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Namibian rainfall and the 1933/34 Benguela Nino

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Historical multi-year records of different length available from two Namibian rainfall stations and shorter series for ten rainy seasons (July 1928- June 1938), compiled by GELLERT (1955) from 70 stations distributed irregularly in the Namibian hinterland, are reanalysed in context with updated monthly series of the sea surface temperature anomaly. These series describe changes in thermal conditions at the surface of the eastern South-Atlantic (2.5° - 37.5°S, 17.5°W - 17.5°E) on the base of gridded 5°x5°-fields compiled by KAPLAN et al. (1998). It is shown that the extreme Benguela Niño 1933/34, which was reported manifold in the literature, coincides with enhanced precipitation in the Namibian hinterland and that strong thermal contrasts between exceptional warm coastal waters (2.5°- 27.5°S, 12.5°E) and colder offshore waters around 27.5°S, 7.5°W accompanied this phenomenon. This thermal dipole is regionally fixed and positive peaks, which exceed the value of 0.5°C, exhibit a quasi-cycle of about 14 years coinciding with that of 'wet years' detected over the St. Helena Island as well as over the Namibian hinterland. It is concluded that the relationship between this thermal dipole and extreme Namibian rainfall mainly results from (i) the south-westward displacement of the climatic position of the Intertropical Convergence Zone (ITCZ), the belt of the south-east trade wind, and the core of the cold Benguela Current (BC), and (ii) enhanced evaporation over the Gulf of Guinea and the belt of warm coastal waters reaching the latitude of about 26°S. Concerning so-called Namibian 'wet years', dominating air flows involve an enhanced south and/ or south-westward advection of humid equatorial air masses towards the Namibian hinterland to reach comparable importance than those originating from the West Indian Ocean.