Beyond Open Data: the importance of data standards and interoperability

Experiences from ECMWF’s Open Data Week | 28 Feb – 5 Mar 2017

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European Centre for Medium-Range Weather Forecasts

- 24/7 operational service
- Research institution
- 22 member states | 12 Cooperation States
- Two Copernicus Services
  - Climate Change Service (C3S)
  - Atmosphere Monitoring Service (CAMS)
- 300 + staff
ECMWF data and data licenses

**ECMWF Forecasts**
- Operational global forecasts from medium-range (3-15 days), to monthly and seasonal, and up to a year ahead
- Twice-daily numerical forecast outputs

**ECMWF Public data**
- Climate Reanalysis data (e.g. ERA-interim)
- Specific projects (for research and education only):
  - S2S (sub-seasonal to seasonal)
  - TIGGE (Ensemble forecast data)

**Copernicus (CAMS, C3S)**
- Climate Change service
  - ERA-5 reanalysis (~ 5 PB)
  - Multi-model seasonal forecasts
- Atmosphere Monitoring service
  - Daily analysis and forecast data of e.g. aerosols, greenhouse gases, fire emissions
Open Data Week @ECMWF
28 February – 5 March 2017

POLICY
Data Policy Workshop

DATA SYSTEMS
Workshop on Meteorological and Operational Systems

USERS
#OpenDataHack @ECMWF
Data Policy Workshop

- Aimed at policy-makers and professionals interested in the evolution of the meteorological industry
- Provided a forum to discuss the challenges linked with the dissemination of large sets of meteorological data

Workshop on Meteorological and Operational Systems

- Aimed at service providers around the world to discuss current developments of serving large volumes of meteorological data
- Exhibition on various web- and desktop-based solutions
#OpenDataHack @ECMWF

- In alignment with **International Open Data Day**
- **70 developers** formed **20 teams**
- 2 main objectives
  - To **raise awareness about ECMWF open data**
  - Evaluation of ECMWF data services and **collecting user feedback**
Focus on a variety of data services…

Data Service Catalogue

1. ECMWF MARS archive - WebAPI
2. ECMWF / Copernicus Web Mapping Service (WMS)
3. ECMWF Web Coverage Service (WCS) (Test service)
4. Copernicus Climate Change Service (C3S)
5. Additional Data Resources

ECMWF WebAPI
OGC Web Services
Copernicus / SIS data

Open Data Policy is just the first step...
… though necessary and important as the Landsat example shows

Before Open Data Policy: 53 scenes/day

After Open Data Policy: 5,700 scenes/day

Financial benefit of open Copernicus environmental data: -30 billion €
Conclusions – Policy Workshop

A forecast has no value until it is understood and changes behaviour!

• Just publishing of vast amounts of open data will not lead to expected benefits
  • Innovative data access and discovery systems have to be implemented along the way
  • This requires investment and it is important to consider how it is funded

• New pricing structures: service costs rather than information charges
  • A sustainable way for data providers might be to charge for different levels of service (SLAs)

• Actors in the NWP value chain are becoming more diverse
  • Users’ needs and actors’ business models have to be understood in order to maximise the impact as data provider
Conclusions – MOS Workshop and #OpenDataHack @ECMWF

• Trend is to bring the processing to where the data is
  • Cloud-based solutions, standardised web-services

• Meteorological data is challenging to work with, especially for users outside the meteorological domain
  • Concept of vertical levels, difference between analysis and forecast

• Open weather and climate data is of most benefit when combined with information from other open data sources

Spatial Data Standards and interoperable web services play a key role of making open data accessible, discoverable and digestable!
Thank you!
Questions?

More information:

20 ways to unleash the power of open data