

Relating Outbreak Frequency of Asian Dust to Landcover (*Kosa*) and Meteorological Conditions in East Asia

AKIHIKO KONDOH¹ and YOSHITAKA MASUDA²

¹*Center for Environmental Remote Sensing, Chiba University, Japan*

²*Department of Earth Sciences, Chiba University, Japan*

The number of dust events observed in Japan increased in 2000, and continued to 2002, following sharp drop in 2003. This should be related to the changes in both meteorological and land conditions in the continental East Asia. Dust often breaks out in the early spring. It suggests the importance of the timing of thaw and foliation. The period of bare land condition between thaw and foliation in the early spring is considered to raise the possibility of dust outbreak. Wind speed is also related to rolling up of the dust at the period. Both meteorological and land cover condition should be examined for dust outbreak analysis.

Satellite data (SPOT/VEGETATION) are used to determine the timing of thaw and foliation to calculate the duration of bare land condition. The visible, near-infrared and shortwave infrared bands of successive SPOT/VEGETATION images enable the delineation of both snow and vegetation distributions and their time changes. Meteorological dataset are used to analyze the dust outbreak frequency and the characteristics of the wind speed.

The number of incidence of large wind speed (above 6m/sec) is well correlated to the outbreak frequencies of dust in Mongolia, however, there exist some years with less correlation between wind speed and dust outbreaks in China. The length of bare land condition in early spring shows that the year with high frequencies of dust outbreaks correspond to the short bare land duration in southeastern Mongolia and the middle of Inner Mongolia. There is less correlation between the wind speed and the number of dust outbreaks in 1999 in China, however, it is related to the short duration of bare land period. The less observation of dust in Japan in 1999 is contributed to the weak wind speed in Mongolia and short bare land duration in Inner-Mongolia, however, the case in 2003 is explained by the short bare land duration in both southeastern Mongolia and the middle of Inner-Mongolia regions.

The outbreaks of dust can be influenced not only by wind speed but also the land condition in early spring. The specific region, such as southeastern Mongolia and the middle of inner-Mongolia are important as source regions of Asian dust (*Kosa*).

Keywords: Kosa, Asian Dust, thaw, foliation, land condition, wind speed, remote sensing, SPOT/VEGETATION