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Sonograph Mosaic of U.S. West Coast Exclusive Economic Zone

The Geological Long-Range Inclined Asdic (GLORIA) side-scanning sonar system was used to obtain data that were compiled as an image-enhanced acoustic mosaic, similar to an aerial photograph, of the sea floor from the edge of the continental shelf to 200 nmi offshore within the U.S. Exclusive Economic Zone off California, Oregon, and Washington. The mosaic clearly displays the large-scale geomorphic and sedimentologic features of the sea floor, including spreading centers, seamounts, fracture zones, sediment fans, continental-slope canyons, and abyssal-plain channels. Hundreds of seamounts (some previously uncharted) dot the deep sea floor, and many have large summit craters and attendant volcanic flows. The major Nitinat, Astoria, Delgada, and Monterey sediment fans are traversed by lengthy channel-levee complexes that extend from morphologically diverse canyons on the adjacent continental slope. Areal extensive sediment-wave fields occur adjacent to the complexes. Some channels on the abyssal plain are straight whereas others are highly sinuous, suggesting that various channel-forming processes occur on the sea floor. The contrast between the transform tectonic regime south of Cape Mendocino and the convergent tectonic regime to the north is particularly apparent on the mosaic. The linear basement ridges that were generated at the Gorda and Juan de Fuca spreading centers and were later moved apart by sea-floor spreading are abruptly truncated by the

Mendocino and Blanco fracture zones that accommodate horizontal slip between adjacent lithospheric plates.