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Mapping the Global Water Footprint of Nations: Integrated GIS/MRIO approaches

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Virtual water accounts, and scarcity-weighted virtual water accounts, prepared using global multi-region input-output (MRIO) databases, provide detailed accounts of virtual water flows embodied in international trade. In this study we use the results of a global MRIO database to spatially map and visualize the changing virtual water and scarce water footprints of each of 187 countries over the last 30 years. During this time increased globalization has dramatically changed the way goods are produced. We present a series of maps showing how each country's water footprint falls in other countries around the world. The aim is to illuminate areas on the map where water in one watershed is used to produce goods bound for consumption in the target country. While the underlying international trade data are not yet precise enough to link a particular consumer purchase to a particular watershed used to produce that good, data visualization can still provide a compelling communication tool for motivating and explaining research into consumption-based accounting of environmental footprints. Consumption-based accounts of water use, especially if accurate to the watershed level, would let researchers see how consumption of water intensive goods in a consumer country is linked to water scarcity (and by proxy, food scarcity) concerns in the supplier nation. We discuss potential methods for integrating spatially accurate watershed-level data with global MRIO trade models.