

On-demand data cubes – knowledge-based, semantic querying of multimodal EO data for mesoscale analyses anywhere on Earth



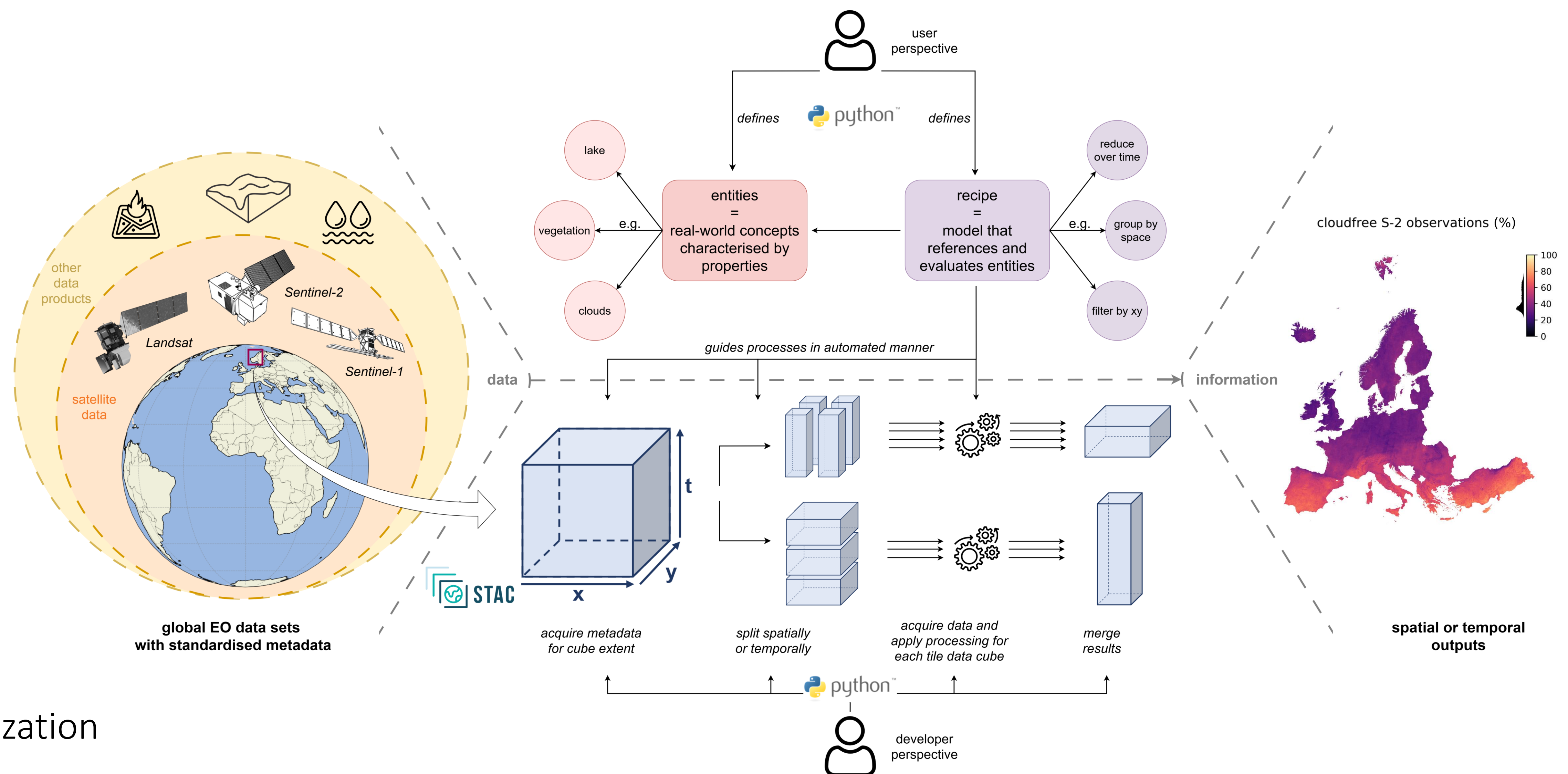
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1. Idea & Concept

- ✓ open-source framework for big EO image analysis
- ✓ predefined & extensible connection to data catalogs
- ✓ focus on semantics using interpretations of EO data (“from numeric values to entity definitions”)
- ✓ flexible model creation supporting inclusion of expert knowledge
- ✓ scalability & efficiency through chunking & parallelization



2. Motivation

- EO data access is still an issue for many users since data is massive in terms of volume, variety, etc
- EO image analyses currently lack a structured approach for information extraction leveraging domain knowledge

