Unevenly distributed archaeomagnetic data and in particular a paucity of data from the southern hemisphere is a limiting factor in evaluating global field models. Here we present first archaeointensity results from New Caledonia (Melanesia) obtained from well dated SW Pacific pottery fragments (cal 900 BC to cal 1585 AD). Taken together with results from Fiji, Vanuatu and Duke of York Islands a preliminary archaeointensity reference curve for the SW Pacific has begun to be built comprising 30 investigated sites with 59 different archaeological contexts. Microwave archaeointensity experiments have been conducted on 248 samples with 134 yielding high quality values of absolute archaeointensity. It has been found that the rate and range of variations in the strength of the geomagnetic field during the last 3000 years are significantly greater than those predicted by current global models. This outcome contributes importantly to international efforts to describe and understand the Earth’s magnetic field and increases the probability of successful archaeomagnetic dating. We attempt for the first time to provide chronological information on three poorly dated archaeological (Lapita) sites on the Santa Cruz Islands by means of archaeomagnetic dating. The hereby obtained archaeointensity results reveal similar values for the sites (RF-2 and RF-6) on Reef Island compared to a significantly higher value on Nendo (SZ-8) suggesting a different age for this site. These promising results strengthen the potential of a new and independent dating tool for the SW Pacific.