

Traditional Poster Abstract

MAPPING THE COLUMBIA RIVER ESTUARY ECOSYSTEM CLASSIFICATION

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TOPIC: Estuary Classification

ABSTRACT: The Columbia River Estuary Ecosystem Classification (USGS Open-file Report 2011-1228; <http://pubs.usgs.gov/of/2011/1228/>) is a six-level hierarchical system intended to improve the understanding of controlling physical factors that drive ecosystem evolution along the Columbia River estuary as well as to provide an inventory of contemporary landforms within the estuary. In support of this classification, we have completed mapping at all levels for the 230 km of riverine estuary between Bonneville Dam and the Pacific Ocean. This hierarchical mapping progressed from coarse, regional scales to local landform and vegetation patches: (1) Ecosystem Province; (2) Ecoregion; (3) Hydrogeomorphic Reach; (4) Ecosystem Complex; (5) Geomorphic Catena; and (6) Primary Cover Class. Levels 3 through 5 entailed new interpretative mapping. Level 6, primary cover class, resulted from an automated image-based object classification of 2009 aerial photographs. The most detailed interpretative mapping is for Levels 4 and 5, for which we mapped landforms within the Holocene floodplain primarily by visual interpretation of Light Detection and Ranging (LiDAR) topography supplemented with aerial photographs, Natural Resources Conservation Service (NRCS) soils data, and historical maps. Mapped landforms are classified as to their current geomorphic function, the inferred process regime that formed them, and anthropogenic modification. At these classification levels, channels were classified primarily by a set of depth-based rules and geometric relationships.