



A global and time-varying database of virtual water trade and consumptive water footprint of agricultural products

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The concepts of water footprint and virtual water embedded in traded goods are becoming widely used in the scientific literature. They are proving useful in a number of multidisciplinary contexts and they enable connections between different fields of study (hydrology, soil sciences, management, economics). Given this increasing popularity, measures of water footprints and virtual water contents are more and more required, with high levels of detail and accuracy. Currently, data are available in a fragmented way and through different studies or institutions and often miss relevant dimensions, such as the global spatial scale or the temporal variability. Here we propose a harmonized dataset of water footprint (WF) and virtual water trade (VWT) data for hundreds products. The dataset covers agricultural goods such as crops, crop-derived products, livestock products, and livestock-derived products. The agricultural WF represents the overall amount of water used along the production process; data are available at the country scale, for every year in the period 1961-2016, for each agricultural commodity, both as total WF (in m^3) and unit WF (in m^3/ton). VWT data are provided as detailed trade matrices, whose elements represent the amount of water (in m^3) virtually traded between the origin and the destination countries. VWT matrices are available for every year in the period 1986-2016, for each commodity. For both the WF data and the VWT matrices, we disentangle the amount of water coming from soil moisture (green water) and surface- and ground-water bodies (blue water). This dataset improves upon earlier datasets because (i) it uses the most updated data provided by the FAOSTAT database on production and trade of goods, (ii) it takes into account the temporal variability of the unit WF, which is generally kept constant in other databases, and (iii) it accounts for both the produced and the imported primary products in the evaluation of the crop-derived products WF. With the present database, that is made open access, we aim at supporting local and global scale assessments of agriculture water use, at promoting an efficient and sustainable management of water resources, and at contributing to the advance of studies at the interface between the environmental and socio-economical sciences.