→ NEAR REAL TIME FLOOD ASSESSMENT

Flood FORECASTING

DISASTER response

IN COLLABORATION WITH:

National Hydrological Services
Windhoek, Namibia

AREAS OF INTEREST

Between 2003 and 2009 **Namibia was stroke by 5 major flooding events, affecting some 462,000 inhabitants** (source UNISDR) and damaging structures, infrastructures and crops. They washed away food reserves, inundated pastures and facilitated spreading of diseases.

The National Hydrological Services of Namibia (Department of Water Affairs and Forestry of the Ministry of Agriculture, Water and Forestry) has a mandate for flood-related activities and have been specifying to ESA tools that would benefit their daily practices.

In current practice, **weather and ground conditions make it difficult to delineate the flood extent during the event: hence the capability to map flood in near real time is crucial for disaster response.**

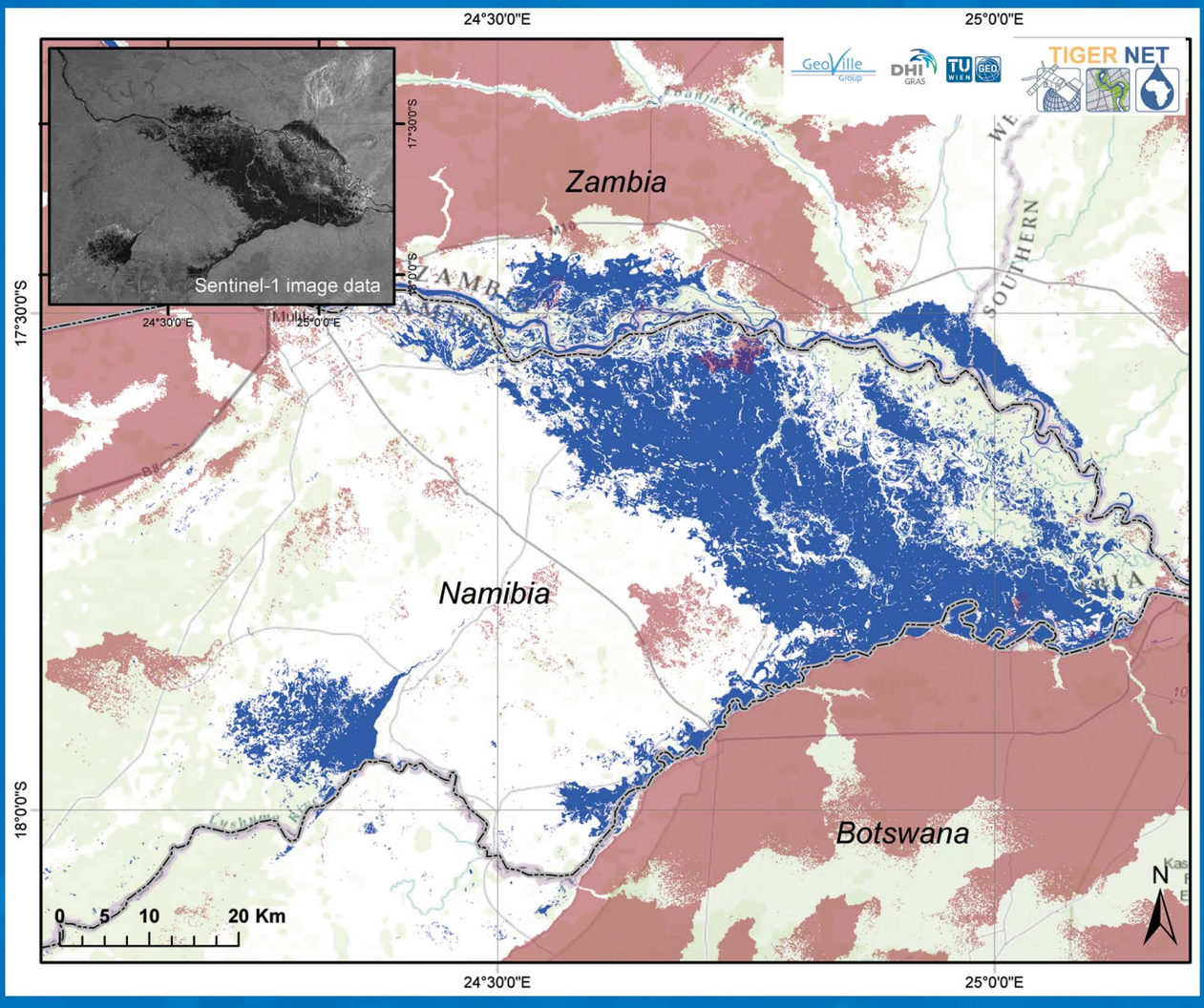
Earth Observation allow to supplement for ground data acquisition in sparsely gauged vast areas: in particular the use of SAR systems, with their capability to image through clouds, proved beneficial in case of floods. **The WOIS offers capacities for near real time flood monitoring exploiting free satellite data.** The tool provides also historical flood documentation, flood vulnerability assessment and **dedicated hydrologic modules, used already by NHS in their daily flood bulletin, enabling flood forecast capabilities.**

Efficiency of the tool **was demonstrated over the Caprivi area in Namibia by exploiting the first data acquired by the Sentinel-1 mission.**

April 2014 flood: image taken at Ngoma bridge (image courtesy E. Muyumbano, NHS).

→ NEAR REAL TIME FLOOD ASSESSMENT

SENTINEL-1 FLOOD MONITORING OF CAPRIVI FLOOD PLAIN, NAMIBIA



"It was practically impossible to monitor the situation from the ground and the communities and NHS staff in the area could not determine where the water inundating their villages was coming from. On 13 April 2014 Sentinel 1 depicted the mass inundation and flooding extent in the eastern floodplains of the Zambezi, showing its potential to monitor floods in near real time.

This demonstrates how ***the use of satellite data can enhance and supplement operational hydrology in vast areas with limited accessibility and of trans-boundary nature."***

Pauline Mufeti, Head of Hydrological Services Namibia

↑ Zambezi Sentinel-1 SAR flood extent map generated with the WOIS dynamic flood mapping module, exploiting 1 Sentinel-1 acquisition

Legend

- Country border
- Derived HAND Index > 10 m
- Flooded areas

Description:
This map shows the flooding situation in the Caprivi flood plain of Zambezi River on 13th of April, 2014. The flood was delineated with the Water Observation and Information System (WOIS) based on SENTINEL-1A satellite data. The flood map is overlayed on the World Topographical layer.

Source data:
SENTINEL-1A IW mode, 20 m resolution, acquired on 13th of April, 2014 at 03:50 GMT.
SENTINEL-1 image was provided by the European Space Agency.

Cartographic Reference
Projection: EPSG:4326
Datum: WGS 84