

ANALYSIS OF JING-JIN-TANG DISTRICT SEVEN-YEAR AEROSOL CHANGE USING MODIS DATA

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ABSTRACT

Aerosols have a significant impact on the climatic change and air pollution. In the end of last century, the particle matter pollution is serious over Jing-Jin-Tang (Beijing-Tianjin-Tangshan) District, which is harm to the lives of human kinds, as well as development of society and economy. In this paper, we aim to explore the changes of air quality over Jing-Jin-Tang district during the period from 2002 to 2009. Based on Moderate Resolution Imaging Spectroradiometer (MODIS) data, Dense Dark Vegetation (DDV) algorithm is employed to retrieve the aerosol optical thickness (AOT) with 1km resolution. The ground-based observation at Beijing AERONET site are used to validated the retrieved AOT from satellite, and the coefficient is $R^2=0.786$.

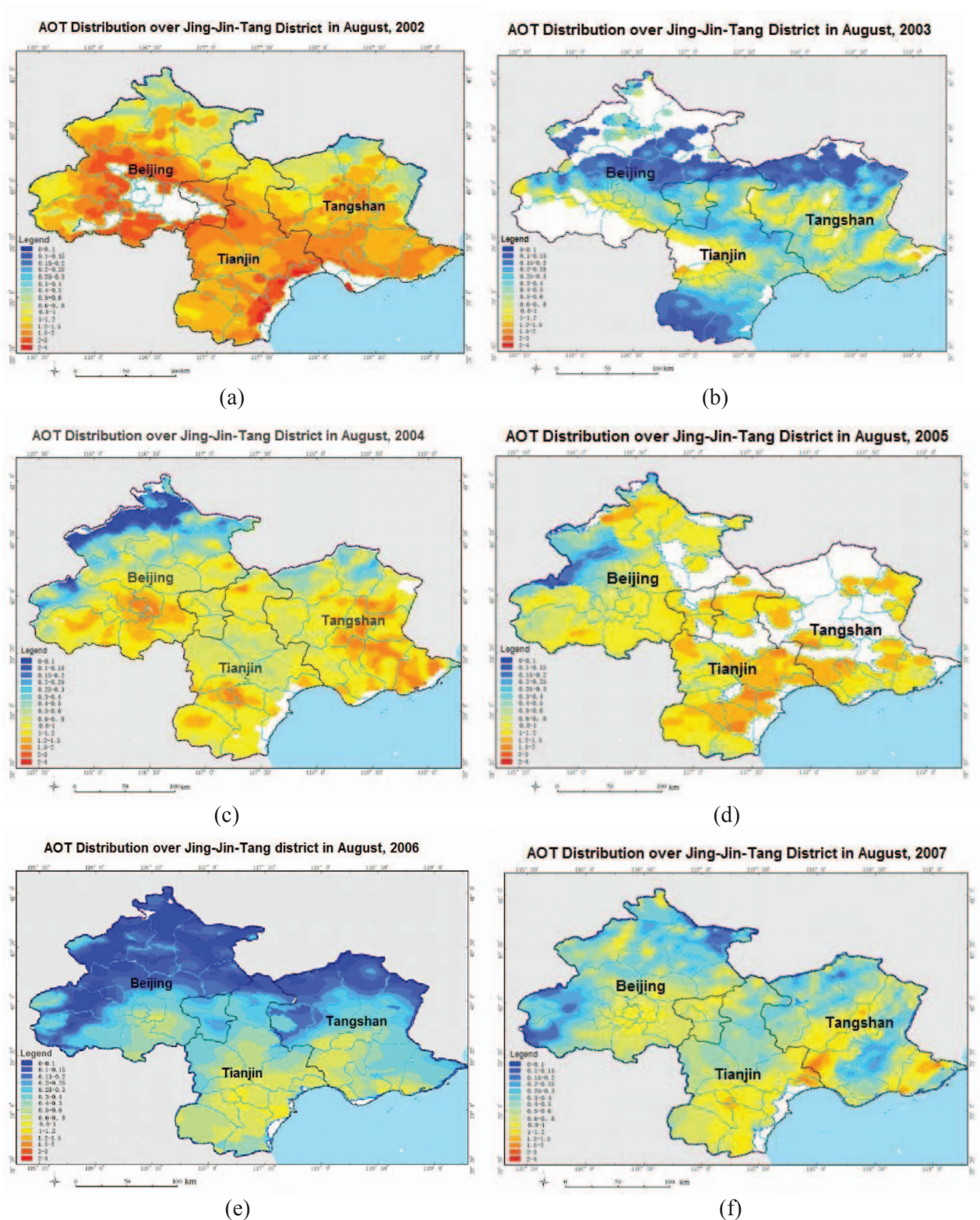
We compared the spatial, monthly and annual variation over Jing-Jin-Tang district and analyzed the main factors of these changes.

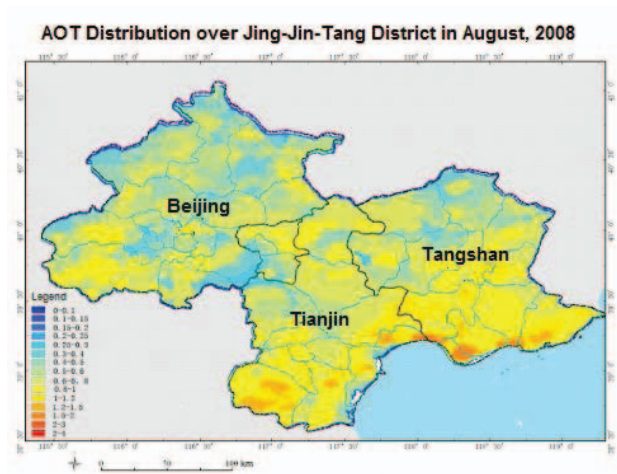
1) In the spatial variation, Fig. 1 indicates that the retrieved AOT over cities and southern areas is obviously much larger than that over rural and northern areas respectively. One of the main reasons is that most construction of Olympic venues are located in the northern part of Jing-Jin-Tang district, which leads an increase of particle matter pollution. With the air pollution control and the completion of some construction, the variation is gradually reducing year by year.

2)The monthly variation shows that the AOT usually increases in summer, for example, the largest AOT value in 2008 is on June, while the figures are relatively smaller during the period from September 2008 to April 2009. Main reason is that large-scale cloudy weather occurred frequently in summer, the haze distribution leads to poor visibility, high relative humidity and the serious particulate pollution.

3) Since 2004, there is a decreasing trend in the annual variation of AOT over Jing-Jin-Tang district (as shown in Fig.1). From 1998 to 2008, over 10 years, Beijing municipal government implemented

more than 200 measures to reduce the pollutant emission from motor vehicles, coal fire units, construction sites and industrial pollution sites. These measures improved the air quality conditions.





(g)

Figure 1. Monthly averaged AOT distribution over Jing-Jin-Tang district in August, from 2002 to 2008, as (a) to (g).

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