

Presenting a prototype platform for mapping epidemiological cohort metadata with environmental and earth observation metadata: the MetaMap³ project

Kathrin Wolf¹ // Marco Dallavalle¹ // Ronny Gey² // Jeroen Staab³ // Marie Standl¹ // Jan Bumberger² // Hannes Taubenböck³

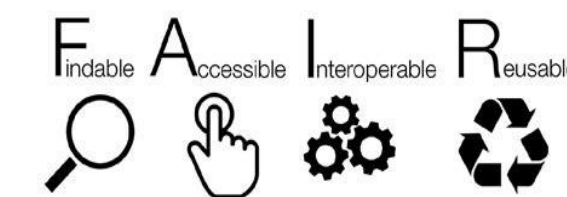
¹ Helmholtz Zentrum München
² Helmholtz Centre for Environmental Research
³ German Aerospace Center

Background and Motivation

- Environmental data heterogeneous in spatial and temporal resolution
- Amount of (openly) available data increasing but not all appropriate for linkage with health data
- Search for appropriate exposure data cumbersome and inefficient

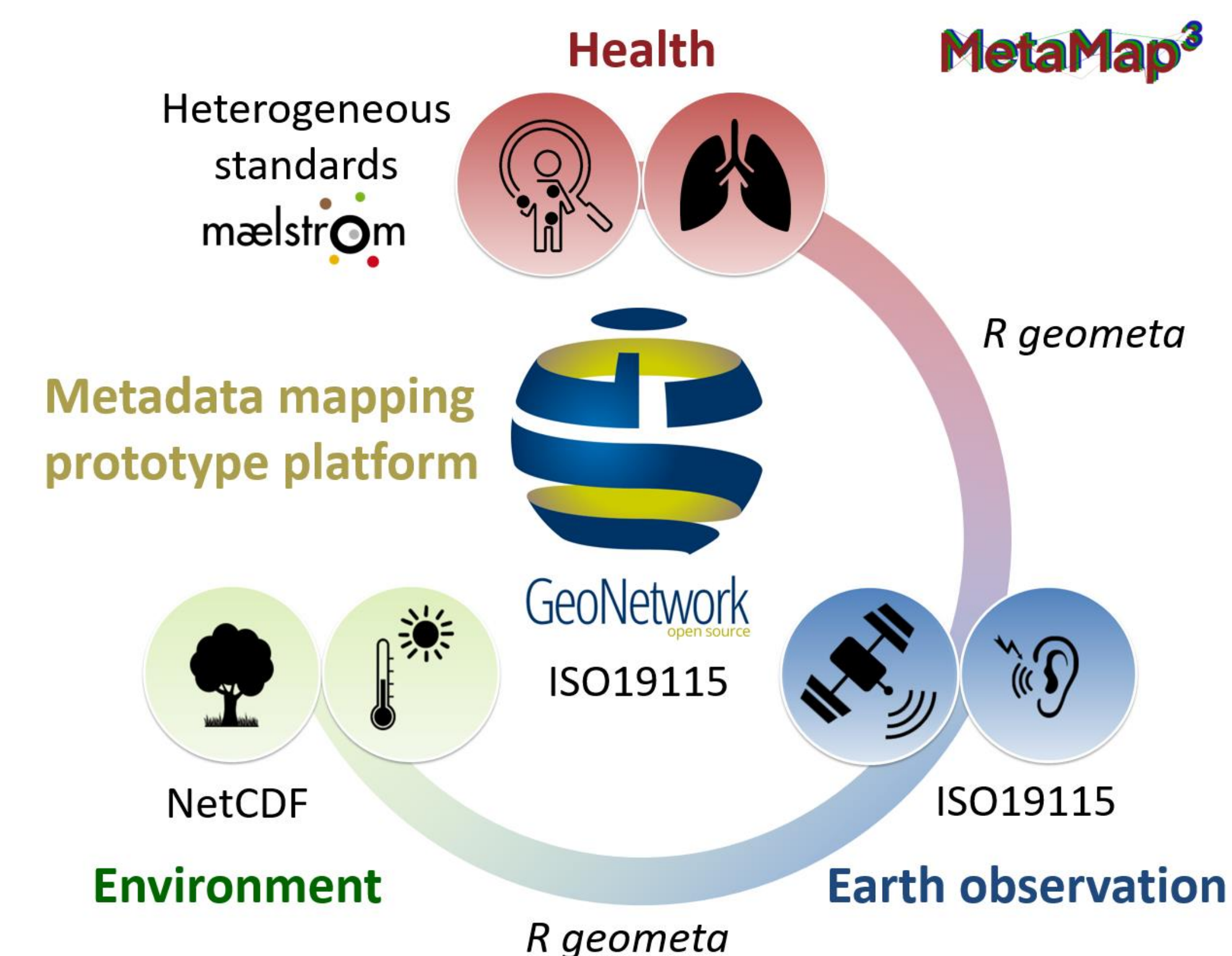
Objectives

- Metadata mapping of exemplary cohort and exposure data for joint querying and searching
- Improve FAIRness of our cohort data



Mapping strategy

- Main mapping criteria: spatial and time coverage
- Mapping platform: GeoNetwork¹
- Joint standard: ISO19115
- Use cases converted and uploaded

