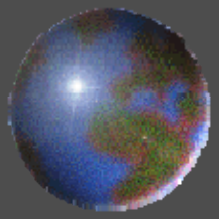

Lesson 3: Hydrologic Assessment – Water Balance

53:171

Water Resources Engineering

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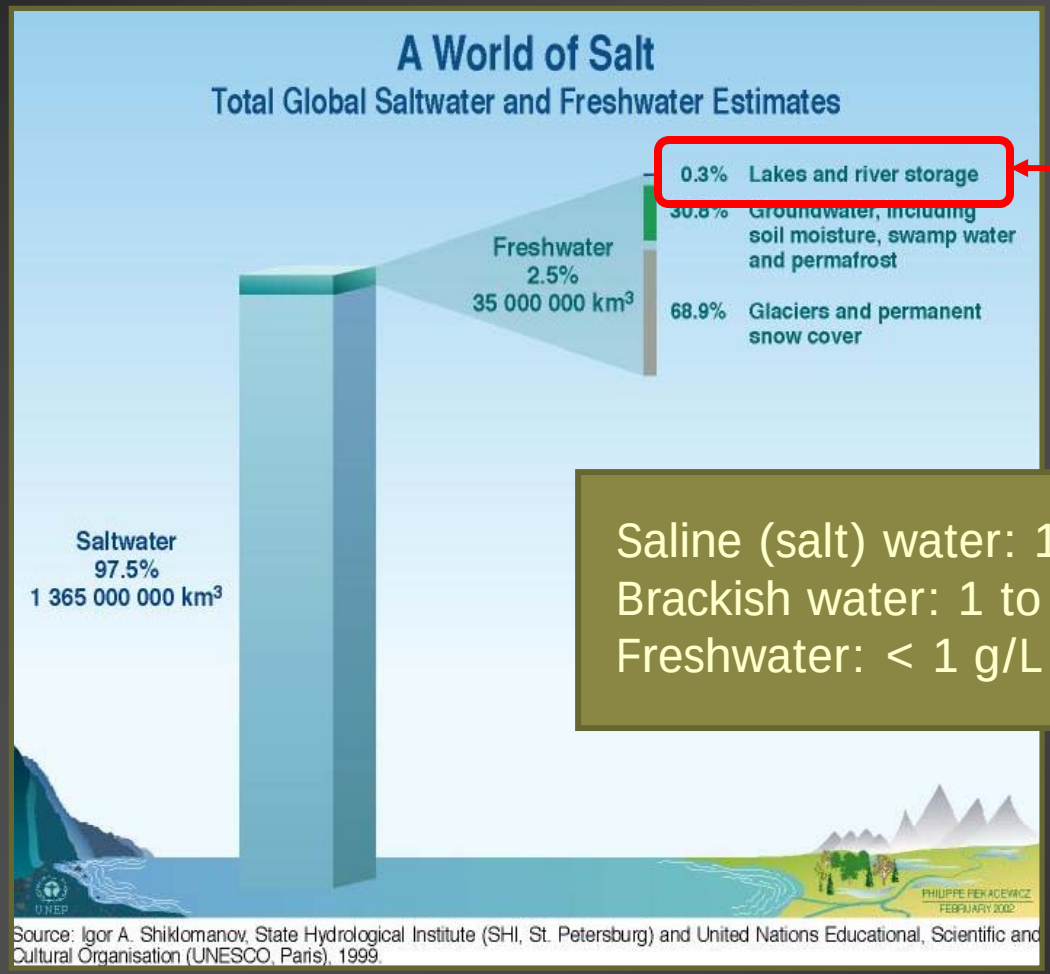
Global Freshwater Resources



Source: Igor A. Shiklomanov, State Hydrological Institute (SHI, St. Petersburg) and United Nations Educational, Scientific and Cultural Organisation (UNESCO, Paris), 1999.

