Useful Resources of the European Copernicus Programme

Overview of the S4ADRR Project

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Outline

- Part I (Adrian)
  - Overview of the Sentinels 4 African DRR project
  - Overview of the Copernicus portfolio relevant for disaster management and risk reduction
- Part II (Victor)
  - Flood related services and products of Copernicus
  - Methods and datasets for flood monitoring

The S4ADRR Project

Overall goal:

To strengthen the benefit from Copernicus in African countries, specifically for Disaster Risk Reduction and Management, through…

- Collection and evaluation of user-requirements and user-feedback
- Development of tailored training material
- Organization of targeted training events

Collaborative framework:

- Partnership between DLR and Uni Bonn
- Close links to Copernicus
- Closely linked to UN-SPIDER activities
- Goal: Establish an African user-network

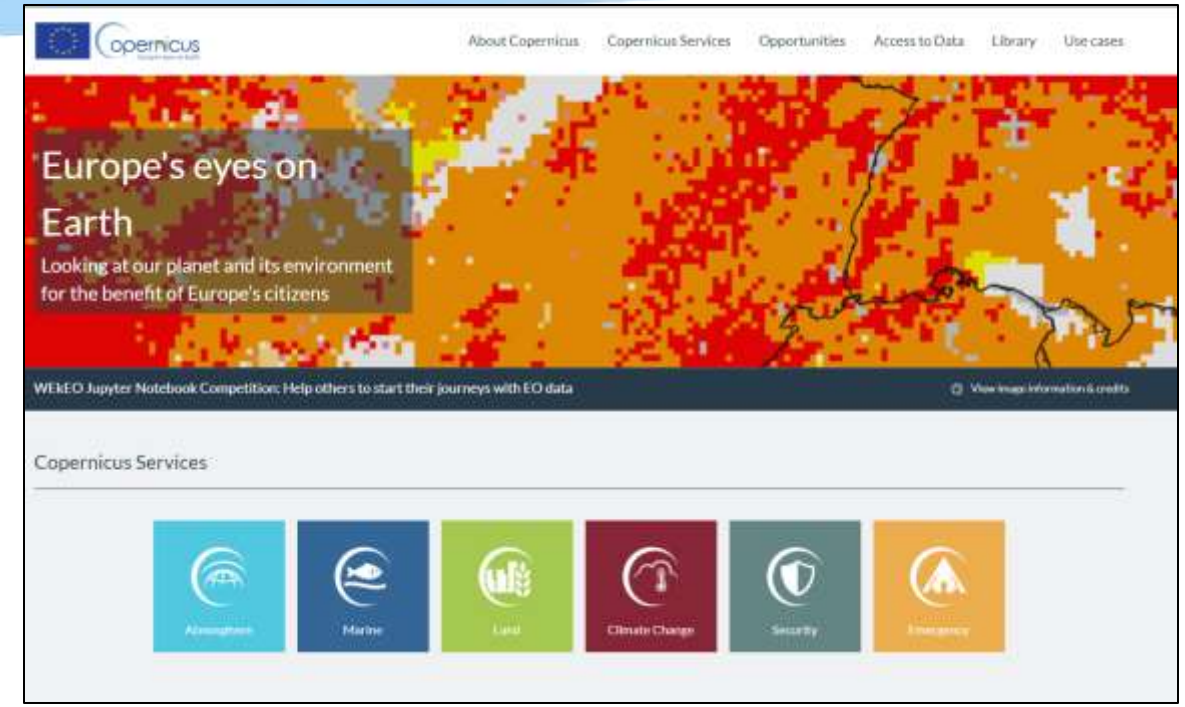
The S4ADRR Project

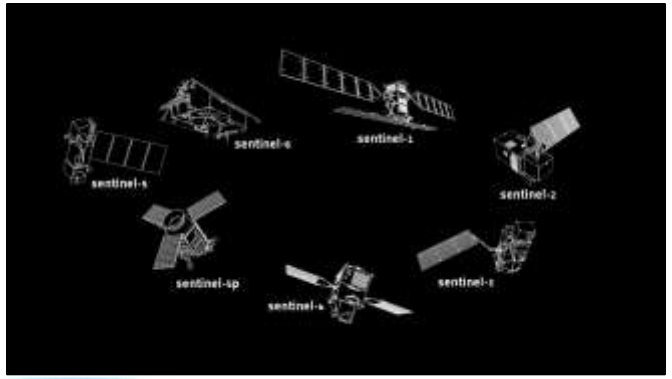
First version of **Training Module Handbook** just finalized.
Shared with first round of users for feedback.
Second version will be spread more broadly.
Virtual training courses are planned to be held in October/November and in 2023.

