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Monitoring flood propagation in the Niger River Inner Delta in Mali: prospects with the low resolution NOAA/AVHRR data

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Abstract The low resolution NOAA/AVHRR$_{14}$ data is used to characterize the space–time propagation of the flood and of the vegetation cover in the Inner Delta of the Niger River in Mali. We propose a method to identify the inundation front on satellite images, and to discriminate pixels of open water, flooded vegetation, vegetation on dry soil and bare soil. From the analysis of four images, taken at different dates well representing the whole cycle of water regime (from the filling to the emptying of the flood plain), we identify the four significant vegetative stages during the annual cycle: bare soil, vegetation on dry soil, flooded vegetation, open water. A selection of indexes sensitive to water surfaces and vegetation cover are presented. Then we propose an analysis of spectral signatures with a visual examination of coloured compositions to finally locate these four classes of pixels during the annual evolution of the flood.

Key words flood monitoring; open water; flooded vegetation; AVHRR; River Niger; Inner Delta; Mali