



Construction and data Integration of Field observation system for Environmental change of the Third Pole and Silk Road

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The Tibetan Plateau, which is called as the Third Pole region, is the most concerned high mountain area in the world. It is called as “Asian water tower” because of its widespread glaciers, rivers and lakes which may exert huge influence on the lower reaches. Most part of the Silk Road economic belt is located within the arid area of Central Asia, with the surface water resources being strongly influenced by the high mountain ice melt water from the Third Pole area. Under the condition of global climate change, the water tower effect of the Third Pole region not only changes the water resources and environmental conditions of the region itself, but also has an obvious influence on the economic development mode of the Silk Road economic belt.

For the lack of long-term monitoring data of regional climate and environmental changes in the Tibetan Plateau and the Silk Road economic belt, and insufficiency of the researches for the reasons derived of nature/human activities, a three-dimensional observation system is being constructed to serve the Third Pole environmental change and the development of the Silk Road. This observation system, based upon the High-cold region Observation Research Network and the field stations of the Central Asian Ecological Center of the Chinese Academy of Sciences, is making the technical specification for observations of land surface process and environmental changes, perfecting the observation and research contents of environmental change elements, constructing new observation stations, integrating the in site network monitoring and remote sensing data, and establish a multi-source climate and environmental element assimilation database based on the scale transformation. This system will serve to clarify the impact process and extent of natural change / human activity on environmental changes in the Third Pole area and the Silk Road.

Through 5 years observation research and data integration, the system will produce the observational data set of meteorological, atmospheric environment, lake hydrology and ecological community index in the study area. Based on the satellite remote sensing image interpretation and in site observation data verification, a series of data products will be established, such as meteorological elements, lake water storage and water quality, surface vegetation biomass, permafrost distribution and glacier area and ice volume change in typical area of the Tibetan Plateau. The data will be managed on an observation data system, which provides the functions of remote control of instruments, real-time transmission of in site observation data and monitoring scene, on-line data quality control, data query and statistics and visual output.

Key words: Tibetan Plateau, Silk Road, in site observation, data products, environmental changes