



ONEMA

Meetings

Reinforcing coproduction and brokering of research, development and innovation results for water and aquatic environments

A symposium organised by Onema in March and April 2015.

How can operational needs be identified in order to steer RDI (research, development, innovation) policy toward the scientific and technical developments most useful for water managers? What forms of coproduction must be implemented to ensure that the intended persons can effectively use the results? And what transfer policy should be instituted so that the results are fully exploited?

In the few months remaining before the launch of the French biodiversity agency (AFB), the above questions are key issues in the debates between stakeholders in water and aquatic-environment management. And they call for collectively prepared responses. That was precisely the starting point for two days of meetings, the first in March for 130 people from the management sector, then in April for the same number of representatives from the scientific community. Following a presentation by Onema of its policy priorities for the period 2013-2018, the meetings examined the method and tools deployed since 2007 to sustain the dialogue between science and management on the various geographical levels. The discussions produced a number of ideas and recommendations on how to more effectively enhance the quality of water and the good status of aquatic environments in the future.

Perpetuate... and improve the interface

Over the two days of meetings, many speakers highlighted the original aspects of the system created, since the founding of Onema, to coordinate and fund RDI (research, development

and innovation), including coordination with the policies of the Water agencies, support for innovation, partnerships with scientific organisations, participation in European projects, etc. This novel mode of operation in France, by diverging from the standard policy of calls for tenders and creating a dynamic interface for dialogue between knowledge producers (scientists) and users



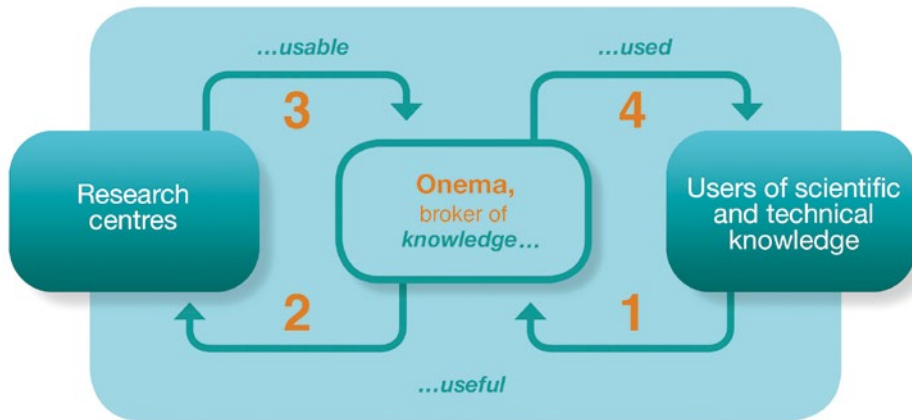


Figure 1. Onema RDI has produced an interface that must be perpetuated and improved.
 1. Assess the needs of users. 2. Encourage the development of knowledge to meet those needs.
 3. Collect the “usable” knowledge. 4. Transfer the knowledge so that it is effectively “used”.

(stakeholders in the water field), has created a true system of co-construction. That interface should be perpetuated, but must also be improved.

The presentations and debates pinpointed ideas for improvement in each of the four steps in the process (see Figure 1 above) that Onema, as the knowledge broker, manages with other stakeholders.

Include end users in identifying needs

The first condition in setting up an RDI policy that is truly useful for stakeholders is to correctly identify their operational needs. This topic was addressed by numerous speakers. Several ideas concerning the general method were proposed to ensure that RDI results better correspond to the operational requirements of the stakeholders in the water and aquatic-environment sector.

Concerning needs in terms of regulations, doubts were expressed about the current system. Going through the national organisations managed by the Ecology ministry results in good identification of needs, but consumes a great deal of time and may result in excessive response times in certain cases. In addition, consulting a single research institute on a subject may lead to incomplete answers, depending on the know-how available in the teams working on the topic.

