

GloFAS v3.2



The following is a description of GloFAS v3.2. For an overview of other GloFAS releases, please see: [GloFAS versioning system](#)

Summary

GloFAS version 3.2 was implemented as a minor change to provide access to the Global Flood Monitoring (GFM) beta version through its web interface (www.globalfloods.eu).

The Global Flood Monitoring (GFM) is designed to provide a continuous global, systematic monitoring of flood events, with significantly enhanced timeliness of flood maps for emergency response and improved effectiveness of Rapid Mapping activation requests (through better identification of the area of interest). The beta version contains flood products that are based on an ensemble approach integrating three robust, cutting edge algorithms developed independently by three scientific teams. The data processing architecture underlying the different scientific algorithms is based on the data cube concept, whereby SAR images are geocoded, gridded, and stored as 'analysis-ready data' (ARD) in an existing spatio-temporal SAR data cube. Users have access to consensus flood maps (Observed Flood Extent layer) where a pixel is marked as flooded when at least two algorithms classify it as water.

Here is a summary of the main changes to the GloFAS web service:

- Introduction of near real-time flood mapping-related products from the Global Flood Monitoring (GFM) beta version including:
 - **S-1 Observed Flood Extent** (data format: raster (GeoTIFF) and vector (shapefile)). The layer identifies the pixels covered by floodwater. Pixels that are usually underwater (such as lakes and reservoirs) are identified based on the monthly Sentinel-1 Reference Water Mask are not part of the Sentinel-1 Observed Flood Extent.
 - **S-1 Observed Water Extent** (data format: raster (GeoTIFF) and vector (shapefile)). The layer identifies the pixels classified as open and calm water using Sentinel-1 SAR backscatter intensity and is derived using the ensemble flood mapping algorithm.
 - **Exclusion Mask** (data format: raster (GeoTIFF)). The layer indicates the pixel locations where the SAR data could not deliver the necessary information for a robust flood delineation. It combines static effects leading to no-sensitivity in flood mapping, water-look-alikes, strong topography, and radar shadows.
 - **Uncertainty Values** (data format: raster (GeoTIFF)). The layer is generated along with the binary map product as a simplified appraisal of trust in the ensemble flood extent detection approach.
- Introduction of reference products from the Global Flood Monitoring (GFM) beta version including:
 - **S-1 Reference Water Mask** (data format: raster (GeoTIFF) and vector (shapefile)). The layer identifies the pixels classified as open and calm water, both permanent and seasonal, using Sentinel-1 SAR backscatter intensity using an ensemble flood mapping algorithm.
 - **Affected Population** layer (data format: raster (GeoTIFF)). The layer is extracted from the Global Human Settlement (GHS) layer and from the GHS-POP dataset. Represents the estimate of the number of people affected by the flood.
 - **Affected Land Cover** layer (data format: raster (GeoTIFF)). The layer provides information for quick assessment of affected land cover or land use types, e.g., how much agricultural/cropland area is affected by the flood extent.
- Introduction of new data access functionalities, including:
 - Function to define Area of Interest.
 - Visualization of the available products for user-defined AOIs.
 - GFM products download option for user-defined AOIs (per layer or for all product layers).
 - Notifications configuration via the app and/or Twitter.

Key specifications of the products

Input satellite data

Satellite sensor	S-1 - Synthetic Aperture Radar (SAR)
Acquisition mode	Interferometric Wide Swath (IW)
Data product	Level-1 - Ground Range Detected (GRD)
Spatial sampling	20 x 22 m
Global revisit frequency	Europe: ~1-3 days. Rest of the world: ~3-14 days, depending on location
SAR polarization scheme	VV + VH

General product specifics

Pre-release date on GloFAS-IS	2021-10-21
Release date on GloFAS-IS	2021-10-27
Geographic coverage	Global
Pixel size	20 m
Timeliness	<8 hours after S-1 image acquisition.
Thematic accuracy	Target threshold of >70-80%, based on the Critical Success Index

Additional information on the Global Flood Monitoring (GFM) service can be found in the GFM Product User Manual ([GFM PUM](#)) and the Technical Specification - Product Definition Document ([GFM PDD](#)). Note: At this stage, both GFM PUM and GFM PDD are subjected to changes.