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ECMWF moves to open data

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SCREEN CAPTURE
WELCOME

ECMWF

ECMWF moves to open data: what aspects to consider

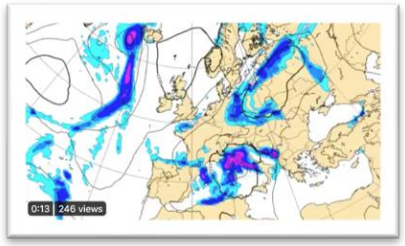
Policy: gradually (until 2025) open a subset of the ECMWF model outputs currently only available to ECMWF Member and Co-operating states and licensed entities

Accessibility: develop systems (e.g. cloud) and engage in partnerships to widen user base and facilitate generation of services

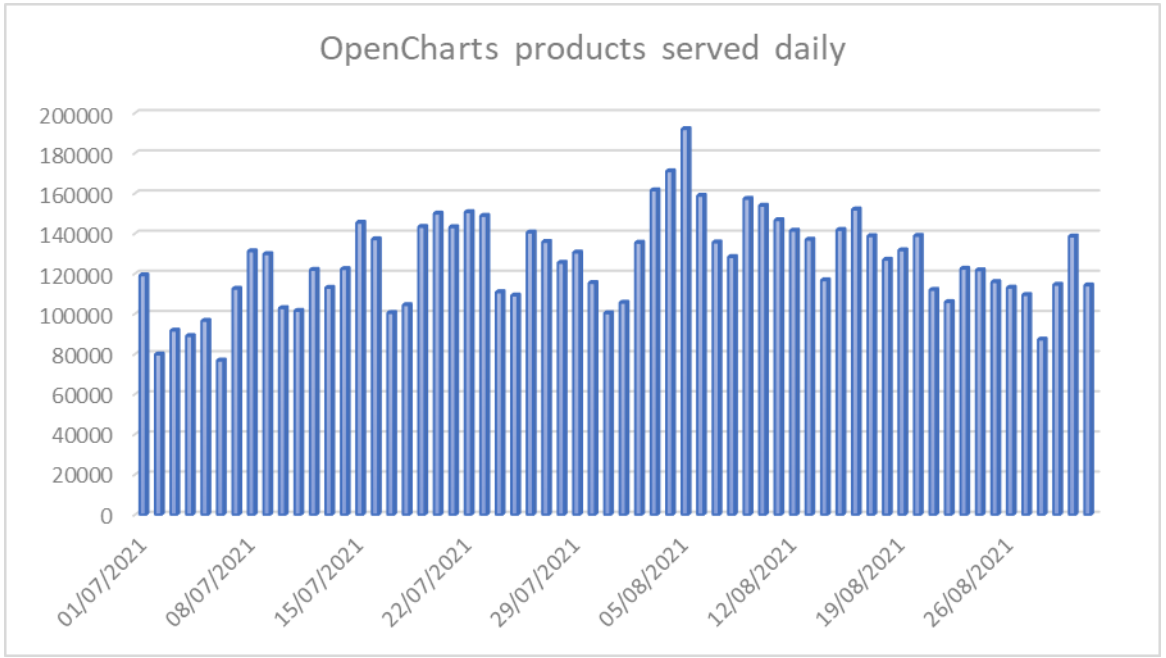
Budget: gradually reduce the dependency on revenue from data charges (called information cost), while delivery services can still be charged for

ECMWF moves to open data: The journey so far (steps made in 2020)

Free and open charts including Meteograms (OpenCharts)



