

Section 7. Process

This section describes the process(es) to develop community standards, protocols, test data, use cases, etc. that are necessary to mature the functionality of the topical area and promote interoperability and integration between elements of EarthCube.

This section relies on previous sections and also on Section 9, Management.

7.1 Overview

Key elements of the processes to be undertaken include:

- Defining workflow types and capabilities, drawn from community requirements.
- Identifying relevant supplemental standards from existing standards-making bodies (OGC, ISO, W3C). These can include data formatting standards, transfer protocols, services and their APIs, metadata encoding standards, etc.
- Classifying software useful for workflows. This should include capabilities and scope and also take into consideration project management and governance, such as OSSWatch evaluations.
- Identifying gaps in standards, workflow tool capabilities, and underlying infrastructure.
- Supporting the use of workflow technologies through training, documentation, outreach, etc.
- Directly supporting NSF (and other) research organizations through advanced support requests that are matched with the appropriate workflow experts.
- Facilitating new collaborations.
- Building scientific and technical bridges to other areas (semantics, data management, etc).

The EarthCube Workflow Working Group will be charged with developing and executing these processes. The Workflow Working Group must adopt an appropriate governance model (Section 9).

7.2 Processes to Develop Community Standards

There are already standard making organizations (OGC, ISO, W3C, NIST), and defacto standards (NetCDF, OPeNDAP). The EarthCube Workflow Working Group will not serve as a new standards-defining body. It will instead provide guidance to the community on existing standards relevant to workflows and underlying services, and it may also provide advice for participating in existing standard-making organizations. It will also monitor standards-making organizations who are developing workflow-related standards and participate.

The Workflow Roadmap will include the creation of a Community Interaction Task Force that will be responsible for documenting existing standards and making recommendations on appropriate standards to specific research groups.

7.3 Processes to Develop Community Use Cases

A recurring problem identified in our workshops was the low adoption rate of workflow technologies even though the potential value was understood. This could result from several causes: the technologies are not known, they are perceived to be too cumbersome or complicated, the researchers are too busy to learn how to use them, the technologies are too general and need to be populated with more geoscience-centric examples, etc.

The Workflow Roadmap will include the creation of a Community Interaction Task Force that will be responsible for documenting use cases for current and potential uses of workflows in geosciences.

7.4 Processes to Develop Community Reference Implementations

An important problem in the cyberinfrastructure community has been the lack of community-developed reference implementations for many standards. This has the potential to produce undesirable results such as standards controlled by a single implementing group or a fragmented development community attempting to implement the same standards independently.

The Workflows Community Group recommends the adoption of Apache Software Foundation-style open community processes (preferably within the Apache organization) for developing reference implementations of community standards. The Apache way has the advantage of creating a merit-driven, neutral development area that is, in addition to being open source, required to demonstrate developer diversity.

7.5 Promoting Interoperability and Integration

Standards assist with interoperability and integration but must be supplemented by requirements, driving use cases, community reference implementations, testbeds, and plans for transfer to operations. See Section 4, “Requirements”, for more information on requirements. A number of existing organizations, such as the OGC, already have considerable experience in these areas, so the Workflows Community should partner with these groups. EarthCube-wide integration efforts will also need to occur. We expect to establish or participate in integration efforts with other EarthCube activities,

particularly the Data Discovery, Mining, and Integration community, the Semantics community, the Brokering concept award, the Web Services concept award, and the Interop concept award. See Section 2, “Communications”, and Section 9, “Management” for more information on liaisons with these other EarthCube entities.