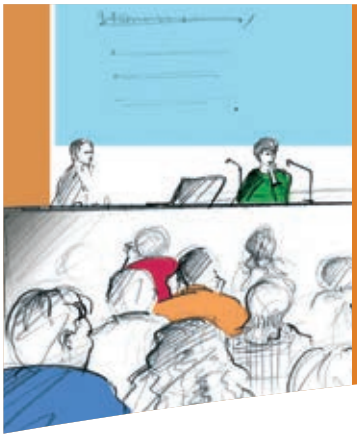
N°41
NOVEMBER
2016



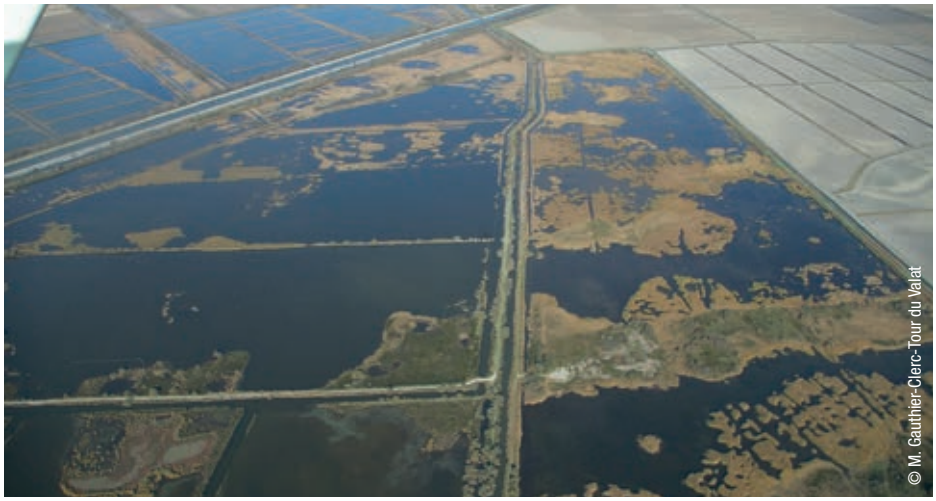
ONEMA
Meetings

Ecological continuity in littoral wetlands, a local, national and European issue

A symposium titled "Ecological continuity in littoral wetlands" *was held on 24-25 March 2016 in Montpellier.*

Discussion sessions and workshops made up a major part of the event in which approximately 100 people participated. Following up on the symposium organised in Nantes in 2013 on the topic of *"Making hydraulic management rhyme with ecological continuity in littoral wetlands"*, questions concerning littoral wetlands are being raised during a time of transition impacted by both natural phenomena (e.g. the influence of climate change on littoral wetlands) and institutional changes with the launch of the regional ecological-continuity plans (SRCE) in the various regions, the NOTRe[1] and MAPTAM[2] laws, the creation of the French biodiversity agency, etc. In this highly fluid context, the objective is to produce a joint project for the Atlantic, Mediterranean and Channel/North Sea coasts, based on a shared vision of the issues.

Transitional zones and focal points for numerous issues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According to the Environmental code, wetlands are *"areas habitually flooded or saturated with fresh, salt or brackish water, on a permanent or temporary basis"*, where the vegetation is *"dominated by hygrophilic plants at least part of the year"*. Littoral wetlands represent one-third of the wetlands in continental France, i.e. 800,000 hectares for the marshes along the Atlantic and Channel/North Sea coasts, and 130,000 hectares for the Mediterranean lagoons. Above and beyond the numbers, the participants all emphasised their decisive role in ecological continuity, at the interface between the land and water components of the French ecological network (TVB).

Multi-faceted continuity

For Romain Sordello, the head of the TVB project at the National museum of natural history, any discussion of continuity in littoral wetlands must take into account the specific factors of both the wetlands and their situation in the littoral zone. These environments stand out in that there is nothing systematic in their natural continuities. In littoral areas, wetlands lie adjacent to a patchwork of environments such as dunes, cliffs, wet meadows, etc. The concept of ecological corridors cannot be the exclusive approach to analysis.

On the contrary, the approach to ecological continuity in littoral areas must be two dimensional. First of all, the transversal dimension is that of the interactions between the terrestrial and marine environments. In this transitional area between the land and the sea, wetlands represent "extremely important interface sectors" due to the complementary interaction with freshwater environments, a source of biodiversity. This dimension is particularly critical in a context of climate change characterised by a retreating coastline, displacement of habitats further inland

[1] The NOTRe law concerns the new administrative divisions in France.
[2] The MAPTAM law deals with the modernisation of public policy and reinforcing the role of major cities.

