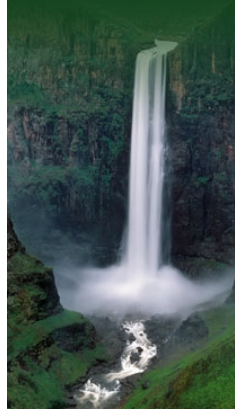


Orange-Senqu River Awareness Kit

The River Basin

- Introduction
- ▶ Geography
- ▶ Climate and Weather
- ▶ **Hydrology**
- Principles of Hydrology
- Water Cycle
- Surface Water
- Groundwater
- SW/GW Interactions
- ▶ **Water Balance**
- Hydrology of the Orange-Senqu River Basin
- ▶ Water Quality
- ▶ Ecology and Biodiversity
- References



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Hydrology: **Water Balance**

Water balance is a concept used to understand the availability and the overall 'state' of water resources in a **hydrological system**. A hydrological system is usually a standard surface water unit such as a quaternary catchment or, in the case of the Limpopo River, a River basin. This concept is also sometimes referred to as a **Water Budget**.

This holistic approach takes into account all of the water inputs into the system and the extractions take out of the system or out of circulation.

Inputs include:

- Precipitation - rain or snow
- Groundwater influx from an adjacent aquifer or a transboundary (trans-riverbasin) aquifer
- Snow melt
- Inter-basin transfer - water transferred into the basin from an adjacent riverbasin

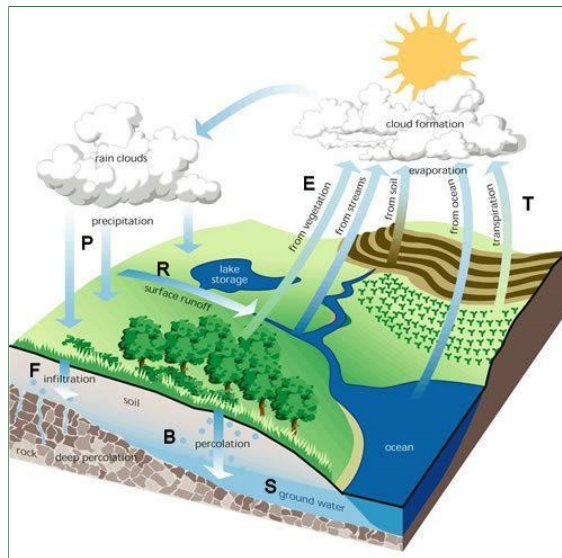
Extractions include:

- Evaporation
- Evapotranspiration
- Extraction for consumptive use from streams and rivers - water for industrial or domestic use and irrigation
- Extraction for consumptive use from groundwater aquifers
- Inter-basin transfer - water transferred out of the basin to adjacent river basin

A simple approach to a water balance equation could be considered as:

$$P + R + B - F - E - T = \Delta S$$

Wanielista *et al.* 1997



Annotated Hydrologic Cycle.
Source: (adapted from) FISRWG 1998
(click to enlarge)

Where:

- P = Precipitation
- R = Runoff or excess rainfall
- B = Subsurface flow
- F = Infiltration
- E = Evapotranspiration
- T = Transpiration
- S = Change in storage in the saturated zone - soil or groundwater

[Next: Hydrology of the Orange-Senqu River Basin](#)

Interactive

Basin Map

Explore the sub-basins of the Orange-Senqu River

[enter](#)

Video Tour

Tour video scenes along the Orange-Senqu River related to the River Basin

[enter](#)

Geography Maps

Investigate land cover and terrestrial ecoregions in the basin

[enter](#)

Water Cycle

Examine how the hydrologic cycle moves water through and around the earth

[enter](#)

Food Web

Explore the interactions of living organisms in aquatic environments

[enter](#)