

# RESEARCH ON THE LAKES CHANGE IN EJIN ALLUVIAL FAN FROM LONG TIME-SERIES LANDSAT IMAGES

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## 1. INTRODUCTION

Inland lakes in the arid and semi-arid areas, due to their sensitivity to the climate change and human activities, can reflect the regional climate change and the effects of the human activities. Remote sensing, which has a capability to acquire the regional information of lakes quickly, has become an effective tool to monitor and study the change of lakes. The long time-series remote sensing data can provide more valuable information of the distribution and changes of inland water bodies for lake study.

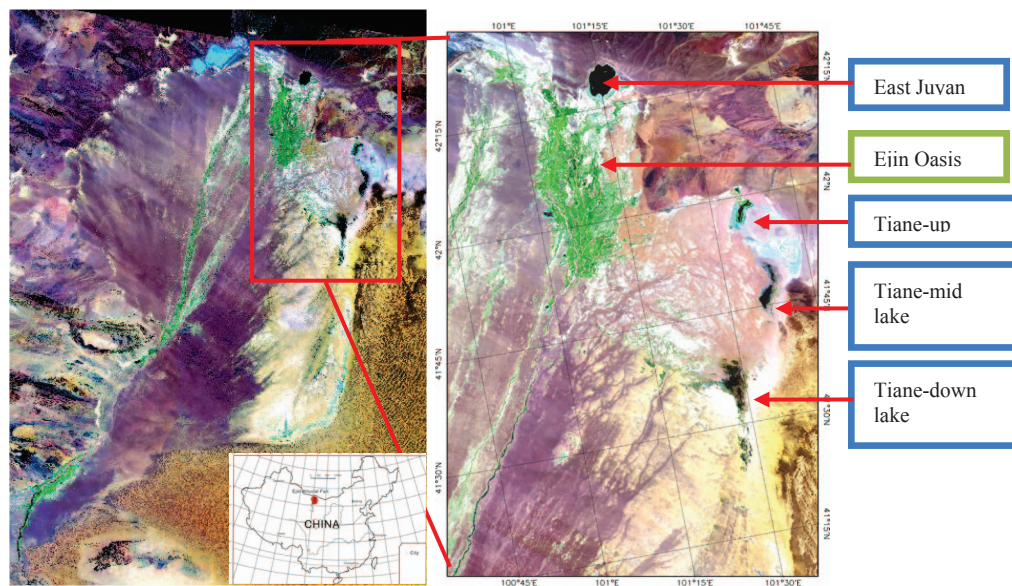


Fig.1 The location of the lakes in the Ejin alluvial fan

In this paper, the lakes in Ejin alluvial fan are chosen as study objects. Ejin alluvial fan, located in a typical arid region in the west of Inner Mongolia, China, is one of the largest alluvial fans in the world (30,000km<sup>2</sup>). The location and the area scale of the Ejin alluvial fan make the study of lakes in the alluvial fan very interesting. The study lakes are shown in Figure 1, including East Juyan lake, Tiane-up lake, Tiane-middle lake and Tiane-down lake. Twenty years period LandSat TM images are used to obtain the long time-series and continental information

of the lake change. The problems including that 1) how does the lake area in Ejin alluvial fan change in latest 20 years, 2) and that what is the relationship between the lakes change the local environment or man-kind factors.

## 2. RESULTS AND DISCUSSIONS

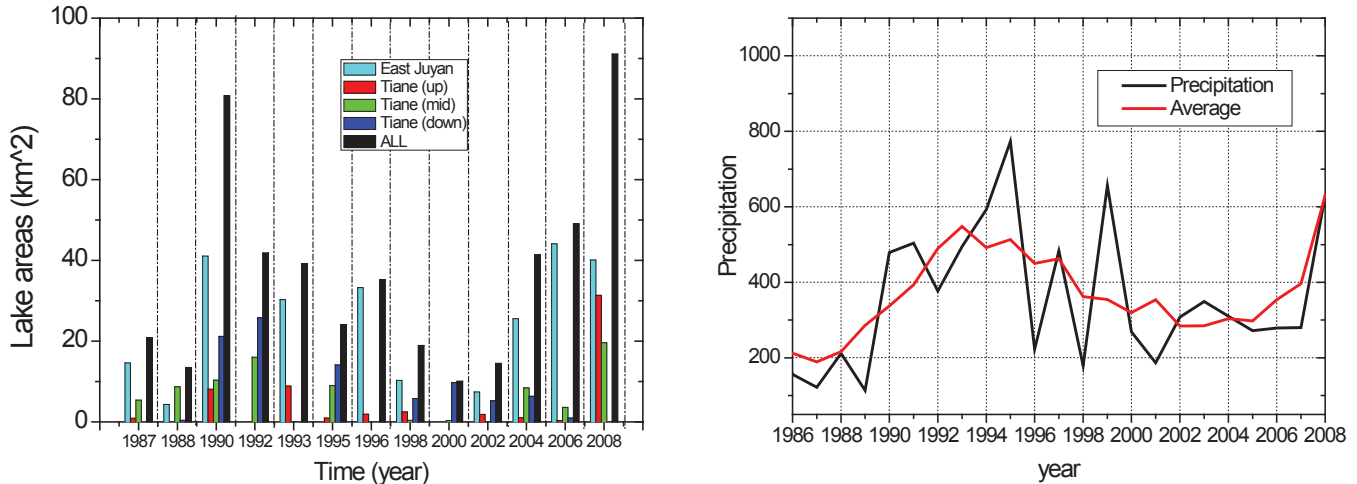


Fig.2 (a) is the area change of the four lakes from 1987 to 2008. (b) is the annual precipitation

The area change of the four lakes from 1987 to 2008 and the corresponding annual precipitation are shown in Fig. 2(a) and Fig.2(b) respectively. From the figure, we can get the following conclusions.

1. In recent 20 years, the total area of the four lakes in Ejin alluvial fan reduced firstly then increased after 2000. The peak value of the total area happened in 1990 and 2008 respectively, reaching to 80km<sup>2</sup>. In 2000, the total area decreased to 10km<sup>2</sup>, reaching the lowest level.
2. The area changes of the four lakes are different. The East Juyan lake is more depended on the Heihe river, while the other three lakes have high correlation with the regional environmental change, especially with the annual precipitation in the study area.
3. Both the environmental change and the man-kind factors are the drivers of the lake change in Ejin alluvial fan. The latter might exert a main influence.