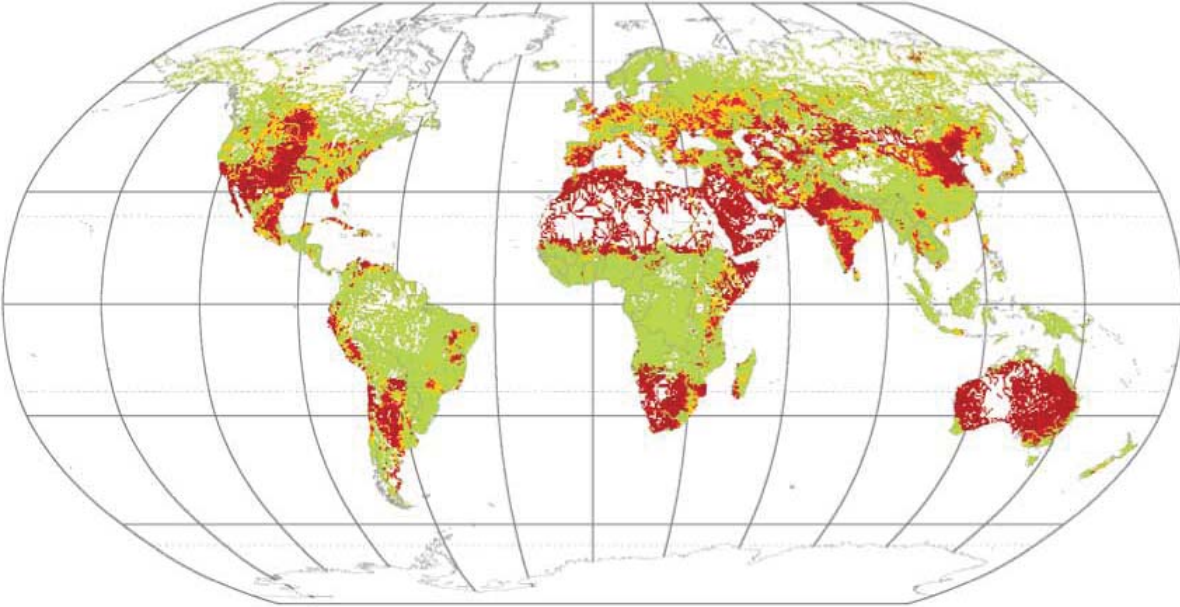


Indicator name	Water reuse index
 <p data-bbox="418 947 1258 997"> 0 < 0.1 0.1–0.4 0.4–1 > 1 </p>	
Prepared by	Water Systems Analysis Group, University of New Hampshire (UNH)
Example	WWDR2, Section 4, Global Map 8 WWDR3, Chapter 8, Figure 8.6
Rationale	Consecutive water withdrawals for domestic, industrial and agricultural water use along a river network relative to available water supplies as a measure of upstream competition and potential ecosystem and human health impacts.
Position in DPSIR chain	Pressure, State
Definition of indicator	Aggregate upstream water demand/use per available water supply per grid cell along river network.
Underlying definitions and concepts	The indicator is based on the following definitions: <ul style="list-style-type: none"> • Aggregate upstream domestic, industrial and agricultural water demand: Sum of upstream demand volume per grid cell. • Water Supply: Volume of water supply available per grid cell.
Specification of determinants needed	Population per grid cell Per capita country or sub national level domestic water demand Per capita country or sub national level industrial water demand Irrigated land extent per grid cell Country or sub national level agricultural water demand (irrigated water use) Digitized, topological river network Gridded discharge fields (volume of water supply per grid cell)
Computation	The indicator is computed as: $\frac{\Sigma \text{DIA}}{Q}$ <p>Where ΣD = upstream domestic water demand (km³/yr); ΣI = upstream industrial water demand (km³/yr); ΣA = upstream agricultural water demand (km³/yr); and Q = water supply (km³/yr)</p>
Units of measurements	This is a ratio and therefore has no units.

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	The water reuse index is a measure of the number of times water is withdrawn consecutively during its passage downstream. Several of the world's river systems bearing large populations, industrial development, and irrigated water use, show water use by society in excess of natural river flow (i.e. >100%). (The index is not to be confused with the widely-used Relative Water Stress Index (also known as Relative Water Demand) and the 40% threshold for severe scarcity which only reflects local-scale use). With high values for this Index, we can expect increasing competition for water between users, both nature and society, as well as pollution and potential public health problems. The Water Reuse Index can vary greatly in response to climate variations. The reuse index reflects the aggregate impact of water competition throughout the basin. With such increased water scarcity and pressure of the resource based there is an increased propensity for: <ul style="list-style-type: none"> • <i>polluted water</i> • <i>governance problems</i> • <i>conflict</i> • <i>human health problems</i> • <i>downstream ecosystem stress</i> • <i>curtailment of economic activities (i.e. abandoning irrigation)</i>
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: <ul style="list-style-type: none"> • Domestic Water Demand • Industrial Water Demand • Agricultural Water Demand • Relative Water Demand • 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. AQUAREC,
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)