Only this portion renewable

Saline (salt) water: 10 to 100 g/L
Brackish water: 1 to 10 g/L (treatable)
Freshwater: < 1 g/L (drinkable)

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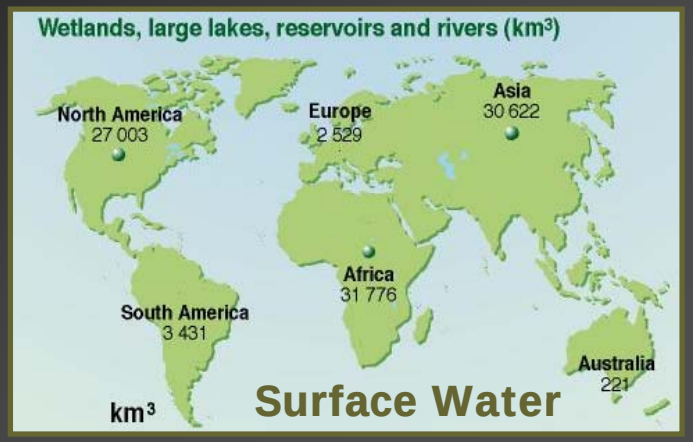
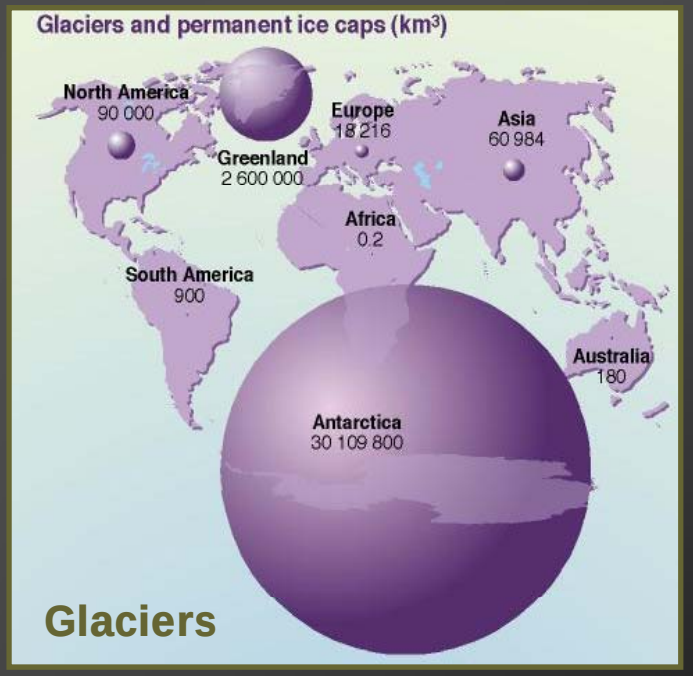
Global Freshwater Storages





Note: Estimates refer to standing volumes of freshwater.
Source: Igor A. Shiklomanov, State Hydrological Institute (SHI, St. Petersburg) and United Nations Educational, Scientific and Cultural Organisation (UNESCO, Paris) 1999; World Meteorological Organisation (WMO); International Council of Scientific Unions (ICSU); World Glacier Monitoring Service (WGMS); United States Geological Survey (USGS).

