



SLAPIS
Système Local d'Alerte Précoce
pour les Inondations de la Sirba

Plateforme de visualisation
des scénarios de Risque
Hydrologique de la Sirba

Mapping of the flooded areas of Niamey following the flood of the Niger River in August-September 2020

Since August 12, 2020, the Niger River had exceeded the red alert threshold. The authorities, following the warnings given by the Directorates of Hydrology and Meteorology since July, had tried to strengthen and raise the protective dikes, which had generally held for more than ten days.

From Saturday August 22, a new rise in water was observed due to the heavy rains which had fallen the previous days in the upstream basin.

On August 23, 2020, at the level of 659 cm, the dikes began to give way in several places under the pressure of the flood water from the Niger River. The lower right bank areas were the first to be flooded. In Harobanda, water overflowed onto the road towards the Total station, passing the AGRHYMET Regional Center which was completely inundated. An earthen dike was erected in the middle of the road in front of Abdou Moumouni University to contain the water. The rice fields downstream of the Kennedy Bridge of the Riz du Niger were completely inundated. The Kennedy Bridge was closed as well as several roads near the River.

On September 6 at 7 a.m., the Niger River reached a new peak never reached at 680 cm following heavy precipitations in Niamey and in the upstream sub-basins. The Lamordé dike, which had been raised, ended up giving way and the districts of Lamordé, Zamargandey, Karadjé and the low areas on the right bank of the river were completely inundated as well as the districts of Gamkalley and Saga on the left bank. The populations evacuated the flooded neighborhoods. EMIG (School of Mines, Industries and Geology) and Lamordé Hospital (CHU) were also flooded.



Figure 1, Aerial view of Lamordé dike

It should be noted that the Niger River, on September 8, 2020 at 7 a.m., reached the highest level since the creation of the Niamey measuring station in 1929, i.e. 700 cm, and well 62 cm more than the record of September 1, 2019 at 638 cm.



Figure 2, Niamey limnimetric scale on September 8, 2020 at 7 a.m.

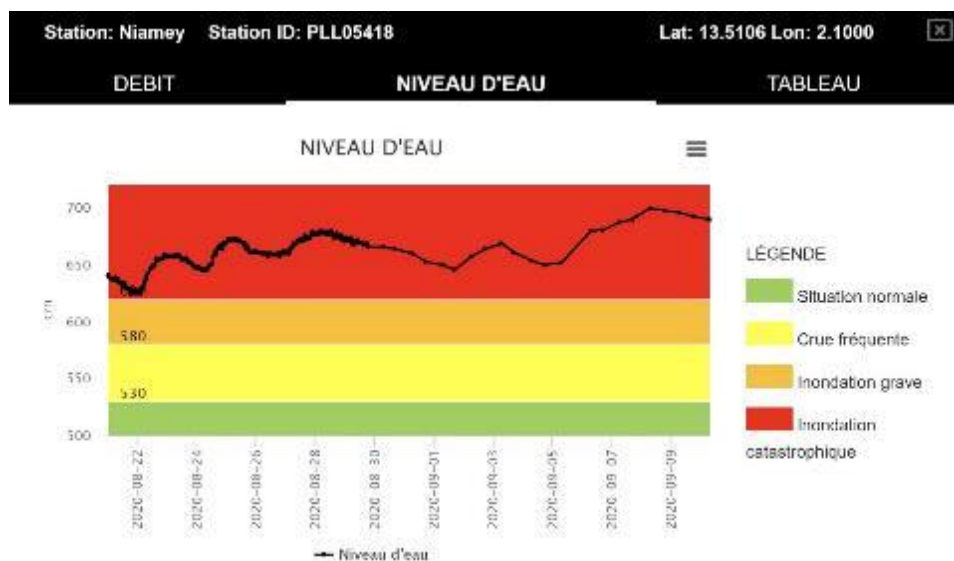


Figure 3, Hydrograph of the Niamey station and alert thresholds (since August 29 the automatic hydrometer has been flooded and the measurements are manual)

The 2020 “red” flood is by far the most intense on record. It is either very early either exceptional in terms of recorded heights due to the very intense precipitation observed this year and also to the gradual silting up of the river bed, which at equal flow increases the water level.

