

**CHARACTERIZATION OF POOL EVOLUTION IN NIAMEY DEGREE (NIGER)  
BASED ON HIGH RESOLUTION OPTICAL  
REMOTE SENSING DATA**

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The hydrology of the Sahel is characterised by the degradation of the drainage network that induces a lack of large watersheds. In the Niamey degree, different studies have shown the importance of pools in the hydrology of the region. It was shown that different processes such as evaporation or deep infiltration depend on the level of filling of the pools. During the last years, several observations have shown different evolutions of these pools in the Niamey degree.

Our objectives in this paper are to identify the pools and their evolution. Our approach is based on high resolution optical remote sensing data, SPOT/HRV (20m) and SPOT5 (10m) images. This study uses a large data base of optical images (5 images in 1992, 1 image in 1994, 1 image in 1996 and 2 images in 2003). The identification approach is based on the NDVI coefficient calculated from Near Infrared and Red channels for each SPOT image. It is observed that the pools present the lowest values of NDVI in the studied optical images. The distribution of NDVI for pools is estimated for the different images, then a threshold is chosen to separate pools from the other types of land use.

First, we observe the evolution of pool surface and their number in the monsoon period from June to November in 1992. It is clearly shown that the maximum of pool surface corresponds to August 1992. This result is well correlated with rainfall statistics. Second, the estimation of pool surface and number from 1992 to 2003 shows an increase of the pools, particularly in the tiger bush. This behaviour could be explained particularly by the increase of the surface runoff in the region.

**Keywords :** water pools, tiger bush, SPOT/HRV, NDVI

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Convective wind system with aerosols, named "haboob", Hombori in Mali, West Africa.