Adapto, strategies for climate change
Marc Duncombe, Seaside and Lake Conservation Trust

Given the facts of climate change and its effects on littoral areas, it is necessary to develop a more dynamic approach to coastal ecosystems. With that in mind, ten experiments on managing littoral areas have been launched since 2015 in Authie bay, the Orne estuary, the Gironde estuary, the old salt ponds in Hyères, etc. The objective is to show in practical terms, in conjunction with the local stakeholders, that it is possible to rationally anticipate future situations taking into account changes in the land-sea interface and a restructuring of littoral ecosystems. Consequently, the objective is to prepare areas for a retreat of successive landforms (e.g. sea - mud flats - salt meadows - lagoons - ponds - wet meadows) and to purchase land behind the current coastline to make space for that retreat. The concept of a return to natural conditions is not enough. Spatial continuities between environments are important, but it is also necessary to manage the ecological discontinuities because they are a source of ecosystem diversity and resilience.

and, consequently, the loss of certain wetlands due to progressively increasing salinity levels. The longitudinal dimension is a function of the structure of the littoral area where numerous movements take place, notably by birds. Wetlands are essential rest areas during migration.

Paradoxical zones

Laurent Roy, General director of the Rhône-Méditerranée-Corse water agency, noted that littoral wetlands are the site of a double paradox. Because they are remarkable, these natural environments have long been used for human activities. Yet the pressures exerted via the development of land could negate the functions of wetlands. The second paradox lies in the fact that continuity is essential, but very difficult to implement. As a result, wetlands are the focal point of numerous issues that should be managed jointly rather than opposing them. Issues include the preservation of water resources and biodiversity, flood control, development work and organisation of water uses, etc. All these issues are tightly interrelated in that there would be no point in maintaining water quality without taking action on ecological continuity, which in turn directly conditions the functioning of natural environments.

A precious capital

During the last century, 50% of wetlands disappeared in spite of the fact that they offer “many free services”, including flood control, attenuation of low-flow levels, improved water quality, a refuge for biodiversity, etc. It has been calculated that it costs five times less to preserve a wetland than to replace the services it provides with a technological solution[3].
Agnès Langevine, vice-president of the Occitanie region where there are 40,000 hectares of lagoons, observed that her region bears a particular responsibility in preserving wetlands in a context of major pressures exerted by population dynamics along the coast (an increase of 30,000 residents each year) and by economic development. The regional ecological-continuity plan (SRCE) for the Languedoc-Roussillon region, adopted at the end of 2015, listed preservation and renaturalisation of littoral wetlands among the major regional objectives, given the exceptional lagoon environments along the Mediterranean coast.

A key role for fish populations

The third national action plan for wetlands (2014-2018) singled out the littoral wetlands for special attention in Action 49, titled “Study and assess the potential of littoral wetlands as habitats for fish populations such as European eels”. The second Report on the French eel-management plan was transmitted to the European commission in 2015. It provided encouraging information on the work to restock European eels, a species in danger of extinction. Bénédicte Valadou, policy officer for migratory fish at Onema, explained that “France has, on the whole, succeeded in reducing mortalities due to fishing thanks to a drop of 55.7% in captures of glass eels and in attaining its restocking objectives. Work to restore continuities primarily addressed obstacles in rivers, though it is true that littoral wetlands are acknowledged as particularly productive habitats for eels”. The initial studies on the potential of littoral wetlands as habitats for eel populations produced assessments of the populations, with a potential of three million silver eels along the Atlantic and Channel/North Sea coasts and eight million in the Mediterranean lagoons. Other initiatives are also producing good results such as the section in the eel-management plan for the Vigueirat marshes (Bouches-du-Rhône department) to study the species dynamics in an unaltered environment. However, all this work must be seen as a very long-term operation.
The role of the lagoons as “fish nurseries” was also highlighted in the ETINCELLE programme (University of Perpignan) with maps of the habitats in the Salses-Leucate lagoon. The patchwork of lagoons would appear to be favourable for ecological richness in that the lagoons provide essential functions for the life cycles of certain species of marine fish, e.g. nursery, rest spots, corridors, etc. The studies conducted on the lagoons along the Gulf of Lions revealed high densities of juveniles, the result of the strong primary production, temperature conditions, the low degree of predation, etc. In light of the above, it is essential to preserve the connectivity between lagoons.


