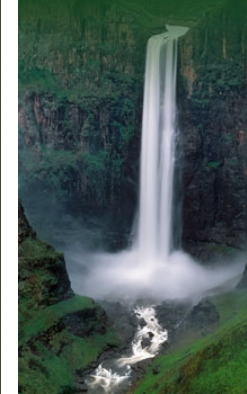




Orange-Senqu River Awareness Kit

The River Basin

- Introduction
- Geography**
 - Basin Landscape
 - Geomorphology
 - Relief
 - Geology
 - Soils
 - Soils of the Orange-Senqu River Basin
- Mineral Reserves
- Vegetation/Landcover
- Basins of Southern Africa
- River Basin and IWRM
- Climate and Weather
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- Water Quality
- Ecology and Biodiversity
- References



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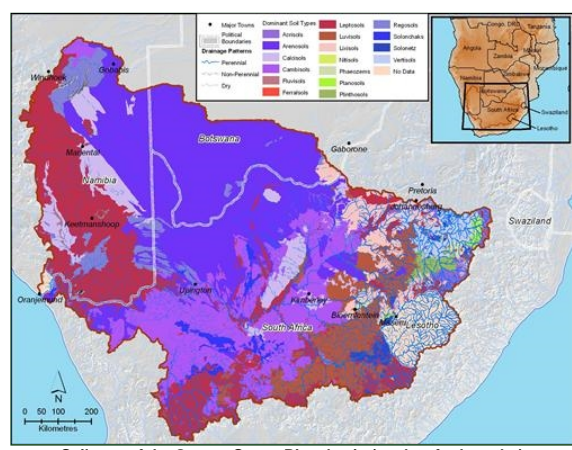
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Geography: Soils: Soils of the Orange-Senqu River Basin

There are two main dominant soil types that can be found in the areas of the Orange Senqu river basin:

1. Mountain Black Clay - These types of clays are usually shallow at high altitude and are easily eroded by surface runoff, cultivation and overgrazing.
2. The remaining larger portion of the Orange-Senqu River basin is covered by sands or weakly developed soils (UNDP-GEF 2008).

As a result of low vegetation cover and poor land management practices, the Orange-Senqu River basin is prone to soil erosion and land degradation. The map below provides a summary of the distribution of dominant soil types across the basin. A table summarising the major soil types and their distribution is also provided at the bottom of the page.



Soil map of the Orange-Senqu River basin (no data for Lesotho)
 Source: ISRIC World Soil Information Database 2003
 (click to enlarge)

Table: Dominant Soil Types in the Orange-Senqu River

Name	Description	Distribution
Arenosols	Sandy soils, developed from weathering of quartz-rich material or rock. Loamy sandy consistency up to approximately 100 cm depth. Less than 35 % rock fragment. Parent material unconsolidated calcareous or sandstone rocks. Code: AR	Particularly in the northern ephemeral river basin
Leptosols	Shallow soils found over continuous stony/gravelly rock and soils. Parent materials are various, with fine earth volumes of less than 20 %. Code: LP	Lower Orange and Senqu river Basin.
Cambisols	are weakly or moderately developed soils found mainly in temperate regions, but do occur all over the world, commonly on Pleistocene or other parent rock material Code: CB	Dominant in the vall and upper orange river basins.
Luviosols	Soils with a higher clay content in the lower horizons, that the upper horizons. Wide variety of different parent material types, including glacial, aeolian (wind-blown), alluvial (water-borne) or colluvial (gravity) deposits. Code: LV	Senqu and Vaal river basins.
Calsisols	are well-drained soils with fine to medium texture and an accumulation of secondary calcium carbonates, making them quite fertile. They are often used for grazing pasture. Code: CL	Vaal and ephemeral river basins.
Lixisols	Lixisols comprise soils that have a higher clay content in the subsoil than in the topsoil as a result of pedogenetic processes (especially clay migration)	Dominant in the Vaal 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

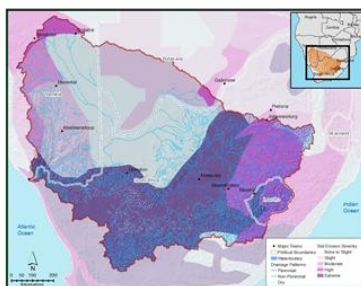
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	leading to an argic subsoil horizon	
Regosols	A group of Weakly developed mineral soils originating from unconsolidated material that do not conform to other classes. Code: RG	Ephemeral and lower orange river basins.
Vertisols	Heavy, churning (internally moving) clay soils that include clay minerals that swell with water, resulting in large cracks when dry. Code: VR	Vaal river Basin.
Solonchaks	Solonchaks are soils that have a high concentration of soluble salts at some time in the year. Solonchaks are largely confined to the arid and semi-arid climate zones	sparse distribution in all the basins of the orange except for the vaal basin.
Acrisols	Soils with higher clay content in the subsurface than upper portions. Parent materials include strongly weathered acidrocks and weathered clays that are degrading. . Code: AC	Ephemeral rivers and the vaal river basin.
Plinthosols	Plinthosols are soils with plinthite, petroplinthite or pisoliths. Plinthite is humus-poor mixture of kaolinitic clay (and other products of strong weathering such as gibbsite) with quartz. Code: PT	Found in the Vaal river basin.
Solontz	Solontz are soils with a dense, strongly structured, clayey subsurface horizon that have a high proportion of adsorbed Na and/or Mg ions Code: SL	Senqu and Vaal river Basins.
Phaeozoms	Phaeozoms accommodate soils of relatively wet grassland and forest regions in moderately continental climates. Code: PZ	Senqu and Vaal river basins.
Planosols	Planosols are soils with a light-coloured, surface horizon that shows signs of periodic water stagnation. Code: PL	Senqu and Vaal river basins.
Fluvisols	Fluvisols accommodate genetically young, azonal soils in alluvial deposits Code: FL	Upper Orange River Basin.
Ferralsols	Ferralsols represent the classical, deeply weathered, red or yellow soils of the humid tropics. Code: FR	Vaal Basin.
Nitisols	Nitisols are deep, well-drained, red, tropical soils, more than 30 percent clay and moderate to strong angular blocky structure elements that easily fall apart into characteristic shiny, polyhedral (nutty) element. Code: NT	Vaal River Basin

Adapted from FAO 2004; IUSS 2006

Soil Erosion and Degradation

In 1990, UNEP conducted a Global Assessment of Soil Degradation (GLASOD), which produced as one of its outputs, a global dataset of human induced soil degradation. Although the application of this data at river basin scale provides a relatively coarse and somewhat out of date result; in the absence of any other consistent basin-wide assessment, it provides a preliminary insight into the state of the soils of the Orange-Senqu River basin.



Soil erosion severity across the Orange-Senqu River basin.

Source: Oldeman, Hakkeling and Sombroek (1990)

(click to enlarge)