If you are interested, please let us know!

- Organization of targ
events

The Copernicus Programme



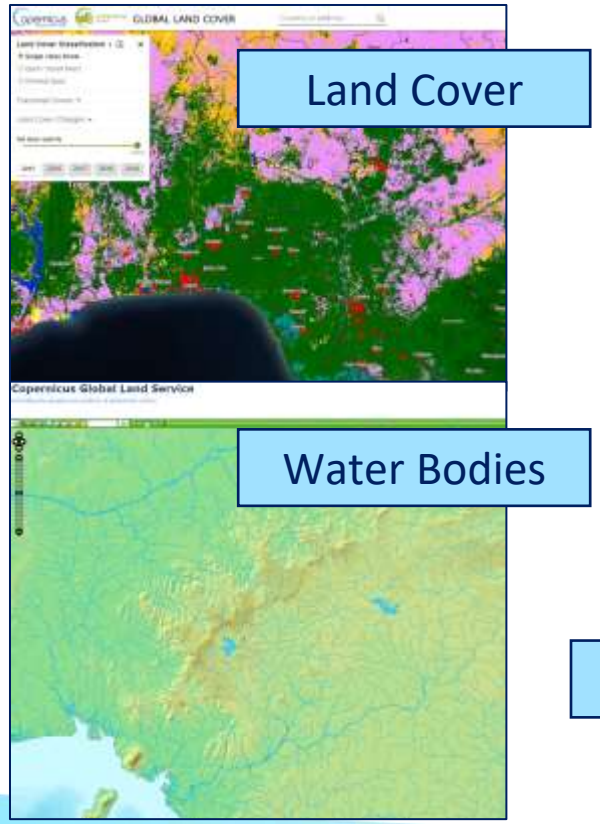


- The European Union's Earth observation programme
- Managing Europe's EO infrastructure (e.g. Sentinel Satellites) and in-situ measurements
- Provision of different thematic products and services based on those datasets
- Global focus, with data and services being free and open

The Copernicus Programme

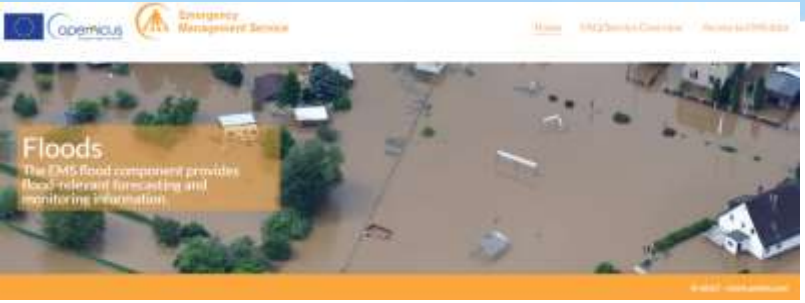
- Many Copernicus products and services offer global information
  - Can be applied in Africa, freely available for African users!

- Examples:



Many more…

Copernicus EMS



Early Warning & Monitoring

Copernicus EMS Early Warning and Monitoring offers critical geospatial information at European and global level through continuous observations and forecasts for floods, droughts and forest fires.

Floods

The **European Flood Awareness Systems (EFAS)** and **Global Flood Awareness Systems (GloFAS)** provide complementary flood forecast information to relevant stakeholders that support flood risk management at the national, regional and global level.

Fires

The **European Forest Fire Information System (EFFIS)** monitors forest fire activity in near-real time. EFFIS supports wildfire management at the national and regional level for EU member states and across the Middle East and North Africa.

Droughts

The **Drought Observatory (DO)** provides drought-relevant information and early-warnings for **Europe (EDO)** and **globally (GDO)**. The service publishes short analytical reports (Drought News) in anticipation of an imminent drought.

