

## NAMIB DESERT



Source: Roadside Geology of Namibia

One of five west coast, low-latitude deserts of the world, the Namib extends along the entire Namibian coastline in an 80-120 km wide belt. Its extreme aridity is the result of the cold, upwelling Benguela Current, which flows up the west coast of Africa as far as Angola, and because of its low temperatures induces very little evaporation and rainfall (<50 mm per year). It does, however, create an up to 50 km wide coastal fog belt providing sufficient moisture for the development of a specialist flora and fauna, many of which are endemic to the Namib. In addition, the lagoons at Walvis Bay and Sandwich Harbour are designated wetlands of international importance, because of their unique setting and rich birdlife, including flamingo, white pelican and Damara tern. Larger mammals like the famed desert elephant, black rhino, lion, cheetah and giraffe can be found along the northern rivers traversing the Skeleton Coast National Park.

Geomorphologically, the Namib includes a variety of landscapes, including classic sand dunes, extensive gravel plains, locally with gypsum and calcrete duricrusts, elongated salt pans, ephemeral watercourses forming linear oases, inselbergs and low mountain ranges. Along the coast, wind-swept sandy beaches alternate with rocky stretches in places carved into striking rock formations (e.g. Bogenfels Arch). Designated a UNESCO World Heritage Site in 2013, the "Namib Sand Sea" between Lüderitz and the Kuiseb River encompasses such well-known landmarks as Sossusvlei and Sandwich Harbour, while the fabled Skeleton Coast north of the Ugab River is notorious for its numerous ship wrecks.



Satellite image of the "Namib Sand Sea" with isolated inselbergs; inset: the frequent early morning fog forms the basis of life for a specialist fauna and flora (e.g. *Welwitschia mirabilis*, Namib Gecko)

Similarly, the floodwaters of the Tsondab to the north and the Koichab to the south were cut off from the Atlantic Ocean by northwards migrating sand dunes during the development of the Namib. Like the Tsauchab, they now terminate in clay-filled depressions amidst the Namib Sand Sea (Tsondab & Koichab Pans).



Sossusvlei

Surrounded by star dunes, Sossusvlei is situated at the termination of the Tsauchab River, whose exit to the Atlantic Ocean was blocked by northward migrating sand dunes. The bottom of the pan is composed largely of pale-coloured calcareous silts derived from carbonates in the Naukluft and Zaris Mountains to the east, and covered in polygonal mudcracks formed through the shrinkage of drying clays. Gravels characteristic of the Tsauchab catchment are found among the dunes to the west, indicating that at one time the river extended to the coast. Today, the seasonal Tsauchab reaches Sossusvlei only in years of high rainfall, when for a while it transforms the dry clay pan into an oasis. Other pans representing former termini of the Tsauchab can be found to the south and west of Sossusvlei. The nearby „Dead Vlei“ got its name from the ca. 900 year old skeleton trees, which died when the Tsauchab of those days changed its course, leaving them high and dry.



Tsauchab between Sesriem and Sossusvlei during the wet

First indications of a *proto-Namib* desert date back to the early Cenozoic (~60 million years ago). This phase reached its peak between 16 and 20 m. y. ago with the development of extensive sand deposits transported north from the *proto-Orange River* by southerly winds and a strong longshore drift, to form a precursor of the modern-day Namib erg (Tsondab Sandstone). Shipwrecks lying high on the beach are proof of the continued accretion of sand along the coast. A wetter climatic interval between 10 and 5 m. y. ago caused alluvial sedimentation off the Great Escarpment to the east, as evidenced by gravel terraces along the major westward flowing rivers (e.g. Karpfenkliff Conglomerate), before conditions once more became drier.