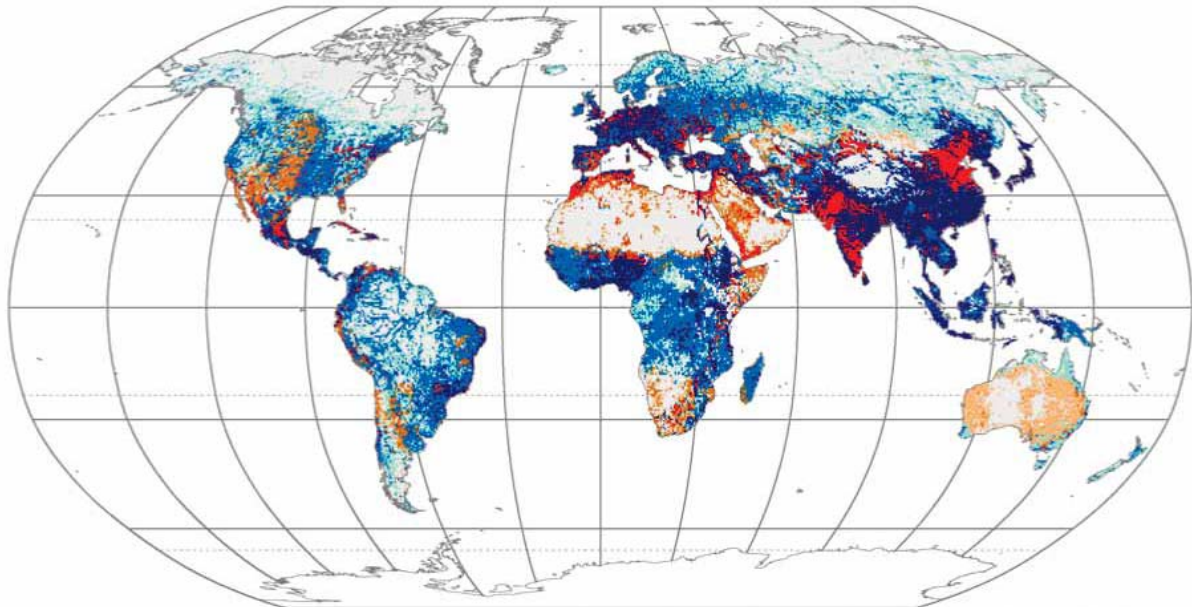


Indicator name

Relative water stress index

Note: Population (in thousands) above (reds) and below (blues) water stress threshold (RWSI=0.4)

Prepared by	Water Systems Analysis Group, University of New Hampshire (UNH)
Example	WWDR2, Section 2, Global Map 3
Rationale	Domestic, Industrial and Agricultural water demand per available water supply.
Position in DPSIR chain	Pressure, State
Definition of indicator	Domestic, Industrial and Agricultural water demand per available water supply per grid cell along river network. This indicator is also known as Relative Water Demand (RWD).
Underlying definitions and concepts	<p>The indicator is based on the following definitions:</p> <ul style="list-style-type: none"> • Domestic Water Demand: Volume of water required for domestic use per grid cell. • Industrial Water Demand: Volume of water required for industrial use per grid cell. • Agricultural Water Demand: Volume of water required for agricultural use per grid cell. • Water Supply: Volume of water supply available per grid cell
Specification of determinants needed	<p>Population per grid cell</p> <p>Per capita country or sub national level domestic water demand</p> <p>Per capita country or sub national level industrial water demand</p> <p>Irrigated land extent per grid cell</p> <p>Country or sub national level agricultural water demand (irrigated water use)</p> <p>Digitized, topological river network</p> <p>Gridded discharge fields (volume of water supply per grid cell)</p>
Computation	<p>The indicator is computed as:</p> DIA / Q

	<p>Where D = domestic water demand (km³/yr); I = industrial water demand (km³/yr); A = agricultural water demand (km³/yr); and Q = water supply (km³/yr). Population exposed to water stress is computed by setting a water stress threshold of RWSI = 0.4 and then summing the number of people in each grid cell that is above or below this threshold.</p>
Units of measurements	RWSI is a ratio and therefore has no units. Number of people exposed to water stress is typically presented as number of people (in thousands) per grid cell.
Data sources, availability and quality	All data for this indicator is available from the Water Systems Analysis Group at University of New Hampshire: http://wwdrii.sr.unh.edu/download.html (Accessed 3 March 2009)
Scale of application	Local for basins exceeding 25,000 km ² (within a city or community); regional (within a sub-national region); national (for a country); international (across several countries or globally).
Geographical coverage	Global, gridded dataset at 30-minute grid cell resolution Africa, gridded dataset at 6-minute grid cell resolution
Interpretation	This indicator provides a measure of the water demand pressures from the domestic, industrial and agricultural sectors relative to the local and upstream water supplies. Areas experiencing water stress and water scarcity can be identified by relative water demand ratios exceeding 0.2 and 0.4, respectively. A threshold of 0.4 (or 40% use relative to supply) signifies severely water stressed conditions (Vörösmarty et al. 2000). The combination of a water stress threshold and gridded population data allow for identification of water stress “hot spots”, areas where large numbers of people may be suffering from the effects of water stress and its consequent impacts.
Linkage with other indicators	This indicator represents one in a series of indicators dealing with water pressures on available resources. Other indicators in this venue are: Domestic Water Demand Industrial Water Demand Agricultural Water Demand Water Reuse Index Flood and Drought Index Non-sustainable Water Use
Alternative methods and definitions	This indicator is currently based on country level estimates of water demand and can be improved by using sub-national (county/province) water demand statistics. Higher quality data on the extent of irrigated areas would also increase the quality of this indicator.
Related indicator sets	None reported
Sources of further information	Charles J. Vörösmarty, Pamela Green, Joseph Salisbury, and Richard B. Lammers Global water resources: Vulnerability from climate change and population growth. <i>Science</i> 289: 284-288 (in Reports). Charles J. Vörösmarty, Ellen M. Douglas, Pamela A. Green, and Carmen Revenga. Geospatial Indicators of Emerging Water Stress: An Application to Africa, <i>Ambio</i> , 34 (3): 230-236, 2005
Involved agencies	Water Systems Analysis Group, University of New Hampshire http://www.wsag.unh.edu/ (Accessed 3 March 2009) World Resources Institute http://www.wri.org (Accessed 3 March 2009)