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[3] Source : Vidéos - Zones humides, zones utiles : agissons ! Agence de l’eau Rhône méditerranée et Corse-2016.

Regions standing at the crossroads of public policy


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Coordinating planning documents

It is impossible to ensure ecological continuity in littoral wetlands without taking into account the many planning documents, particularly the river-basin management plans (RBMP) that target the good status of continental and littoral waters on the river-basin scale, the migratory-fish management plan (PLAGEPOMI) dealing with fisheries management and the free movement of migratory fish, and the action plan for the marine environment (PAMM) that targets the good status of marine waters. Other planning documents may also play a role, including the flood-risk management plans (PGRI), local development plans (SCoT), flood-prevention plans (PPRI), local urbanisation plans (PLU) and the documents listing objectives for Natura 2000 sites (DOCOB).

These planning documents often cover the same areas, but their legal status differs significantly. For example, PLAGEPOMI lists recommendations for the management of environments in continental waters and its regulatory framework applies essentially to the fisheries sector. An RBMP, on the other hand, contains environmental measures that are binding on the population as a whole.

The EU and the French State are aware of the need to coordinate policies. The Blueprint to safeguard Europe's water resources (2012) foresees coordination between the European framework directives and a joint schedule for the revision of the documents. A circular from 2014 outlined the coordination between RBMPs and the PAMM, in particular concerning the application of measures depending on the impact and the origin of pressures. RBMPs are the reference documents for terrestrial pressures and the PAMM the reference document for marine pressures. For pressures on littoral areas, which are transitional zones, the measures may be contained in either the RBMPs or the PAMM.

It was with the above issues in mind that the Seine-Normandie basin aligned the revision of the PLAGEPOMI with that of the RBMP and the PAMM by establishing regular contacts between the different management teams and even joint drafting of certain policies. A decree will soon organise the collaboration between the teams. The purpose is to rationalise the work done in the same areas in order to enhance the effectiveness of the work on the basis of shared objectives, even if the wording differs in the various documents. One of the results is the addition of a "challenge" in RBMPs to preserve and restore the functions of littoral and marine aquatic environments. Similarly, the PAMM adopted a recommendation initially contained in the PLAGEPOMI to "Establish comprehensive land and sea management of fishing of diadromous species".

Work on the regional level

How can the proposed projects be effectively implemented in the regions? Work on the regional level must necessarily be coordinated with the regional ecological-continuity plans (SRCE). The SRCEs are true territorial-planning tools and they incorporate an assessment and an analysis of the issues concerning the preservation and restoration to good status of ecological continuities. This coordination must take place during the current reorganisation of the national administrative

Obtaining reliable data, the case of river obstacles

Vincent Marty, Onema Mediterranean regional office

The ROE database is a national catalogue of obstacles to river flow, namely the tens of thousands of obstacles that severely disturb the functioning of river ecosystems and create discontinuities.

Many managers had data on hand, but they were not consistent and were designed for different purposes. Consequently, Onema developed a central database within the framework of the Water information system WIS-FR, and proceeded to eliminate double entries, check the validity of the information, create a single data format, fill out the data, etc.

ROE is a searchable database containing a set of basic datapoints, i.e. each structure is geolocated and has a unique name, number, information on the type of obstacle (weir, dam, lock, etc.), a status and a few additional fields of information. The database may be consulted on-line. The second step is to determine the potential impact of each obstacle on ecological continuity, e.g. possibilities for aquatic fauna to overcome the obstacle, disturbances to migration, sediment transport, etc. This information is collected using the ICE (Information on ecological continuity) protocol that processes the data and produces a passability class for each obstacle.