Storages

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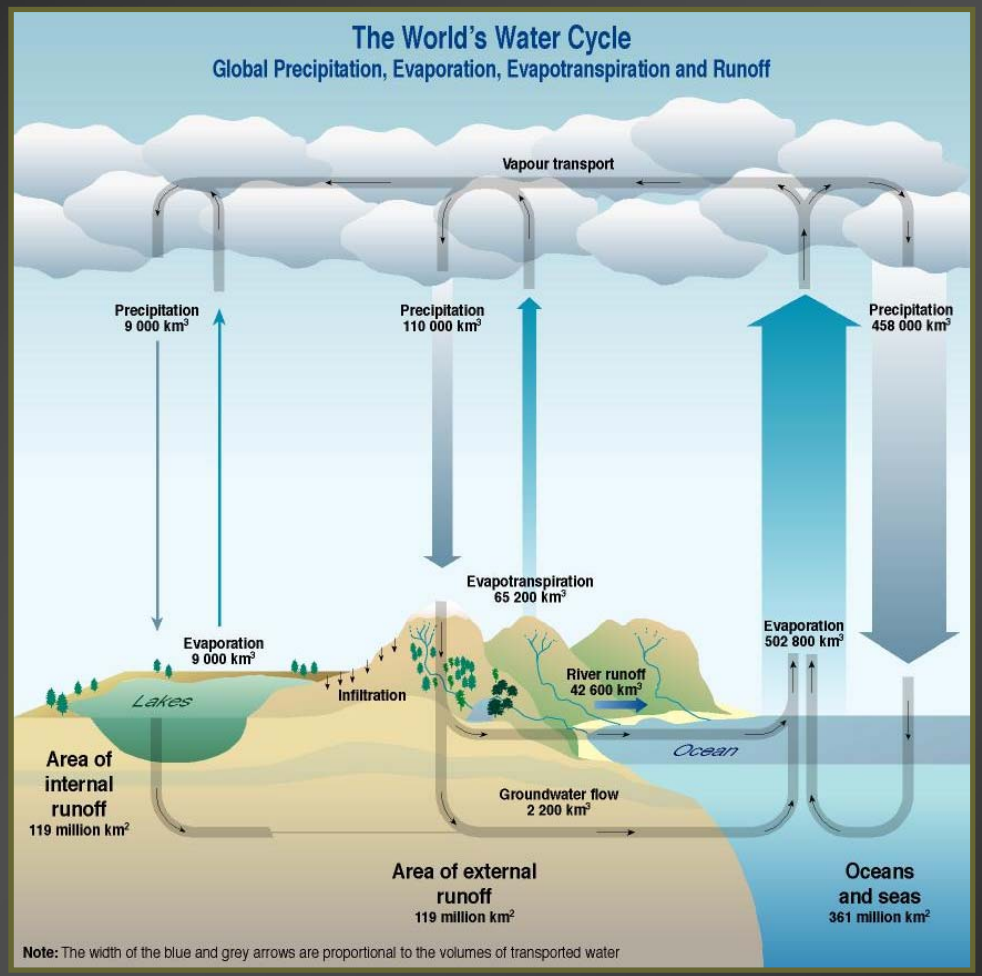
