

Symbols for historical map	Features	Symbols for present-day map
	Shoreline	
	Indefinite shoreline	Not applicable
	Mean lower low-water line	Seaward edge of intertidal wetland
	Boundaries for agricultural plots	Not shown
	Dikes or levees	
	Subaerial wetland (salt-water or fresh-water marsh)	
	(forested wetland)	Not shown
	Area between shoreline and lower low-water line	
	Intertidal wetland	Not shown
	Forested upland	Not shown

SNOHOMISH RIVER AND POSSESSION SOUND

Setting
The Snohomish River is second only to the Skagit in size and annual discharge within the Puget Sound region. The Snohomish River discharges into Possession Sound through several distributary channels, principally Ebey and Steamboat Sloughs and the main Snohomish River channel. The delta plain supports mostly agriculture, but includes a variety of land uses that range from undeveloped open space to urban land. Another significant use at present is for garbage landfills and municipal sewage lagoons. The part of the delta adjacent to the city of Everett is the site of harbor and industrial development. Much of the intertidal area is used as log storage by lumber, plywood, and pulp mills.

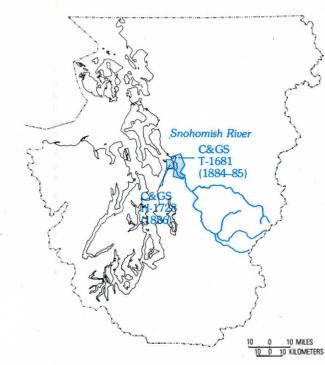
Shoreline and Wetland Changes
In 1884-85, virtually the entire Snohomish delta plain that was mapped was shown as wetland, totaling 39 sq km (15 sq mi)—the largest for the delta areas studied in the Puget Sound region. At that time, only three small areas were diked, the largest in the middle of Spencer Island. Subsequently, land-filling and construction of dikes and drainage ditches allowed for conversion of much of the wetland to other land uses. Except for small area near the mouths of the Snohomish River distributaries in the northern part of the delta, between Steamboat and Ebey Sloughs, most of the former wetland has been converted to agricultural land. The present-day wetland actually covers an area somewhat greater than is shown by the marsh pattern on the modern (1968-73) topographic map.

The major shoreline changes in the Snohomish delta have resulted from dike construction and artificial filling. For example, many of the smaller channels branching from the main distributaries or sloughs have been blocked off and filled. Some sloughs have been filled entirely, thus eliminating much shoreline. Filling along the western shore of Everett for docks also has modified the shoreline. From the mouth of the Snohomish River for a distance of 4 km (2.5 mi) south along the Everett waterfront, the intertidal area has been dredged to make navigation channels. The excavated material was deposited on the west, or the bay side, of the channel to create a breakwater to protect Everett Harbor. Nearly all development at the mouth of the Snohomish River and along the water front of Port Gardner Bay reportedly has taken place since 1892 (Droker, written commun., 1978). Despite extensive shoreline changes along parts of the Snohomish delta, the present positions of most of the distributary channels and the marine shoreline are closely similar to those shown on the historical topographic map.

Compilation of Map
The 1884-85 topographic survey (T-1681) was the source material for map compilation, except for the low-water line, which was transferred from C&GS hydrographic survey H-1728. An error made in the 1884-85 survey, caused a lateral distortion in the placement of the shoreline which increased as the mapping progressed upstream. Major lateral adjustments, ranging from 1 to 13 mm (0.04-0.51 in) at the 1:24,000 scale, were required during the present compilation to compensate for the error. Using the ZTS, a correction was made within each field of view to achieve best alignment of topographic features on the early and modern maps.

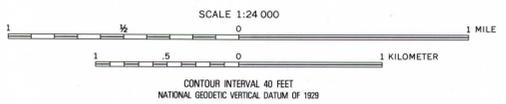
Summary of Environmental Changes and Some Planning Considerations

Progradation (seaward advance of shoreline)	None apparent.
Recession (landward retreat of shoreline)	None apparent.
Channel migration	None apparent.
Channel straightening	None apparent.
Diking or substantial filling of subaerial delta land near salt-water shoreline	Dikes or levees extend along the front of most of the subaerial delta, blocking smaller distributary channels; and some sloughs have been filled entirely.
Diking or substantial filling near stream banks	Extensive dikes have been built along the distributary channels, extending upstream 18 km along Ebey Slough, the longest of the diked distributary channels.
Other artificial landfill on subaerial delta land	Several former sloughs have been filled or converted to smaller drainage channels. There has been considerable landfill for commercial and industrial sites and disposal of garbage.
Landfill on intertidal delta land	About 2.6 sq km of the intertidal land has received landfill for dock facilities and earthen breakwaters. Extensive log rafting occurs on the intertidal delta, and results in the deposition of log debris.
Loss of subaerial wetland	About 10 sq km of wetland remain from 39 sq km mapped in 1884-85 (table 2). About one-half of present-day wetland is forested.
Loss of intertidal wetland	About 2.6 sq km of original intertidal area has been lost by dredge-and-fill operations. The total present-day intertidal area is about 4.2 sq km less than the historical area (table 3).
Some planning considerations	Diking and bank-stabilization projects have reduced habitat availability to fish and wildlife. Changing land uses have been associated with a decrease in water quality of Snohomish River and Port Gardner Bay. At present, the greatest potential for water-quality degradation in the delta area probably is related to municipal and industrial activities, including waste disposal (Williams and others, 1975).



SOURCE MAPS FOR COMPILATION OF HISTORICAL SHORELINE AND LOCATION OF RIVER-MOUTH DELTA

Base from U.S. Geological Survey, Marysville and Everett, 1956. Photorevisions as of 1968 and 1973.



HISTORICAL CHANGES OF SHORELINE AND WETLAND AT SNOHOMISH RIVER AND POSSESSION SOUND, WASHINGTON

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