Water Footprint Outcomes and Policy Relevance Change with Scale Considered: Evidence from California

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Abstract

Methods and datasets necessary for evaluating water footprints (WFs) have advanced in recent years, yet integration of WF information into policy has lagged. One reason for this, we propose, is that most studies have focused on national units of analysis, overlooking scales that may be more relevant to existing water management institutions. We illustrate this by building on a recent WF assessment of California, the third largest and most populous state in the United States. While California contains diverse hydrologic regions, it also has an overarching set of water institutions that address statewide water management, including ensuring sustainable supply and demand for the state's population and economy. The WF sheds new light on sustainable use and, in California, is being considered with a suite of sustainability indicators for long-term state water planning. Key to this integration has been grounding the method in local data and highlighting the unique characteristics of California's WF, presented here. Compared to the U.S., California's WF was found to be roughly equivalent in per-capita volume (6 $m^3 d^{-1}$) and constituent products, however two policy-relevant differences stand out: (1) California's WF is far more externalized than the U.S.'s, and (2) California depends more on "blue water" (surface and groundwater) than on "green water" (rainwater and soil moisture). These aspects of California's WF suggest a set of vulnerabilities and policy options that do not emerge in national-level assessments. Such findings demonstrate that WF assessments may find more policy relevance when scaled to analytical units where water-related decision making occurs.

Keywords: water footprint; virtual water; analytical scale; California