Detection of geomorphological environment changes using time-series Landsat images and grain size data : a case study in Baramarae tidal flats, Korea

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As transition zones wherein the land and sea meet, tidal flats have been regarded as high productive zones and particular ecosystem. Geomorphological changes such as significant coastal erosion and/or sedimentation may affect the ecosystem and land use of tidal flats. Thus, of great importance is to monitor environmental changes in tidal flats for coastal zone management. In this paper, geomorphological environment changes in Baramarae tidal flats, Korea have been investigated by using time-series Landsat images and grain size data. First, digital elevation models (DEMs) were generated from waterlines extracted from time-series 22 TM/ETM+ images in the early of 2000 and 2010. By comparing those two DEMs, areas where erosion or sedimentation was dominant during the considered time period could be extracted. In addition to morphological change information, grain size distributions were also generated from ground sampled data for an interpretation of surface sediment characteristics. Some typical characteristics at areas with dominant erosion or sedimentation could be extracted by accounting for both elevation changes with grain size distributions. In conclusion, remote sensing images in conjunction with surface sediment grain size data would be effectively used to estimate geomorphological environment changes in tidal flats.