Extraction of potential areas of river dust emissions using SPOT imageries

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During the winter, an increase of exposed bare riverbed at the estuary of Jhuoshuei River in Taiwan often causes river dust episodes which harm the health of nearby residents. This study selected the river section from bridge Ziqiang to bridge Xibin as study area. The SPOT satellite imageries, within 15 days of the aeolian dust event during 2005 – 2014, were obtained to classify the land cover and discuss the relationship of bare land change and aeolian dust emission.

Normalized Difference Water Index (NDWI) derived from SPOT imageries can display the spatial distribution of moisture content and particle size in the surface of soil layers. The bare land can be categorized into coarse, medium and fine particles using K-mean cluster analysis, and then combined with the meteorological factors from a nearby air quality monitoring station to explore the contribution to aeolian dust emission.
The results show that the bare land with fine particle has a positive correlation with daily average PM10. Therefore, the bare land with fine particle could be the potential zones of river dust emissions. Monitoring the changes of bare riverbed using remote sensing technology is an effective way for river dust episodes prediction.