On demand mapping

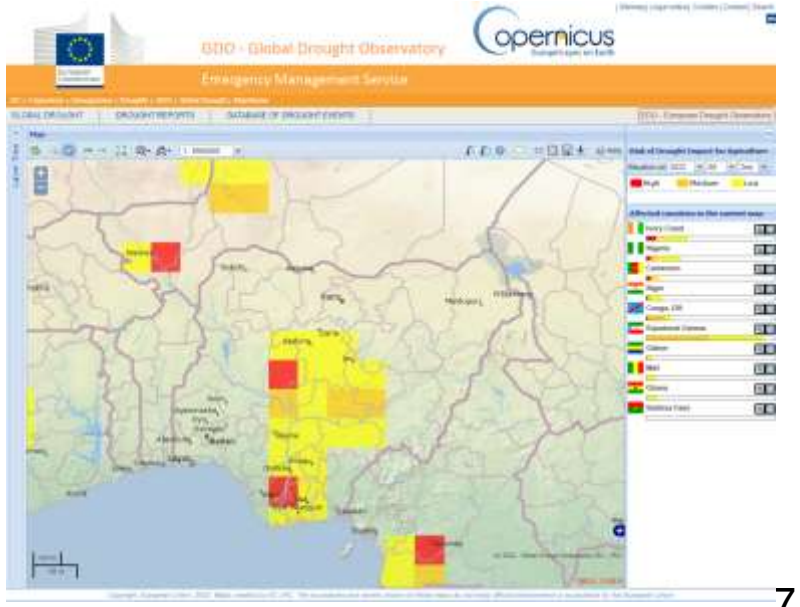
Copernicus EMS On Demand Mapping provides on-demand detailed information for selected emergency situations that arise from natural or man-made disasters anywhere in the world.

Rapid Mapping

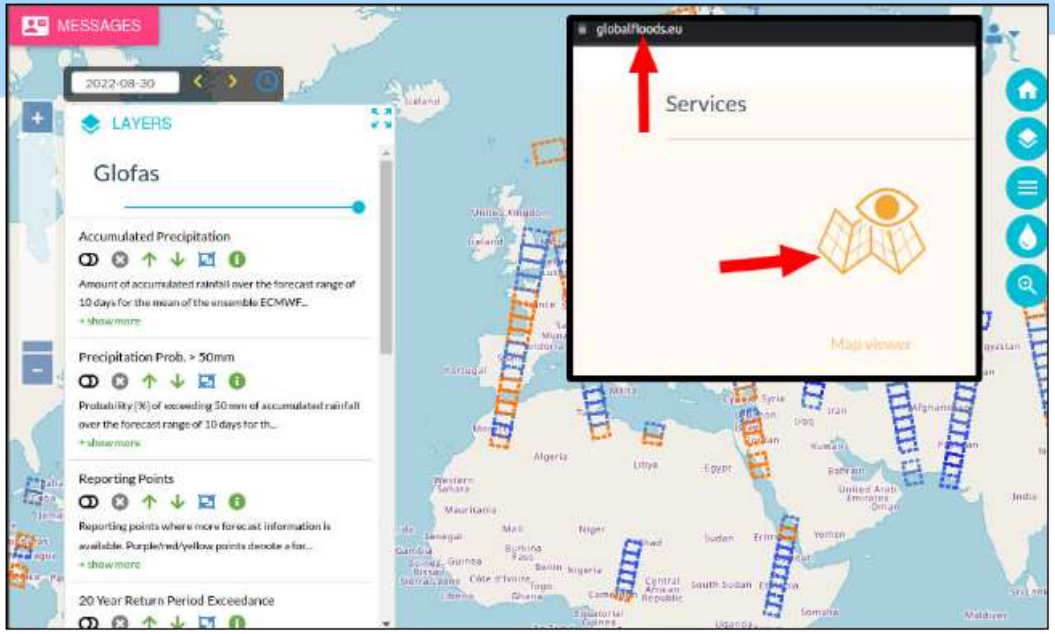
Rapid Mapping provides geospatial information within hours or days of a service request in order to support emergency management activities in the immediate aftermath of a disaster.

Risk and Recovery Mapping

Risk & Recovery Mapping supplies geospatial information in support of Disaster Management activities including prevention, preparedness, risk reduction and recovery phases.