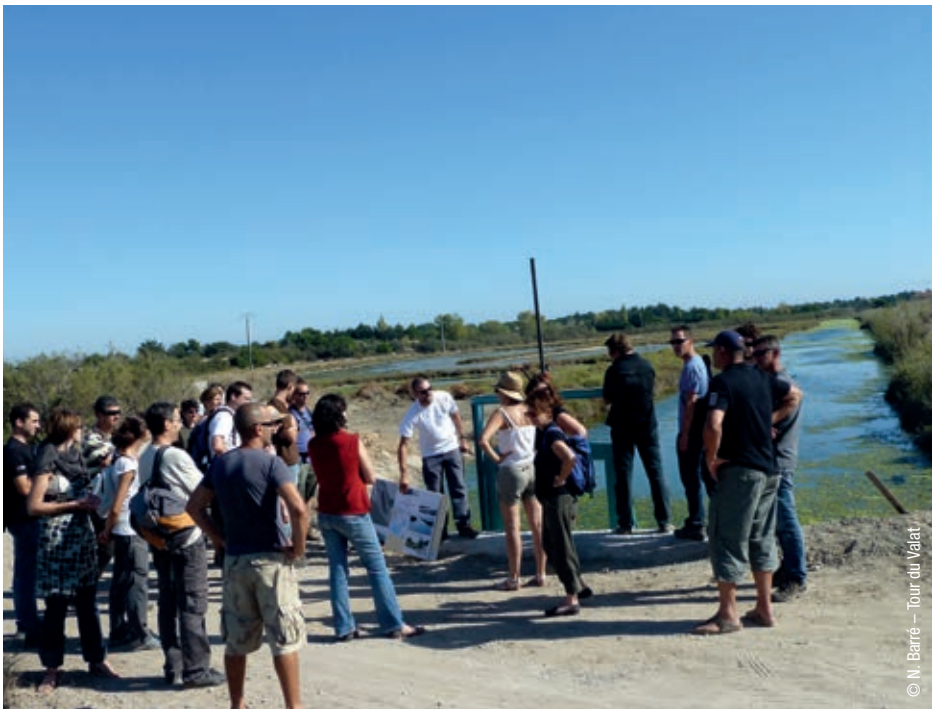
structure following the law on the new administrative divisions in France.
The situation in the Occitanie region is a good example of the difficulties and the issues that must be examined. The new region now has two SRCEs that must be folded into a single SRCE and subsequently (2019) integrated into its future regional sustainable-development and territorial-equality plan. But starting immediately, efforts are being made to achieve joint governance between the two former regions and to capitalise on the discussions already held. In the framework of the Biodiversity law, the regional committee for ecological networks must be transformed into a regional committee for biodiversity spanning the entire new region.
The approval of the two SRCEs in 2015 was in itself coordinated with the RBMP for 2016-2021. According to Zoé Mahé from the Occitanie regional environmental directorate, *"We did not attempt to reproduce the RBMP in the SRCE, but rather to produce additional information, e.g. improving our knowledge of how continuities function, on restoring ecological corridors, dunes, estuaries, etc. The objective is to shift from development to sustainable development of the littoral region confronted with a retreating coastline, by examining a fall-back strategy"* (see the box). The fact that all the river basins are now covered by a management structure is seen as a positive factor.

Removing barriers to make progress

In this context, how can ecological continuities be improved? The main sources of progress will be improving knowledge, adopting a comprehensive view of ecosystems and improving synergies between stakeholders.

Enhancing knowledge and improving its use

Knowledge is required in an array of fields, including better understanding of how ecological continuities function at the land-sea interface, more complete inventories, better reference datasets for brackish environments, continued monitoring of migratory fish, more information on the carrying capacity of marshes and lagoons for different species, etc.
That being said, the need for knowledge must not hinder action. Managers have expressed their desire to access the available data more easily, but also to obtain recommendations on management techniques. They would like to remove the barriers between researchers and themselves. The expectations addressed to the scientific community are on a par with the issues at hand, namely obtain information on how to manage the flows of fresh and salt water, receive assessment scenarios for the impact of restoration work, count on solid, forward-looking analysis pertaining to climate change, implement indicators adapted to local conditions, benefit from reports on past projects and work, etc. The importance of establishing management scenarios and making available decision-aid tools was stressed, notably for hydraulic management during work on installations and for depolderising.
Another useful idea would be to pool data, i.e. collect and store information input by different entities. In many fields, the data and reference datasets already exist. For the people in the field, the objective is to identify the stakeholders with the data, to obtain access and to use the information in a rational manner. Necessary features are the interoperability of databases and facilitated dissemination.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Managing the Camargue using a shared tool?
Marie Granier, Camargue regional nature park

There is currently a project for the Camargue, a vast area confronted with many issues, to share the available information on ecological continuity, management of water levels and salinity, safety, preservation of nature, management of human uses, etc. In addition to these issues, the Camargue is faced with a wide array of stakeholders and management documents targeting renaturalisation and reconnection, namely the 2012-2018 Camargue delta contract, the Camargue reserve management plan, the management document for the "Camargue ponds and salt marshes" site, the management plan for the "Marine reserve", etc. It was decided that the best approach was to pool the data produced and to set up a partnership network to monitor water and the environments. The objective is to centralise the data (on installations, discharges, biological inventories, etc.), monitor changes, assist in decision-making and management, and finally, provide information. The project is structured around an on-line GIS (geographic information system) and the technical specifications are now being drafted in view of the system going on-line in 2017.

