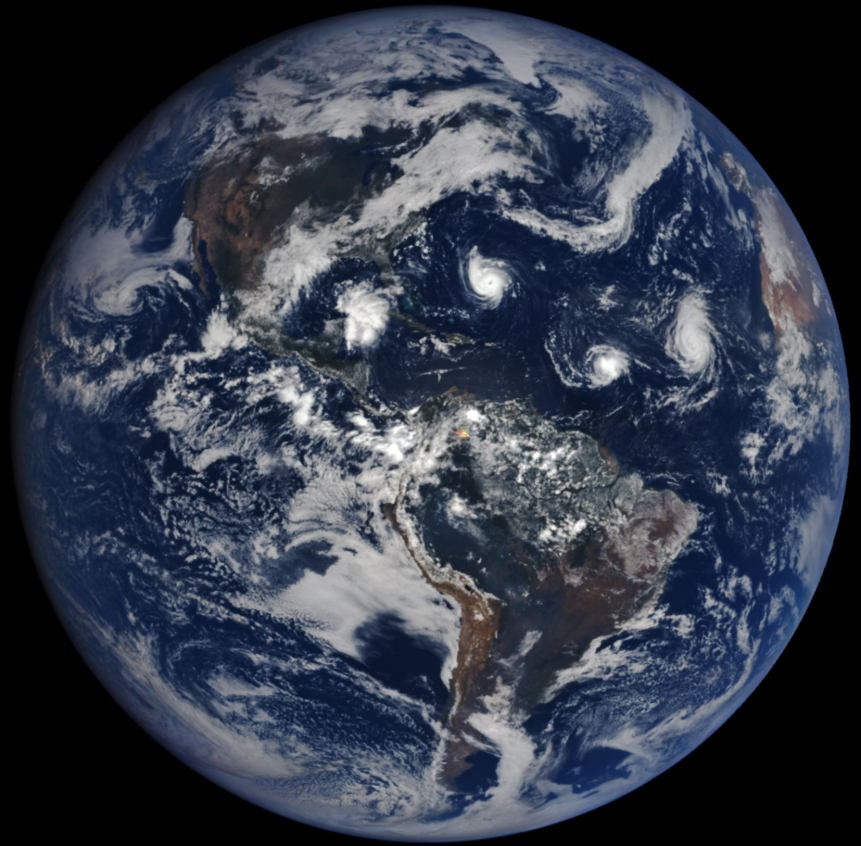
DPI in the Water Sector: Google Flood Hub



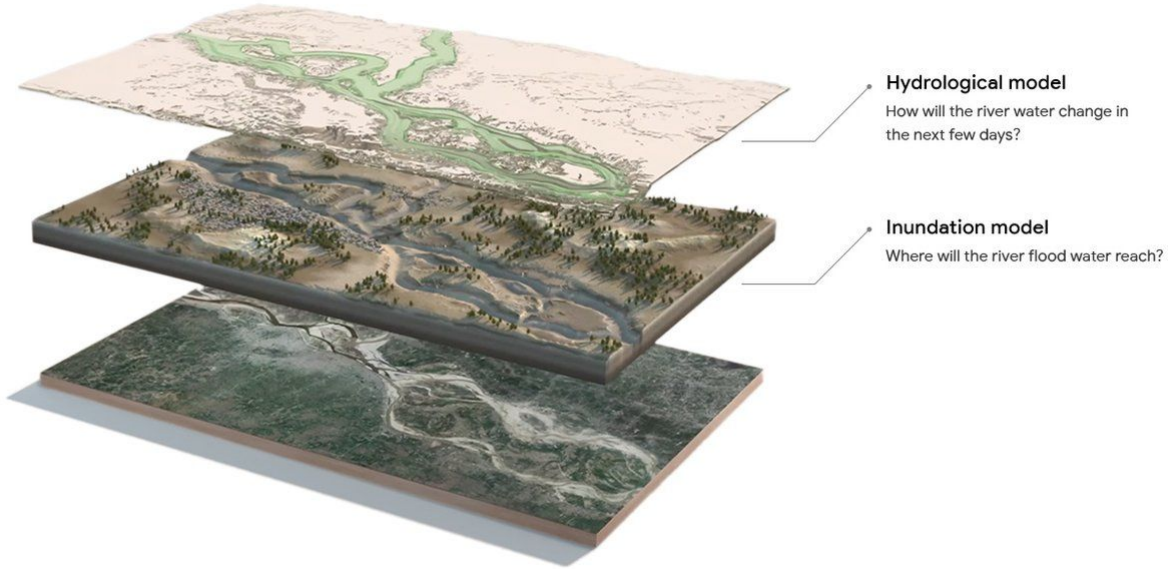
Spencer Low, Head of Regional Sustainability, APAC

Flood Forecasting at Google



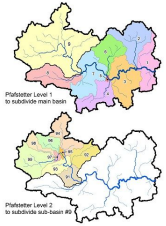
Google

Our AI Flood Forecasting Global Model is trained on publicly available precipitation and streamflow data.

