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Emergency Management

#EUSpace

The Copernicus Global Flood Monitoring – GFM

Latest news and updates

Tobias Stchl, EODC, Vienna, Austria

3rd CEMS GloFAS Annual Meeting – 05-March-2024



DLR

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LIST



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Product Evolutions (GFM NRT v3.0.0)

1. Updates of the individual flood detection algorithms
2. Stabilization and performance improvement of the entire NRT workflow
3. Improved exclusion masks through bringing land cover parameters up-to-date and fine-tuning of disturbing effects
4. Computing the reference water mask for a period of 5 years instead of 2 years
5. Usage of an updated GHSL data set for flood impacts (GHS_POP_E2020_GLOBE_R2022A)
6. Colour indication of output layer outlines based on flood anomaly information
7. Re-processing of the whole flood archive (2015 until release date GFM NRT v3.0.0)

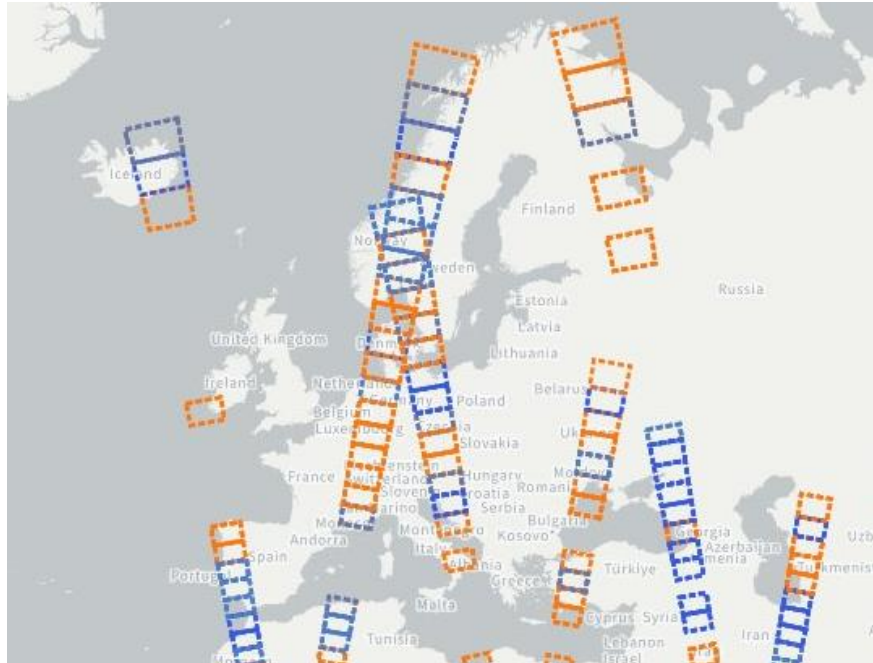


Algorithmic updates

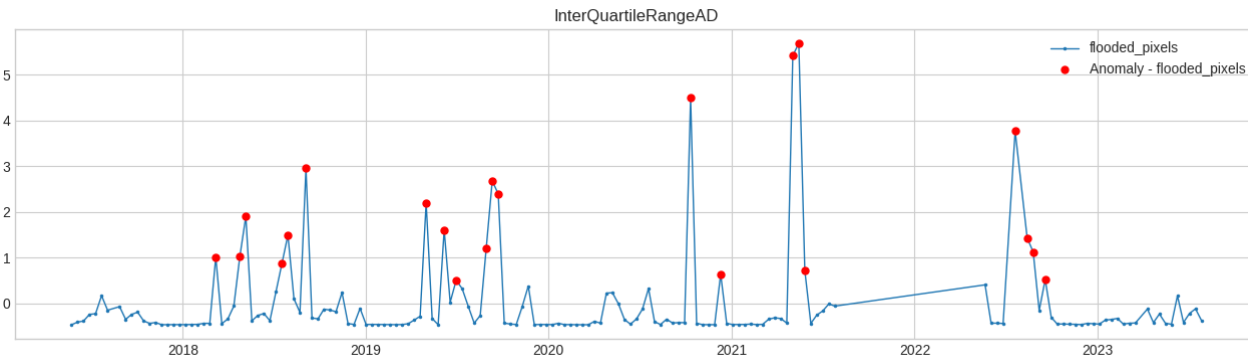
- TUV flood detection algorithm
 - Updated parameters of harmonic model (based on years 2019-2021 and less prone to annual variations)
 - Improvements to performance and reliability
- LIST flood detection algorithm
 - Updated hyperparameters for parameterization
 - Incorporated incidence angle from ellipsoid, splitting the image into three strips and performing parameterization on each strip independently
 - Implemented parallel processing for the divided image stripes
- DLR flood detection algorithm
 - Exploiting Copernicus Water Body Mask (COPWBM) to avoid selecting tiles over ocean which can affect the thresholding



Colour indication based on anomalies



Observed flood extent



Observed Flood Extent

- No Floodwater
- Floodwater

Observed Flood Extent Footprint

- Significant flooding detected
- Flooding detected, not significant
- Flooding detected, unknown significance (incomplete SAR time series)



GFM Archive V2

- Processing is currently taking place on **VSC5** on 50 nodes with 128 CPUs and 512 GB per node
- Date range **from 2015-01-01 to 2024-01-24** (release date of GFM NRT v3.0.0)
- Expected total processing time of **38 years** without parallelization
- Expected total processing time of **6 weeks** with parallelization
- Post-processing steps
 - Completeness checks
 - Preparation of all output layers for ingestion
 - Ingestion into dissemination system
- Current average runtime per scene is 10 minutes
- Expected storage volume is appr. 250 TB consisting of
 - 50 TB of GFM output layers
 - 100 TB of interim layers
 - 100 TB of GFM output layers reprojected for dissemination

| Continent | # Sentinel-1 scenes |
|--------------|---------------------|
| AF | 364.106 |
| AS | 437.789 |
| EU | 499.475 |
| NA | 294.347 |
| OC | 169.420 |
| SA | 193.888 |
| Total | 1.959.025 |



Outlook

- GFM Archive V2 (**new**):
 - All relevant GFM output layers are saved as Cloud Optimized GeoTiffs (**COGs**) (Archive + NRT)
 - Accessible via GloFAS in the next month
- Implementation of a GFM **STAC** Collection with data access (fair-usage policy)
- Next version (Q1 2025) - streamlined and improved post-processing - quicker product generation - and enhanced quality
- Stay tuned on GloFAS channels for GFM news and updates

extwiki.eodc.eu/en/GFM

www.globalfloods.eu/glofas-forecasting/



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Thank you



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