Assessing and improving the interoperability and trustworthiness of research data repositories in the Earth System Sciences.

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Challenges

- **Heterogeneous landscape**: repositories and aggregators differ in features, metadata standards, and APIs

- **Lack of integration**: ESS repositories are isolated, making it difficult to combine data across disciplines

- **Existing certificates**: Frameworks like CoreTrustSeal or Nestor are not ESS-specific and are difficult to obtain for smaller repositories

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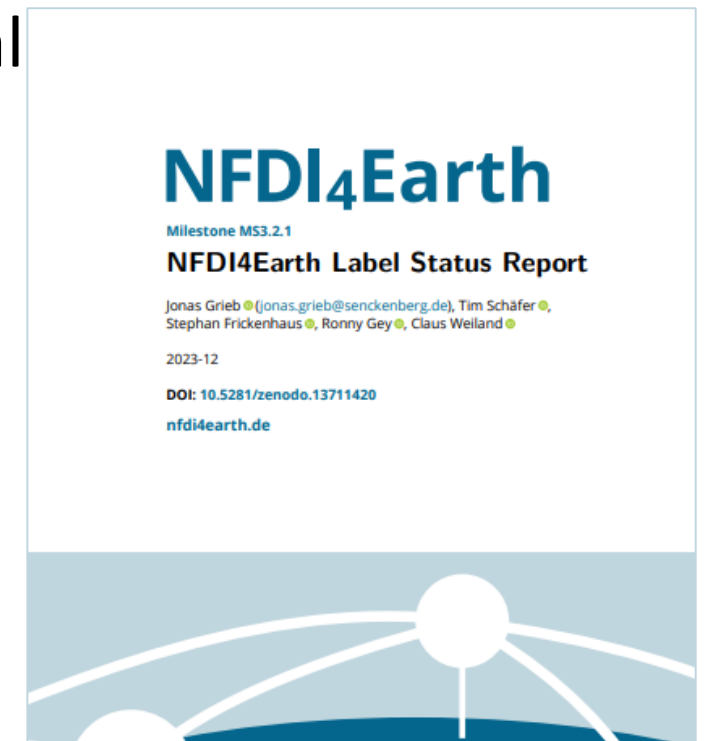
Community-driven process

Goal:

Define indicators for **interoperability** of integrated **data infrastructures**, assessing the **FAIRness** of digital resources and supporting service harmonization

Participative development:

Criteria were developed together with the Earth System Science community

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Milestone MS3.2.1
NFDI4Earth Label Status Report

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2023-12

DOI: 10.5281/zenodo.13711420

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Approach

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A semi-automated assessment procedure, that consists of:

- **re3data assessment** - automated retrieval of repository metadata from the global registry

- **self-assessment** - additional information provided by repository representatives