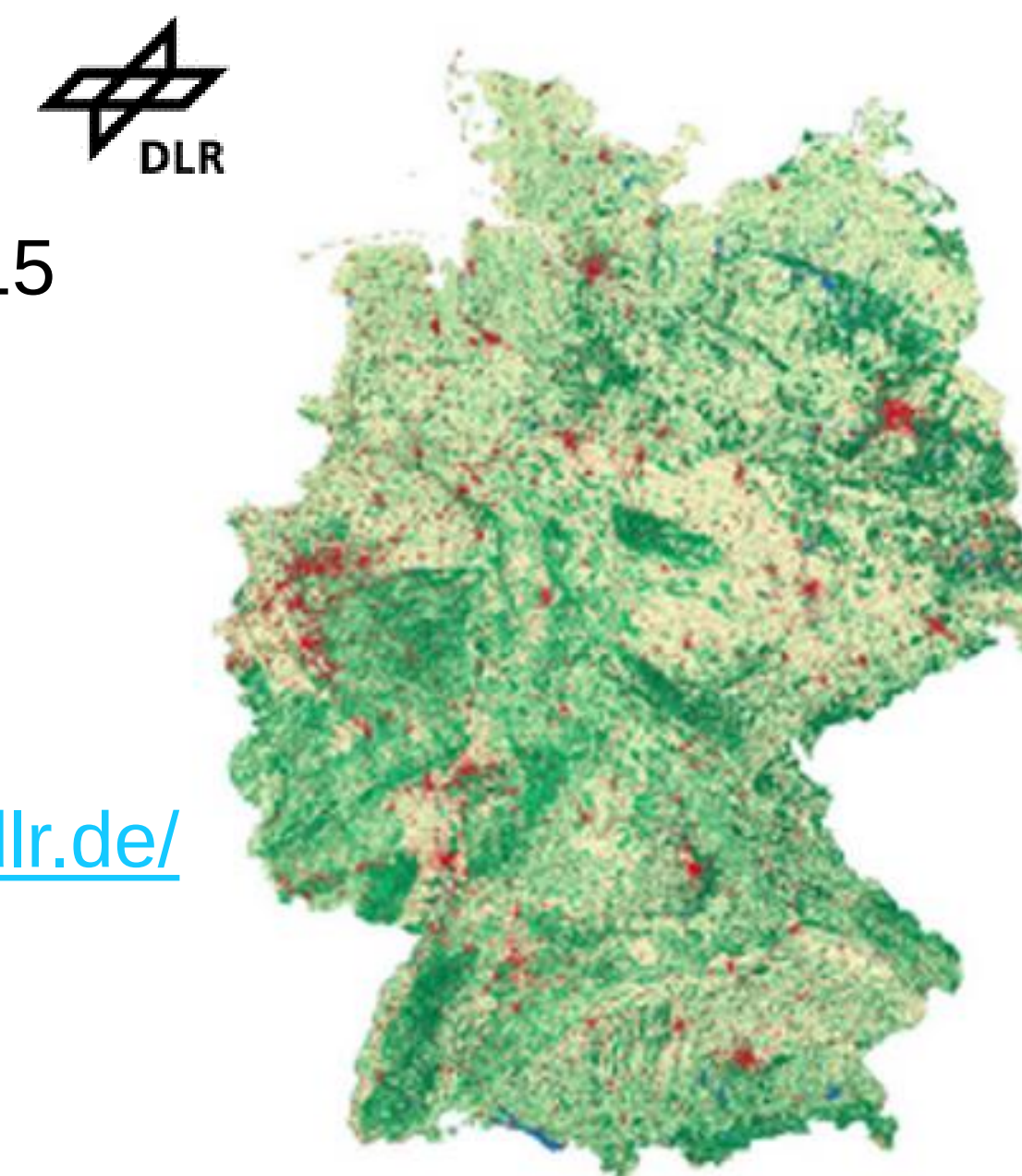


Mapping strategy for domain-specific research data from three domains

Use cases

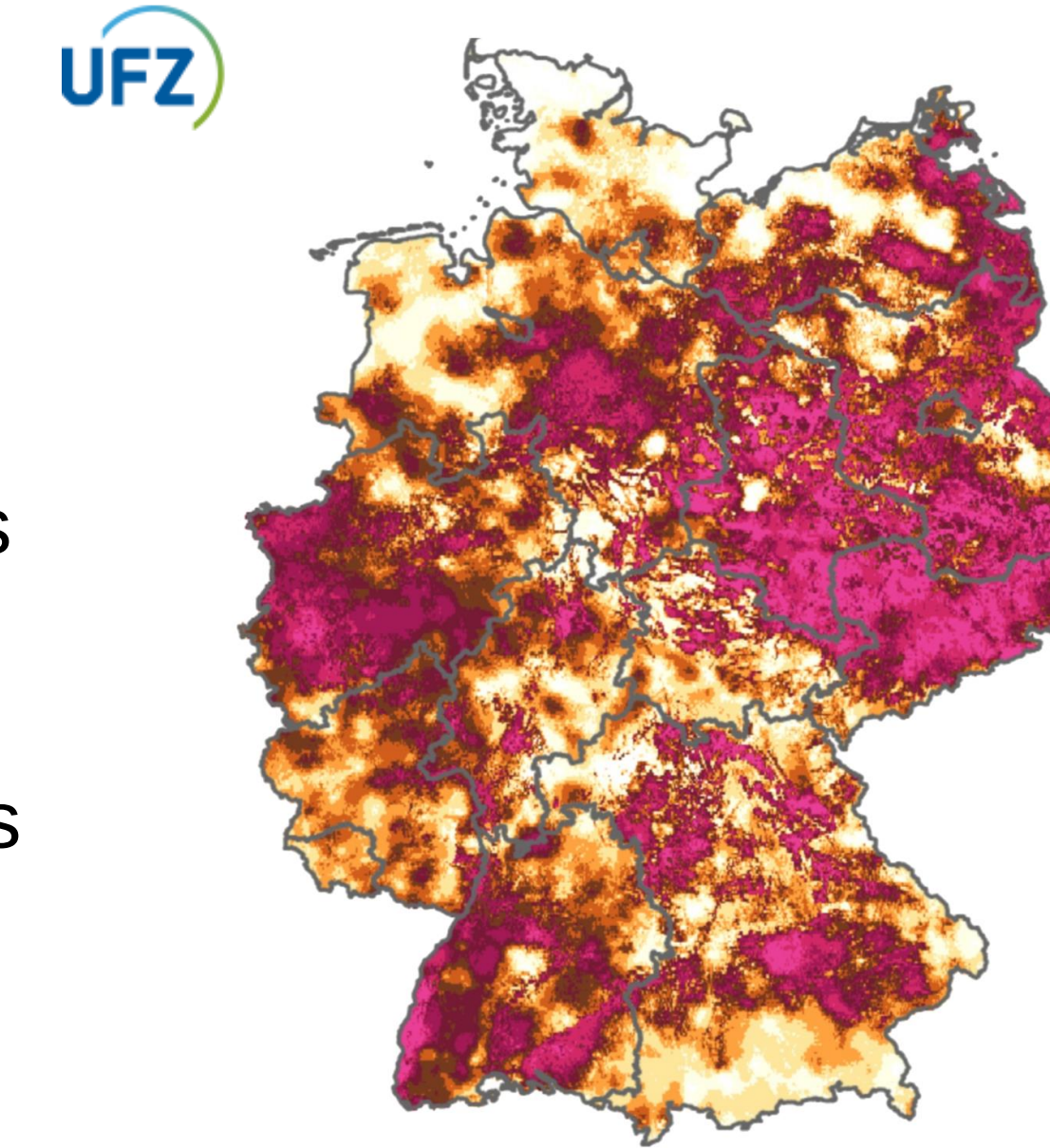
Land cover²

- Annual data for 2015
- Format: GeoTIFF (one variable)
- ISO-19115
- <https://geoservice.dlr.de/>
- **Already FAIR**