apps.ecmwf.int/webapps/opencharts



Contents of the ECMWF archive catalogue provided with an open licence

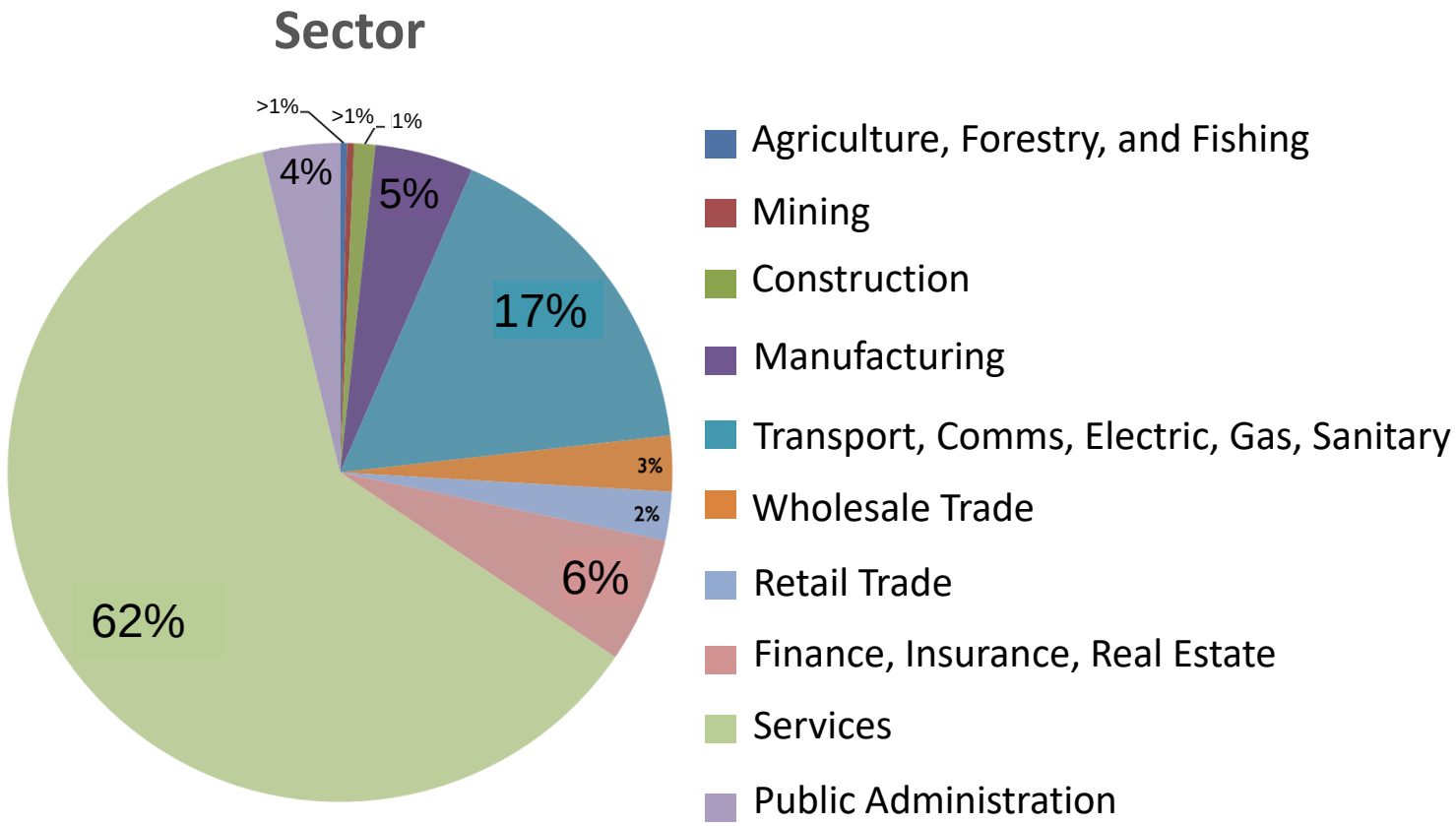
Expected increase in archive access licences in 2021 by around 33% compared to 2020

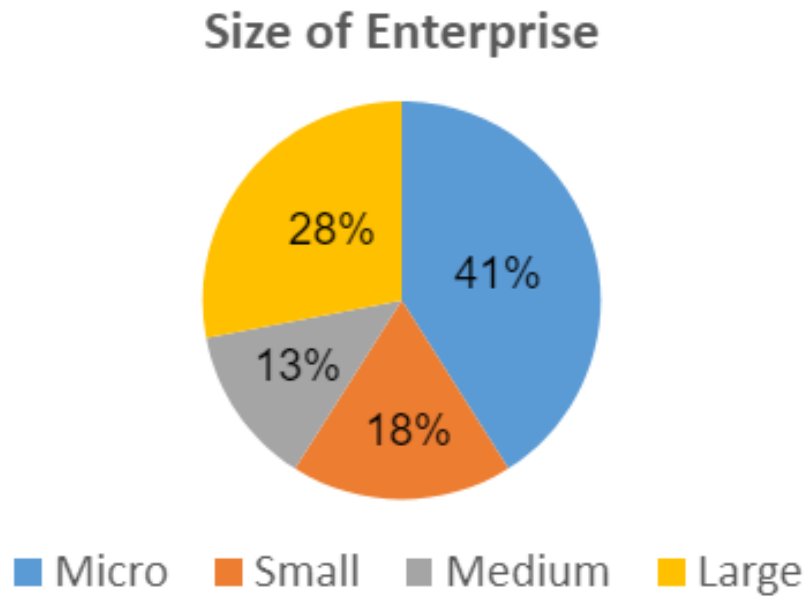
Reduced fees for some licence types

Increase in data sales, especially for high-frequency data (1-hourly), but difficult to draw conclusions