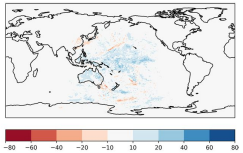


Model Inputs: Hydrologic Model

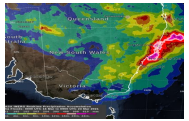
HydroSHEDS **Global Basins data**



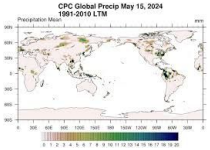
ECMWF - IFS **global weather forecast**



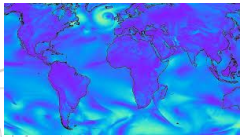
IMERG - NASA **global precipitation data**

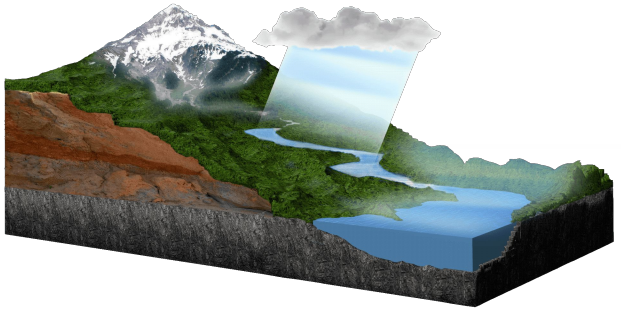


CPC - NOAA **rainfall gauge data**



GDM **global weather forecast**





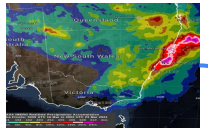
Hydrologic Model

How will the river change?

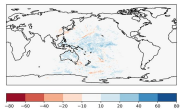
Google

Urban flash floods: modeling

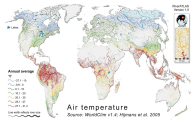
Past week weather



Tomorrow's forecast



Region characteristics



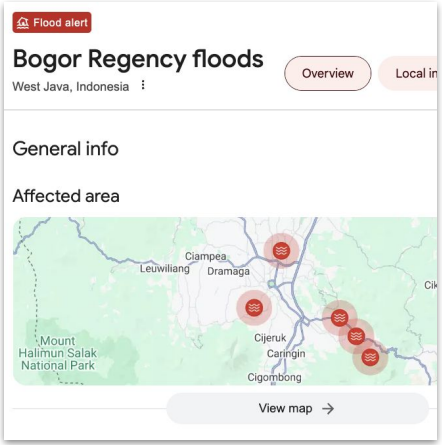
RNN model

Trained on **news data**

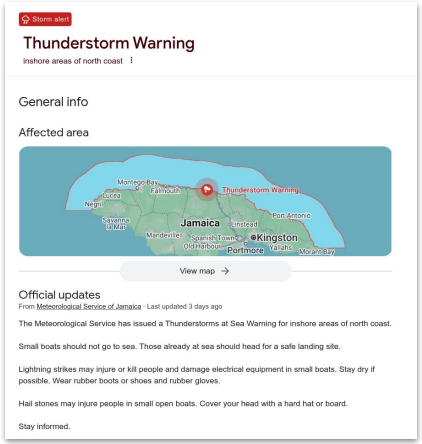
Output: **Flood probability** in the region tomorrow

Google

Notifications & Alerts



SOS notifications
Curation of authoritative information from the web



Public Alerts
CAP alerts from local authorities

CAP Feeds Ingested from APAC (examples)

India: IMD (+ active conversations with NDMA for SACHET integration)

South Korea: Korea Meteorological Administration

Vietnam: National Center for Hydrometeorological Forecasting

Singapore: Meteorological Service Singapore

Japan: Japan Meteorological Administration

Indonesia: BMKG

Philippines: PAGASA

Taiwan: National Center for Disaster Reduction

Proprietary + Confidential

How flood forecasting can inform early warning systems



July 2025: Nigeria's 1st large-scale government **Floods Anticipatory Action Program,** based on Google's Flood Forecasting, provides life-saving anticipatory assistance before a riverine flood strikes.
Coverage: 350K vulnerable people
Budget: $7m USD

United Nations | Anticipatory Action Framework
Nigeria - Floods
29 July 2025

Approved by the RC/HC on 4 August 2025
Endorsed by the ERC on 11 August 2025

Executive Summary

The humanitarian sector is scaling up anticipatory action (AA), enabling proactive mobilization to get ahead of predictable climate-related shocks and disease outbreaks through robust forecasting (triggers), pre-agreed activities, and pre-arranged funding. This approach has proven effective, dignified, cost-efficient, and protective of development gains.

