

Coastal Geographic Surveying Result on Gyoam beach in South Korea by Integrated Coastal Zone Management

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Coastal erosion is generated by complex interrelationships of causes, influencing factors, and elements and appear by repetitive cycles of erosion and deposit over a long time. An increasing need exists for regional-scale measurements of shoreline change to aid in management and planning decisions over a broad portion of the coast and to inform assessments of coastal vulnerabilities and hazards. In order to prevent coastal erosion, the beach nourishment and the man-made construction, like a submerged breakwater, are widely used, it is desirable to monitor the post nourishment shoreline to evaluate the projects' success.

The Gyoam beach has the typical shape of a pocket beach. The river mouth of the Munam stream had been a sediment source in the littoral cell in the past. However, as the location of the river mouth changed from the Gyoam beach to the Backdo beach, the Gyoam beach was eroded by the blocking of the sediment source, as well as the construction of the coastal road. It is supposed that the coastal erosion was aggravated as the seasonal equilibrium collapsed after the construction of the Munam-2 Harbor. As the CIP progressed, the beach changes were analyzed by season through continuous monitoring in each construction phase. During the construction of submerged breakwaters from the first half of 2014 to the second half of 2016, the south of Gyoam beach was eroded and the northern beach received deposits in the summer, whereas the northern beach was eroded, and the southern areas were deposited during the winter season owing to the seasonal movement of sediments. After the completion of the submerged breakwaters in the second half of 2016 and the beach nourishments from 2016 to 2018, the shoreline is maintaining seasonal equilibrium as of February 2019. According to the stable shoreline analysis, a stable shoreline was not reached near the Gyoam beach on the south of the littoral cell due to the lack of sand volume in the littoral cell; however, as of August 2018, it seems that the total sand volume has been adjusted to some degree. After the implementation of submerged breakwaters, the results show that the fully submerged breakwaters produce more stable and balanced sediment loss/gain in the protected area, and yield more desirable formation of salient behind the breakwaters.

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