More generally, during the presentations, particularly those of the Ecology ministry, Onema scientific officers from the R&D department and various RDI users, it was noted that:

- end users have a key role to play during the assessment phase of the problems requiring work and in the precise description of needs;
- end users must be included in scientific and technical projects from the design phase through to the final stages to ensure that the results correspond to the needs;
- the intended use of the results produced by funded projects must be specified, if possible, in advance. The results may consist of knowledge that is useful, but has no direct operational impact, of data for use locally or of techniques and methods for widespread implementation, etc.;

- RDI work must target the provision of simple solutions adaptable to the various job sectors and local conditions, for example in the form of basic products with modules that can be adjusted to meet specific needs.

The Ecology ministry, the Water agencies and various State services are already among the entities putting thought into the definition and management of RDI policy and their contribution is essential to the success of the policy. However, Onema would like to involve to a greater degree in its work certain categories of users that to date have participated very little in scientific and technical work, though they may have been active in other aspects of the process. Examples are the local participants in water and territorial management (local water commissions, river committees, public river-basin territorial agencies and other local governments, etc.), who are the true driving forces behind management, as well as engineering firms involved in preparing and executing the work. It was suggested that these stakeholders be regularly questioned concerning their needs and that certain organisations be mobilised to act as relays with those stakeholders.

In general, the linking of projects to local areas (field experiments, pilot sites, etc.) should be developed because it is seen as a powerful means to ensure that results are effectively in line with the operational expectations of stakeholders.



The opinions of users

During the March meeting, a varied group of people active in water and aquatic-environment management presented to the audience the issues and needs of the different sectors. Their contributions injected real-life data into the efforts to identify the areas where research, development, innovation (RDI) work is needed.

Planning on the river-basin level

“The Water agencies and State services work with tight deadlines and mandatory results. Late is too late. Deliverables must supply traceable and binding data. They may include prioritising and decision-aid tools or methods, reference values (threshold values, environmental quality standards) and operational methods, e.g. assessment of risks of not reaching environmental objectives, substance inventories, environmental assessments, etc.”

Thomas Pelte

Rhône Méditerranée Corse
water agency

Onema territorial units

“Field personnel are confronted daily with the need to ‘prove’ that an impact exists, that a restoration project is of value, etc. They require operational tools, e.g. assessment tools and indicators for certain types of alterations to environments and habitats (riverbed clogging, hydraulic work), decision-aid tools for restoration work and to prioritise inspection work, etc. They also hope to receive solid information such as project feedback, and tangible assistance such as demonstration sites to persuade sceptics.”

Alix Nihouarn

Onema Bretagne-Loire
regional office

Regional directorates for the environment, development and housing (DREAL)

“When assessing ecological status, DREALs are confronted with difficulties in interpreting certain indices, in particular the IBGN (standardised biological index), which will soon be replaced by the I₂M₂ multimetric invertebrate index, and the IBD diatom biological index, which would appear not to be suited to sand-bed rivers. Additional tools, making full use of the faunistic and floristic inventories, could refine the pressure assessments. Concerning restoration efforts, we need the means to monitor the effectiveness of measures, as well as technical data and feedback on riverbed projects.”

Anne-Sophie Hesse

DREAL for the Centre region

Overseas territories

“Concerning RDI, the overseas territories suffer from an erroneous perception of their ‘specificities’, which leads to their not being treated in the same manner as continental France. But we want to see them treated just like continental France wherever possible. Significant progress has been made, but work remains, notably concerning pressure-impact relations and the toxicity of certain pollutants (mercury and chlordecone). We must also make progress on transitional waters and lakes. In addition, ecosystem services and compensatory measures require more work. The overseas territories are also experimental sites for the development of remedial solutions or for remote sensing, among others.”

Loïc Mangeot

Martinique water office

Local management

“The local water commissions (CLE) and the public river-basin territorial agencies serve as information relays between data producers and the end users (project organisers). The commissions and agencies could be encouraged to assist more in transmitting the needs of water managers and in ensuring that the knowledge produced is put to the best possible use. The CLEs already express numerous needs in terms of operational knowledge, for example concerning groundwater-river and groundwater-wetland interaction to assist in decision making and cost-benefit analysis.”