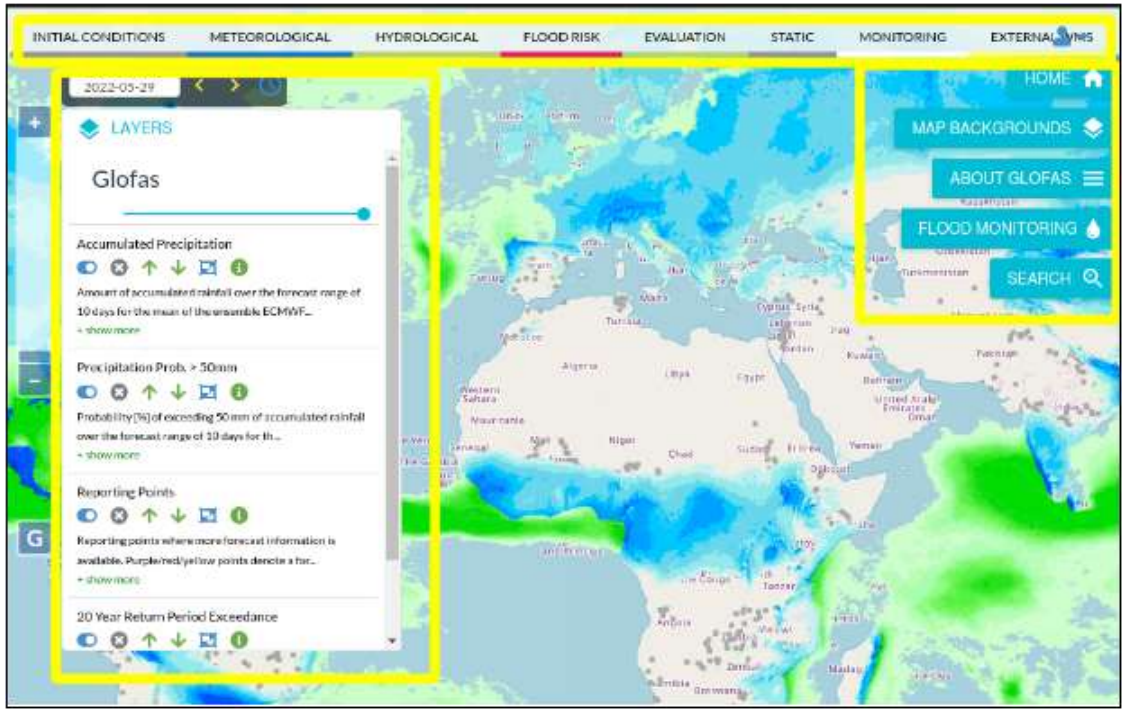


GloFAS Overview



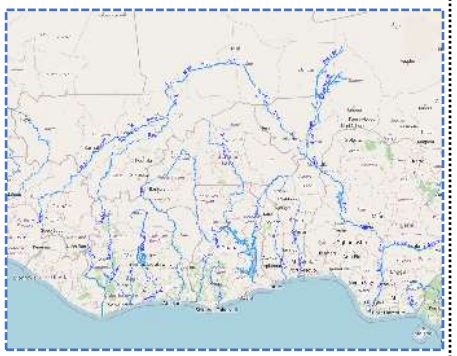
- The **Global Flood Awareness System (GloFAS)** is one component of the Copernicus Management Service CEMS.

- To provide information on both ongoing and upcoming flood events, GloFAS combines information from **satellites, models** and **in-situ** measurements to produce:
  - GloFAS forecasts
  - GloFAS Seasonal forecasts
  - GloFAS Impact Forecasts



GloFAS-Static

Major rivers



Layer showing the major rivers.

Major river basins

Major river basins of the world. Source: Global Runoff Data Centre (GRDC)

Flood hazard

Inundated areas for flood events with a return period of 100 years, based on GloFAS climatology.

Upstream area

The GloFAS river network is plotted with river pixels above 1000 km^2, represented by the upstream area (in km^2).

Admin regions

Administrative regions merged using NUTS-2 or NUTS-3 classification from EUROSTAT and the region classification from GADM.

GloFAS-Flood Risk

Rapid flood Mapping

- **Rapid Flood mapping**: estimated flood extent at **1km spatial resolution** for basins that are larger than **5,000 km²** and the maximum return period is greater than **10 years** in the **30 day forecast horizon**.

Rapid Impact assessment

- **Rapid Impact assessment:** potential impact of floods, aggregated over administrative boundaries, on population, land use (agriculture and urban), schools, health and education based on their intersection with the rapid flood mapping layer.

GloFAS-Initial conditions

Initial Precipitation

Total precipitation (mm), and anomaly brought on by meteorological forcing.

