Changes in the water level of the northern basin of Lake Chad between 2013 and 2024: What are the implications for productive activities in the Nigerien part?
(Oral)

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ABSTRACT

This research is part of a study of the hydrological dynamics of Lake Chad, whose fluctuations significantly influence productive activities such as agriculture, livestock farming, and fishing—the main drivers of socioeconomic development in the northern basin. The objective of the study is to analyze the spatiotemporal evolution of Lake Chad's water over the 2013–2024 period, with a particular focus on the northern basin, using spatial data. The methodology involves processing Landsat satellite images in the Google Earth Engine environment, utilizing the Random Forest classification algorithm. The mapping of water bodies is supplemented by an analysis of water level variations, conducted using radar altimetry data processed in the R environment. The results highlight recurring fluctuations in the water body, particularly pronounced in the northern basin, corresponding to the Nigerien portion of the lake. These hydrological variations are closely linked to the transfer of water inflows from the southern basin to the northern basin, which became particularly significant between 2019 and 2024, with frequent exceedances of the 280.99 m elevation and occasional peaks reaching 281.14 m. These changes have significant repercussions, such as the expansion or contraction of grazing lands and floodplain croplands depending on water level fluctuations.

Keywords: Lake Chad, variation, northern basin, Random Forest, productive activities