Nigeria faces recurrent and destructive flooding. In 2024, floods displaced 1.2 million people, destroyed 116,000 homes, critical infrastructure and 1.4 million hectares of farmland (an estimated loss of 1.1 million tons and $1 billion, enough to feed 13 million people). This is while people were still reeling from devastating floods in 2022 which had displaced 4 million people and destroyed 600,000 hectares of farmland.

This document presents the collective framework for flood anticipatory action in Nigeria. It entails coordinated packages of assistance planned to be delivered to people at risk of riverine floods in Nigeria across seven local government areas (LGAs) – Fufore, Yola South, Yola North, Girei, Demsa, Numan, and Lamurde – along the Benue River in Adamawa State, an area prone to recurrent flooding. The framework was developed through a participatory process of humanitarian partners and the Inter-Sector Coordination Group who formed a Core Anticipatory Action Group, coordinated by OCHA, under the overall leadership of the Resident and Humanitarian Coordinator (RC/HC) and in collaboration with the government of Nigeria.

The financing

This framework pre-arranges US $7 million in pooled-fund financing – $5 million from the UN's Central Emergency Response Fund (CERF) and $2 million from the Nigeria Humanitarian Fund (NHF). It aims to protect up to 350,000 people in the seven LGAs through timely, targeted multi-sectoral assistance. Payout of the CERF funds will only occur if triggers are reached, indicating a major riverine flood. NHF funds, while prioritizing a river flooding event, have further flexibility to be reprogrammed to a flash flood scenario or regular rapid response to prioritized humanitarian gaps, in case a riverine flood is not predicted.

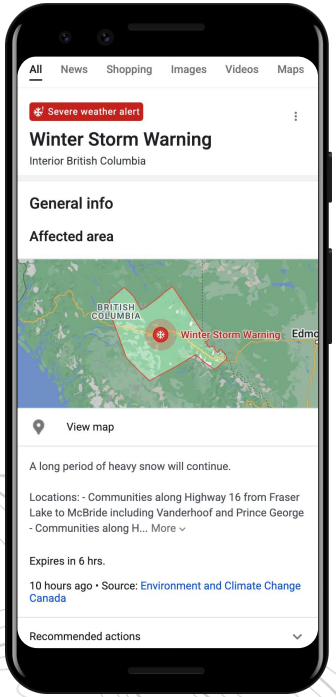
While this framework is valid for a period of two years (2025 and 2026), it will be dual financed by CERF and NHF in 2025. If a major riverine flood does not occur in 2025, only the CERF amount ($5m) will remain pre-arranged in 2026, as the NHF is expected to transition at the end of 2025, with a scale-down of OCHA's operational footprint as part of the humanitarian reset. However, this does not preclude additional co-financing from the Government of Nigeria, other humanitarian partners, funds and financial institutions that may alter the pre-arranged amount for 2026.

The trigger

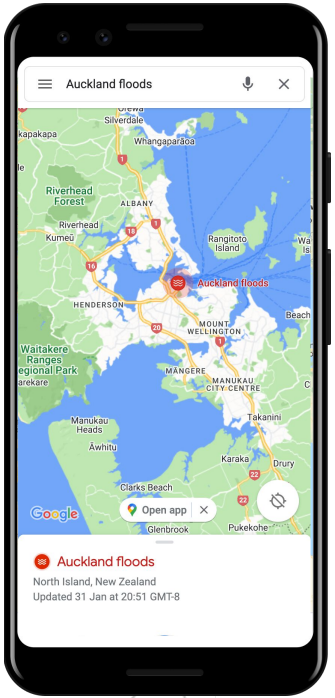
The trigger mechanism for this framework includes two separate triggers which can be activated independently:

1. ***Riverine flooding trigger:*** used to release CERF *and* NHF funding to implement activities in the 7 LGAs along the Benue River in Adamawa state (Fufore, Yola South, Yola North, Girei, Demsa, Numan, and Lamurde).
2. ***Flash flooding observational trigger:*** used to release *only* NHF funding to implement activities in the 6 additional flash-flooding LGAs in the BAY states (Bama, Bade, Kawasuwa, Madagali, Maiduguri, Ngala)