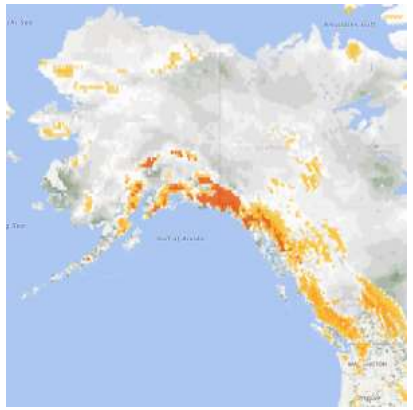
Initial Snow melt

Accumulated snow melt (mm) and its anomaly resulting from meteorological forcings.

Initial Soil Moisture

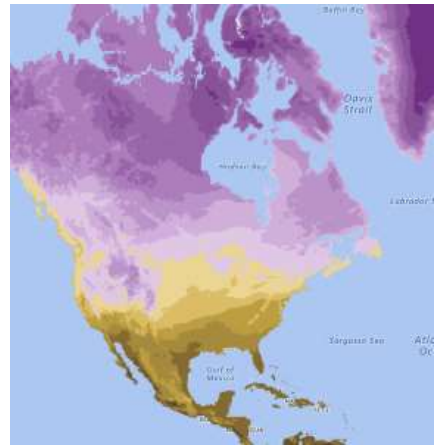
Soil moisture [%] from meteorological forcing input at initial time (00 UTC) on the day of the forecast run.

Initial snow cover



Daily mean snow cover from meteorological forcing input for the 24-hour period before the date of the forecast run.

Initial temperature



Daily mean 2m temperature (°C) and anomaly from meteor. forcing input for the 24-hour period before the date of the forecast run.

GloFAS-Hydrological products

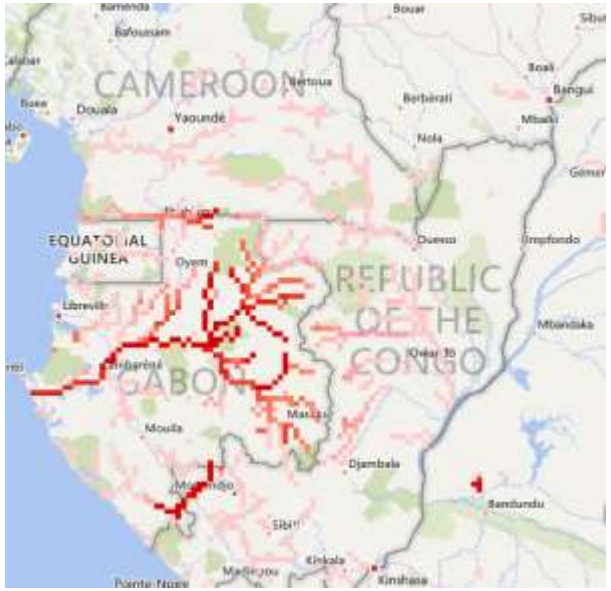
Reporting points

Reporting points where more forecast information is available.

Flood Summary

Flood summary map combines the 2-, 5- and 20-year exceedance probabilities into a category-based information.

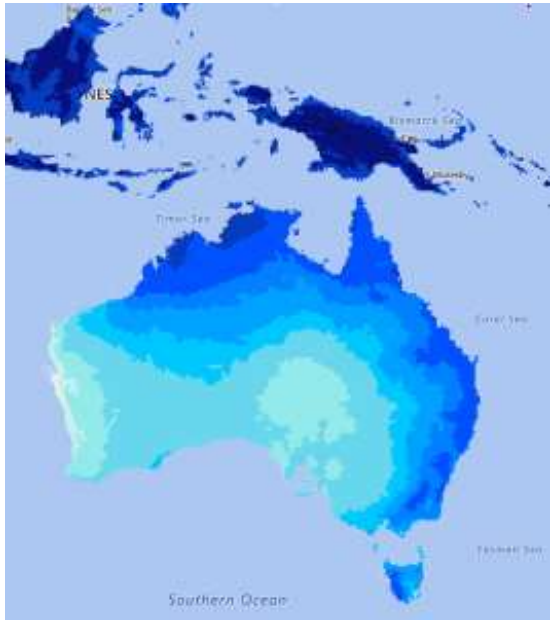
Return period exceedance



Probability of ensemble streamflow predictions [%] to exceed a 5 and 20-year return period discharge level.

