REGIONAL SPATIAL AND TEMPORAL CORRELATIONS AMONG FE-MN OXYHYDROXIDE CRUSTS, CENTRAL PACIFIC OCEAN

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Hydrogenetic Fe-Mn oxyhydroxide crusts form pavements on seamount rock substrates at water depths of 400-4000m. Those pavements of crusts are continuous over large areas where the seamount flanks and summit have been swept clean of sediments by bottom currents for millions of years. The Fe-Mn crusts formed by precipitation of metal oxyhydroxides from cold ambient seawater and contain minor amounts of biogenic and aluminosilicate detritus. Chronostratigraphy of central Pacific Fe-Mn crusts delineates layers that reflect the stage by stage accumulation of metals from the Late Cretaceous through the Pleistocene, with hiatuses in growth between intervals of metal deposition. Three main stages of crust growth are indicated: Late Cretaceous, Eocene and Miocene-Pleistocene, which correspond to times of polytaxic conditions, including increased bioproductivity, a relatively high CCD and considerable production of biogenic carbonate. Early Paleocene and Early-Middle Oligocene hiatuses in crust growth coincided with oligotaxic ocean conditions. The central Pacific seamounts on which crusts precipitated formed during the Cretaceous, whereas much of the Fe-Mn crust growth on those seamounts occurred during the Eocene and Miocene-Pleistocene, long after the cessation of volcanism. The emergent Cretaceous seamounts became submerged during the late Cretaceous, during which time Fe-Mn oxyhydroxides cemented some breccia deposits, probably through replacement (dissolution and immediate precipitation) of a precursor carbonate matrix. However, it cannot be excluded that the carbonate matrix was replaced during a later time period, such as during the Eocene when the stratified crust layers began to grow.