

## TECTONOSTRATIGRAPHIC EVOLUTION OF SOUTHWESTERN PUERTO RICO

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The Bermeja Complex in southwestern Puerto Rico is comprised of serpentinized peridotite, greenstone, and amphibolite overlain by silicified volcanic rock and chert. The oldest chert beds (Mariquita Chert), which contain Pliensbachian radiolarians, probably originated in the eastern Pacific Ocean. We propose that the complex is part of a rooted mantle fragment from which the crust has been detached, probably at a releasing bend of a transform fault system. Detachment, which created a structural basin, occurred during Early Cretaceous time. The oldest overlying stratified rocks, which have been mapped as Yáuco Formation, contain chert and LREE-depleted mafic volcanic rock, that are probably Cenomanian. Conglomerate at the base of the Yáuco contains clasts of chert and serpentinized peridotite, suggesting that the contact with the northern-most serpentinite belt is nonconformable. Accumulation of Yáuco continued from Cenomanian until Turonian time within the basin floored by serpentinized peridotite. Yáuco does not extend southward, across a proposed structural discontinuity, to exposures of uplifted Jurassic chert and volcanic rock, which are assumed to represent the oceanic crust above the peridotite. In Maastrichtian time, the structurally low Yáuco basin began to fill with volcanic rocks, clastic rocks, olistostromes, and olistoliths. Among the displaced masses are Campanian reefs which had grown on uplifted Jurassic oceanic crust. They subsequently slid northward into the basin along with other reefal debris and olistoliths, synchronous with volcanism. Emplacement of coarse debris may record destabilization and destruction of a back-arc basin caused by a change in subduction polarity from south-facing to north-facing. Subduction of oceanic lithosphere formed a trench approximately coincident with the present Greater Southern Puerto Rican fault zone. During convergence the coarse-grained Cretaceous strata were detached and folded. Imbrication with fine-grained strata occurred where the debris-rich Cretaceous rocks entered the trench. Surficial exposures of mantle rocks are probably the result of structural inversion of the basin in response to transpression in the currently active east-trending left-lateral fault system.