Stéphanie Gries

Rhin-Meuse water agency

Engineering firms

“Engineering firms are often very small and have difficulties in maintaining a technical watch and acquiring access to information. We need guides and reference tools to facilitate our work, up-to-date technical documents with scientific backing for use in discussions with project participants, sizing tools (e.g. for fish passes or the cumulative impact of structures on sediment transport) and condensed project feedback on various topics. Finally, training courses are highly appreciated, but the available courses are often insufficient.”

Gilles Warot

SCE Aménagement et environnement

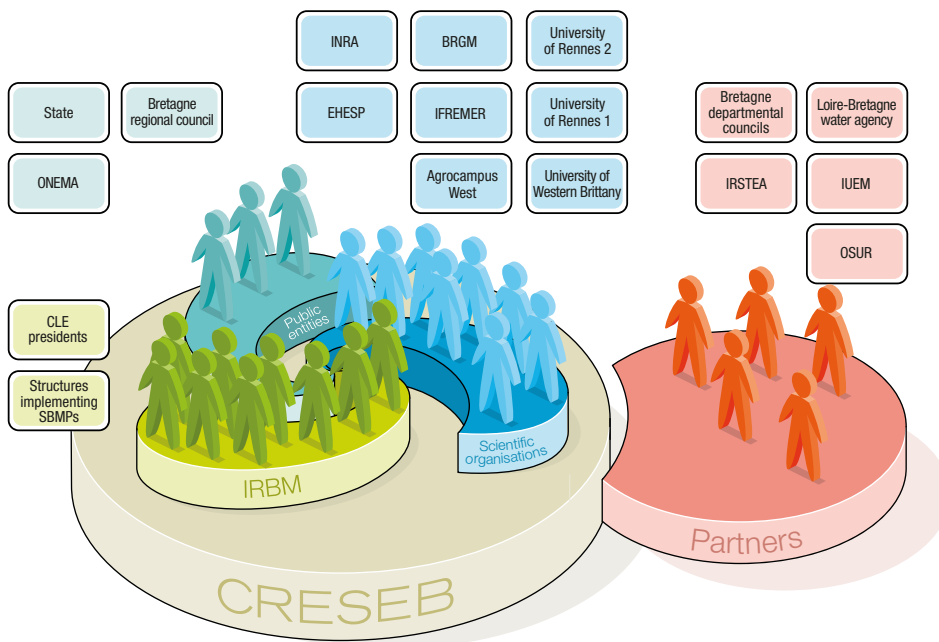


Figure 2. CRESEB, the regional centre for stakeholders in integrated water management and the scientific community. (Source: Creseb). CLE: local water commissions; SBMP: sub-basin management plan.

Joint structures to make knowledge usable

Once needs in terms of RDI have been clearly expressed, the next step examined by the symposium dealt with how the results are in fact produced. The need for fundamental scientific research was stressed. However, over the two days of meetings, a general consensus emerged concerning the value of collaborative groups set up locally and bringing together scientists and managers for RDI projects in order to ensure that the results are effectively usable by the intended recipients and, more generally, to generate a common understanding of the issues. Various co-construction structures already exist for different topics and in different areas around the country. A number of them were presented during the symposium as examples of approaches that others could develop and expand.

The Water information and science-advice centre in Brittany (Creseb) is one example of a structure that has made significant progress in providing stakeholders in integrated water management and the scientific community with a place to meet and exchange information (see Figure 2 above). The centre, created by the French State and the region, serves to catalyse RDI work on the regional level at each step, from the identification

of needs through to the production of results and organisation of their transfer to end users. Research topics are always debated and pertain to actual difficulties encountered in the field. For example, they concern river morphology and flooding, nitrogen releases and farming practices, socio-economic approaches to modifications in agricultural techniques and the concept of biological minimum discharges.

The research and study centres established by Onema over the past few years fit perfectly with this approach where a multi-disciplinary research team sets up a joint project while maintaining close ties with the people active in water management.

