European Commission

Copernicus
Emergency Management Service

2024 GloFAS and GFM Annual Survey

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Executive summary

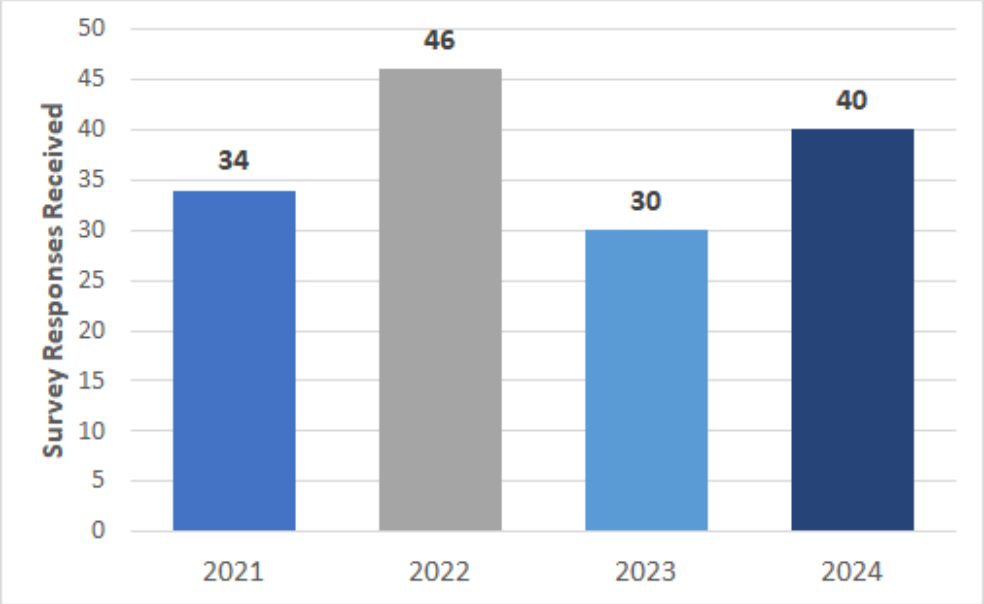
The GloFAS and GFM annual survey for 2024 provided valuable insight in the GloFAS/GFM services and needs of the user community. The main findings are summarised below:

- ***GloFAS Usage***: The survey responses suggest that the participants use GloFAS on an "as needed" basis in response to e.g. imminent or ongoing events.
- ***GloFAS Map Viewer***: Overall, the survey participants seem very pleased with the GloFAS map viewer, and responses indicate that the map viewer provides adequate information for the participants to assess the hydrological condition in their region.
- ***GloFAS Data Export***: The preferred method for exporting GloFAS data is the Copernicus Early Warning Data Store. However, approximately 1/5 of the survey participants were unaware of the options for exporting GloFAS data.
- ***GFM Products***: Only approximately half of the survey participants responded that they use the GFM products. However, the survey participants who do use the GFM products indicated that the products generally provide enough information to assess water and flood extents in their region.

1 Introduction

The GloFAS/GFM survey regarding the general satisfaction with the GloFAS and GFM services, products and performance during the year 2024 was published on March 6th 2025 and it was open until April 3rd to coincide with the 4th CEMS Global Flood Forecasting and Monitoring Meeting. In total 40 responses were received in the survey for 2024, which was similar to the number of responses received during previous years (Figure 1). Approximately half of the respondents answered also the questions solely focusing on GFM. While promotion at the GloFAS/GFM annual meeting did not lead to a noticeable increase, further engagement strategies will be considered to enhance participation in the future. The survey is anonymous, and results from the 2024 survey indicate that there is high satisfaction with GloFAS/GFM and that the services are continuing to improve. In addition, the survey results show that GloFAS Map Viewer and GFM products provide users with adequate information to assess the hydrological condition and water/flood extents in their regions.

