Integrated ichnological, sedimentological, and geochemical investigation of the Late Cretaceous Nanaimo Group, Saltspring Island, B.C., Canada was undertaken to examine the existing lithostratigraphic mapping, and facies characteristics of high-relief basin slope deposits. Maximum depositional ages from U-Pb dating of detrital zircon grains (N=3744) provide a geochronologic framework for facies relationships studied at a cm-scale over ~1500 m of stratigraphic thickness. Passive gamma-ray emissions (K, U and Th spectra) were collected using a hand-held gamma-ray scintillometer. The results of this integrated analysis suggests that: (1) almost all of the Cretaceous-aged strata in the study area belongs to the upper Nanaimo Group; (2) sedimentation in the earliest Nanaimo Basin may have occurred during the Late Jurassic indicating that further study of basin evolution is needed; and (3) integrated facies analysis of thin-bedded slope deposits provides improved criteria for recognizing their different subenvironments compared to employing purely sedimentological observations.

**Keywords:** Late Cretaceous Nanaimo Group; Deep-Marine Slope Deposits; Sediment Gravity Flows; Ichnology; Sedimentology; Detrital Zircon U-Pb Geochronology