How can the European structural and investment funds (ESIFs) be mobilised for littoral wetlands?

Most projects focus on two approaches, namely 1) encourage adaptation to climate change and risk management and prevention, and 2) protect the environment and promote effective use of resources. However, a decisive factor in the selection process is that projects must include economic leverage, be innovative and encourage territorial development. The ERDF places greater emphasis on investment projects than on research. The availability of funds for the restoration of ecological continuities is the result of negotiations between the regions and the European commission. For example, the Occitanie region obtained 12 million euros by innovating with the operational implementation of its SRCE in conjunction with ecological-continuity issues.
Projects require solid preparatory work and, quite often, assistance. Project managers that have obtained ESIF funding stress the red tape involved and the risk of straying from the original objectives in an effort to comply with the European strategy. However, there are synergistic benefits including scale economies due to the collective proposal, exposure to new forms of collaboration and partnerships, learning from the past experience of the other participants, innovation by going beyond the traditional programmes set up by the regions, etc. Other opportunities include the cross-border cooperative programmes, the LIFE programme that will be revamped in 2017-2018 and, finally, the European research programmes in response to the social challenges listed in the H2020 strategy.

The inventories of river structures are a good example of a useful approach. The national database on river obstacles (ROE) developed by Onema in the framework of the Water information system provides a consistent inventory of river structures in France (see the box). LOGRAMI has also created an inventory of 80 structures in estuaries of the Pays-de-la-Loire region and restoration projects exist for 22 of them. The data may be easily accessed, ensuring rapid sharing and analysis for more effective work. The objective is not to increase the number of national databases, but to expand their scope of action, similar to ROE and the hydro-biological fish network (RHP). Similarly, implementation of the national management strategy for migratory fish in conjunction with the third national action plan for wetlands should result in reliable and consistent data becoming available on-line.

Sharing, exchanging and collecting data

A number of experiments have shown the value of setting up networks of sites, for example the Seudre salt marshes in the Charente-Maritime department (approximately 9,000 hectares with over 1,000 owners), for a project to recolonise the area with eels. Given the positive results of the programme to restore the ditches for fish and the installations, the objective now is to pursue the work, to improve the monitoring protocols and to set up a joint work method for all of the salt marshes. The Mediterranean lagoons centre highlighted the importance of developing methods that may be used on a wide range of sites. It is with this in mind that the “1150 - Coastal lagoons” project to standardise assessments of habitat-conservation status is being conducted, in compliance with the Habitats directive. This approach, developed as a management tool for managers and incorporating project feedback, is designed as an inter-regional, participatory project.
What are the criteria determining the success of a network of sites or of stakeholders? Three factors stand out, namely the presence of a person specifically in charge of breathing life into the network, a multi-disciplinary approach (water and biodiversity, upstream and downstream) and the means to assist managers. A communications system is clearly a positive factor in sharing information and “good management practices”. A number of network “nodes” have already proven their usefulness, including the wetland centres, associations for migratory species and the networks of protected natural areas. Following a series of productive initial discussions, a joint project uniting these organisations may come into being.


