



A New Method Exploration on the Measurements of the Sand Ridges Changes in Exposed Radial Sand Ridges Area by means of Remote

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The coastline of Jiangsu starts from the estuary of Xiuzhen River in the north, extending to the Yangtze River estuary in the south, with a total length of 954 km, including 884 km long silt and mud coastal line, which is the dominant type of the coast in Jiangsu, making 93% of total shoreline, and along which there is vast areas of tidal flat. The most remarkable part of Jiangsu coast is the radial sand ridges, which include more than 10 large sand bars with tidal channels among them, and have complicated geomorphologic and hydraulic dynamics. In June of 2009, "The Development Plan for Jiangsu Coastal Zone" was approved by the Chinese State Council, indicating that the development of Jiangsu coastal zone has been considered at a part of national developing strategy. Therefore, there is an urgent demand on understanding topographic and morphological change of the radial sand ridges area in South Yellow Sea. New technologies, such as remote sensing technology, are helpful for decision-making, which can capture topographic condition rapidly and effectively.

One important feature of sand ridges is that, the soil moisture changes with the change of water level. When water level falls down with the tide, the higher the place on the sand bar, the earlier the place will emerge from the water, and in consequence, the drier the place will be. Therefore, by detecting the soil moisture of the sand bar surface, we can derive the topography of the sand bars. The present study identify the most sensitive spectral wavelength for detecting soil moisture on tidal flat using the relationship between soil moisture and spectral reflectance as well as the relationship between soil moisture and tidal flat elevation, and select the equivalent spectral channel of Landsat\TM satellite images to outline the ridges of the sand bars automatically. Based on spectral analysis for the tidal flat at Dongsha, it was found that the wavelength centered at 2224nm is sensitive to soil moisture. Therefore, equivalent spectral channel of Landsat\TM7 is chosen to delineate the ridges of the sand bars, and the result matched field measurements well. Then, using the ridge outlines identified by TM images at different periods, the geomorphologic changes of the tidal flat and sand ridges are investigated.

Key Words: Radial Sand Ridges, Soil Moisture, Remote Sensing