

New Research Opportunities by Open Data

Open Source GIS meets the DWD Open Data Portal



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MOTIVATION

- **INSPIRE (Infrastructure for Spatial Information in the European Community)** is an EU initiative to establish an infrastructure for spatial information in Europe to make spatial information more accessible and interoperable for a wide range of purposes supporting sustainable development.
- **In parallel, the number of freely available geospatial open source software tools to derive information from spatial data sources continues to grow.**
- **The combination of these two developments has created a critical mass of research opportunities for (citizen) scientists within and beyond Europe.**



https://wiki.osgeo.org/images/thumb/5/52/Osgeolive_wordle.png/750px-

Stakeholders

DIW Berlin

The **German Institute for Economic Research (Deutsches Institut für Wirtschaftsforschung)** or more commonly **DIW Berlin** is one of the leading economic research institutes in Germany. It is an independent, non-profit academic institution which is involved in basic research and policy advice. DIW Berlin presents its research results in science journals, within the scope of national and international scientific events as well as at workshops, symposia and colloquia. Current economic and structural data, forecasts and advice as well as services in the area of quantitative economics are provided to decision makers in economics and policy and the broad public. DIW Berlin endues a target group specific range of publications, events and data sources. DIW is committed to the FAIR (Findable, Accessible, Interoperable, Reusable) paradigm to enable Open Science and is a signatory of the Enabling FAIR Data commitment statement.

Deutscher Wetterdienst

Deutscher Wetterdienst (DWD) is the **German Meteorological Service** based in Offenbach am Main. Basic charges are to monitor weather and meteorological conditions across Germany and to provide weather services for the general public and for nautical, aviation, agricultural and hydrological purposes. It is governed by the Federal Ministry of Transport and Digital Infrastructure. Principal tasks include warning on weather-related hazards as well as monitoring and accessing climate variability and trends affecting Germany. DWD operates its own numerical weather prediction model suite on its supercomputer and a network of 17 C-Band weather radars for reliable weather forecasts. DWD also manages the national climate archive and one of the largest libraries dedicated to weather and climate worldwide.

OSGeo Foundation

The **Open Source Geospatial Foundation (OSGeo)** is a non-profit non-governmental organization whose mission is to support and promote the collaborative development of open geospatial technologies and data. The foundation was formed in February 2006 to provide financial, organizational and legal support to the broader Free and open source geospatial community. It also serves as an independent legal entity to which community members can contribute code, funding and other resources, secure in the knowledge that their contributions will be maintained for public benefit. The foundation pursues goals beyond software development, such as promoting more open access to government produced geospatial data and completely free geodata, such as that created and maintained by the OpenStreetMap project. Education and training are also addressed.