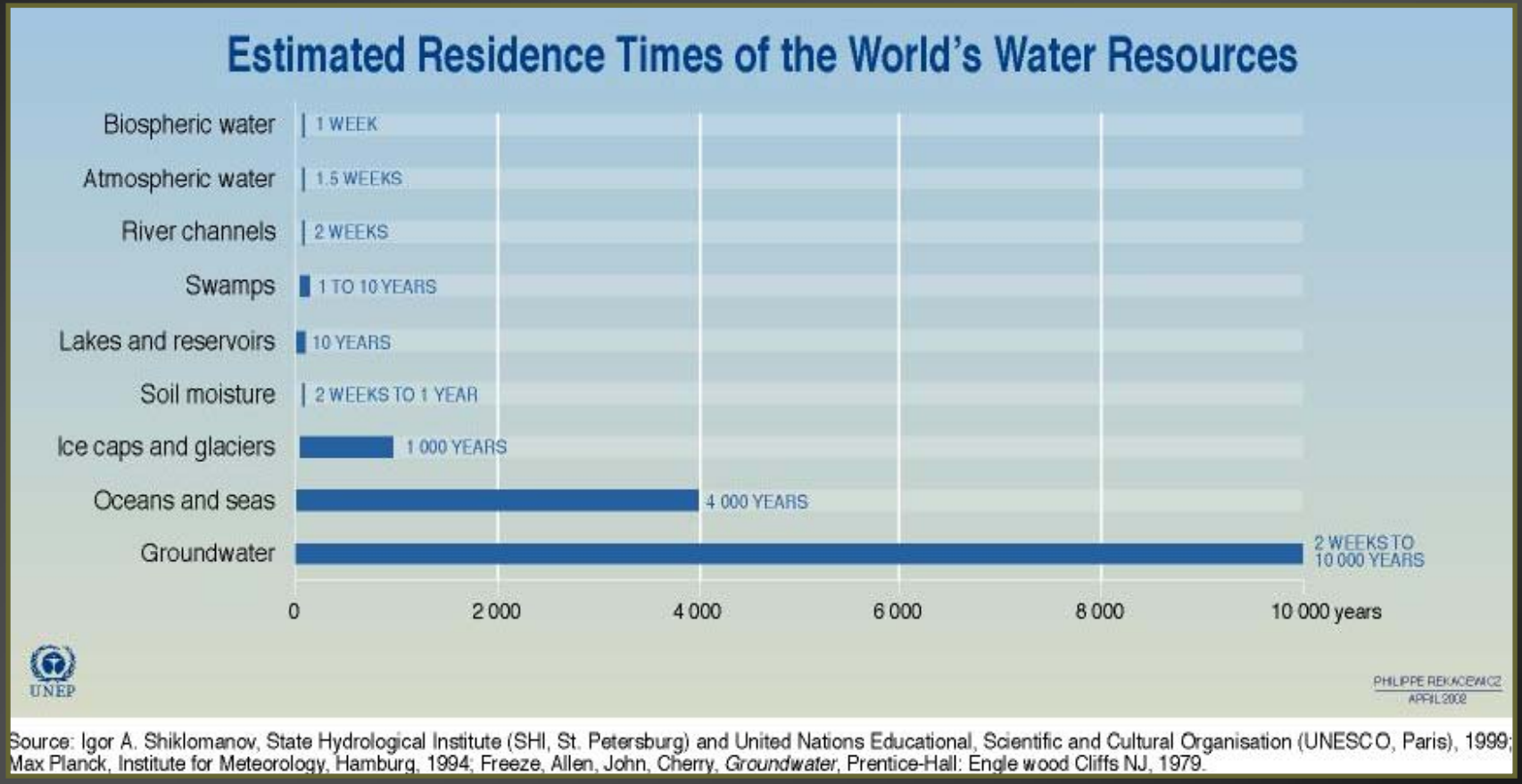
Water Cycle Fluxes