Figure 1. Number of responses received per year



The survey responses are divided according to the following categories:

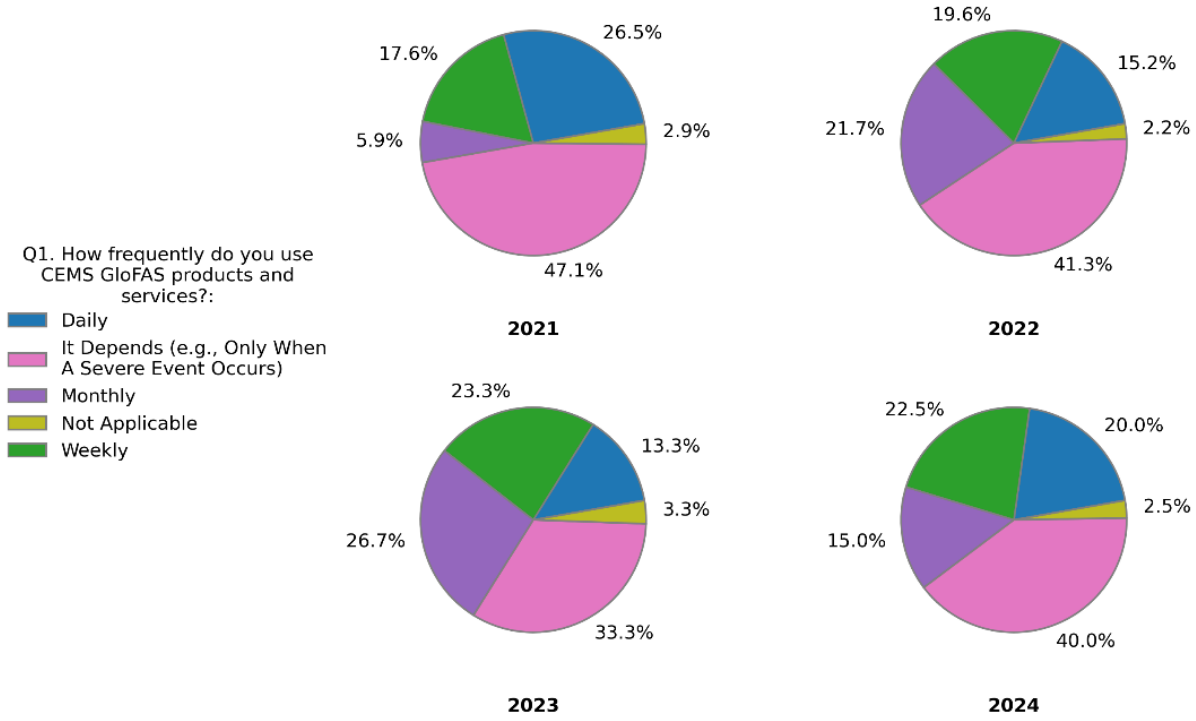
1. GloFAS Usage
2. GloFAS Map Viewer
3. GloFAS Data Export
4. GFM Products
5. Additional Feedback

2 Survey results and analysis

2.1 GloFAS Usage

The first question of the survey asked the survey participants how frequently they use the CEMS GloFAS products and services (Figure 2). Responses have been generally consistent across the different survey years. In each survey, the most selected option, "It Depends (e.g. only when a severe event occurs)", indicates that the use of GloFAS by the survey participants is dependent on factors such as imminent or ongoing events. Since 2022, the percentage of respondents using GloFAS Monthly or Weekly have been approximately equal (roughly 20% of respondents each). From 2023 to 2024, the percentage of survey participants using GloFAS daily increased from 13.3% to 20.0%.

Figure 2 . Frequency of GloFAS usage.

