The growing pains of the Pacific plate: How hotspots and superswells shaped the Pacific domain

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The Pacific plate was born around 180 Ma as an oceanic microplate surrounded by mature tectonic plates (Izanagi, Farallon, and Phoenix). There is great uncertainty in reconstructing the Mesozoic tectonic history of the Pacific plate with respect to the surrounding tectonic plates as they have been largely subducted and there is a lack of seafloor spreading magnetic anomalies in the Early to Late Cretaceous due to a long geomagnetic quiet period during this time. Despite this less than complete record of the early Pacific plate tectonic growth, it is clear from the existing geological record that the oceanic crust in the Pacific region developed in special conditions: it experienced growth at very high spreading rates, numerous ridge jumps frequently changed the location of plate boundaries, and unusual thermal anomalies (hotspots, superswells?) highly influenced the structure of the oceanic crust. The thermal anomalies (moving or stationary mantle plumes) produced not only numerous oceanic plateaus and seamounts, but it seemed to have determined the development of a transitional zone between the Pacific and the Tethys/Eurasia domain characterized by numerous back-arc basins and marginal sedimentary basins that exhibit anomalous depth, heat flow and volcanic activity. In the last decade, a large number of studies have addressed hotspot behaviour, and global or regional mantle convection patterns that might have influenced the oceanic litosphere. These type of studies are well poised to revealing potential mantle influences on the growth of the Pacific plate and its neighbouring plates. We welcome all contributions that further our understanding of the growth of the Pacific plate and its surrounding plates since the Mesozoic, in particular the relationship of hotspots and tectonic plates in the Pacific domain.