Fluxes

Vapor transport
Precipitation
Evaporation
Transpiration
GW Flow

Residence Times



Source: Igor A. Shiklomanov, State Hydrological Institute (SHI, St. Petersburg) and United Nations Educational, Scientific and Cultural Organisation (UNESCO, Paris), 1999; Max Planck, Institute for Meteorology, Hamburg, 1994; Freeze, Allen, John, Cherry, *Groundwater*, Prentice-Hall: Engle wood Cliffs NJ, 1979.

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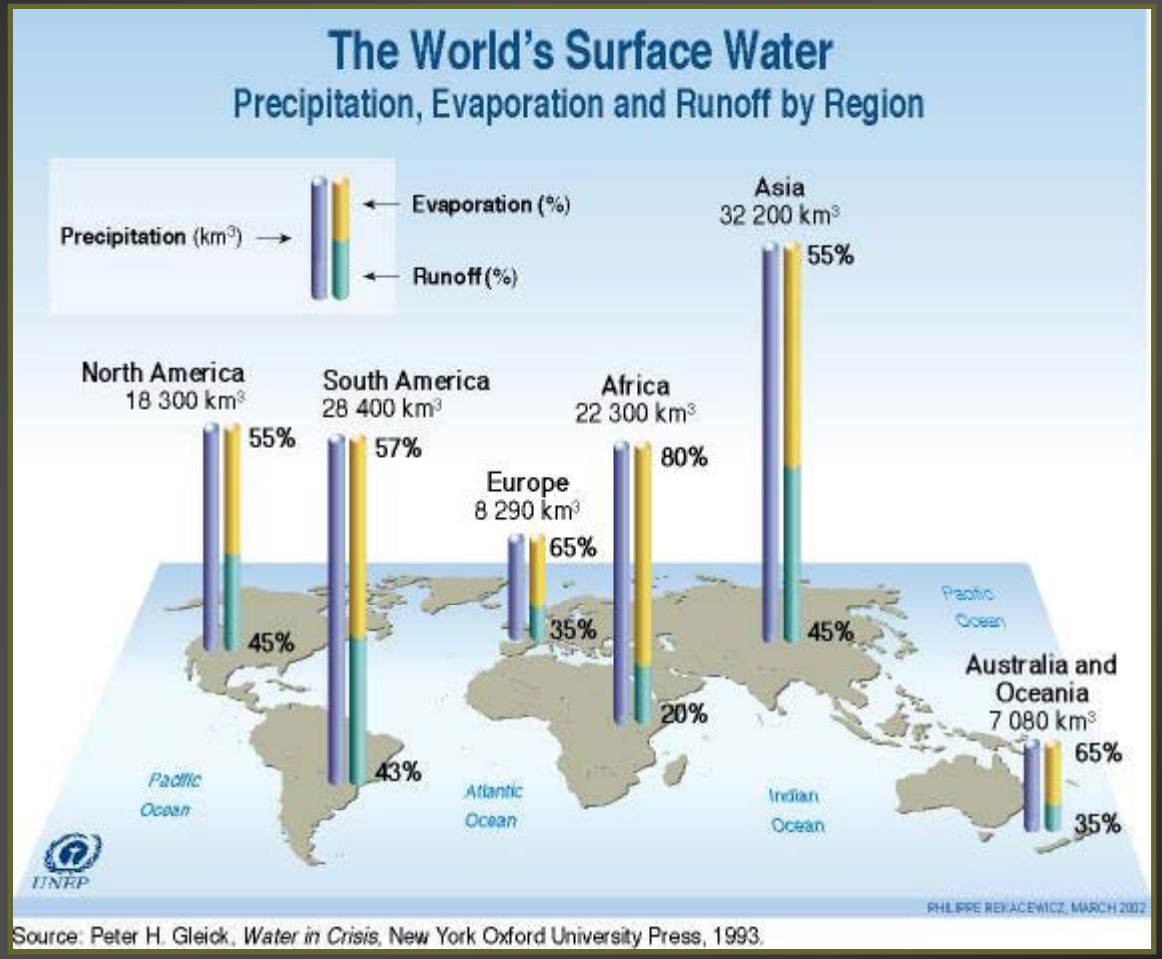
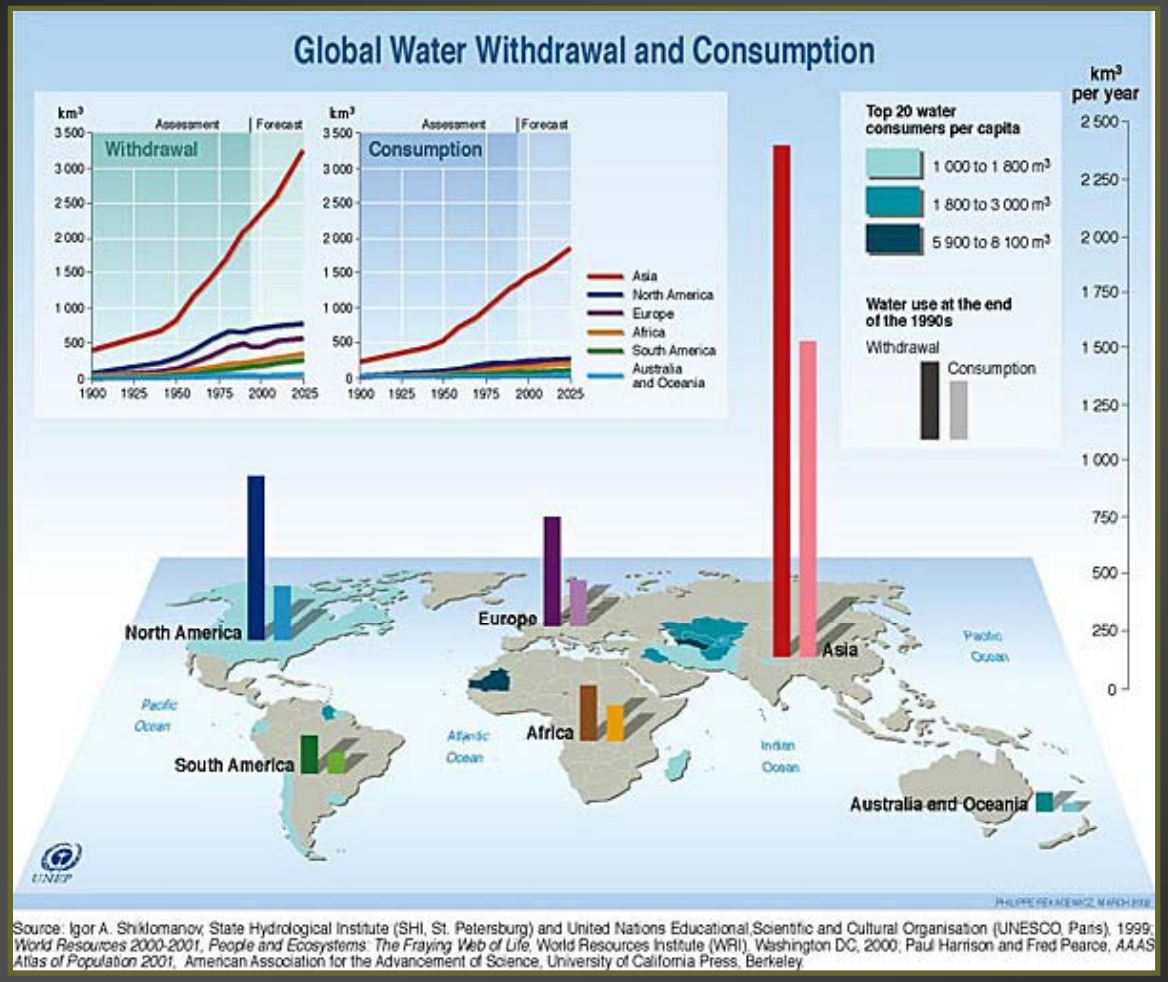
Global Water Balance