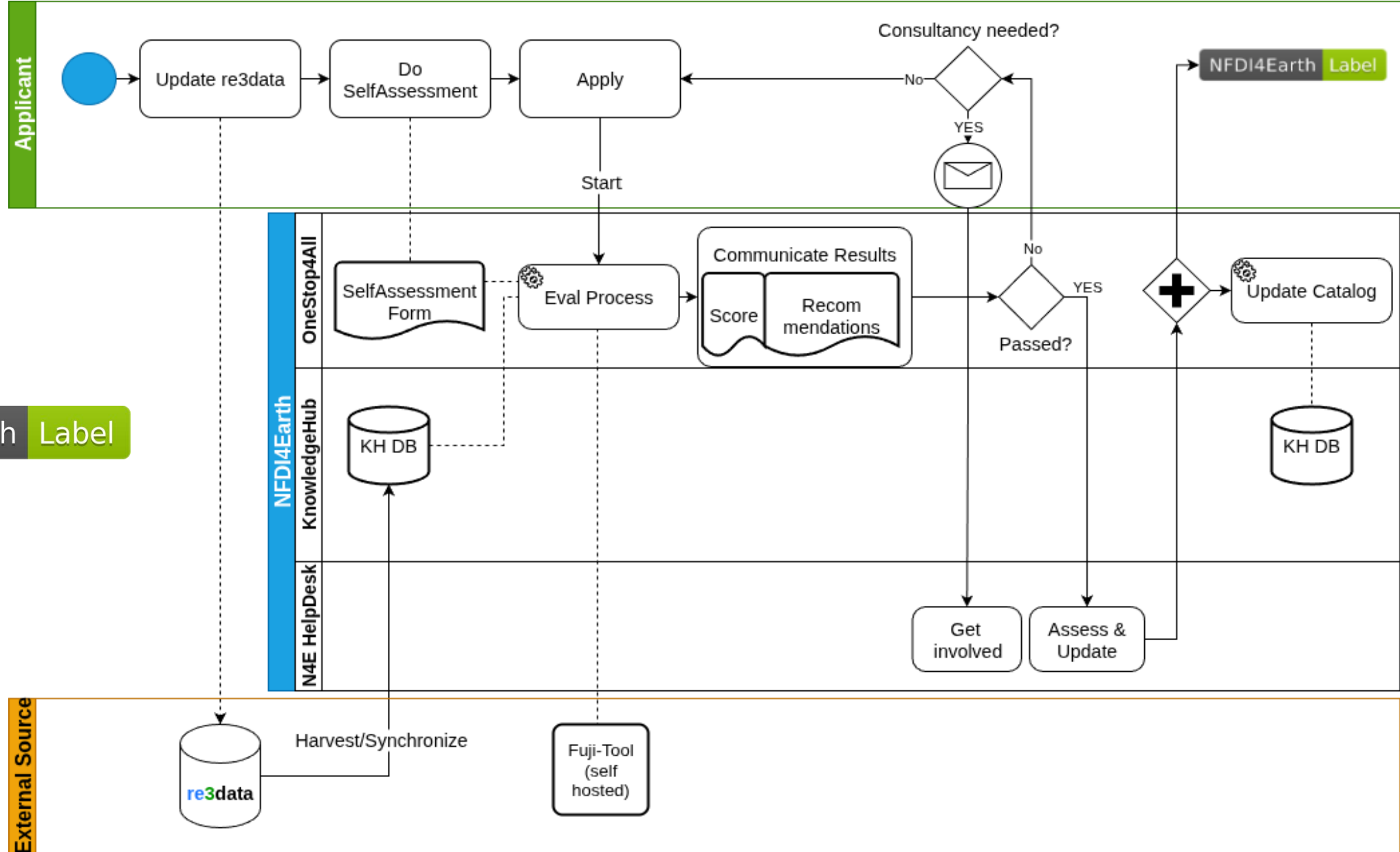- **F-UJI assessment** (optional) - automated FAIR check of a dataset sample

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Re3data – an established foundation

Building on re3data.org as a established entry point for repositories

- Global visibility
- Unique identifiers
- Machine-readable metadata
- Strengthening existing infrastructures

Assessment Workflow

Assessment Criteria

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Re3data Assessment

N4E Metric	Guideline		Accepted Standards	Related FAIR principle
n4e:assignsUniqueIds				
n4e:assignsPersistentIds				
n4e:providesAnyAPI				
n4e:p				
n4e:s				
n4e:s				

F-UJI Assessment

N4E Metric
n4e:hasDescriptiveMetadata
n4e:metadataIncludesIdentif
n4e:metadataLinks
n4e:includesLicense
n4e:includesProvenance
n4e:metadataRepresentation

Self-Assessment

N4E Metric	SAF Field	Guideline	Corresponding CTS criteria
n4e:hasBackupStrategy	Backup Strategy	The repository should have a backup strategy.	R14
n4e:hasArchivingStrategy	Archiving Strategy	The repository should have a long-term preservation strategy in place.	R09
n4e:hasFundingStatement	Funding	The repository should have a funding statement, mission statement or some other self description that allows users to understand the purpose of the repository, which institution runs it, and how it is funded. The mentioned information should be made clear to repository users on the repository website.	R05
n4e:hasCuration	Curation	The repository should have data curation. The degree of curation should be made clear to repository users on the repository website.	R08/R10
n4e:hasUserSupport	User Support	The repository should have some form of user support. The options for user support should be made clear to repository users on the repository website.	R06

Metadata of records stored in the repository should specify the content of the data: the type of the object and technical properties like file format, size, and names. — FsF-R1-01MD

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Demo

https://onestop4all.nfdi4earth.de/label/

Outlook and relation to HGF Indikatorik

- N4E Label is live
- Process is straightforward, relying on existing tools (re3data, F-UJI)
- Discussions about implementation on NFDI level & w/ other consortia
- direct link (guess who;) when any changes would be necessary

So what now HGF?
- **_Our challenge_**: we can not assess each single data publication. Instead => evaluation of repositories needed
- Alternatives e.g. CoreTrustSeal too demanding

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