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Linking the Wrangellia flood basalts to the Galápagos hotspot

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The Triassic volcanic rocks of Wrangellia erupted at an equatorial to tropical latitude that was within 3000 km of western North America. The mafic and ultramafic volcanic rocks are compositionally and isotopically similar to those of oceanic plateaux that were generated from a Pacific mantle plume-type source. The thermal conditions, estimated from the primitive rocks, indicate that it was a high temperature regime (T_P > 1550°C) consistent with elevated temperatures expected for a mantle plume. The only active hotspot currently located near the equator of the eastern Pacific Ocean that was active during the Mesozoic and produced ultramafic volcanic rocks is the Galápagos hotspot. The calculated mantle potential temperatures, trace elemental ratios, and Sr-Nd-Pb isotopes of the Wrangellia volcanic rocks are within the range of those from the Caribbean Plateau and Galápagos Islands, and collectively have similar internal variability as the Hawaii-Emperor island chain. The paleogeographic constraints, thermal estimates, and geochemistry suggests that it is possible that the Galápagos hotspot generated the volcanic rocks of Wrangellia and the Caribbean plateau or, more broadly, that the eastern Pacific (Panthalassa) Ocean was a unique region where anomalously high thermal conditions either periodically or continually existed from ~230 Ma to the present day.