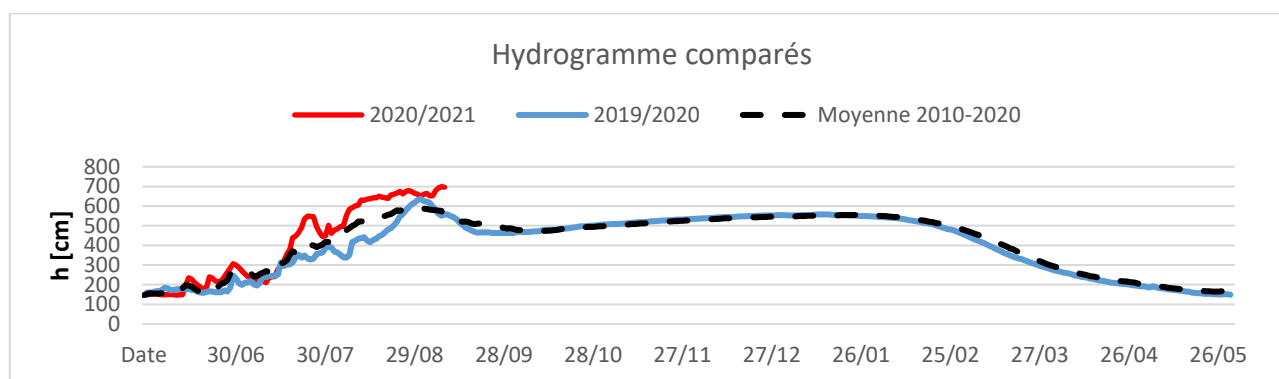


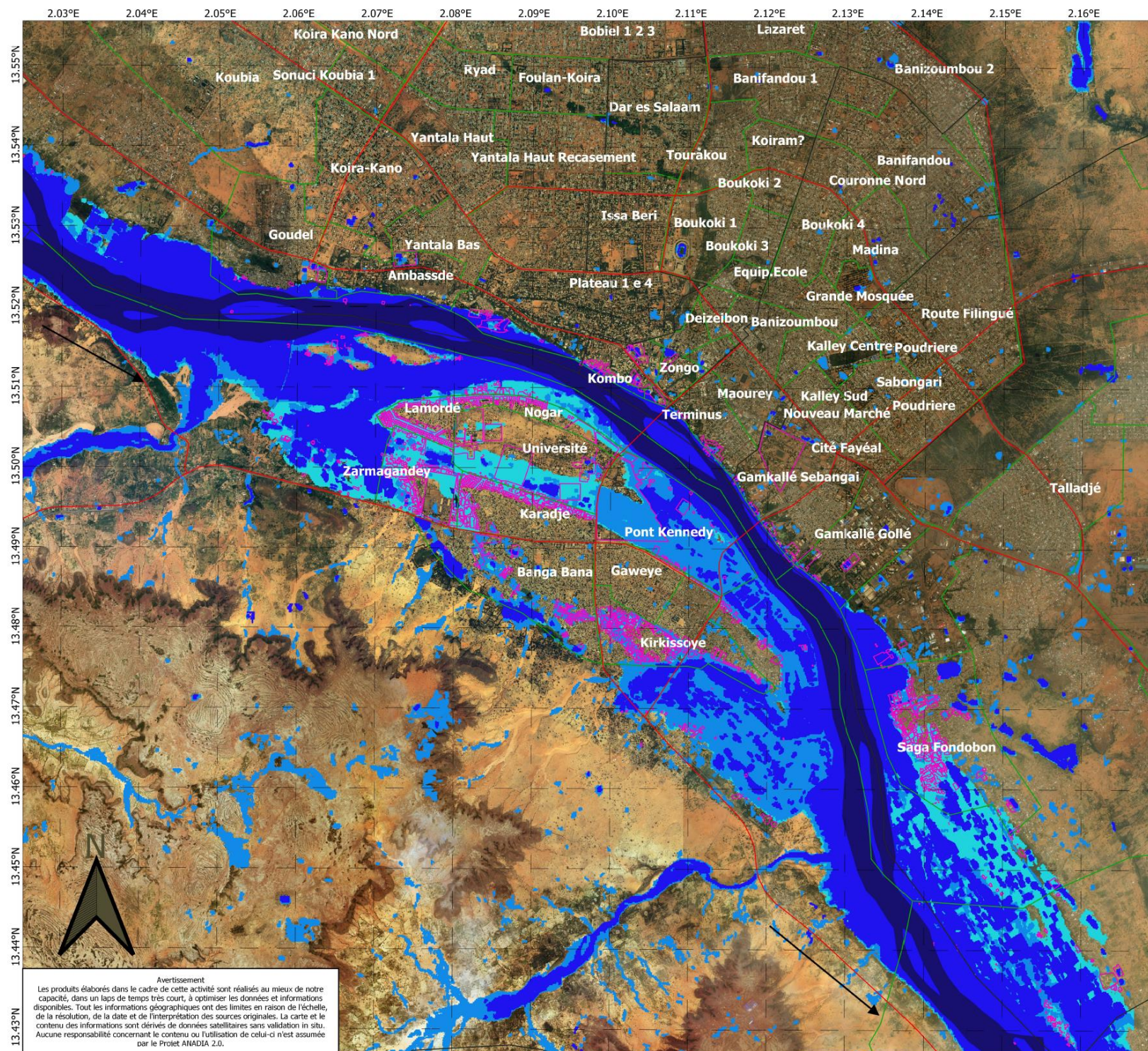
Figure 4, Hydrogrammes comparés de 2020/21, 2019/20 et moyenne 1990/2020