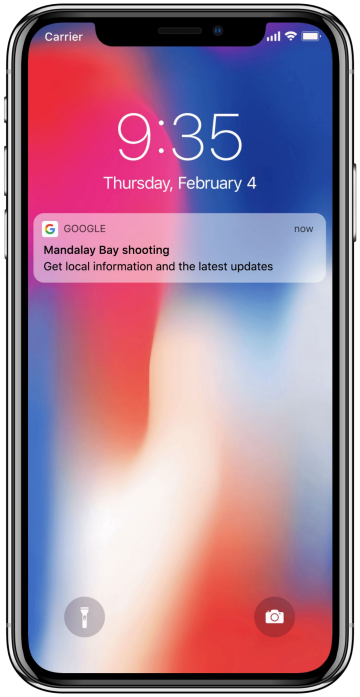
Helping People Stay Safe: Alerting Surfaces



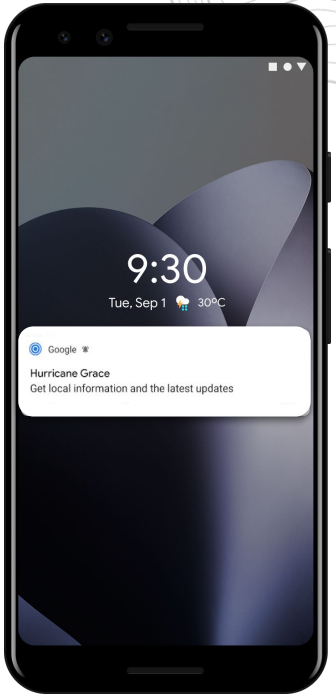
Search



Maps



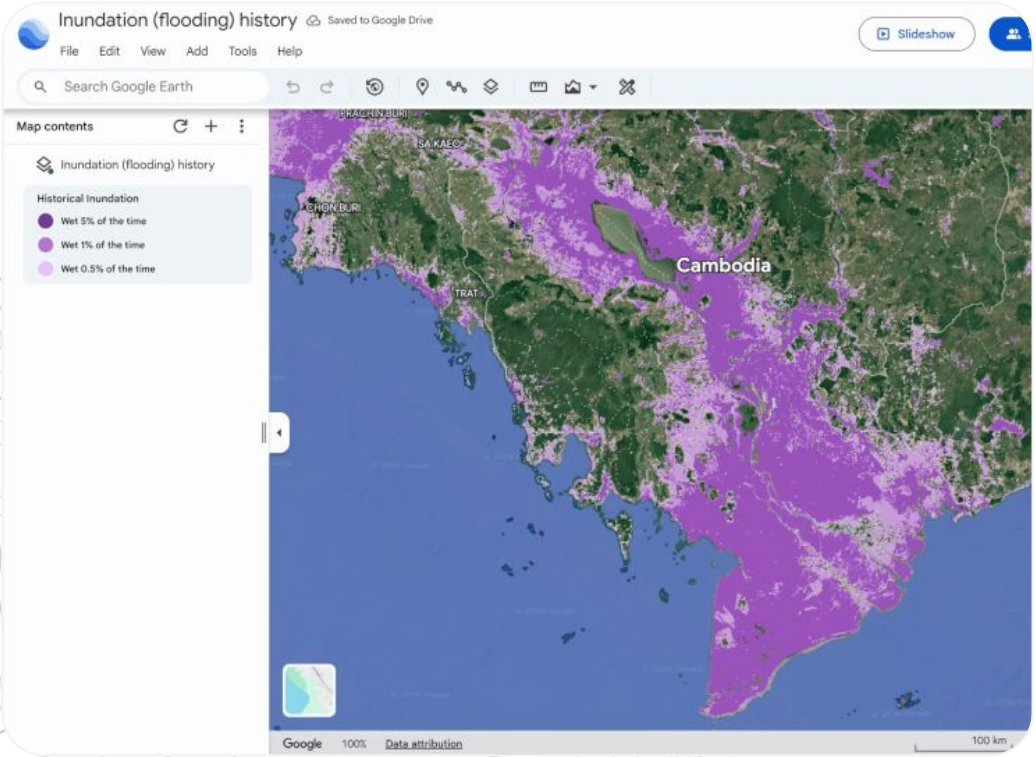
Google App Notifications on iOS



Android Notifications

Data Access

Empowering Governments and Humanitarians



Flood Hub
https://sites.research.google/floods/

Floods API
Google Floods API form

Google Earth
https://earth.google.com/web/

Groundsource
Groundsource blogpost

Working with Meteorological Agencies in APAC

IMD

Ingested CAP feed and exploring other potential collaborations in India.

PAGASA

Deploying our 1,000 member ensemble model.

BMKG Indonesia

Exploring cyclones through WNI and direct collaboration.

WNI

Operationalising Floods API & Google Cyclones in SE Asia.

Global reach and support

Many other official met agencies using our cyclone predictions including **United Kingdom, Taiwan, China, Hong Kong, and Jamaica**.