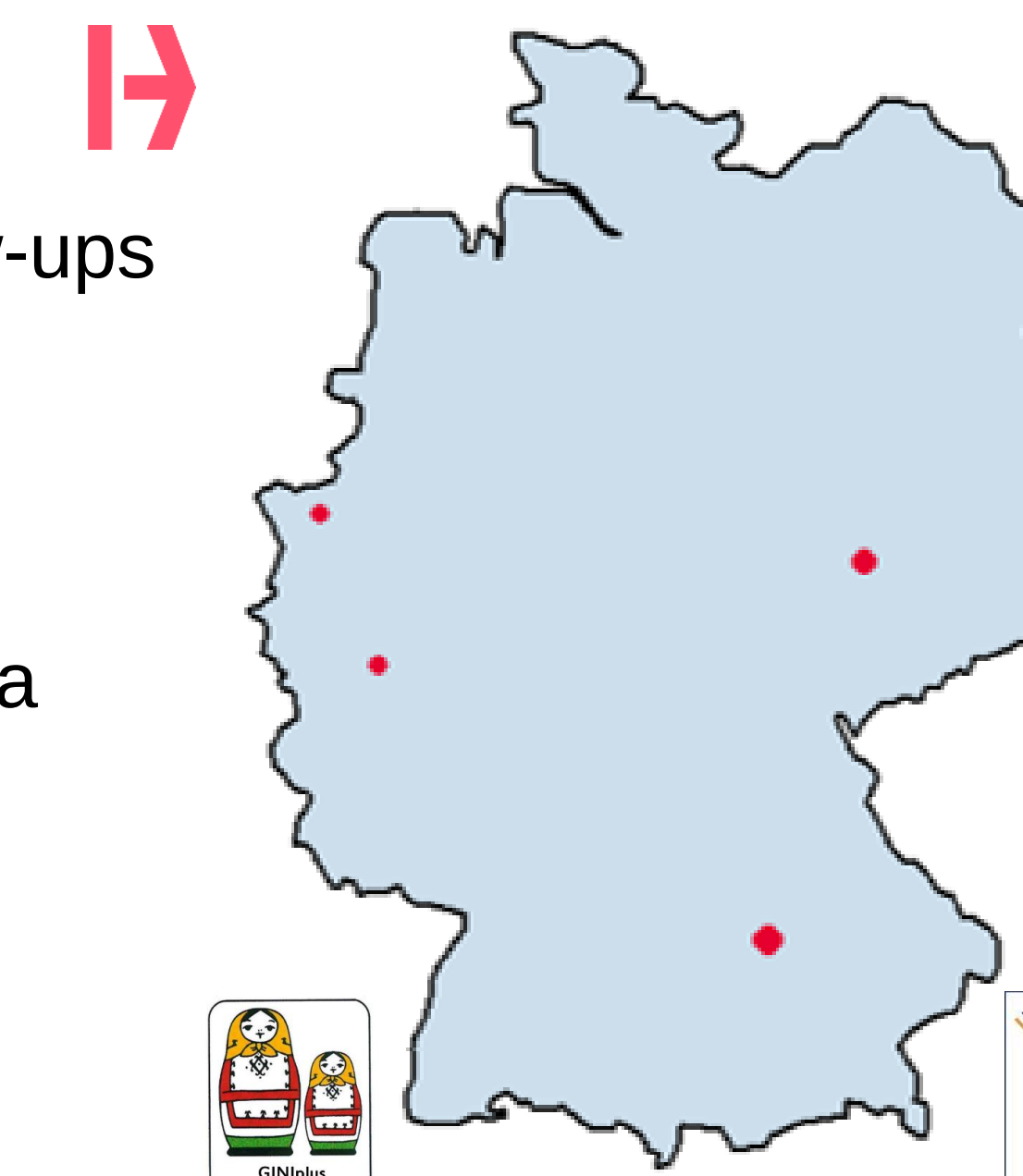
Soil moisture index³

- Daily data
- 1951 – present
- Several parameters
- Format: netCDF
- Standard-like status
- www.ufz.de/mhm
- **FA, only partly: IR**



