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Lifting the fog in the central Namib – where did it come from?

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The interplay between wet and dry is a distinct climatological characteristic of the hyper-arid coastal strip in the Namib. Moisture in form of low clouds/fog provides an important input of water to the Namib's biota via the atmosphere. Advection of low clouds/fog of marine origin is thought to be the dominant mechanism for fog, which, in the case of low clouds, occurs as fog where the cloud layer intercepts the land. This advection-dominated fog regime was questioned recently based on isotope analyses and led to the suggestion that it might be rather a radiation-dominated fog regime in the coastal Namib. Against this background we present a ground-based meteorological view to this debate. Net radiation and fog precipitation measurements from the FogNet in the central Namib are used to detect and distinguish low clouds/fog and the spatio-temporal patterns are analyzed.
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FogNet is a network of 11 meteorological stations which form a west-east transect from the coast to 733 m asl at 85 km inland, and a north-south transect at around 50 km inland at 400 to 500 m asl, where the inland-reaching stratus frequently intercepts. At all stations the following meteorological measurements are recorded: wind speed and wind direction at 10 m, air temperature and humidity at 2 m, net radiation, global radiation, surface temperature, soil moisture and soil temperature, leaf wetness, precipitation and fog precipitation using a Juvik-type fog collector. At three stations only: air pressure, net radiation and visibility. The measurements started in July 2014 with nine stations. Two additional stations were added 2015 and 2016 close to the coast.