The meteorological market seen from ECMWF's perspective

Understanding our market to plan the evolution of our data policy





Prioritizing moves and user perspectives

- The majority of our customers are European micro/small enterprises

- Survey conducted by ECMWF (2020) shows that the vast majority of users prioritize 1) horizontal resolution and 2) temporal resolution as most important aspects of open data

- Survey conducted by Wagemann et al. (2021) shows:
  - Users still prefer downloading large volumes of data and process them locally
  - They can move to cloud-based services, but still want to be able to download data
  - Cloud services are a plus, but data discovery and interoperability is still a challenge
  - In Europe users prefer publicly funded cloud services (especially in public sector)
  - Data analysts are not necessarily experts in cloud services
  - Scepticism about cloud security and emerging costs

- New survey will be launched to understand the delivery services our users prioritize. This will inform the setup of a new charging model based on data volumes and customized delivery services to substitute the current handling charges

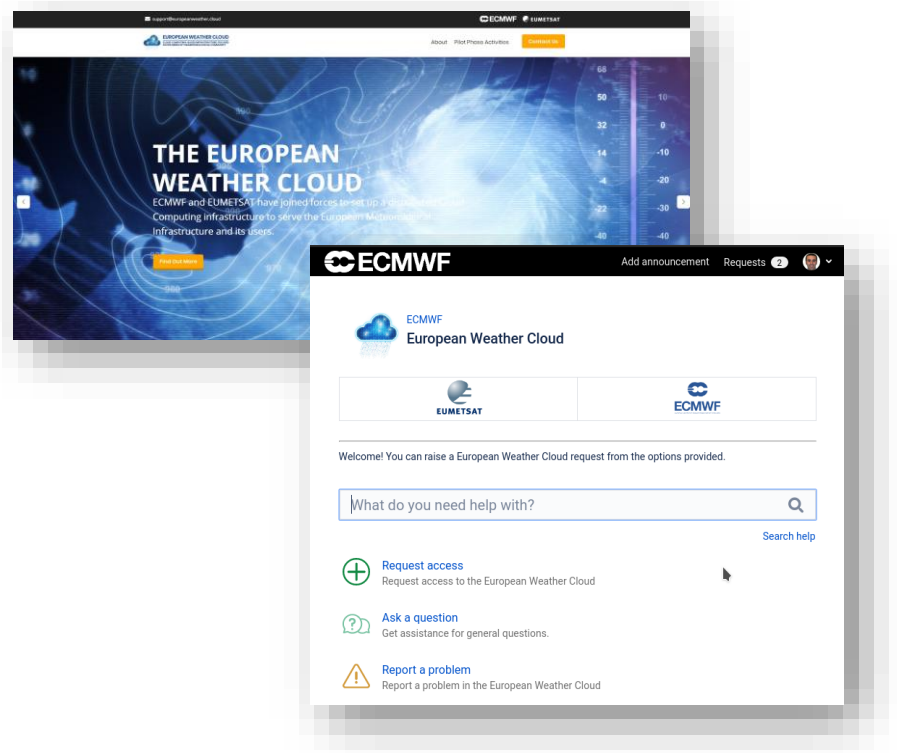
Supporting the European market (2022)

- European cut-out area: 1/3 of max charge fee, max 15 Catalogue parameters, no sub-setting, max resolution
- Consolidated and simplified discount system to support micro enterprises
- …and at the same time gradually reduce revenue from data charges

European cut-out area

Supporting the NMHSs of WMO (2022)

- Handling charges only for non-commercial use by NMHSs of WMO (no information cost)
- …and at the same time gradually move to a service charge model
- Make data better exploitable via the European Weather Cloud (being piloted in the SEE-MHEWS-A project)



Strengthen open NWP data offering: “ECMWF Open Data (real-time)”

Aim:

- Consolidate and expand the current open data offering of real-time forecasts (2022)
- Gradually further enhance the “ECMWF Open Data (real-time)” dataset (until 2025)

Initial configuration (2022)

