



Overcoming organizational, cultural and technological barriers in a cluster of European Research Infrastructures

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European Research Infrastructures (RIs) in the ESFRI roadmap are major international organizations, with established user bases and highly developed products. However, particularly in the environmental sciences, there are many global challenges which individual disciplinary RIs are not suited to answer by themselves. This need of interoperability, together with the requirements for e.g. better cost efficiency, better data management and societal impact, have created a need for common cluster projects to help the RIs develop together. This paper is based on experiences from working in the FP7 ENVRI cluster project and on managing the ongoing H2020 ENVRIplus (www.envriplus.eu) project.

The cluster project, even seen as useful for many aspects by the RIs, is still challenging to manage. Many cultural, organizational and technological challenges persist and need to be addressed. In the ENVRI community, there are more than 20 RIs, representing wide variety of geosciences, from solid earth and deep sea observatories to high atmosphere radars. This variety in the disciplines covered is also represented in the different scientific practices and cultures in the Consortium. Even more challenging is the difference in working culture between the Technical expert work packages (often mainly driven by IT specialists) and the RI operatives with science background.

The ENVRI and ENVRIplus projects have brought many experiences worth sharing to the project management community, particularly in very heterogeneous and multidisciplinary communities. Some of the key lessons learned can be summarized:

- 1) Engagement from the beginning is crucial, taking the user communities (in this case, the RIs inside the Consortium) into the planning process and all the way to the product updates reduces the risk of misfit products and failure in implementation, however, there must be...
- 2) ... follow through in engagement, building agile teams if needed. Even if the RIs (clients) are a part of the planning process, they are often limited in personnel resources and thus there is always a risk of losing connection. This needs to be checked from the project management level, including e.g. preparation of deliverables, etc. to avoid need of later corrections. Some help comes from including actual PMs in the project plan to the user community involvement (i.e. in ENVRIplus the RIs get direct PMs to engage in the technical development), but this alone is not enough to ensure the connection;
- 3) Outreach, even inside the consortium is crucial. Informing others on the activities in a major project is important and many tools are needed for such activities. Passive methods, such as email lists, newsletters, videos and plenary talks in meetings are useful, but nothing seems to be as effective as physical meeting;
- 4) Concentrating physical meeting time, is a tool to make sure that the information flow in a large project is manageable and to ensure that all the key people are available. In ENVRIplus, there are twice a year organized ENVRIweek, where all project partners and stakeholders join in a week-long conference. This has additional challenges though, particularly in organizing parallel sessions with attendance conflicts. One key outreach success has been lightning talks in the evenings on project advances, followed by poster session with refreshments;
- 5) Regular virtual meetings are needed for working teams, and these need to be followed regularly by the Project Management;

- 6) Proper document management and other virtual tools are crucial to the success. Particular attention should be paid to ease of use, and standardization of tools, as not all project participants use these tools often;
- 7) Concentrated outreach activities (e.g. common ENVRI booth in EGU) make sure that the project and the community will have necessary visibility, and they help in..
- 8) ...Building a community which is one of the key advances in ENVRI: A community makes it far easier to find peer support, and build successful collaboration.