ECV IN BRIEF

Domain: Terrestrial
Subdomain: Human Use of Natural Resources
Scientific Area: Hydrosphere
ECV Stewards: Nigel Tapper
Products: Volume of Water Use

Anthropogenic Water Use

Data on water extractions by sector and available renewable freshwater provide key information on the availability of freshwater and the amount of water stress in a country. Climate Change is projected to reduce renewable surface-water and groundwater resources significantly in most dry subtropical regions. In contrast, water resources are projected to increase at high latitudes. Climate change is also projected to reduce raw water quality, posing risks to drinking water quality, even with conventional treatment. The availability of freshwater plays a crucial role in food production and food security.

ECV Product[1]

PRODUCT	DEFINITION	REQUIREMENTS				
		FREQ.	RES.	REQ. MEAS. UNCERT.	STAB.	STANDARDS/ REFERENCES
Volume of Water Use	Total human use of global freshwater resources for livestock, irrigation, industrial and domestic consumption ($km^3\ yr^{-1}$)	Annual	100 km	n/a	n/a	n/a see refs below

Data Sources[2]

- Global data source: Aquastat of Food and Agricultural Organization (FAO) http://www.fao.org/nr/water/aquastat/data/query/index.html?lang=en
- Multiple national data sources, e.g. for Australia; Australian Bureau of Statistics (ABS) https://www.abs.gov.au/ausstats/abs@.nsf/mf/4610.0

[1] Current Products and Requirements as in the Implementation Plan 2016 (GCOS-200). GCOS is reviewing and will update the requirements until 2022. More information on: gcos.wmo.int and climatedata.wmo.int.

[2] This list provides sources for openly accessible data sets with worldwide coverage for which metadata is available. It is curated by the respective GCOS ECV Steward(s). The list does not claim to be complete. Anyone with a suitable dataset who would like it to be added to this list should contact GCOS.

Global Water Use

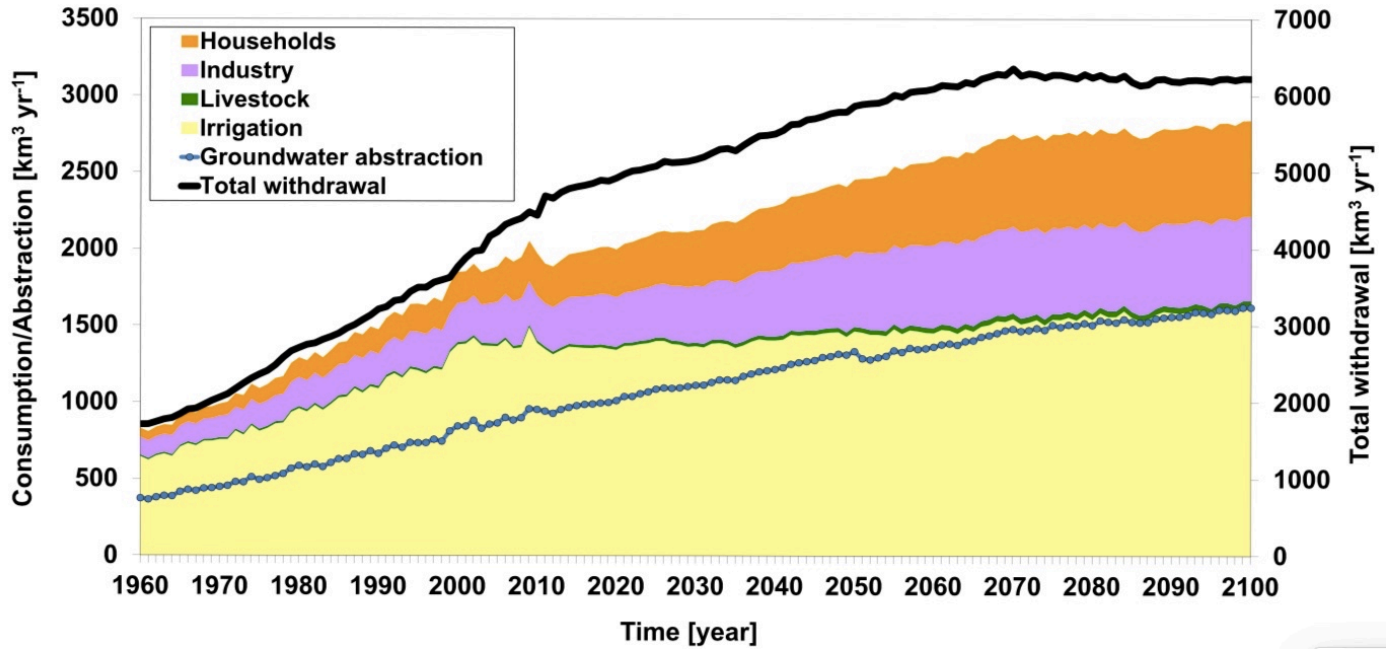

Figure: Estimated and projected trends of total global blue water withdrawal (right y-coordinate), sectoral blue water consumption (households, industry, livestock and irrigation) and total groundwater abstraction (left y-coordinate) over the period 1960–2099 (km³ yr⁻¹). (Wada and Bierkens, 2014)

Some Key References

- Amarasinghe UA, Smakhtin V. (2014). Global water demand projections: past, present and future. International Water Management Institute Research Report No. 156, xxxvi pp.
- Flörke et al. (2018). Water competition between cities and agriculture driven by climate change and urban growth. Nature Sustainability 1, 51-58.
- Hoekstra AY, Mekonnen MM. (2012). The water footprint of humanity. Proceedings of the National Academy of Science (PNAS) 109, 3232-3237.
- Parish, ES, Kodra, E, Steinhauser, K, Ganguly, AR. (2012). Estimating future global per capita water availability based on changes in climate and population. Computers and Geosciences, 42, 79-86
- Shen, Y, Oki, T, Kanae, S, Hanasaki, N, Utsumi, N, Kiguchi, M. (2014) Projection of future world water resources under SRES scenarios: an integrated assessment, Hydrological Sciences Journal, 59:10, 1775-1793, DOI: 10.1080/02626667.2013.862338
- Vorosmarty, CJ, Green, P, Salisbury, J, Lammers, RB. (2000) Global water resources: vulnerability from climate change and population growth. Science 289 (5477), 284–288. doi:10.1126/science.289.5477.284.
- Vorosmarty, CJ, McIntyre, PB, Gessner, MO, Dudgeon, D, Prusevich, A, Green, P, Glidden, S, Bunn, E, Sullivan, CA, Reidy Liermann, C, Davies, PM, (2010). Global threats to human water security and river biodiversity. Nature 467, 555–561. doi:10.1038/nature09440.
- Wada, Y, Bierkens, MFP. (2014). Sustainability of global water use: past reconstructions and future projections. Environmental Research Letters 9, doi:10.1088/1748-9326/9/10/104003.