
[EE] Evening Poster | H (Human Geosciences) | H-TT Technology & Techniques

[H-TT15]Geographic Information Systems and Cartography

convener: Takashi Oguchi (Center for Spatial Information Science, The University of Tokyo), Yuji Murayama (Graduate School of Life and Environmental Sciences), Yoshiki Wakabayashi (首都大学東京大学院都市環境科学研究科)

Thu. May 24, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

This session discusses various methods which acquire, store, analyze and visualize geospatial data, and presents the outcomes of empirical studies using GIS or mapping methods. The session also deals with applications of digital data, and GIS, and mapping to various fields of earth and planetary science and human society. All presentations and discussion of this session are made in English.

[HTT15-P02]Clarification of relationships between coastal dune vegetation and landforms based on ALS and UAS-SfM photogrammetry for nature conservation and restoration: Tottori Sand Dunes, Southwest Japan

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Coastal dunes are often subject to human activities. The landward sides of dunes are often modified by the development of farmlands, erosion control forests, and residential areas. On the sea-sides of dunes, coastal structures tend to be installed to prevent wave erosion. Therefore, the total area of natural coastal sand dunes in Japan has significantly decreased, and the ecosystem therein has been greatly affected by human modifications. For the conservation and restoration of such dunes and their ecosystem, investigating both natural and human-affected dunes is indispensable. This study focuses on relationships between coastal dune landforms and vegetation, the primary producer in the ecosystem. Although previous studies suggested that the accretion of sand greatly affects the distribution of vegetation, detailed geomorphological studies on the dynamic environment with frequent sand movement have been limited.

Here we investigate spatial relationships between landforms and vegetation in the coastal Tottori Sand Dunes, Southwest Japan, using high-resolution ground surface information obtained from airborne laser scanning (ALS) and unmanned aerial system-based structure-from-motion (UAS-SfM) photogrammetry.

Vegetation was classified into several communities, and their distribution was mapped based on orthorectified aerial images by using UAS-SfM. We analyzed the spatial correlation using the Jacobs Index. The results indicate that the distribution of vegetation is influenced by western to northern wind in winter and southern wind in other seasons. We found that coastal dune vegetation usually creates sand accumulation areas. We also found that short and low vegetation cover communities tend to occur on gentle dunes, whereas tall and high vegetation cover communities tend to occur on steep dunes.