Monitoring river flow and water recourse management for Ili River from microwave satellite observation

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The Ili River is a transboundary river shared by China, upstream, and Kazakhstan, downstream. About 70% of the flow of the Ili River is formed in China and historically 80% of water in Lake Balkhash is supplied by the Ili River. The main consumer of water resources in China and Kazakhstan is irrigation during the growing seasons. Near real-time satellite observations can be used to mitigate the adverse impacts of extreme events as a flood and drought. Remote sensing observations using Special Sensor Microwave Imager (SSMI) are based on using the wetness index to predict expected river flow on the Ili River. The findings from the project will particularly exciting, since we will be able to use the wetness index to identify the relationship between the liquid water accumulating in the basin and the volume of water reaching Kazakhstan. This relationship between SSMI and river gauge data will be calibrated on early years (1992 to 2002), which was a period of time before many of the reservoirs were built, the calibration were performed at a time representing more natural flow. The model calibration for later years (2003-2013) to identify a pattern of flow when the river has been increasing controlled and used for irrigation. The analysis and river flow will be used to quantify the loss of water during the growing season, based on the wetness index and the model prediction.

**Key words:** Kazakhstan, China, upstream, downstream, Special Sensor Microwave Imager (SSMI), wetness index