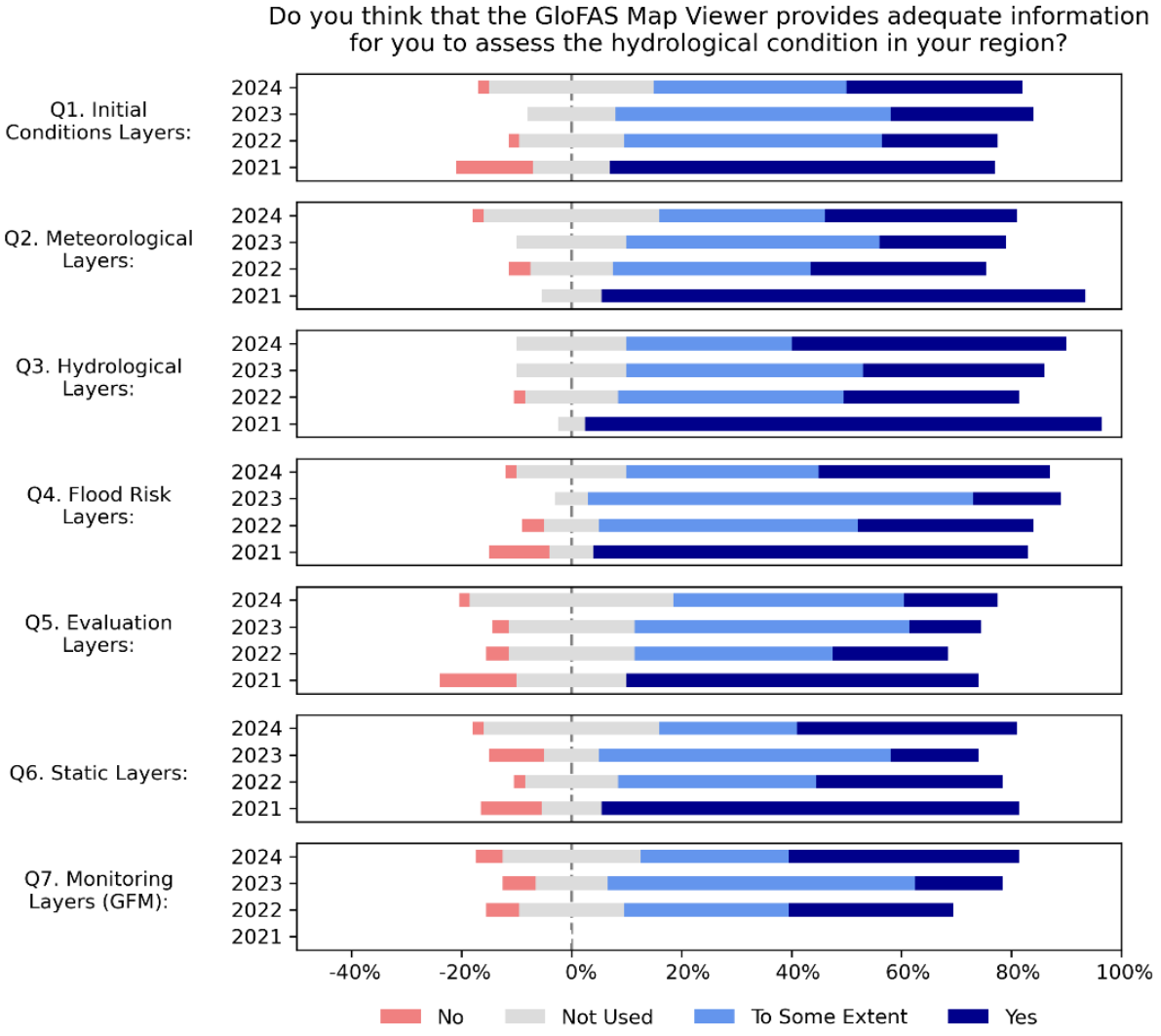


2.2 GloFAS Map Viewer

Survey participants were next asked if they thought that the GloFAS map viewer (https://global-flood.emergency.copernicus.eu/) provides adequate information for them to assess the hydrological condition in their region. This question was slightly rephrased from previous survey years in which users were asked if the map viewer provided adequate information for them to "understand the layers". Overall, there is a high level of satisfaction with the information provided by GloFAS to understand the hydrological condition in their region (Figure 3), and satisfaction was generally higher in 2024 than in 2023.

Figure 3 . Users responses regarding whether or not the GloFAS Map Viewer provides adequate information to assess the hydrological condition in their region.