An example is the Ecohydraulic centre created in Toulouse by Onema, the *Institut de Mécanique des Fluides de Toulouse* and Irstea. It focusses on ecological continuity, develops fish passes and devises management procedures suited to the needs of migratory fish and to applicable regulations, while taking into account the constraints weighing on stakeholders (local governments, hydroelectric power companies, etc.). Promoting an approach based on discussions, experimentation and feedback, the centre has produced an array of operational results, including general knowledge, technical reference data-sets for the construction of civil works,

science advice, technical and policy guides, and training courses.

In 2007, in response to a growing need for standardised monitoring methods for aquatic environments, Onema and the Ecology ministry created the Aquaref consortium that is now the reference lab for the development of measurement methods and sample collection and analysis techniques. Via a partnership bringing together five research institutes (BRGM, Ineris, Irstea, Ifremer and the National metrology and test laboratory), the consortium federates know-how on the national level and delivers a wide range of results targeting knowledge transfer (draft standards, protocols and guides, technical meetings, field tests), for a wide range of “clients”, including public authorities, field managers, industrial companies, certification organisations, etc.

Zoom on partnership networks

The network of study areas created by the CNRS is a good example of multi-disciplinary structures closely tied to local areas and combining both fundamental and action research. The study areas are currently 13 in number, including four for river ecosystems (Loire, Seine, Moselle, Rhône basin). They represent highly valuable scientific tools for the long-term study of the relations between the natural environment and human societies. Each area comprises several study sites and field observatories targeting a specific topic, e.g. urban hydrology, sediment dynamics, agriculture and water, wetlands near rivers, etc.

Another collaborative structure at the interface between fundamental and applied research is the Onema network of demonstration sites, approximately 30 in number, that focus on monitoring restoration work involving a set of partners. Onema and the Water agencies, with support from Irstea, have set up *in situ* scientific monitoring on hydromorphology, biology and physical chemistry. The results constitute a source of standardised long-term scientific data series and feedback for use as a decision-aid tool in restoration work.

Information on other structures was presented as well. EPNAC, a work group set up to assess new sanitation techniques, has since its founding in 2008 put effort into acquiring, sharing and disseminating technical information intended for small and mid-sized local governments. The group, whose large steering committee includes Onema, the Ecology ministry, Irstea, the Water agencies and several departmental councils, has already produced a number of methods guides that may be downloaded, e.g. an operating guide for reed-bed filter systems, and organises each year technical meetings to encourage discussions and information exchange among the partners.

The same approach led Onema and the Ecology ministry to launch a study on the creation of regional resource centres to assist in implementing public policies to protect drinking-water abstractions. Following in-depth discussions organised by Inra with all the partners involved, the resource centre will assist in coordinating stakeholders, in supplying various tools and in providing legal support to abstraction owners. The study, organised as a continuous dialogue between scientists and field managers, also highlighted the importance of creating a nested structure spanning the various governance levels (national, river basin, regional, local, etc.), with human resources on each level providing interface and management functions.

The value of these joint structures (resource centres, research centres, study sites, etc.) was widely acknowledged by the participants from the two communities. The development of such structures is seen as a priority means to ensure a fully effective RDI policy in support of public water policies and the preservation of aquatic environments. It is, however, confronted with a cruel lack of resources in some cases, for example the EPNAC work group that does not have any permanent personnel. In an overall context of reduced public financing, the issue of the necessary financial means for joint structures will of course be a key factor in establishing RDI practices closely linking stakeholders in water management and scientific research.



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A study is currently under way on the partnerships set up for RDI. In addition to direct contracting, they could also issue calls for proposals that would enable more flexibility in establishing consortia or including competent new participants during projects. The practical conditions for calls for proposals are now being determined.

A transfer policy

The scientific and informational quality, plus the choice of topics of the documentation produced by Onema are deemed excellent (notably the Knowledge for action series), however its use by the targeted audience remains insufficient according to several speakers during the symposium. For example, the territorial units of Onema are often unaware of and do not use the documents produced by the agency. Similarly, the DREALs observe that a great deal of useful information is available on the Onema site, but that the potential readers do not make a sufficient effort to access the information.