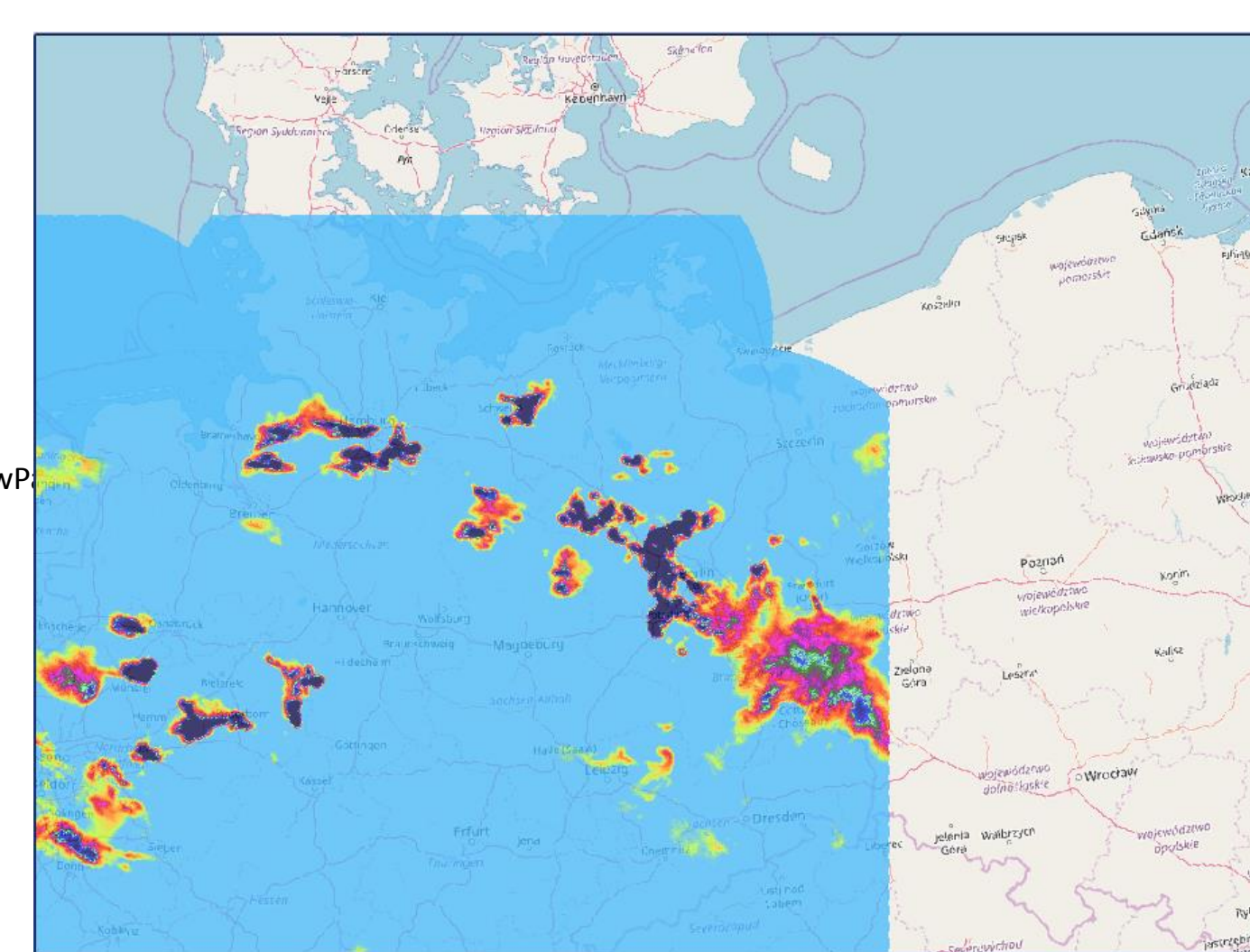
New Opportunities

DWD Open Data Portals for meteorologic data and models

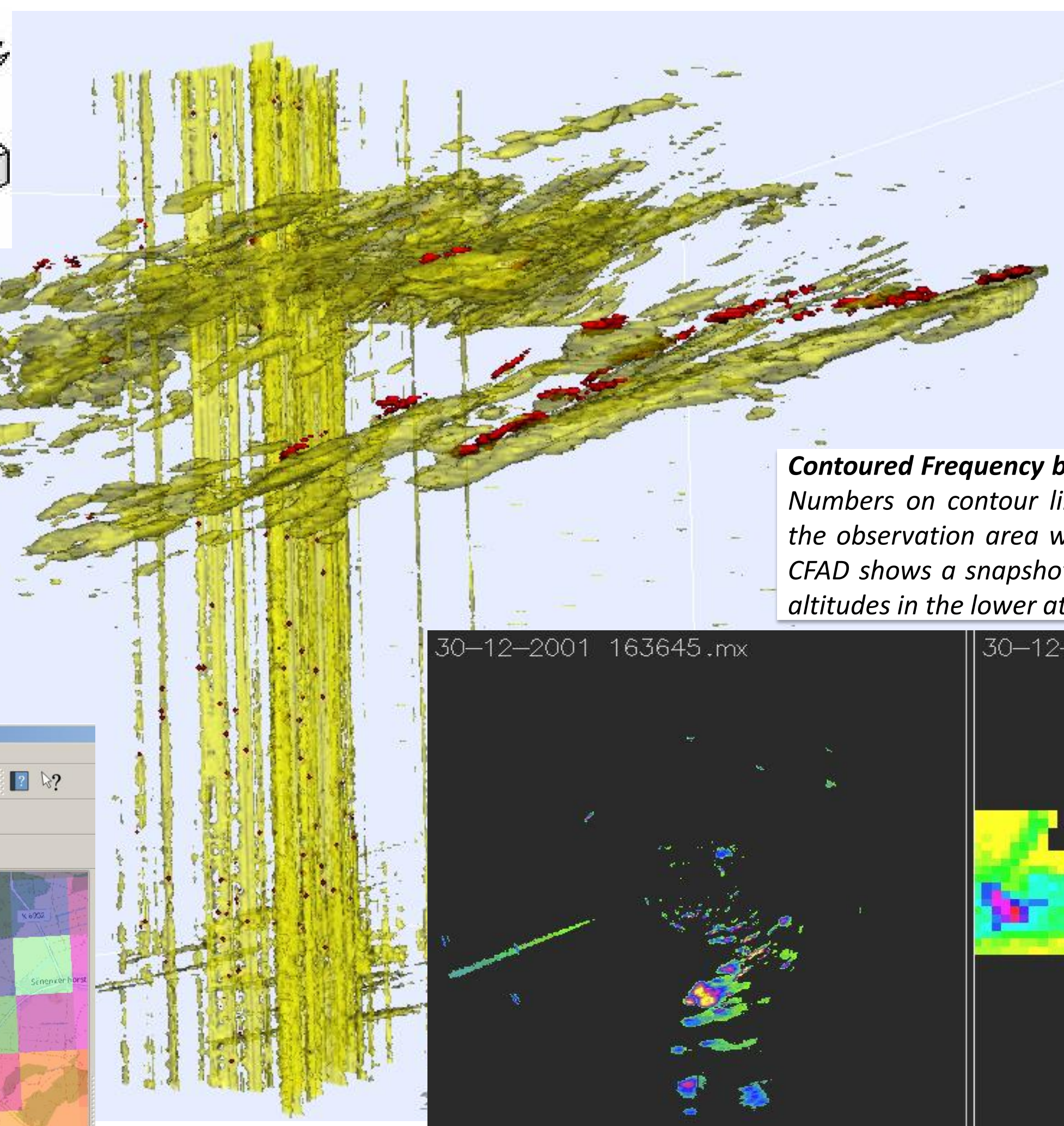
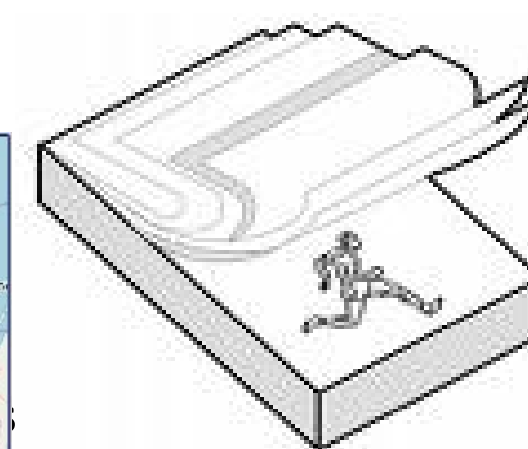


https://www.dwd.de/DE/leistungen/openoata/openoata_oiaa.jpg_f_oiaa=posterov=1,z
<https://maps.dwd.de/geoserver/web/wicket/bookmarkable/org.geoserver.web.demo.MapPreview>