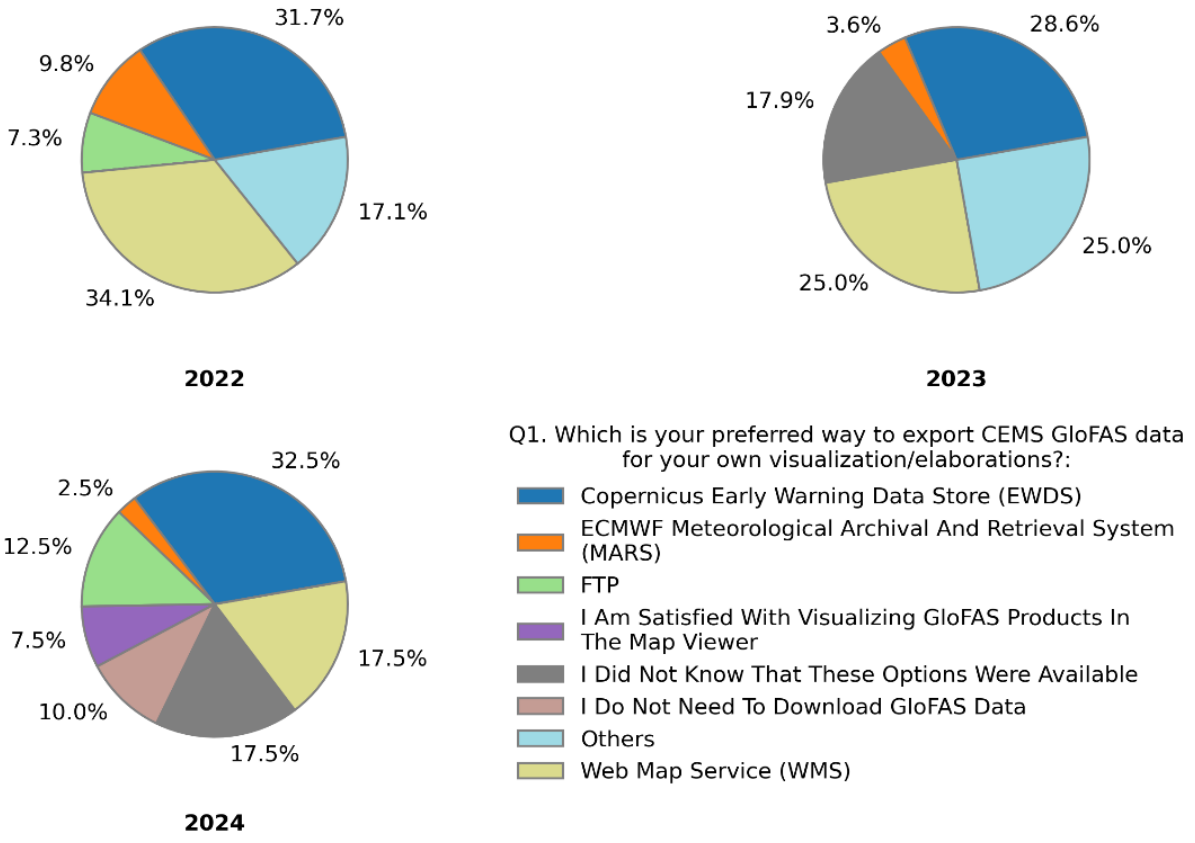
Note that the response options for the previous survey years differs slightly from the options in the 2024 survey. To facilitate comparison between the years, responses from the previous surveys were remapped such that "Very Satisfied" was considered "Yes", "Satisfied" was considered "To Some Extent", "Unsatisfied" and "Very Unsatisfied" were considered "No", and "Neutral" was considered "Not Used".



2.3 GloFAS Data Export

There are many different channels for accessing and exporting GloFAS data (https://confluence.ecmwf.int/display/CEMS/Data+Access), and the survey participants were asked to indicate their preferences (Figure 4). Overall, the Copernicus Early Warning Data Store (EWDS) and Web Map Service (WMS) options were the most preferred channels for accessing GloFAS data whereas the ECMWF Meteorological Archival and Retrieval System (MARS) was the least preferred channel. Two new response options were introduced in 2024 — "I am satisfied with visualizing GloFAS products in the map viewer" and "I do not need to download GloFAS data" — and 7.5% and 10.0% of the survey respondents respectively selected these options. Similarly to last year's survey, 17.5% of survey respondents indicated that they did not know that there were options for downloading GloFAS data.