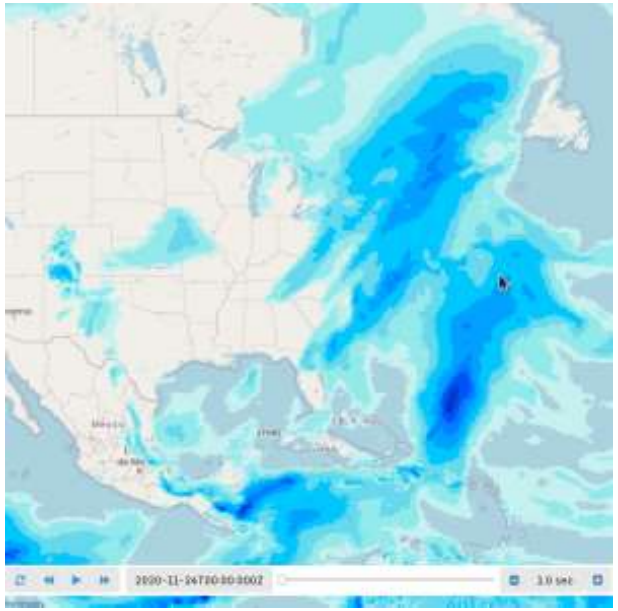
GloFAS-Meteorological products

Accumulated precipitation



Amount of accumulated precipitation over the first **10 days of the 30-day** forecast horizon, computed as the mean of the ECMWF ensemble forecast.

