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Shipboard data from West Pacific seamounts

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Absolute plate motion (APM) models for the Pacific Plate have long relied on Hawaii and Louisville in particular. However, both volcanic chains are subducted around 80 Ma, and the Emperor stage of Hawaii moved independently from the Louisville and Rurutu-Arago hotspots. Prior to 80 Ma, existing APM models rely on three areas that have unclear relationships to typical hotspot chains: 1) the Mid-Pacific Mountains and Line Islands, 2) Shatsky and Hess Rise, Musician and Liliuokalani Seamounts, and 3) Wake and Magellan Seamounts, Marshall Islands. The first two groups erupted near a mid-oceanic ridge around 100 Ma, potentially causing plume motion that would affect the absolute plate motion record. Among the third group, the Wake Seamounts morphologically extend the Marshall Islands and may extend the Rurutu-Arago hotspot >80 Ma, while the Magellan Seamounts are located near the predicted Samoan hotspot >80 Ma. Existing Sr-Nd-Pb isotope data and $^{39}Ar/^{40}Ar$ ages are in agreement with this model, but in order to redefine APM models, detailed sampling and analysis of the Wake and Magellan area seamounts is necessary. Over 40 seamounts were recently sampled with a dredging expedition in the Western Pacific; the majority were found to be guyots, a small subset formed peaked seamounts with multiple rift zones, and one volcano revealed a large (~5 mile) crater. Preliminary major element data obtained through LIBS analysis of thin section billets was collected to augment hand sample descriptions. We used a Catalina Scientific EMU120/65 spectrometer with 200-850 nm wavelength range, coupled to a Nd:YAG laser, and an Arduino-based sample stage to analyze 2.5x2.5 mm grids on fresh-cut surfaces of sample matrix. Submarine samples of known composition were used as calibration standard with each analytical session. Three sample grids were averaged for each sample, for a reproducibility better than 1 wt.%. In SiO_2 versus $Na_2O + K_2O$, most of the sample compositions cluster around the basalt field, with some trends toward more evolved compositions. Variability within each dredge haul was very limited, and it is likely that most of the dredge hauls represent single eruptive events.