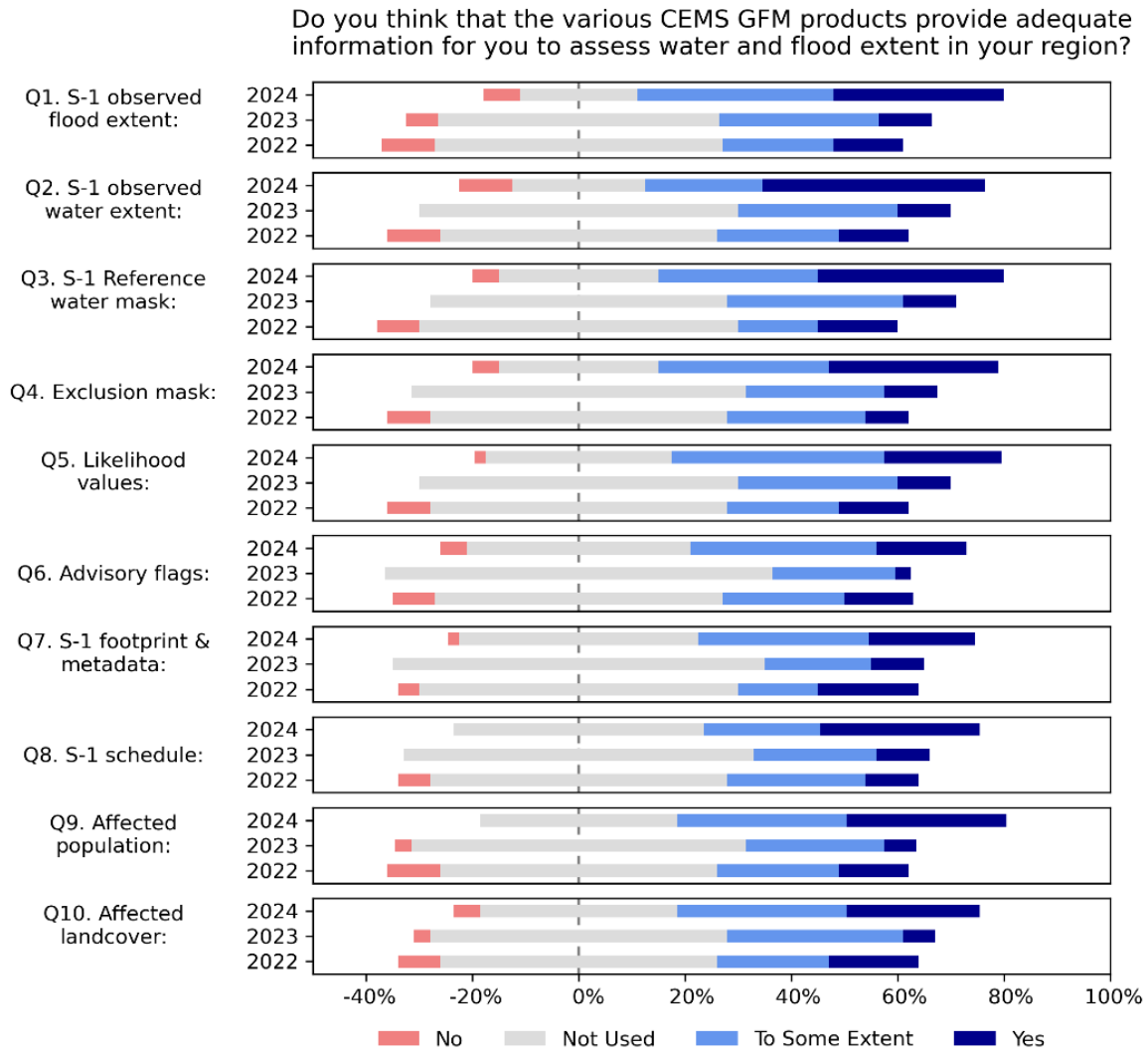
Figure 4. Users responses regarding their preferred channel to export GloFAS data. Note that the "FTP" option was not included in the 2023 survey and that the "I did not know these options were available" alternative was introduced during the 2023 survey.