Data access is a pre-requisite but by itself doesn't support the user in achieving sophisticated image understanding



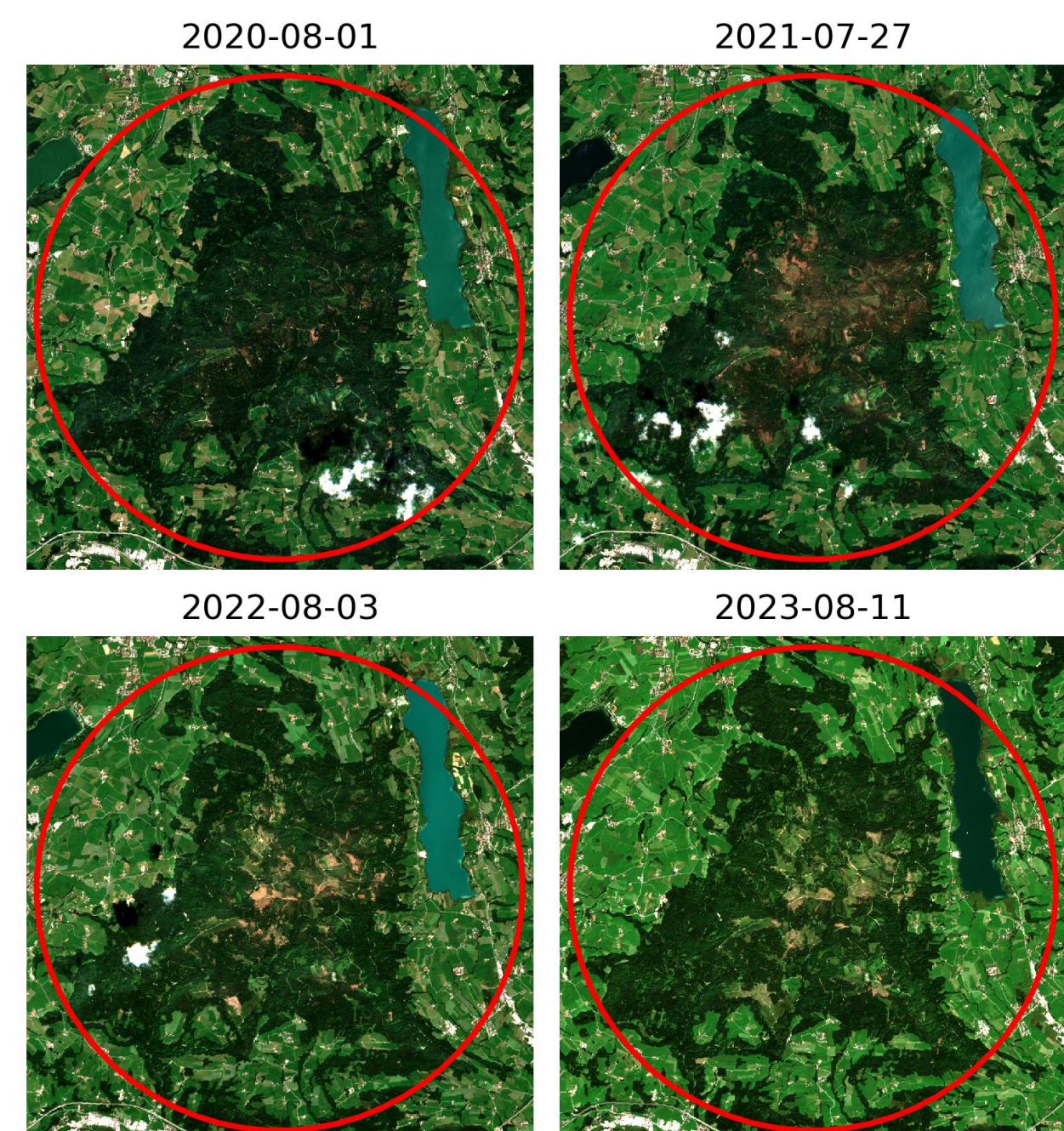
3. Implementation

A novel EO data cube framework packaged as a standalone Python library (**gsemantique**) that can be deployed locally or in the cloud