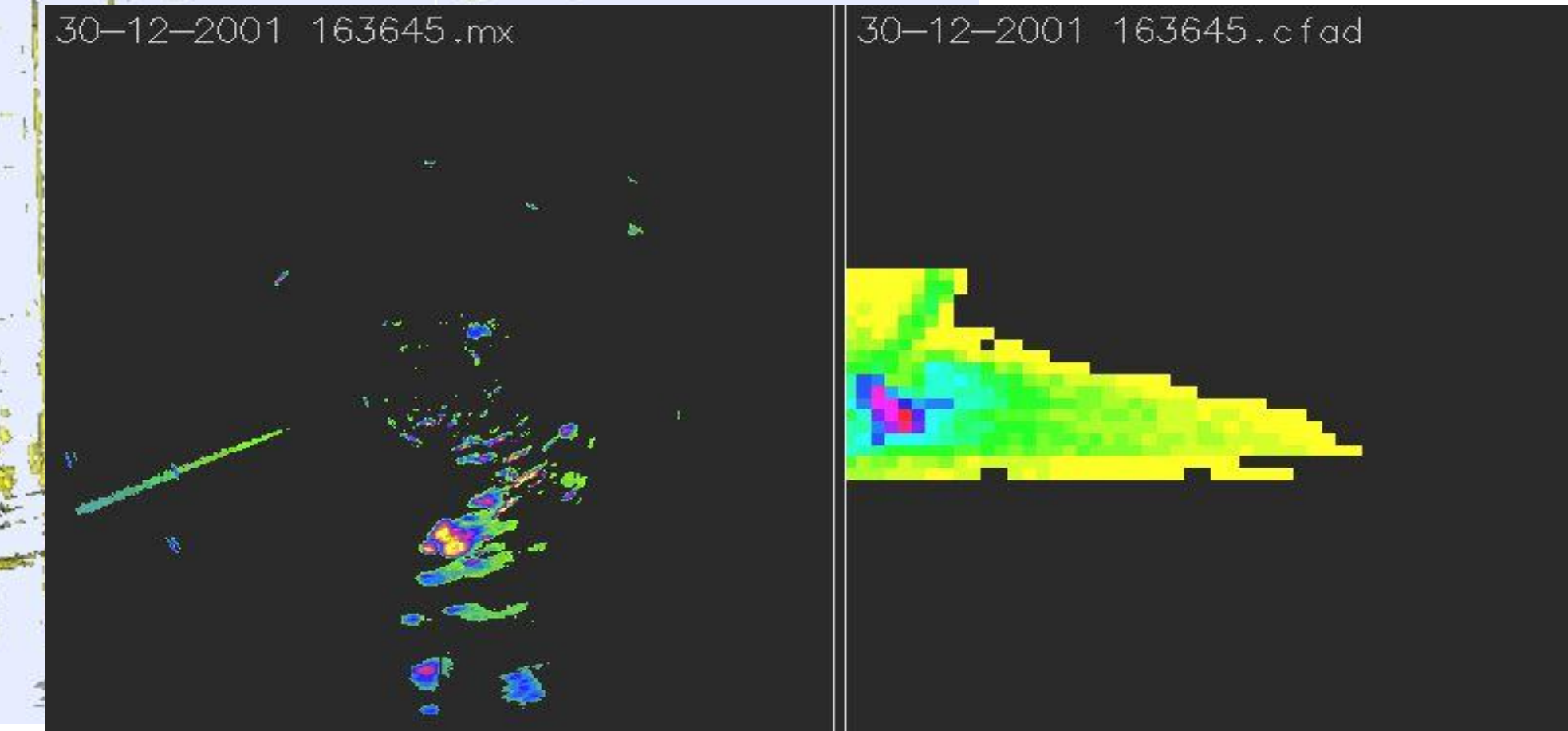
Custom high resolution precipitation maps for citizen scientists



Space-time cubes for precipitation (yellow) and erosivity (red, REI-modell). [example: SAWS data, 24 hours]

