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RESEARCH COLLOQUIUM SERIES

Yubao Li

Wenzhou University, China
and Visiting Research Fellow, UNBC

Friday

Jan. 13, 2012

3:30 - 4:30

LECTURE THEATRE

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IMAGING AND MODELING APPROACHES TO CHARACTERIZE SEDIMENT ENVIRONMENTS IN CHINA

The erodible fraction of land surfaces is an important parameter for calibration and validation of models to predict wind erosion. Effective assessment of the erodibility of sandy surfaces needs accurate information on erodible and non-erodible surface grains. Field sand collection and sieving have been broadly used to obtain grain size fractions. However, this traditional method results in surface destruction of sample plots and does not allow for calculation of the areas covered by each size fraction. It is easy for human eyes to discriminate grains of different sizes from both images and in the field but it is nearly impossible to count grain numbers and measure geometry of each size fraction. Based on an image processing system and a geographic information system (Erdas Imagine and ArcGis), we developed a method that can discriminate clasts, non-erodible grains, and fine materials. The approach can also count numbers and calculate the geometry of each clast and grain larger than 0.42 mm that is believed to be semi-erodible. This technological system can perform high-resolution image acquisition, image processing, modeling and extraction, vectorization, statistical analyses and validation. It was applied to a sandy area located 38°59′08″N and 109°08′49″E in Inner Mongolia, China. The approach presented here may provide a better methodology for calibration and validation of wind erosion models, assessment of soil surface erodibility, and studies into physical processes of wind erosion.

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