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# Research on Earth-Surface Interaction Mechanism, Process and Dynamics of Human-Earth System\*: Case Study on the Geographic Belt Transect from Shenzhen in Guangdong Province to Bayanhaote in Inner Mongolia Province of China

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## Abstract

China epitomizes a rapidly growing economic region typified by human-induced urbanization at a geometric rate. Considering the regional differentia of the Chinese geography, this paper chose a geographic belt transect of human-activity disparity to accomplish the earth-surface system research. The study area is a narrow southeast-northwest geographic belt transect of China, passing through six cities of China. The total study area measures 385600km<sup>2</sup> with a width of 100—150km and a length of 2200km. Using the GIS and database technology, this paper integrated the basic geographic information, remote sensing images, statistical data, and special-subject pictures. Subsequently the geographic information system for the Shenzhen-Bayanhaote Geographic Belt Transect was generated. Founded on the database and GIS platform, the related geographic belt transect research on earth-surface interaction mechanism, process and dynamics of Human-Earth system was carried out. This is capable of providing scientific support and the foundation for expressing the impact of human activity on earth-surface system and understanding the differentia of regional geographic process. With regard to the research mechanism of Human-Earth system interaction, the impacts of both temperature and precipitation variation and the human-dimension factors on disaster loss were discussed and analyzed in the research belt transect. When considering the process and dynamics research of Human-Earth system interaction, the spatiotemporal pattern of the ecological assets, land use change and its impact on ecological assets in the research belt transect during the last five years of 1990s were analyzed. The flood-drought disasters and its relation with spatiotemporal pattern of land use in the research belt transect were investigated and discussed. Meanwhile, for performing in-depth research of the typical sample-points in the research belt transect, this study chose the Buji river watershed in Shenzhen. Shenzhen is characterized by population-induced rapid. The land use/cover change were measured and analyzed, and various hydrological process scenarios were simulated using SWAT distributed hydrological model under the situation of lack of observation data. The ultimate objective of this process was to reveal the impact of urbanization on the land use/cover change and improve the relevant research mechanism.

## Keywords

GIS, Human-Earth system interaction mechanism, process and dynamics, geographic belt transect

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