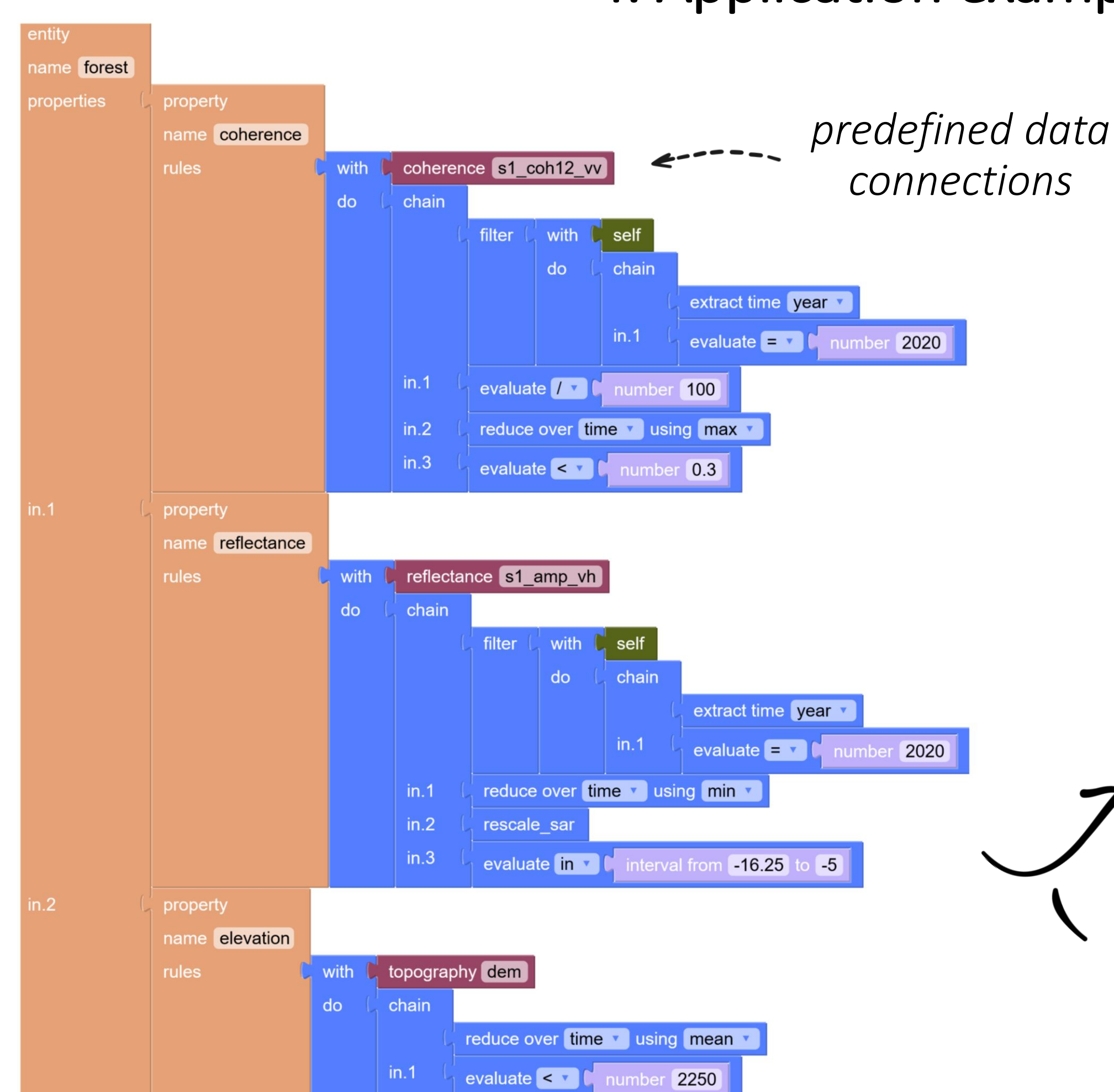
4. Application example

Assessment of forest disturbances

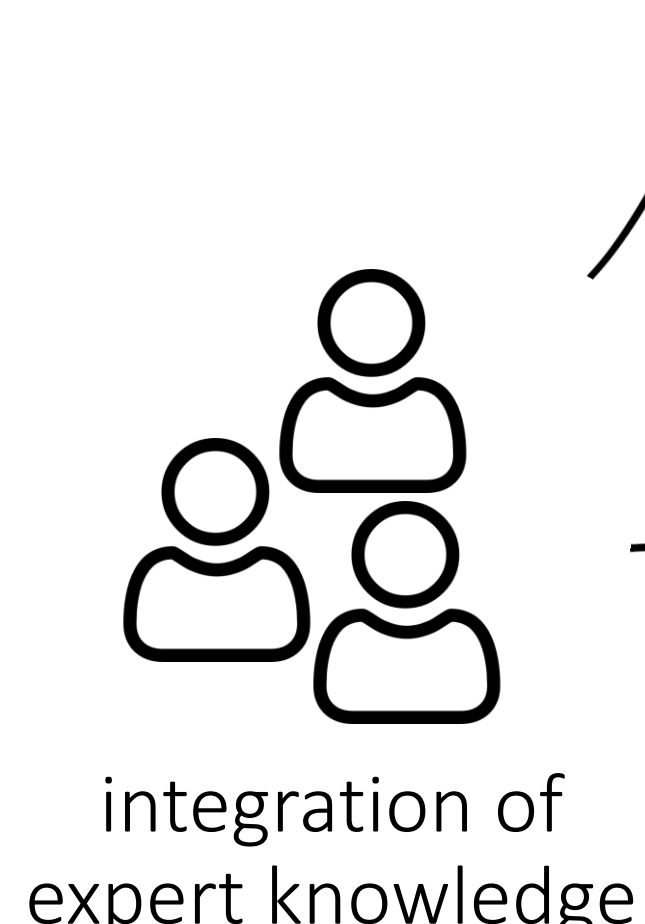


complicated EO image understanding task that requires...