Source: Peter H. Gleick, *Water in Crisis*, New York Oxford University Press, 1993.

Withdrawal & Consumption



Source: Igor A. Shiklomanov, State Hydrological Institute (SHI, St. Petersburg) and United Nations Educational,Scientific and Cultural Organisation (UNESCO, Paris), 1999; *World Resources 2000-2001, People and Ecosystems: The Fraying Web of Life*, World Resources Institute (WRI), Washington DC, 2000; Paul Harrison and Fred Pearce, *AAAS Atlas of Population 2001*, American Association for the Advancement of Science, University of California Press, Berkeley.

Withdrawals for agriculture, industrial, and domestic uses.

Consumption is the usage + waste/losses

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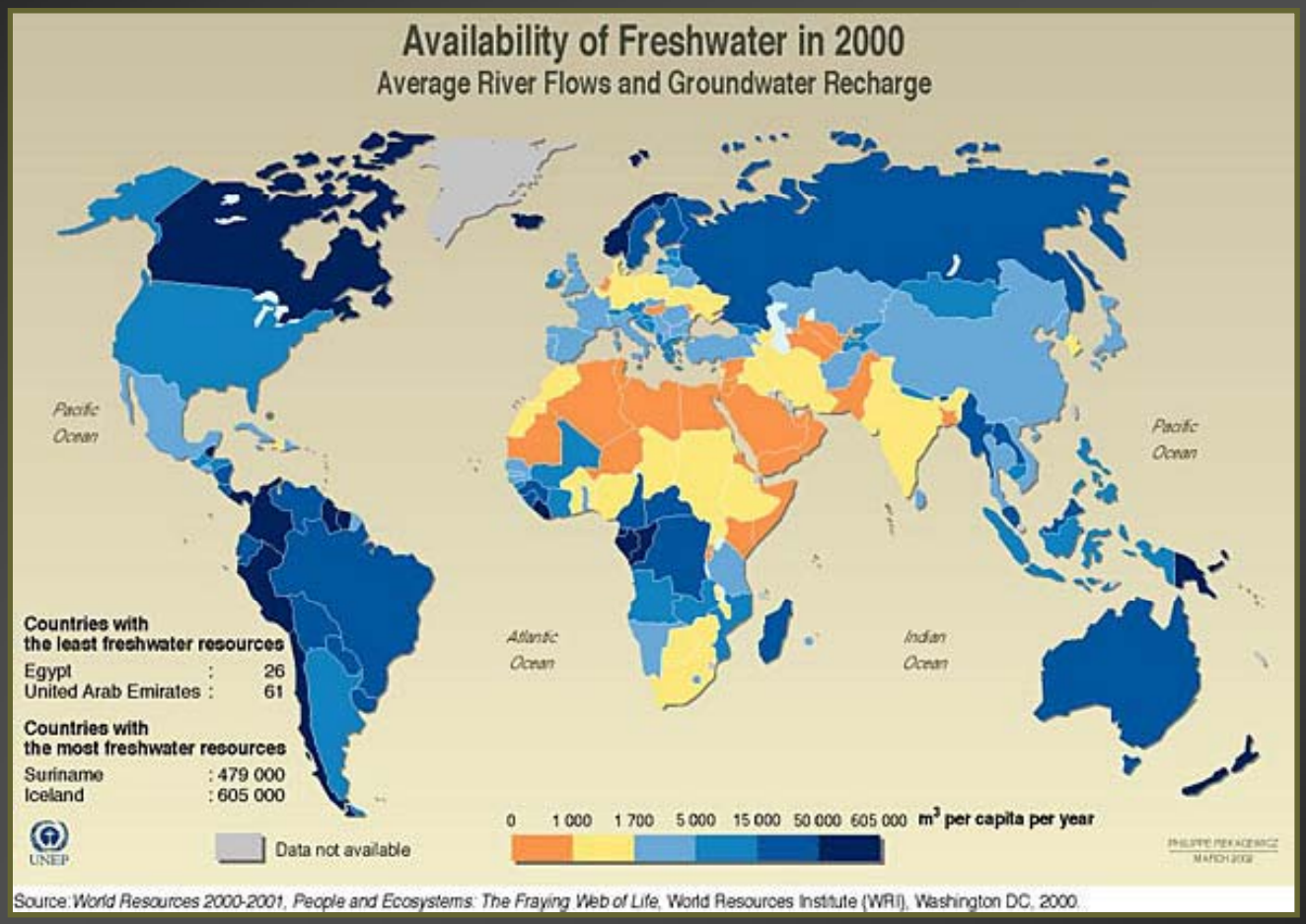
Freshwater Availability



Severity
< 1000 m^3/p
Stress
1000-1700 m^3/p
Sufficient
>1700 m^3/p

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Source of Information

- United Nations Environment Programme (UNEP)
  - Vital Water Graphics: An Overview of the State of the World's Fresh and Marine Waters

http://www.unep.org/dewa/assessments/ecosystems/water/vitalwater/index.htm

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