Precipitation animation

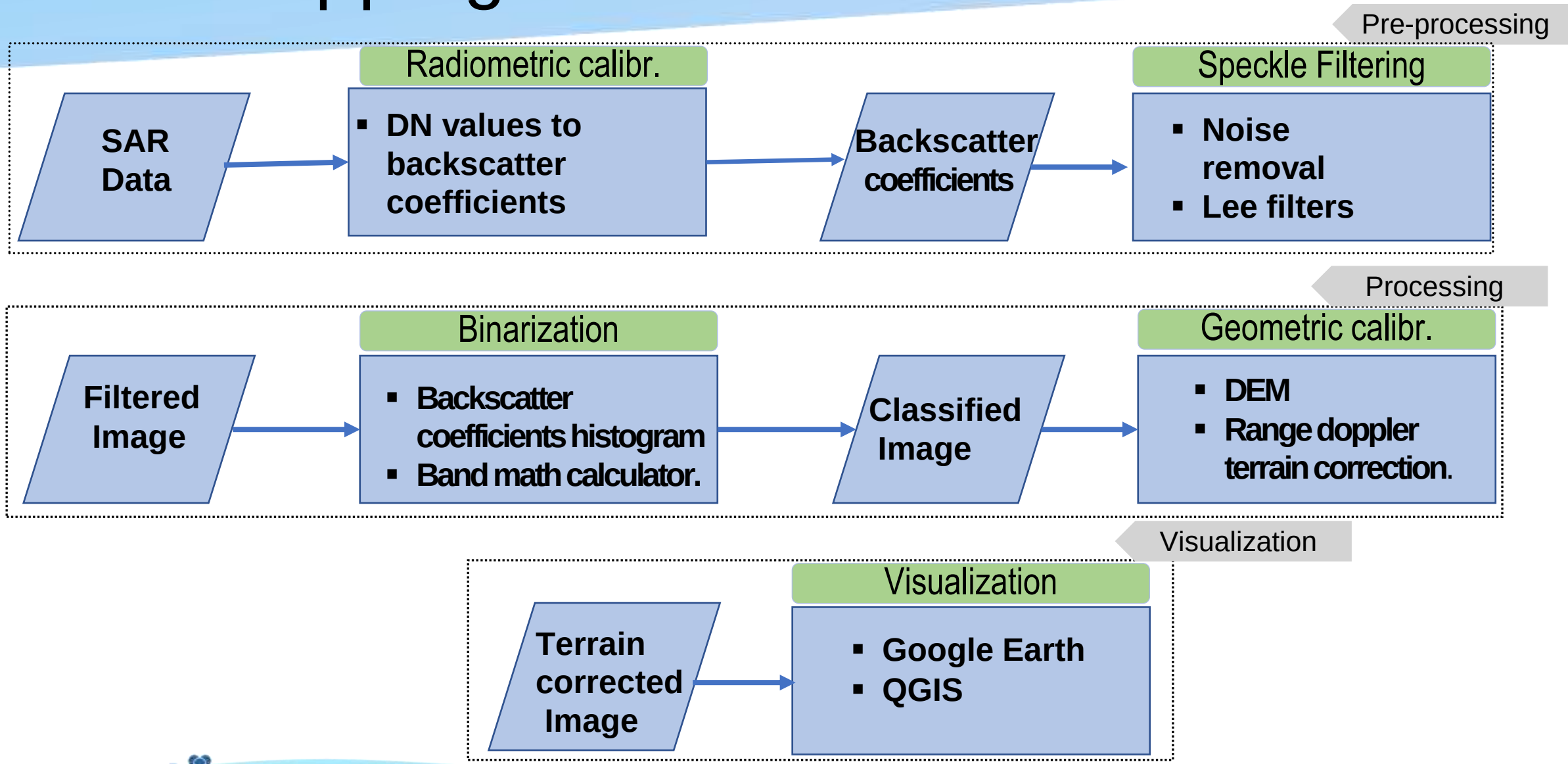


Animation of the daily (00-00 UTC) precipitation for the first **10 days of the 30-day forecast** horizon as the mean of the ECMWF ensemble forecast.

Precipitation Probability

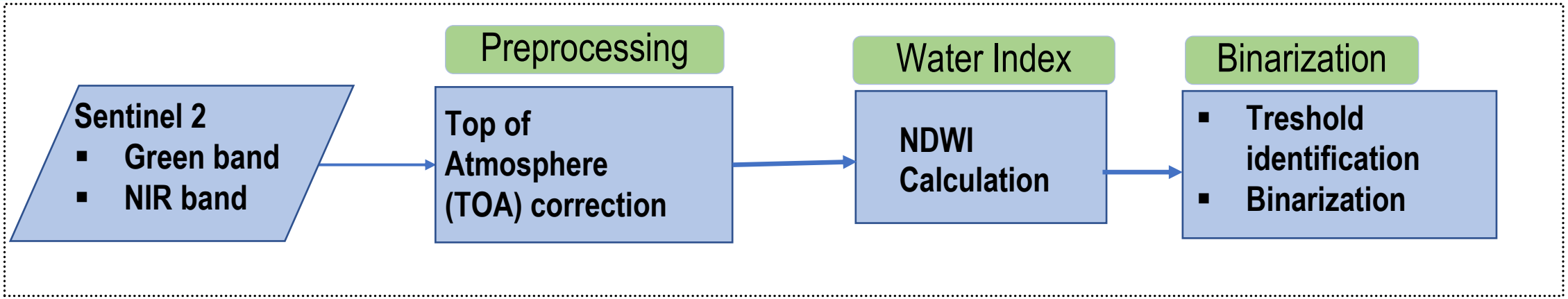
Probability [%] of exceeding **50,150,300 mm** of accumulated precipitation over the first 10 days of the 30-day forecast horizon in the ECMWF ensemble forecast.

Flood Mapping from Radar data

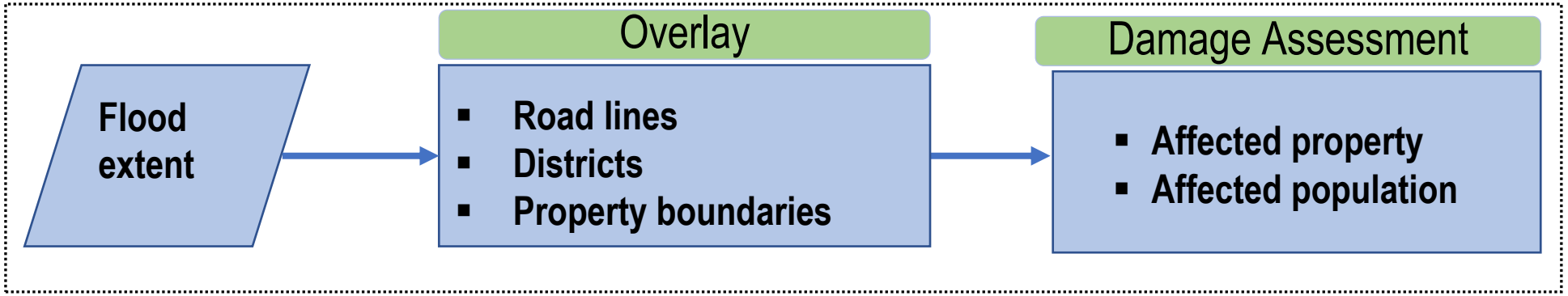


Flood Mapping from Optical data

Part 1



Part 2



Thank You for Your Attention

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