The flooded area map presented below has been developed from Sentinel 2 satellite images at a resolution of 10 meters acquired on the dates of August 16, September 5 and September 10, 2020. The classification of the flooded areas was carried out using the NDFI index (Normalized Difference Flooding Index)¹.

The hydrological data of the stations of Bossey Bangou and Garbey Kourou on the Sirba and Niamey on the Niger River are available in real time on the platform www.slapis-niger.org.

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¹ Boschetti, M., Nutini, F., Manfron, G., Brivio, P. A., & Nelson, A. (2014). Comparative analysis of normalised difference spectral indices derived from MODIS for detecting surface water in flooded rice cropping systems. PloS one, 9(2), e88741.



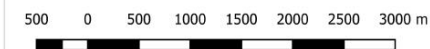
Projet ANADIA 2.0



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Carte des zones inondées Ville de Niamey (Niger) Fleuve Niger - crue 2020

1:50'000 (1 cm = 500 m)

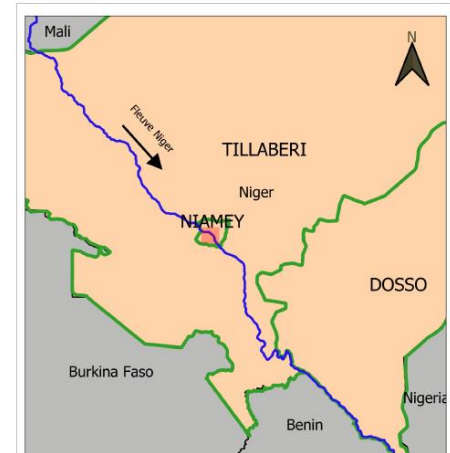


Niamey

- Routes principales
- Limites administratifs
- Quartiers
- Zones bâties inondées

Zones inondées

- Direction d'écoulement
- Lit fluvial
- 16 août 2020
- 5 Septembre 2020
- 10 Septembre 2020



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Système de référence: ellipsoïde WGS 84
Ortophotos: Bing Satellite, Microsoft C. 2019, D.G.D.A. DS
L'identification des zones inondées a été réalisée en utilisant images Sentinel 2 (10x10 m) du 16 août et du 5 septembre 2020 et l'indice NDFI (Normalized Difference Flooding Index).