

## **Urbanization and Water Quality Trade-offs: A Geochemical Case Study from Jaipur, India**

R.M. COYTE<sup>1\*</sup>, K.E. FURST<sup>2</sup>, W. MITCH<sup>2</sup>, A. VENGOSH<sup>1</sup>

<sup>1</sup> Division of Earth and Ocean Sciences, Nicholas School of  
the Environment, Duke University, Durham, NC 27708  
(\*correspondence: rmc33@duke.edu)

<sup>2</sup> Civil and environmental Engineering,  
Stanford University, Standford, CA 94305 USA

Jaipur is the capital city of the Indian state of Rajasthan and the 11th largest city in India. Population pressures have greatly increased demand for freshwater in the city in recent years. Without reliable surface water, the city and surrounding areas are heavily reliant on groundwater for all of their needs.

We look at the groundwater chemistry of the city and surrounding rural communities to describe the unique water challenges faced by both groups. Water quality problems such as salinity, fluoride, boron, nitrate, and uranium are rife in this area, and people in rural communities have limited alternatives for drinking and agricultural water. While city dwellers are provided with an intermittent water supply from the state, the mixing of imported surface water with local groundwater and subsequent chlorination comes with its own risks. We use geochemical tools in addition to disinfection by-product data from the urban water supply to describe the processes which affect the ultimate drinking water quality for residents in these areas, and provide some insights for the future of urbanization in water stressed areas.