Introduction to EO Data Visualisation

Using satellite to track and visualize floods in Pakistan in 2022

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Last summer, **the floods in Pakistan** caused :

- 1,700+ deaths
- $15 billion of damage
- $15.2 billion of economic losses.

- 33.2 million people affected
- 900,000 houses destroyed
- 1.4 million houses damaged
- 2.1 million people left homeless.

Between june and september, the country has experienced the most intense monsoon rains of its history.

It was so big it had to be told… from ***space***.

I contacted the Copernicus Support Office for two sets of data:

1. get satellite imagery before/after the floods from Sentinel-2
2. get satellite data of the floods' extent from Sentinel-1

Sentinel-2 can offer up to 10-meter resolution images in the visible spectrum.

Below: two images of the town of Ahmad Ali Lar (Punjab province), close to the Indus river that flows through Pakistan, taken on 11/08 and 02/09.

Another example: the town of Bakhshu Banhar, taken on 11/08 and 02/09.

Sentinel-1 is quite different for it is a **radar** satellite. Its instrument can monitor a wide range of phenomenons such as:

- Sea-ice levels
- Oil spills
- Land-use (agriculture, forestry)
- Floods
- Landslides
- Volcanic activities

The Product we're interested in for floods is call the Global Flood Monitoring (GFM).

The Global Flood Monitoring (GFM) project is part of the Copernicus Emergency Management Service (CEMS).

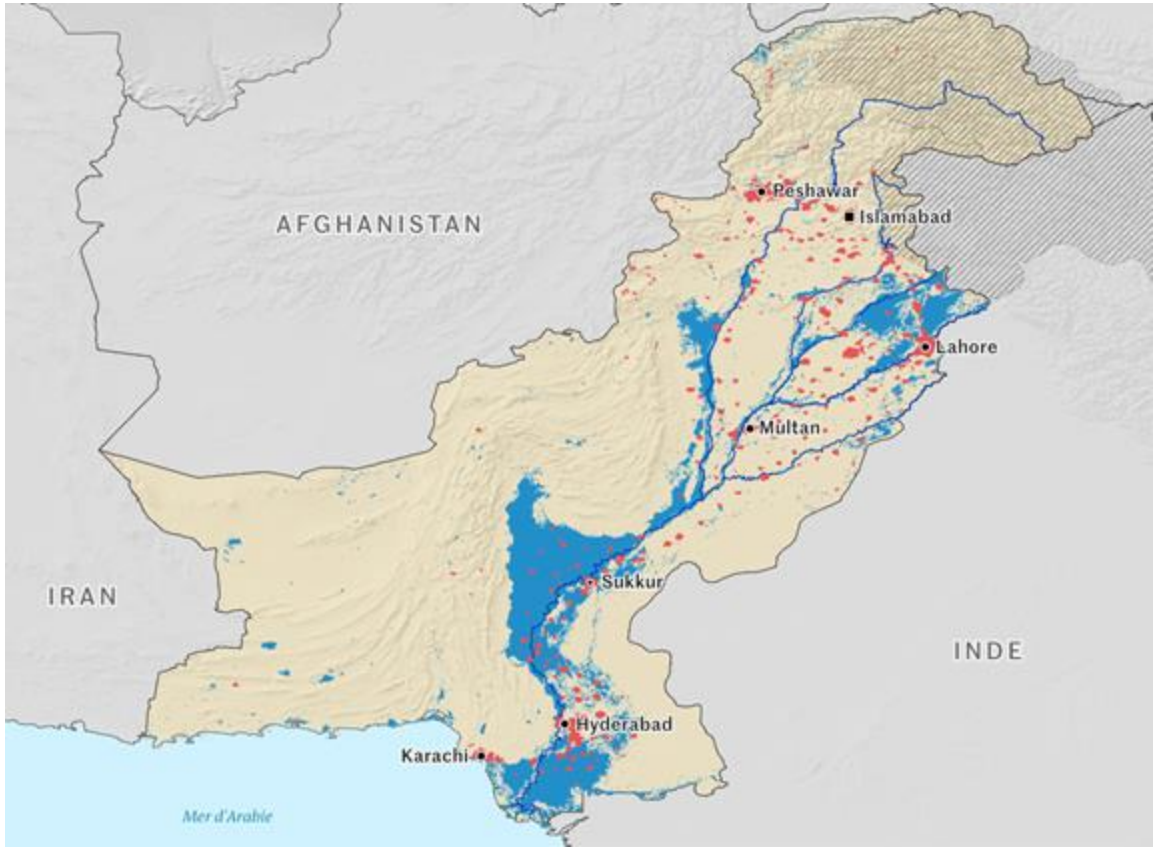
- It relies on processing Sentinel-1 radar images by three flood detection algorithms within an 8-hour delay
- It is freely available (but you need an account)

The GFM data can then be visualised on a map. For mine, I took the following steps:

- The data presents itself as a shapefile, which you can easily work with QGIS, using “Natural Earth” data
- QGIS can then export your map as an SVG file that you can customize with a software like Illustrator
- I then took the map to HTML myself in order to make it interactive.

The only drawback: the shapefile can be *really* heavy to work with because of the GFM high resolution -> need to check

The final Map:



Thank you for your attention

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