In addition to the above resources, users would like to receive very specific information in the form of action sheets. It would appear necessary to improve the availability of RDI results by developing “tool boxes” presenting the data in various forms suited to the different

audiences targeted. Finally, there is strong demand for training courses (on site and on line), technical workshops and symposia.

Onema is aware of these requests and intends to set up a true transfer policy to ensure that the available information is effectively used by the intended persons. Policy implementation will take time because it implies modifying the work practices of the various participants in the RDI process. The last sessions during the two days of meetings were devoted to determining the necessary steps.

A number of key factors in the shift toward a policy of systematic transfers were identified.

- The policy would require building a common culture between RDI producers and users through the development of professional networks (job groups) capable of co-assessing needs. The culture would be promoted via legitimate relays in the regions.
- The policy would be facilitated by the reinforcement and development of the joint structures mentioned above (joint research centres, operational research centres, demonstration sites, etc.) to encourage co-construction. In such structures, knowledge transfer would be a natural extension of the RDI policy.
- It could be strengthened by contacts

between research organisations and engineering firms, thus contributing to knowledge transfer.

- Within the scientific community, the policy would require far-reaching changes in assessment practices by peers toward enhanced recognition of results suitable for transfer, the latter often seen as being of lesser value than academic publications and thus less favoured by researchers.
- It would also require a progressive increase in the skills of the various stakeholders, which in turn implies the creation of structures integrated in each job sector, e.g. training courses and continuing-education programmes, technical workshops, mentoring, etc., to say nothing of the time required for the learning curve.
- The increase in skills must be facilitated by regulatory measures, e.g. acknowledgement of individual skills, certification of training structures, etc.
- Finally, the policy must mobilise “knowledge brokers” having a mixed set of scientific and practical skills.

The transfer of scientific and technical results to users is an essential and standard activity for an agency assisting in the deployment of public policies and it requires specific skills and organisation. In the future, its success will be one of the major RDI challenges for the water and aquatic-environment sector and for the French biodiversity agency (AFB) whose missions include providing support to local governments and State services.

More generally, the AFB will have an essential role to play as an interface between science and the water sector. Even if it is not set up as a research-programming agency, it must nonetheless be capable of putting to use the knowledge produced and mobilising where necessary the required skills and research teams. It must also be in a position to develop field experiments,

Olivier Laroussinie, director of the founding committee for the French biodiversity agency (AFB)

“One of the things that the four organisations that will merge into the AFB (Technical workshop for natural areas, Agency for protected marine zones, National parks and Onema) have in common is a shared scientific and technical culture. In a variety of manners, each organisation calls on robust science in fulfilling its mission to support public policy, even though the approach and resources vary from one to the other. Onema already has some experience in the field, but research, development and innovation will be one of the basic building blocks for AFB as a whole and it is widely acknowledged that the agency has an essential role to play as an interface. In terms of its scope, the law is very clear, AFB is in charge of all land, aquatic and marine environments. However, the agency must also identify topics cutting across the fields of land, aquatic and marine environments that will enable us to create links between the environments. Examples are restoration, ecosystem services, metrology, global change, invasive alien species, etc.”

e.g. pilot sites, networks, observatories, etc., an aspect that all the involved partners see as highly important.

The success of all these efforts will, of course, depend on the availability of the necessary human and financial resources.

The president of the Onema scientific council noted in his closing remarks for the March meeting the progress already made by Onema in this transition and explained how RDI fit into the overall scheme of Onema scientific activities, ranging from fundamental research (on topics often directly related to needs expressed by water managers) to the provision of operational results and expert support.

Above and beyond its role as an RDI interface, Onema is also a participant in efforts to link fundamental science and RDI, policy and technical aspects, national and local activities. In short, the agency acts as a knowledge broker, a role that should be reinforced to enhance its operational capacity in contributing to sustainable development. ■

For more information

Presentations of the two meetings:

<http://www.onema.fr/seminaire-RDI2015>

RDI at Onema: <http://www.onema.fr/>

RECHERCHE-DEVELOPPEMENT-INNOVATION

Workshop organisation

Philippe Dupont and Frédérique Martini, Research and development department, Onema

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