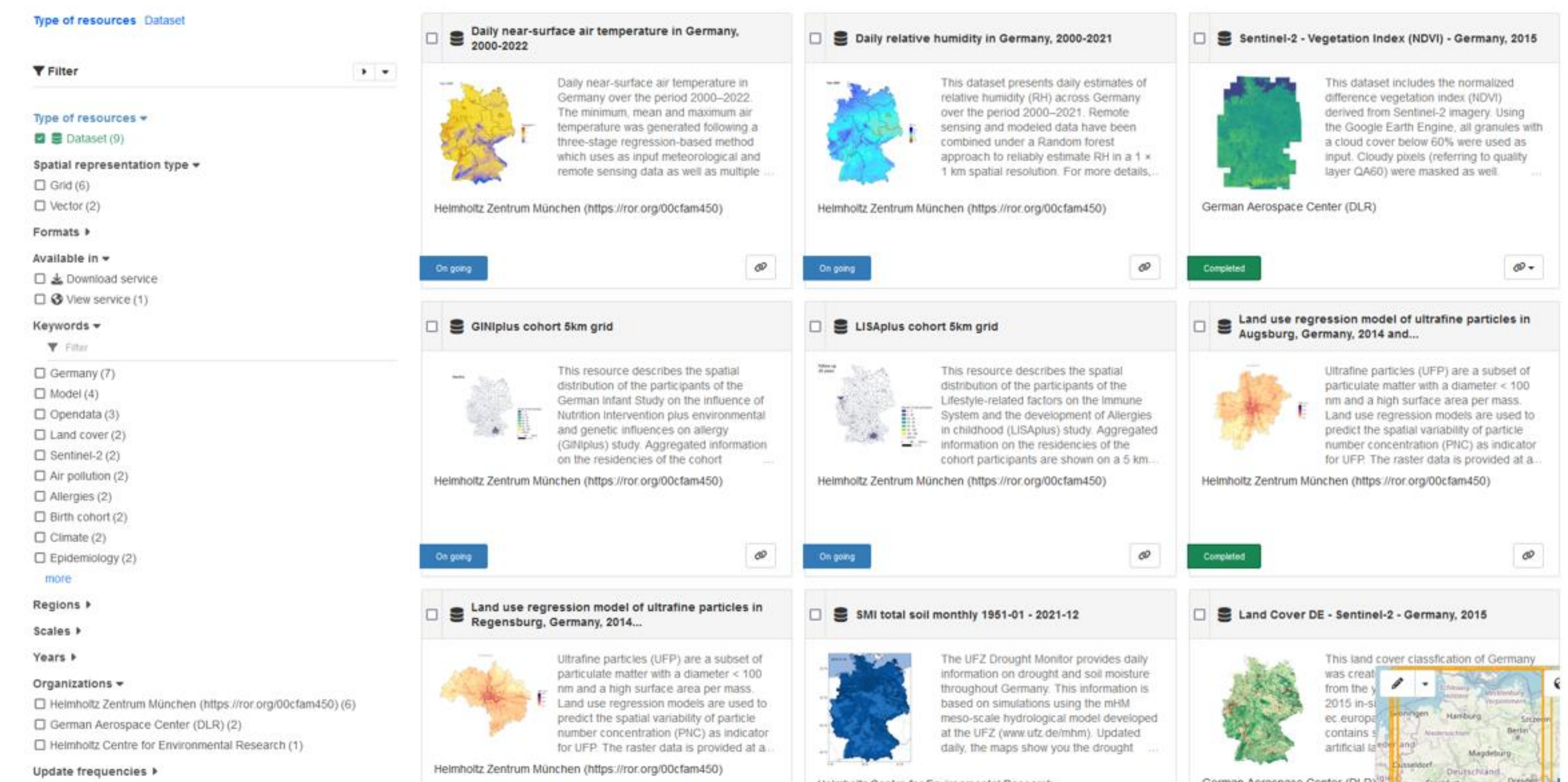
GINIplus/LISA⁴

- Baseline and follow-ups
- 1995 – present
- ~16,000 variables
- Heterogeneous data
- Format: csv
- **Partly: FA, not: IR**