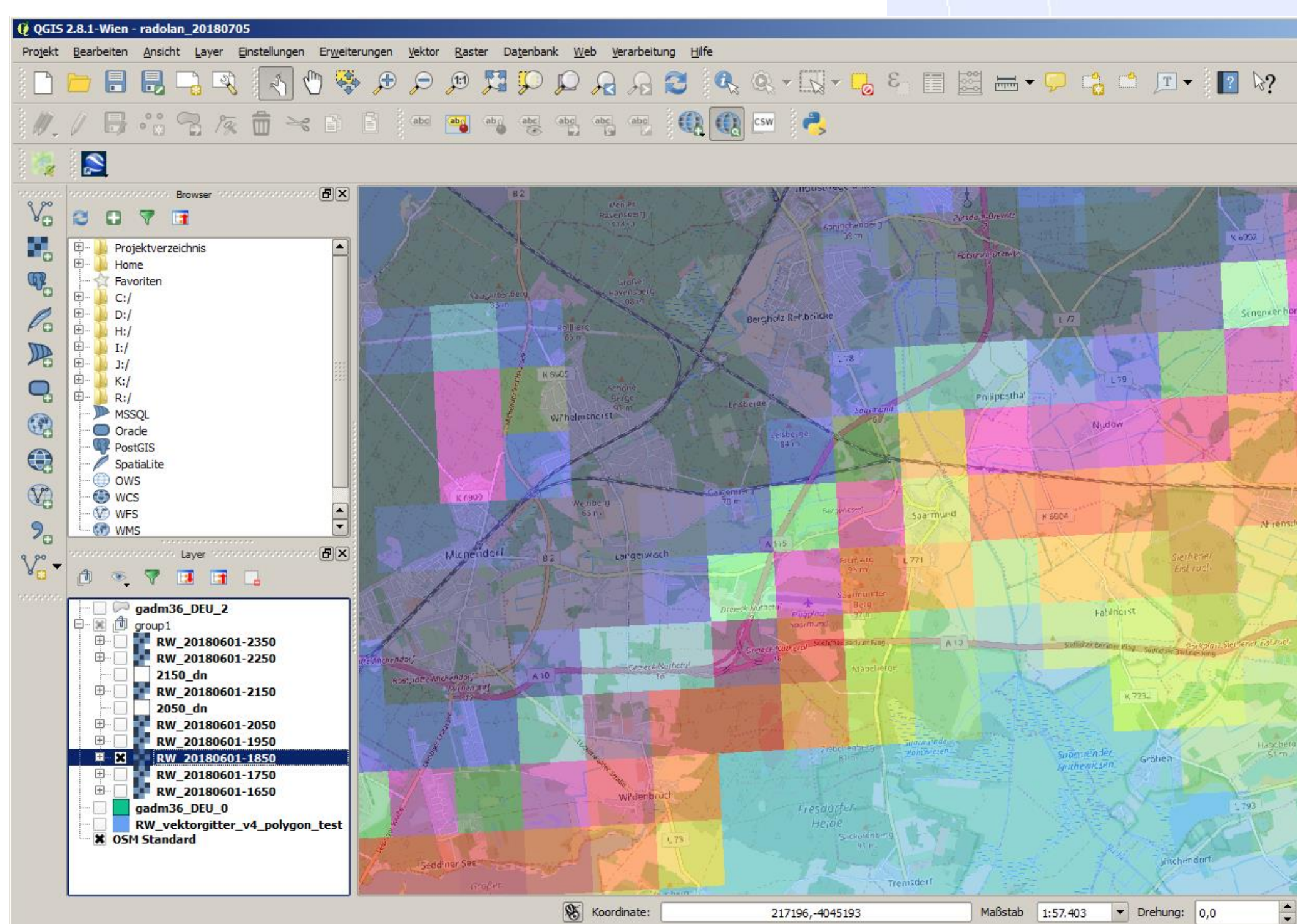
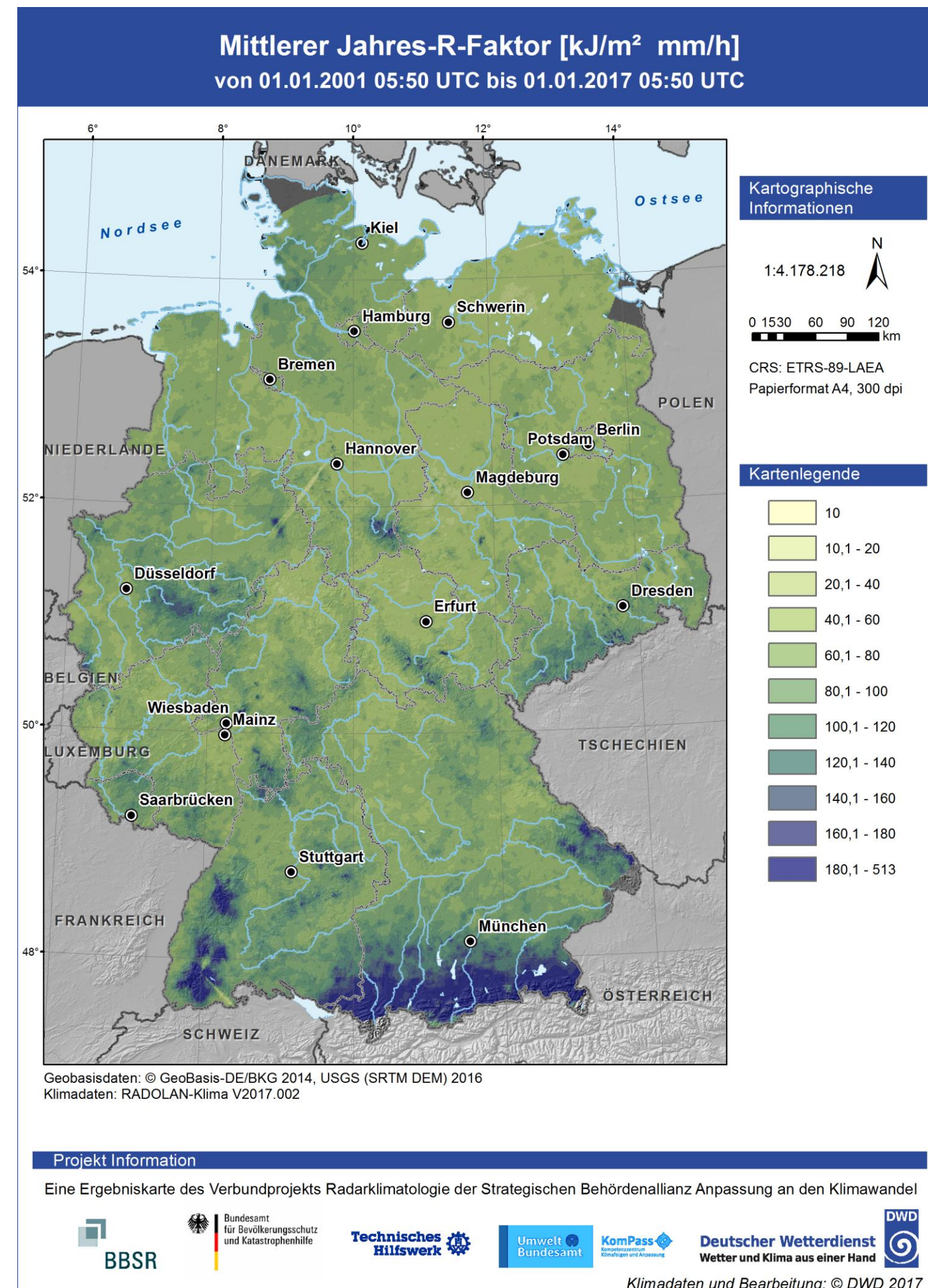