Domain: global

Horizontal resolution: 0.4 degrees

Parameters: over 20 of the most popular high resolution (HRES) and ensemble forecast (ENS) parameters

Forecast range: 3h or 6h steps up to 240h (HRES) and up to 360h (ENS)

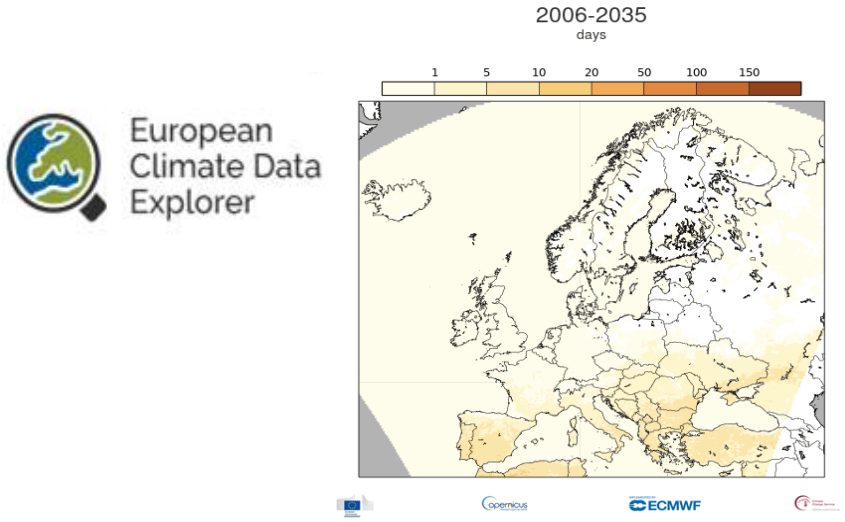
Output frequency: 6 hours (00, 06, 12, 18 UTC)

Levels: single and pressure levels (hPa) 1000, 925, 850, 700, 500, 300, 250, 200, 50

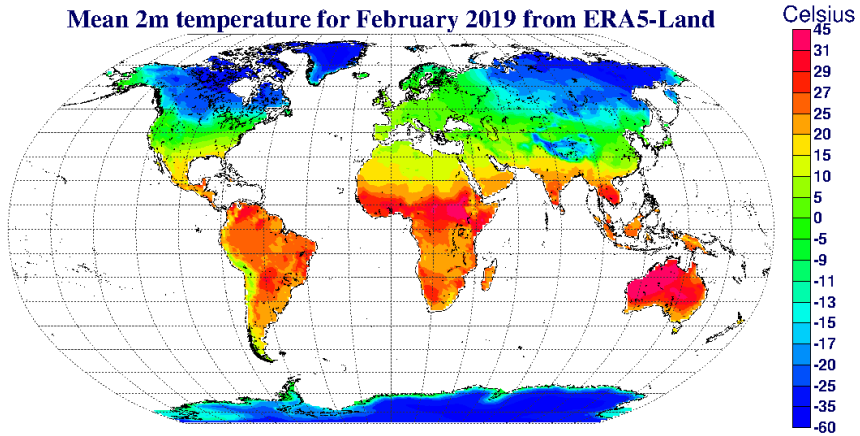
Plus…: over 20 parameters representing means and probabilities

ECMWF and Copernicus Climate Change Service (C3S)

- Integration:
  - Climate Data Store (CDS) toolbox applications embedded in the EEA ClimateAdapt

