TERRA COVER INSIGHTS: Flood Mapping in Nigeria

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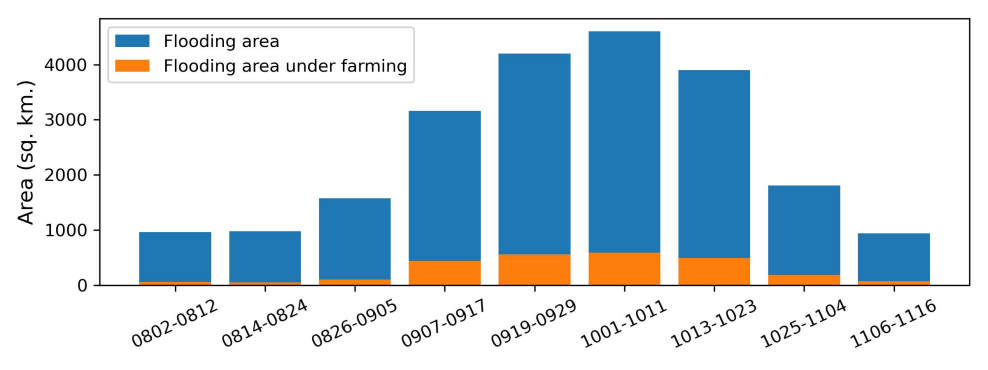
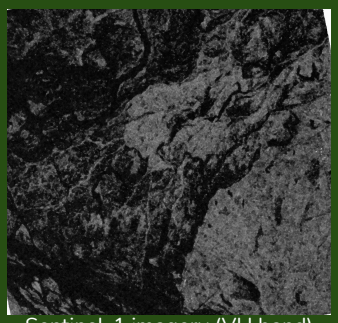
Analyzing cloud free SAR (Synthetic Aperture Radar) imagery to map flood extents.

SAR sensors enable data acquisition during inclement weather and low-light conditions, making them ideal for rapid flood extent monitoring across large geographies at significantly lower costs compared to ground surveys. Flood extents derived from SAR imagery can be combined with other sources of information such as farmland maps and population maps to quantify the economic and human impact of floods.

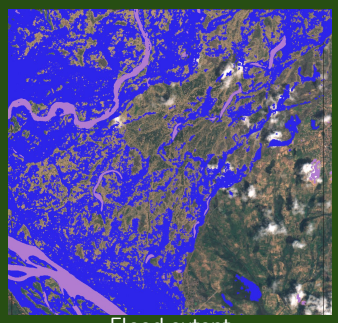


Bi-weekly flood extent variation for the 2020 flood season along the Niger and Benue rivers in Nigeria. Pixels under farming were identified using a public farmland dataset from USGS[2]. Since the satellite constellation does not capture such a large study region in a single day, each bar represents a 10-day period in which the whole study region was captured once.

Sentinel-2 imagery



Sentinel-1 imagery (VH band)



Flood extent

A 10 km x 10 km region in the state of Kebbi in Nigeria where rice farms were flooded on September 22nd, 2020.

IMPACT of 2020 Floods

- More than 25 % of rice production was impacted in 2020[1].
- We analyzed 85,225 sq. km. area along the Niger and Benue rivers.
- At peak flooding, 4600 sq. km. of this region was flooded.
- Using a public farmland area dataset[2], we estimate that approximately 584 sq. km. of the flooded region was under farming.

DATA SPECIFICATIONS

- Area Monitored: 85,225 sq. km.
- Pixels Analyzed: ~852 million
- Frequency: Bi-weekly
- Spatial Resolution: 10m
- Satellite: Sentinel 1A and 1B
- Duration: 2020

1. Nigeria Economy Latest: Floods Destroy Rice Harvest - Bloomberg | 2. Global Food Security Analysis-Support Data Project

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CASE STUDY