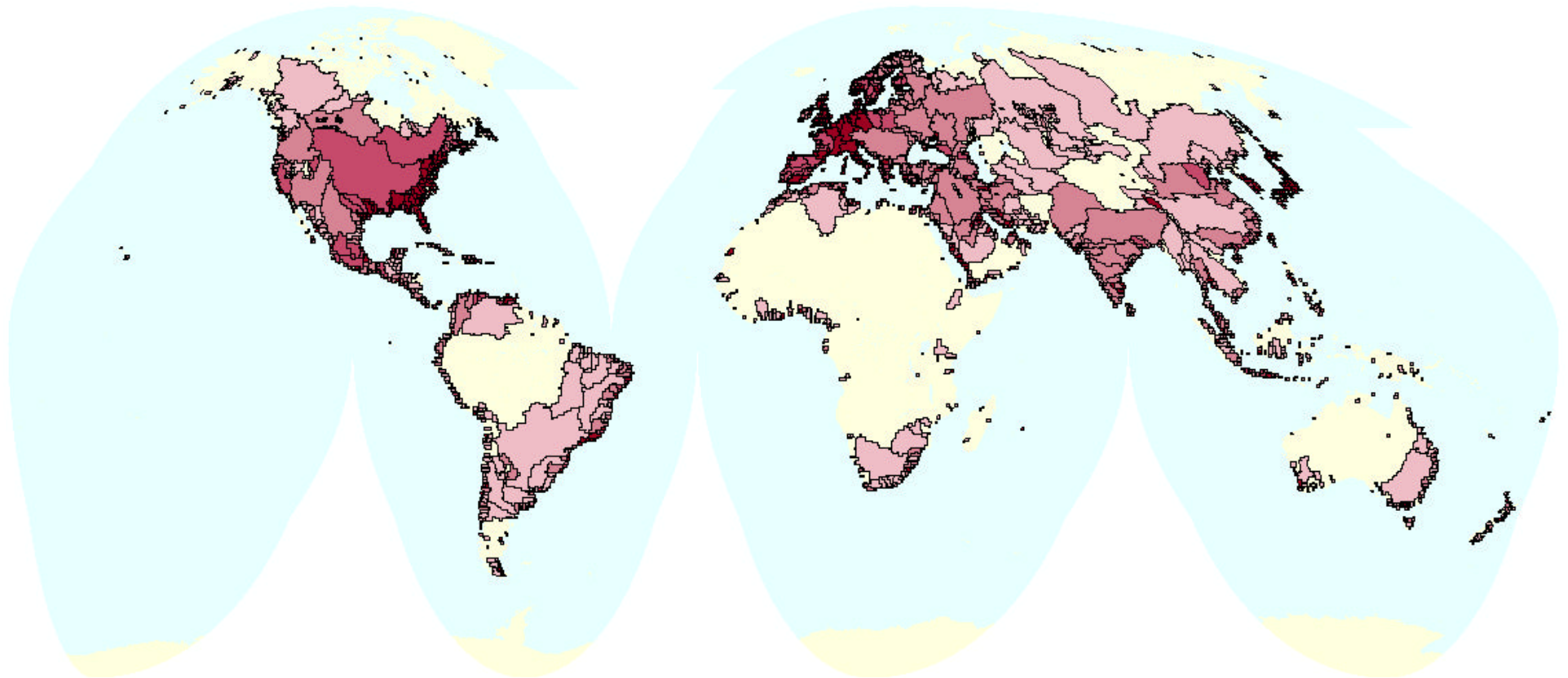


## Urban and Industrial Land Use by River Basin



**Map Projection:** Interrupted Goode's Homolosine

**Citation:** World Resources Institute - PAGE, 2000

**Notes:**

Percentage of  
urban and  
Industrial  
land use by basin

< 1

1 - 5

6 - 10

11 - 15

> 15

**Map Description:**

Freshwater systems are influenced not only by modifying rivers, lakes, and wetlands directly, but also by changing land-use patterns in the whole watershed. The pattern and extent of cities, roads, agricultural land, and natural areas within a watershed influences infiltration properties, transpiration rates, and runoff patterns, which in turn impact water quantity and quality. For example, expanding impervious areas increases the volume and rate of runoff of receiving streams and impacts the water quality and biodiversity of freshwater systems. This map presents the distribution of urban areas as judged by satellite images of nighttime lights for 1994 - 95. Because more urbanized watersheds tend to have greater impervious areas as well as higher quantities of urban and industrial pollution, this map also shows greater pressure on freshwater systems. This map shows that highly urbanized watersheds are concentrated along the east coast of the United States, Western Europe, and Japan, with lesser concentrations in coastal China, India, Central America, most of the United States, Western Europe, and the Persian Gulf.

**Analytical Overview:**

Urban areas came from a five-kilometer resolution stable-lights database (NOAA-NGDC 1998). The stable-lights database measures emitted nighttime visible and near-infrared radiation from cities, towns, and industrial sites. The data better represent urban areas with highly developed economies indicated by extensive electricity networks, street lighting, and industrial activities, such as refineries. They underestimate urban areas within countries with less developed economies. Percentage of urban area was aggregated by large river basins to produce global maps. Basin boundaries come from Fekete et al. 1999.

**Source:**

1. NOAA-NGDC (National Oceanic and Atmospheric Administration-National Geophysical Data Center). 1998, Stable Lights and Radiance Calibrated Lights of the World CD-ROM. Boulder, Colorado, USA: NOAA-NGDC. Available On-line at: <http://spidr.ngdc.noaa.gov>. 2. Fekete, B., C.J. Vörösmarty, and W. Grabs. 1999, Global, Composite Runoff Fields Based on Observed River Discharge and Simulated Water Balance. Koblenz, Germany: WMO-GRDC.