



The model for the development of shore platform in Penghu Islands, Taiwan

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Penghu Islands, in the southern Taiwan Strait, is a remnant of a middle-late Miocene basaltic shield volcano. The relief of islands is flat and getting lower northward. Because of the erosion process, islands were ever separated. According to traditional morphological province, Penghu Islands was classified to abrasion tableland rather than volcano island. During Holocene period, Penghu Islands was ever tableland landform, due to sea level change and inequality of mass movement, forming mesa-like island landform. The well developed shore platforms which could reach 3 to 5 km at lowest tide fringe Penghu, Jongtun, Baisha and Shiyu Island. However, the NE-wider, SW-narrower and wider in sheltered area distribution of shore platform in research area is quiet obvious. According to the previous studies, the wide shore platforms which developed along the northeastern coast and facing the open sea are strongly affected by the winter monsoon and its high wave energy. However, the wide shore platforms are also developed along the leeward coast within the bay that sheltered by these islands. The geology of most islands is composed of hard and resistant Tholeiite or Alkali Basalt, with interbed of basalt lava and sedimentary rock or breccias and paleosols of intermediate resistance. Moreover, The variability of the structure of columnar joint on cliff and shore platform provides an excellent opportunity to examine the influence of rock resistance on the development of the spectacular rock coast landforms that occur around the island. The hardness of rocks of sampling zone were assessed using a Schmidt hammer, and statistical analysis was undertaken to remove outlying values. Besides the measurement of rock hardness, we complied statistics of wave data that was used to calculated wave energy on study site. In this study, a geomorphological index used to examine the influence of initial landform to the evolution of shore platform in Penghu Islands. Based on the result of field investigation of the shore platform morphology, rock strengths, initial landform, and the analysis of wave climate, the mesa-like initial landform is the primary control for the development of shore platform. Rock strengths and wave energy are the secondary controls, the mesa-like initial landform should be the primary control for the development of shore platform, especially in the bay area sheltered by islands. Just because this reason, the rate of shore platform developed is very high which suggested 0.5 to 1 meter per year. Rock strength and wave energy are the secondary controls, and the highest correlation coefficient between the controls and platform width is in the coast where facing the winter monsoon.