Output

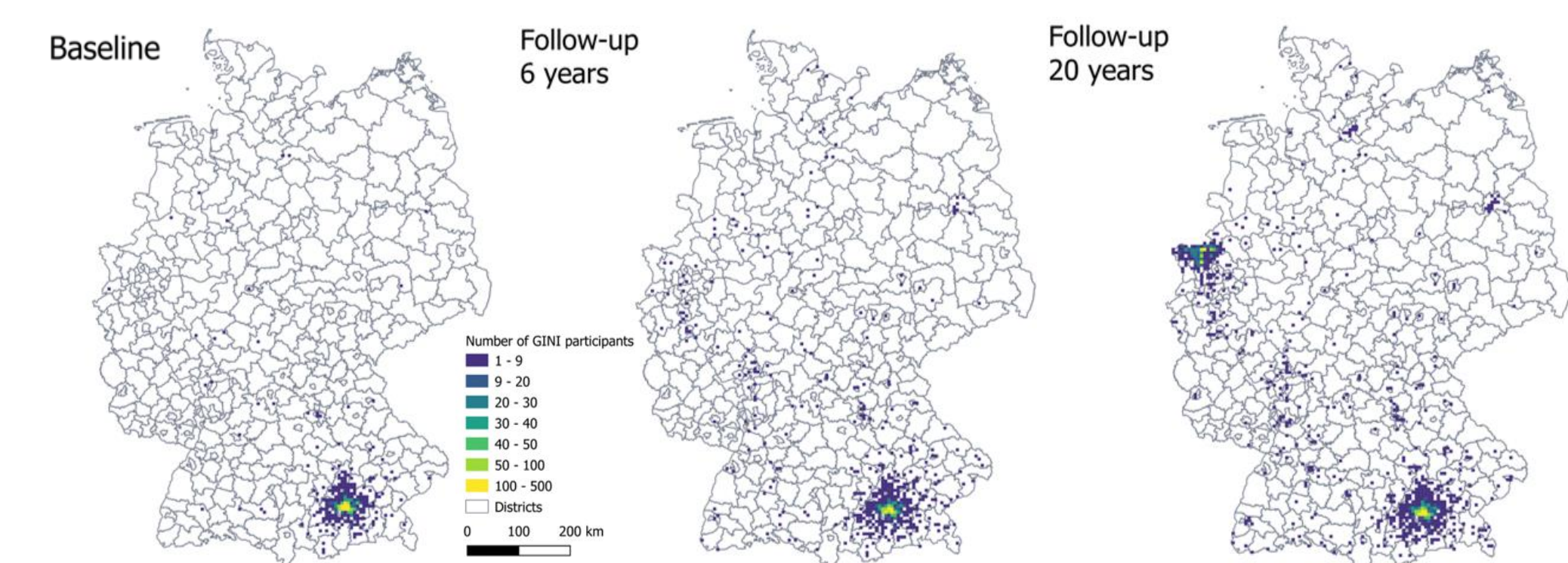
- GeoNetwork catalog application to store and manage spatially referenced resources
- Interactive web map viewer, search functions, metadata editing
- Supports multiple metadata standards from ISO to the Dublin core
- Metadata can be uploaded directly to the catalog as XML, MEF or ZIP
- Catalog list view (<https://envepi.helmholtz-munich.de/geonetwork>)



- FAIRness improved for cohort metadata

GINIplus cohort 5km grid

This resource describes the spatial distribution of the participants of the German Infant Study on the influence of Nutrition Intervention plus environmental and genetic influences on allergy (GINIplus) study. Aggregated information on the residences of the cohort participants are shown on a 5 km INSPIRE grid. 5,991 participants have been recruited in Munich (Southern Germany) and Wesel (Western Germany). Spatial distribution of the participants have been recorded at baseline and during follow-ups at 2, 6, 10, 15, and 20 years.



Outlook

- Continuously add further datasets, finalize technical paper
- **We are open for additional (meta-)data!**
- Now part of the German National Cohort (NAKO) environmental data unit (<https://nako.de/edu>)



¹ GeoNetwork, catalog of location-oriented information, <https://geonetwork-opensource.org/>

² Weigand, M. et al. Int. J. Appl. Earth Obs. Geoinformation 88, 102065 (2020)

³ UFZ - The mesoscale Hydrologic Model. <https://www.ufz.de/index.php?en=40114>

⁴ Heinrich, J. et al. Allergol. Sel. 1, 85–95 (2017).