adopted by the National Ocean Service as the official time segment during which tide observations are taken and calculated to mean (average) values for tidal datums. The most recent epoch is the period 1960-1978.

North American Vertical Datum of 1988 (NAVD 1988): A new geodetic datum implemented by the National Ocean Service to replace NGVD 1929.

Ordinary: A nontechnical term synonymous with mean. Thus, ordinary low water is the equivalent of mean low water.