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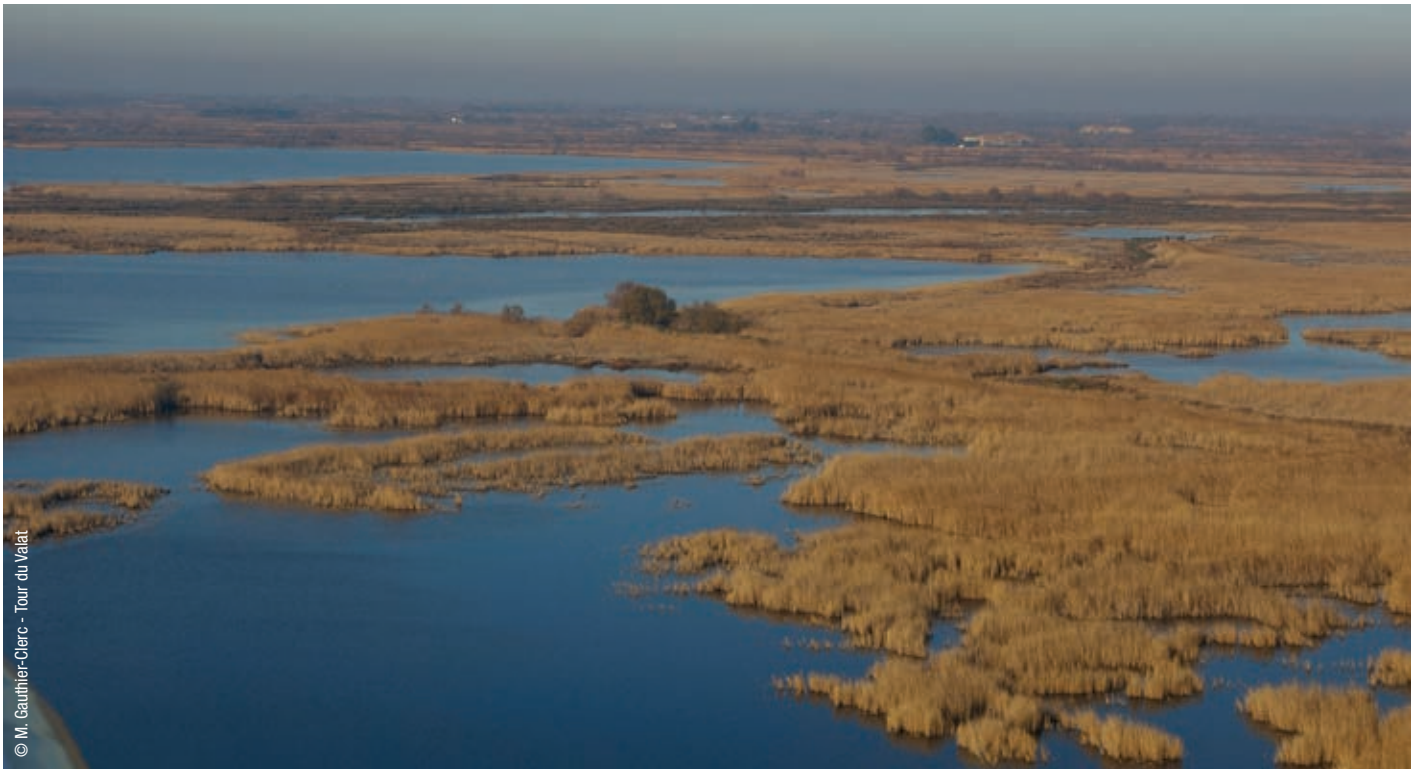
Building future territories together

The work groups insisted on the importance of the “very local” level in efforts to work together or to implement management projects, and of the river-basin level in gathering data and monitoring indicators, while at the same highlighting the need to remove barriers (ensure flows of information between managers, scientists and decision-makers, but also remove geographic and topical barriers). Everyone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agreed on the need to make progress toward a shared and comprehensive view of the situation.

Experiments involving integrated management would seem to be bearing fruit by creating a shared approach and relationships based on mutual confidence (see the box). The experiments create links between water policy, flood control, landscape enhancements, territorial planning, economics, etc. The example of the Thau basin in Languedoc-Roussillon demonstrates the advantages of having a single entity (Thau Agglomération) manage both the RBMP and the SCoT.

Many programmes for littoral wetlands have multiple sources of funding, an example being the Migrateurs Rhône Méditerranée (MRM) association whose budget includes 32 funding projects with 14 financial partners. What solutions are available to ensure that this diversity does not hinder projects, given that each funding entity has its own rules and priorities?

Though the great number of funding possibilities creates uncertainties, solutions do exist. Isabelle Lebel, the director of the MRM association, explains that *"Each year, we systematically invite all our financial partners for discussions because it is essential to set up truly comprehensive financial plans for programmes, particularly when several areas or regions are involved"*. The feedback from projects would indicate that the key to success lies in inviting all the partners together to meet each other and to discuss each project on a case-by-case basis. That is also a way to tap into European funds (see the box page 5).

New possibilities would also seem to be provided by the NOTRe and MAPTAM laws. By modifying the administrative limits (creating larger regions) and increasing the responsibilities of local governments, the two laws have made the regions the driving forces in many fields. The responsibility for managing aquatic environments and flood control (GEMAPI) is attributed either to towns, to the intermunicipal associations of towns or to the public agencies for water management and planning. ■

Find out more

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Mock-up: Éclats Graphiques
Creation: www.kazoar.fr
Printing: IME by Estimprim
Printed on paper produced in sustainable managed forests.
Onema: 5 square Félix Nadar - 94300 Vincennes
Available at:
http://www.onema.fr/Les-rencontres-de-l-Onema