- multimodal and -temporal data and knowledge integration
- transparency in modelling and exchange with domain experts



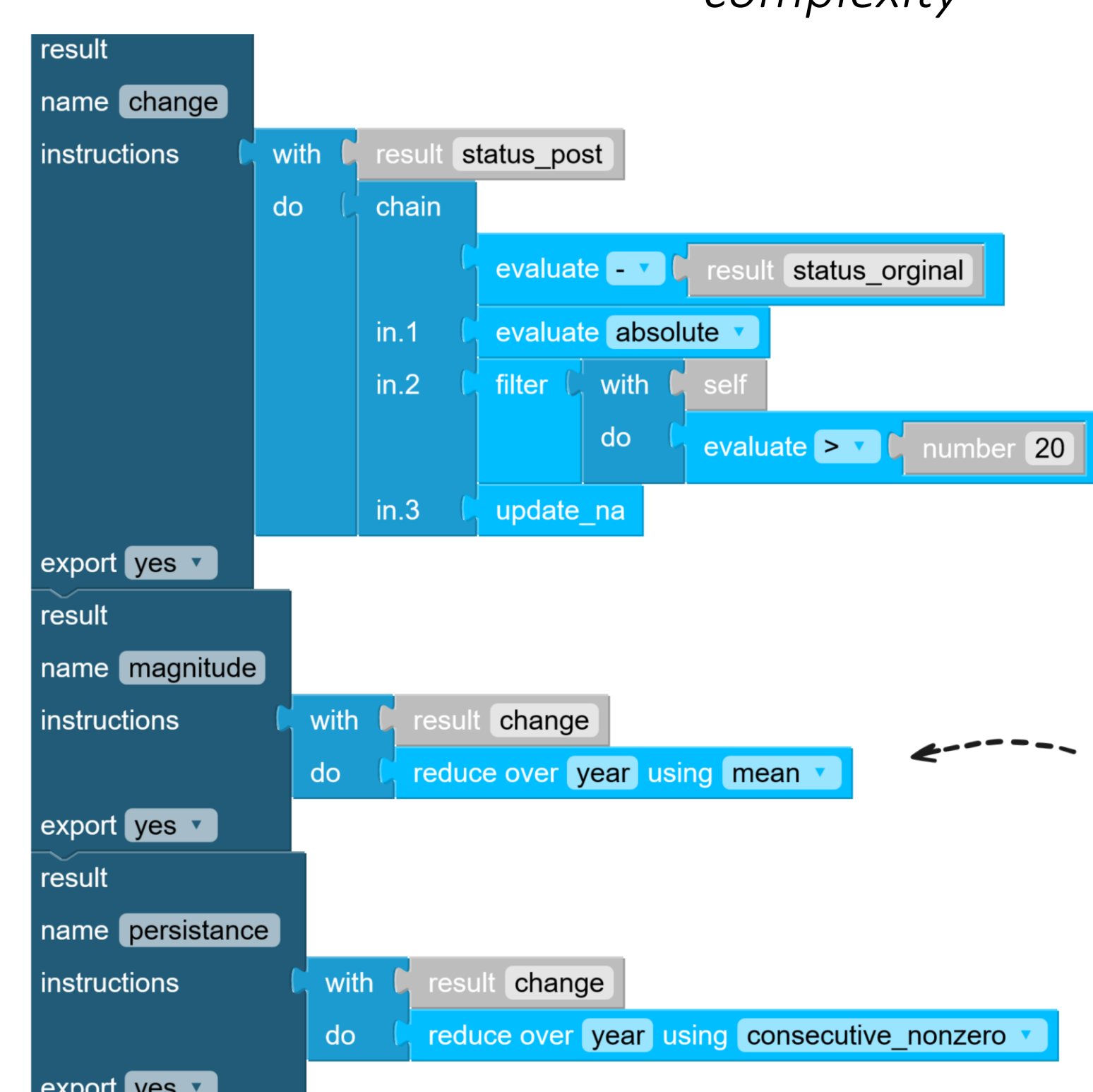
Step 1.1: Entity definition
“What’s a forest?”



