Reducing Water Scarcity by Improving Water Productivity

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Nearly one-sixth of US river basins are unable to consistently meet societal water demands while also providing sufficient water for the environment. Water scarcity is expected to intensify and spread as populations increase, new water demands emerge, and climate changes. Improving water productivity by meeting realistic benchmarks for all water users could allow US communities to expand economic activity and improve environmental flows. Here we utilize a spatially detailed database of water productivity to set realistic benchmarks for over 400 industries and products. We assess unrealized water savings achievable by each industry in each river basin within the conterminous US by bringing all water users up to industry- and region-specific water productivity benchmarks. Some of the most water stressed areas throughout the US West and South have the greatest potential for water savings, with around half of these water savings obtained by improving water productivity in the production of corn, cotton, and alfalfa. By incorporating benchmark-meeting water savings within a national hydrological model (WaSSI), we demonstrate that depletion of river flows across Western US regions can be reduced on average by 6.6%-23.5%, without reducing economic production. Lastly, we employ an environmentally-extended input-output model to identify the US industries and locations that can make the biggest impact by working with their suppliers to reduce water use “upstream” in their supply chain. The agriculture and manufacturing sectors have the largest indirect water footprint due to their reliance on water-intensive inputs but these sectors also show the greatest capacity to reduce water consumption throughout their supply chains.