2.4 GFM Products

The survey participants were also asked if they thought that the GFM products provided adequate information for them to assess water and flood extents in their region (Figure 5). For the 2024 survey, this question was slightly rephrased from previous years in which participants were asked to rate their satisfaction with the GFM products. Therefore, in order to facilitate comparison between the years, responses from the previous surveys were remapped such that "Very Satisfied" was considered "Yes", "Satisfied" was considered "To Some Extent", "Unsatisfied" and "Very Unsatisfied" were considered "No", and "Neutral" or no response were considered "Not Used". The vast majority of survey participants who use the GFM products indicated that the GFM products provided information to assess water and flood extents at least to some extent in their regions. Responses were also more positive for each product in 2024 compared with 2023 and 2022. However, approximately half of the survey participants in 2024 do not use the GFM products.

Figure 5. Users responses regarding whether or not the GFM products provide adequate information to assess water and flood extent in their region.



2.5 Additional Feedback

Lastly, survey participants were also asked to provide any additional comments, remarks, and or requests regarding the GloFAS and GFM products. These feedbacks/requests are presented below. The response to the suggested improvements can be found on the main page for this report: https://global-flood.emergency.copernicus.eu/get-involved/users-feedbacks/.

General Feedback

- All is working well
- One user reported issues when downloading GFM data, however, the download and import to GIS works without problems.
- I'm a volunteer firefighter and I've been working intensively on the subject of flood forecasting. That's when I came across the GloFAS system. [....] It would also be interesting to know to what extent the data from GloFAS is transmitted to the national authority. (Note, that this user provided an email-address and was contacted to receive more information.)

Product Performance

- During the flood in 2024, the extent of the flood was not accurately reflected. Some cities that were significantly damaged were not marked as affected by the flood according to the system.
- The water extent layer does not reflect actual water extent in reclamation areas (not shown as land) and ground subsidence areas (now under water) are still displayed as land in the Philippines.
- For us it is still a lot of work to adjust the modelling pipeline to the GloFAS v4 update. I would like to have a better GloFAS performance in the Greater Horn of Africa.
- GloFAS: It would be helpful to include more calibration and validation for specific regions such as the Andes in Ecuador. The forecasted discharge often does not fully reflect local observations. Integration with local hydrological stations (e.g., from national services like INAMHI) would improve confidence in forecast use.
- GFM: The S-1 flood mapping is useful but could benefit from a faster update cycle and higher resolution for small basins. Adding tools to cross-compare historical flood extent with forecasted conditions could enhance situational awareness.

Future Developments

- Are there any plans to integrate into GloFAS the relevant information on floods originating from the sea for a more complete picture of meteorologically driven flood risk?
- It would be useful to have more specific information on meteorological conditions in the forecasts. As ECMWF open this data up, could we have data less aggregated in time?
- I would be happy if the system would allow us to integrate local data and support national forecasting and warning agencies.

Training & Resources

- Would it be possible to provide training courses with Basin Authorities for the critical use of the platform?
- It would be helpful to provide GloFAS in other languages
- A downloadable tutorial or Jupyter Notebook examples for working with GloFAS/GFM data in Python or QGIS would be useful for capacity building.
- It would be useful to have time series or CSV options for data download. Jupyter notebook examples would also be helpful.

3 Conclusions

The annual survey for 2024 provided valuable insight in the GloFAS and GFM services and needs of the user community. Overall, the results indicate that there is high satisfaction with GloFAS/GFM and that the services are continuing to improve. In addition, the survey results show that GloFAS Map Viewer and GFM products provide users with adequate information to assess the hydrological condition and water/flood extents in their regions.

Compared to the large number of registered users, the response rate of the survey (40 users, half of them answering the GFM question as well) is rather low and measures will be taken to increase participation in the survey.

As already seen in the previous year's survey, an area for improvement is increasing the awareness of the possibilities for downloading GloFAS data, because many users seem to not be aware of this service.

Follow-up actions stemming from the outcomes of the annual surveys are listed in https://global-flood.emergency.copernicus.eu/get-involved/users-feedbacks/: this page is timely updated to track the progress in the implementation of the improvements to the GloFAS and GFM service and products.

List of figures