modelling on the semantic level

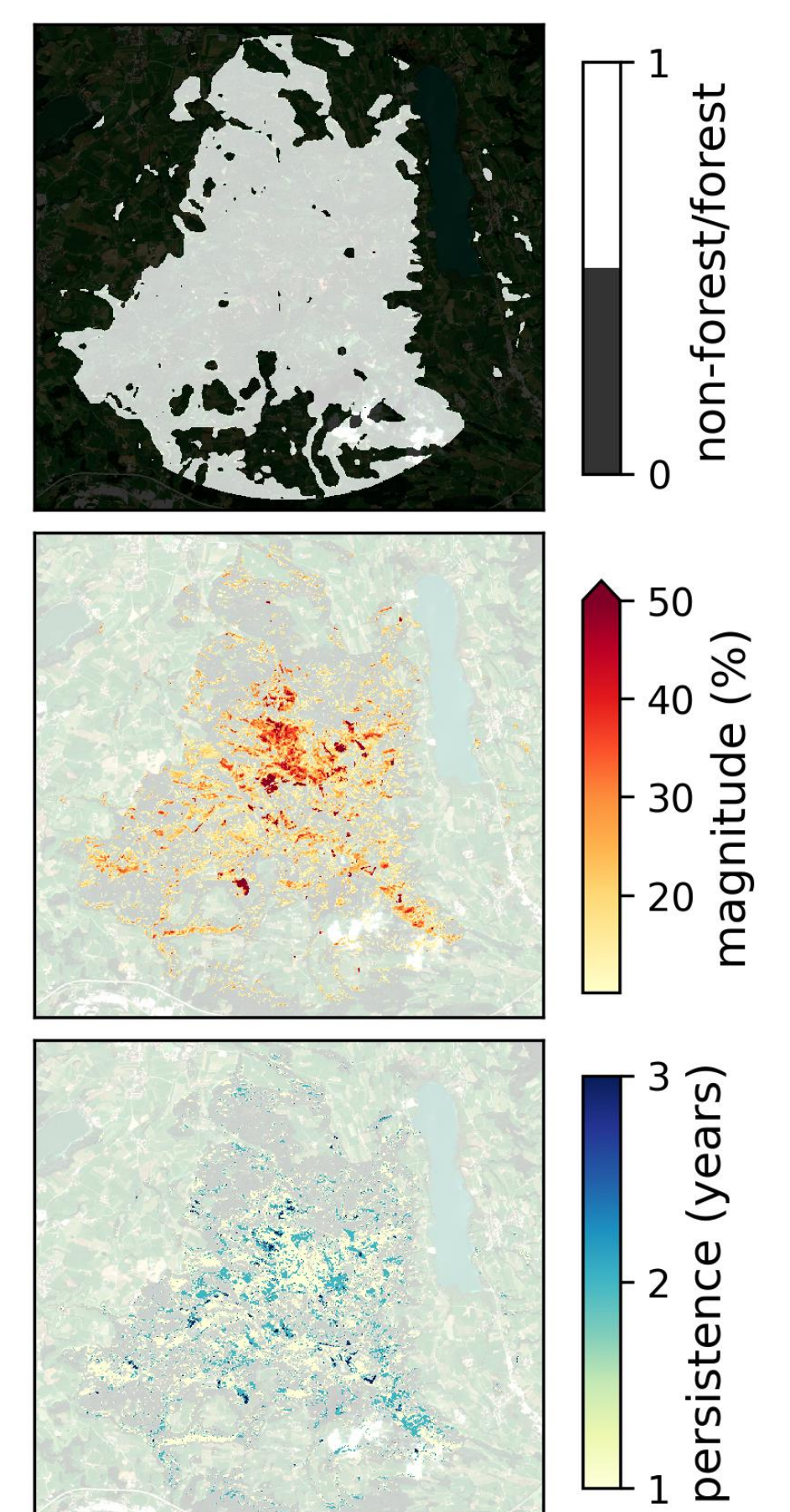
Step 1.2: Recipe definition
“How to process the forest entity to capture disturbances?”

Step 2: Encoding in a few lines of Python code



Step 3: Automated data cube creation

abstraction of processing complexity



Knowledge-based, interpretable map visualizations

predefined standard data cube operations

user-defined functions