

2020-2022 GEO Work Programme

Copernicus Climate Change Service (C3S)

1. Executive Summary

The Global Flood Awareness System (GloFAS), which is part of the Copernicus Emergency Management Service (CEMS), became fully operational in 2018 and had a major upgrade and release of GloFAS v2.0 in November 2018. Also the interface was upgraded in 2018. The important developments over the period 2019-2020 will be to improve the hydrological model further and release additional global assessments of forecast performance. A new release is planned for late 2019/early 2020. This will also include a better archiving of the data and a release of these data through the Copernicus Climate Data Store (CDS).

2. Purpose

The **Copernicus Emergency Management Service (CEMS)** consists of four operational services: Emergency Mapping, European and Global Flood Awareness System (EFAS, GloFAS), European Forest Fire Information System (EFFIS) and European Drought Observatory (EDO). These services provide monitoring and early warning of a range of natural hazards on European and global level.

CEMS floods operates as a complement to national and local warning systems with the aim to provide information in a consistent way. The Global Flood Awareness System (GloFAS) is CEMS-Floods and provides complementary, added value flood forecasts independent of administrative and political boundaries. It couples state-of-the-art weather forecasts with a hydrological routing model, and with its global scale set-up provides downstream countries with information on upstream river conditions as well as continental and global overviews.

GloFAS can predict floods up to 30 days in advance depending on the situation and river size. It also provides a seasonal outlook with lead time of eight weeks. It became fully operational in 2018, which guarantees a 24/7 service as part of the Copernicus Emergency Management Service.

GloFAS' principal objectives are to improve preparedness and response for floods at a global level by providing

- added value flood forecasting information to the relevant national authorities complementary to existing national systems
- international organizations with global scale, comparable, and basin-wide flood forecasting information.
- a sub-seasonal to seasonal outlook of low and high flows

3. Background and Previous Achievements

The main achievement of 2018 was that GloFAS became fully operational in April. This means a very high service level and 24/7/365 support. 2018 also saw a major model upgrade which resulted in the release of GloFAS v2.0 on 14 November 2018. The release included a new calibration, updates to the initialisation, a new long-term reanalysis and better documentation. The GloFAS interface was also upgraded to improve the user experience. In addition, GloFAS now delivers WMS-T as web map service which enables the users to import layers into their own applications.

The interaction with the GloFAS user community has been very intense and fruitful during the period. A workshop on “**Hydrological Services for Business**” was held in May 2018, which brought together users and developers of the system to discuss the current and future developments of the system.

GloFAS shares data with a number of research groups, institutions and NGO’s all over the world. This includes, for example, CEMADEN (Brazil), SENAMHI (Peru), the Regional Integrated Multi-Hazard Early Warning System for Africa and Asia (RIMES), Red Cross/Red Crescent Climate Centre, and many more. These are using the output for their own decision making and are refining the product for further dissemination. GloFAs now has over 2000 registered users from all over the world. A major addition to the launch of GloFAS v2.0 was the release of a long-term reforecast dataset that enabled users to, for example, re-calculate their customised flood thresholds and perform their own assessments of forecast performance for their area of interest.

4. Key Activities

The current Framework contract ECMWF and Joint Research Centre of the European Commission (JRC) covers the period August 2014 until August 2020. The framework contract allows for an extension up to 6 months. This means that the current GEO work programme 2020-2022 goes beyond the current arrangement with the European Commission and we will report here only what activities are envisaged until the end of 2020.

As GloFAS became fully operation, much effort during 2019 and 2020 will be dedicated to further develop the services. The important developments over the coming period will be to improve the hydrological model and release additional global assessments of forecast performance. A new release is planned for late 2019/early 2020. This will also include a better archiving of the data in the MARS archive and dissemination of these data through the Copernicus Climate Data Store.

5. Relationship to GEO Engagement Priorities and to other Work Programme Activities

GloFAS is freely available to users, and therefore supporting the United Nations Sustainable Development Goals (SDGs), and is an important tool for the implementation of the Sendai Framework. GloFAS is also contributing to the GEO Global Water Sustainability (GEOGLOWS) through interaction and collaboration with other GEO centres.

6. Governance

The governance of C3S follows the Framework contract signed between ECMWF and the JRC. The activities are governed through specific contracts which will run during the length of the framework contract. GloFAS is scientifically scrutinized by an internal advisory board.

7. Data Policy

GloFAS follows the Copernicus Programme Data Policy. Currently, The Regulation requires Copernicus data and information to be made available on a full, open and free of charge basis, subject to limitations concerning registration, dissemination formats, and access restrictions.

8. Annexes:

1. Brief CV of Project Leaders

Fredrik Wetterhall: Senior Scientist in the Environmental forecast team

Dr Fredrik Wetterhall (M) joined ECMWF as a researcher in 2011, coming from the Swedish Meteorological, Hydrological Institute (SMHI). Fredrik has a PhD in Hydrology from Uppsala University, and has over 18 years of experience in hydrological modelling and forecasting. He is currently working as a Senior Researcher within the Environmental Forecasts team at ECMWF who is responsible for the computational part of the Copernicus-funded European Flood Awareness System (EFAS) as well as its Global equivalent (GloFAS). Fredrik is leading the development of several components of the system and is very active in the international community, acting as co-chair of the Hydrological Ensemble Forecast Experiment (HEPEX).

Fredrik Wetterhall is the GEO Point of Contact for GloFAS.