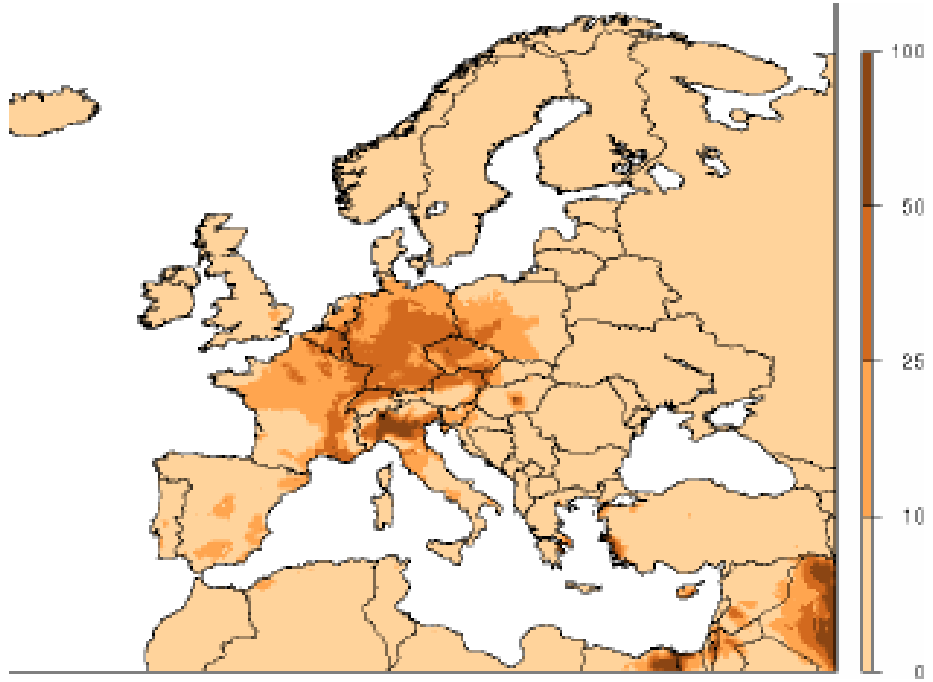


- New/enhanced datasets:
  - ERA5-Land back extension (1950), Ocean Reanalysis (ORAS5) ready in October on CDS
  - Develop ERA5 back extension possibly to 1920



ECMWF and Copernicus Atmosphere Monitoring Service (CAMS)

- Integration:
  - Atmosphere Data Store (ADS) and Climate Data Store (CDS) will merge → good news for thematic hubs e.g. in services for health
- New/enhanced datasets:
  - CAMS regional re-analysis (Europe) at 10km resolution just made available on ADS for 2018. Working on previous years

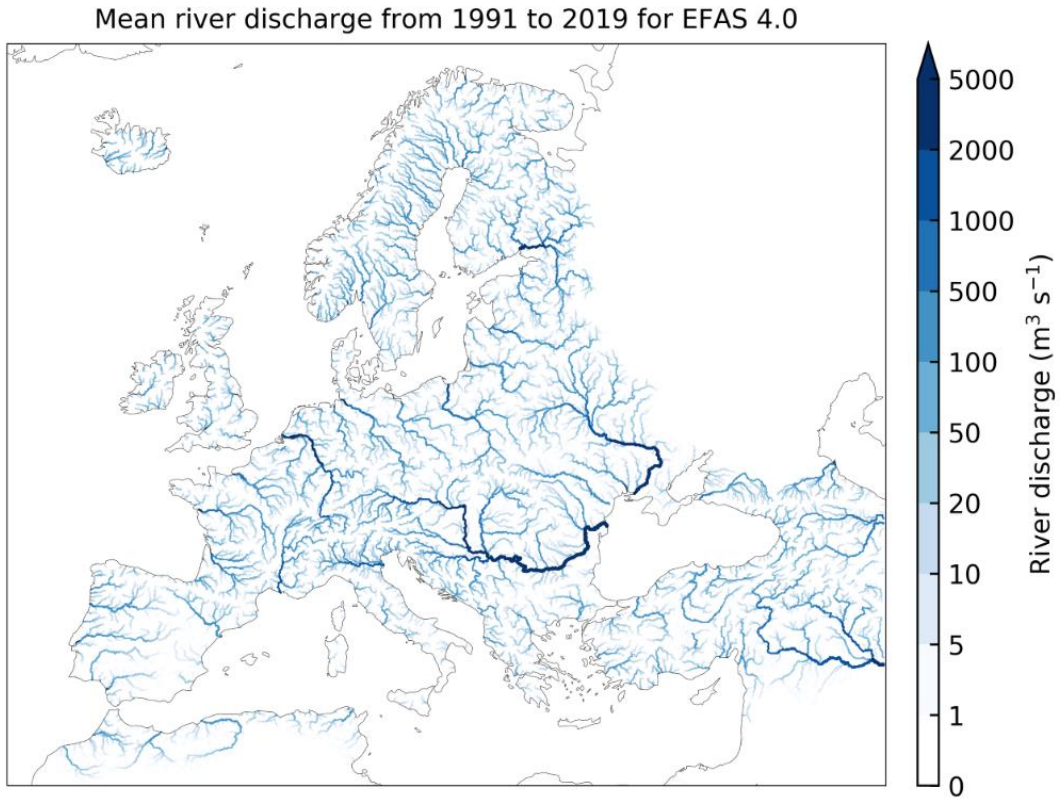


Number of days when 120 µg.m^{-3} ozone concentration (maximum daily 8-hours average) was exceeded in 2018