CFAD and CFADT visualisation (SAWS data) for validity assessment of 4D data



Contoured Frequency by Altitude Diagram (CFAD, right): Numbers on contour lines give the number of voxels in the observation area with a given radar reflectivity. The CFAD shows a snapshot of weather intensity at different altitudes in the lower atmosphere.

High resolution erosivity maps (r-factor) for soil loss assessment



CONCLUSIONS

- **Meteorological data is a valuable resource for near-real time and retrospective analysis**
- **Measuring, archiving, provision and analysis of streams of meteorological data, which continue to grow in volume, variety and velocity, require reliable digital infrastructures.**
- **European initiatives ensure open access to publicly funded geospatial data for citizens, science and education.**
- **Open source software tools opens up new opportunities for innovation in science, education and commerce.**

SELECTED REFERENCES

- 4D Data Visualisation and Quality Control: <https://doi.org/10.5281/zenodo.1422359>
- SAWS MaxCAPP / CFAD video: DOI:10.5281/zenodo.1418432
- SAWS CFADT video: DOI:10.5281/zenodo.1288304
- SAWS Space Time Cube video: DOI:10.5281/zenodo.1415411
- Methoden der Künstlichen Intelligenz in Radarmeteorologie und Bodenerosionsforschung (<urn:nbn:de:hbz:20-opus-7594>)
- DISSIX: DOI:10.5281/zenodo.1164724

Radar-based Precipitation Climatology of DWD:

- 10.5676/DWD/RADKLIM_RW_V2016.003 (gauge-adjusted one-hour precipitation sum)
- 10.5676/DWD/RADKLIM_RW_V2017.002 (gauge-adjusted one-hour precipitation sum)
- 10.5676/DWD/RADKLIM_YW_V2017.002 (quasi gauge-adjusted five-minute precipitation rate)