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INTRODUCTION TO THE FEATURED SERIES ON SATELLITES AND TRANSBOUNDARY WATER: EMERGING IDEAS[1]

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During the catastrophic floods of 2001 in Mozambique, there were reportedly only four precipitation gages reporting rainfall for the whole country, an area larger than New Mexico. According to Arthur Askew, director of hydrology and water resources at the World Meteorological Organization in Geneva, *"Many stations are still there on paper, but in reality they don't exist. Even when they do, countries lack resources for maintenance"* (Stokstad, 1999).

Precipitation and stream gages are controlled by the countries in which they are located; their governments decide who has access to the data. However, commercial and scientific satellite data generally are available to all, and this might bring about an interesting twist to the way we have traditionally done business with water. We live in a world where terrestrial water flow does not recognize political boundaries of nations, only the topographic limits of the catchments. Yet, more than 260 river systems of the world are subject to international political boundaries (Wolf *et al.*, 1999). These river systems flow through multiple nations within the basin before draining out. An International River Basin (IRB) is such a basin within the jurisdiction of many nations. IRBs are ubiquitous in all five continents and a total of 145 countries are geographically associated in their drainage area. Today, these basins account for more than 40% the earth's inhabitable land mass and more than 50% of global surface flow.

Sections of the scientific community already have forged partnerships for the development of spaceborne missions for cost-effective, global hydrologic measurements. Examples are the Soil Moisture Active Passive (SMAP) mission for global mapping of soil moisture (Entekhabi *et al.*, 2004), the Surface Water and Ocean Topography (SWOT) mission for surface flow measurement (Alsdorf *et al.*, 2003) and the Global Precipitation Measurement (GPM) mission for global monitoring of rainfall (Hossain and Lettenmaier, 2006). All these are planned for launch as early as 2013 and can be expected to make measurements freely available in near-real time. The scientific community as well as the water-user community could leverage these spaceborne missions for most of its data needs for hydrologic research, water resources management, and operational forecasting.

So what does this globally evolving scenario of having more satellites for hydrologic measurement bode for us in a changing climate where the availability of water resources is likely to shift during this century? Will the availability of such freely-available information on water fluxes solve many of the fundamentally intractable problems, such as real-time forecasting of transboundary water flow?

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Will nations in IRBs become more and more "independent" and "sovereign" in forecasting and managing water resources flowing from and to other nations? Will the increased transparency of data increase trust among nations for greater cooperation on water issues?

In light of these upcoming new earth-observing space missions, JAWRA is running a featured series on satellites and transboundary water. In this issue, the first two papers report on the institutional capacity for managing transboundary flooding
1 (Bakker, this issue) and the community-wide effort to produce global and quality-controlled satellite
2 rainfall data (Kidd *et al.*, this issue). Future papers in the series will focus on satellite-based water resources modeling in the Ganges-Brahmaputra basin, tracking of water-borne disease in African rivers using satellites, and gauging the state of climate of the Amazon basin.

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