During an intensive heat flow survey carried out by NEDO across the Nankai accretionary complex off Cape Muroto, five piston core samples were obtained for geological, geophysical and geochemical analysis. Thermal conductivity and P-wave velocity measurements were made onboard for half-round cores. The average P-wave velocity was 1640 m/s, and some good correlation was seen within 1m interval. Thermal conductivity was nicely correlated with porosity, from which we estimated grain conductivities. These data have a local anomaly near the deformation front, implying a focused fluid expulsion along the thrust.