QUATERNARY GEOLeCIII8 INVESTIGATIONS OF THE CONTINENTAL SHELF OFFSHORE SOUTHERN WASHINGTON AND NORTHERN OREGON

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Straits of Juan De Fuca

Washington

We contoured an erosional unconformity beneath the seafloor using present sea level as the plane of reference. Due to navigational errors some contours do not exactly coincide with water depths where the erosional surface is exposed at the present sea floor. We used a 5 m contour interval to depict the morphology of the erosional surface. Detailed contour lines denote intersection across areas lacking data.

The contour map displays several significant morphologic features including:

1. In the southern shelf region, a buried erosional surface slopes gently seaward between 47° N and 48° N latitude, and seaward along 124° W longitude. This surface drops from 150 m in depth below present sea level in the north to 20 m in the south. The erosional surface is complexly overlain by Quaternary deposits, which are characteristic of erosional surfaces cut during Pleistocene eustatic low stands.

2. On the southern shelf, a large disconformable feature 60 m above the surrounding erosional surface at 47° N latitude, 134° W longitude. This is a likely composed of Miocene sediments (Bibby et al. 1978).

3. On the outer shelf between Astoria Canyon and the eastern end of a buried channel offshore from Grays Harbor, another buried erosional platform extends from 120 to 125 m below present sea level. This surface also likely represents an erosional platform cut during a low sea level stand.

4. An apparent former channel between the Columbia River and Astoria Canyon is depicted with existing data. A small incised valley cuts through the Columbia River mouth and exits the channel. This incised valley extends toward the Columbia River mouth and is filled with sediments. The incised valley is likely an eroded channel cut during lowered sea level.

5. The axis of a major channel aligns with the present entrance to Grays Harbor. The well-defined channel axis dips from 50 m in the north to 125 m in the south. The axis of this channel extends seaward of the mouth of the Columbia River and may be a major channel feature, possibly associated with the Columbia River mouth.

6. On the inner shelf near the present coastline between Grays Harbor entrance and Humbug Head, several sedimentary features are identified. These erosional surfaces are located near existing surficial features. The most significant channel forms a north-south feature to the north channel located west of Grays Harbor entrance. The buried channel originates offshore from the Capilano River mouth and exits present sea level toward the southeast. The erosional feature is likely a channel that may have been blocked or truncated by surficial sediments.

7. In the northern study area, the erosional unconformity has an irregular topography characterized by the present coastline. The erosional unconformity is characterized by the present coastline and may be a north-south feature located near the mouth of the Columbia River mouth. The erosional surface extends from 60 to 125 m below present sea level. The morphology of these buried channels probably reflects the topography of the present coastline.

8. Erosional surfaces are likely associated with Quaternary deposits that have been dropped during lowered sea level.

9. The erosional surfaces are likely associated with Quaternary deposits that have been deposited during lowered sea level.

10. The erosional surfaces are likely associated with Quaternary deposits that have been dropped during lowered sea level.

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CONTOUR MAP OF LATE QUATERNARY EROSIONAL SURFACE