ECMWF and Copernicus Emergency Management Service (CEMS) - Flood

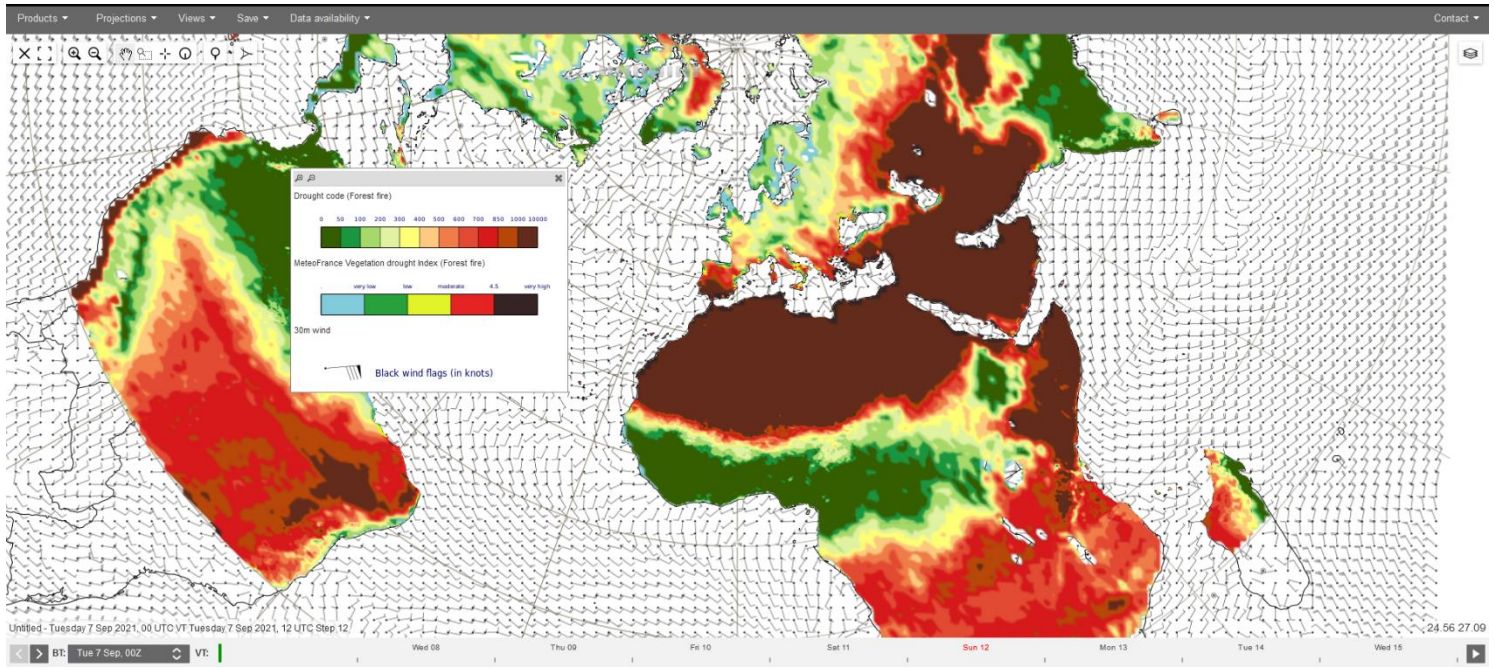
- Integration
  - Exploring ways to disseminate data via GeoGLOWS
  - Support of SEE-MHEWS-A

- New/enhanced datasets:
  - New re-analysis river discharge simulations based on observations (in CDS end of 2021)



ECMWF and Copernicus Emergency Management Service (CEMS) - Fire

- Integration
  - Thanks to open software, Global ECMWF Fire Forecasting (GEFF) model is now one component to generating the fire indicator forecasts for the NOAA's Climate Prediction Center
  - Data governance: Fire danger variables codified in WMO GRIB2



Conclusions

- ECMWF Strategy 2021-2030 clearly sets the move to open data as a key action
- Measures introduced in 2020-2021 (OpenCharts and open archive data, reduction of information cost) have increased use of data but not reduced revenue from data charges
- In 2021-2022 more measures to increase open data offering, reduce dependency from data charges revenue, support European market and NMHSs of WMO
- In 2023-2024 gradually open more datasets, reduce data charges (but maintain service charges)
- Favour solutions that increase exploitability of data, via cloud technology and by enhancing integration with external processes/systems