

OneWater

Eau Bien Commun

2022 – 2031

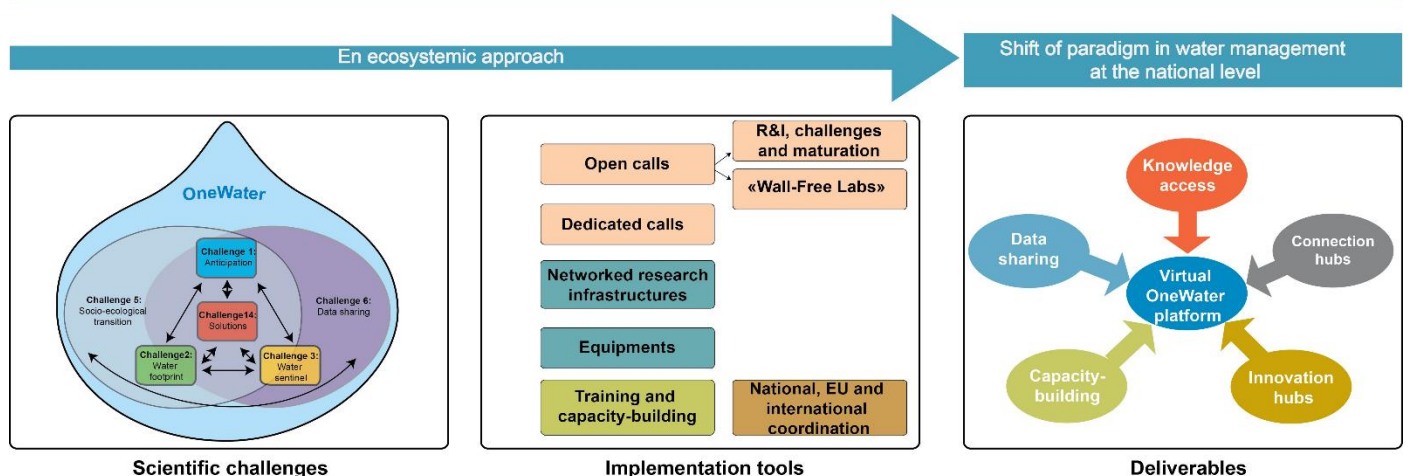
A national research and innovation program to accelerate transitions, measure impacts on socio-hydrosystems. An opportunity to respond to current and future challenges.

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An environmental, social and political context to OneWater

With global change, natural and anthropogenic pressures on water resources are exacerbated, hereby becoming a major challenge for our societies in the 21st century: there is an urgent need for action now and at all levels. **Water is a common good** that is pivotal for life and socio-economic development. It is a resource, a living environment, a vital element for climate regulation, for the functioning of ecosystems and human development. France has been a world pioneer for the establishment of water governance by river basin, but the underlying assumption that everything can be solved at the basin level is eroding. The global is catching up with the local and new questions are emerging. These challenges must be addressed by **more integrated, systemic, multi-stakeholder approaches to co-construct solutions adapted to contrasting realities**. Over a period of 10 years, OneWater aims to **shift the paradigm by placing water as a common good, a central element of socio-ecosystems prone to climatic and anthropogenic forcings**.

The OneWater concept and its deliverables



OneWater: six major scientific and technological challenges to accompany transitions

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Challenge 1 - Anticipate the evolution of water resources to allow the adaptation of territories according to their singularities ● Improve knowledge of past and future variabilities of water resources based on hydroclimatic observations and modelling. ● To understand and model natural and anthropogenic feedbacks on the water cycle, Analyse hydroclimatic trajectories since the 20th century by integrating uses and pressures ● Develop seasonal to ten-year forecasts. ● Evaluate adaptation scenarios based on solutions proposed in challenge 4.

Challenge 2 - Develop a "water footprint" of environmental processes and human activities, considering not only water quantity but also its quality ● Universally apply the concept of water footprint to biogeochemical elements to differentiate the combined effects of natural and anthropogenic processes related to water quality and quantity. ● To conceptualize the water footprint as a determining pressure on the quality and quantity of water. ● Quantify the evolution and transformation of this footprint. ● Generate appropriate and deployable measures ● Analyze the evolution of the impact of responses.

Challenge 3 - Use water as a sentinel of the health of the environment and human societies along the land-sea continuum ● Foster a transition from a repressive approach, linked to regulatory thresholds, to a co-construction of objectives based on trend analyses, to better understand the functioning and trajectories of socio-hydrosystems. ● To quantify the response times of hydrosystems to climatic and anthropogenic constraints ● Determine the responses of spatio-temporal variability to changes in scale ● Distinguish the cumulative effects of impacts on the ecological functioning and biodiversity of hydrosystems.

Challenge 4 - Propose solutions to promote the adaptability and resilience of socio-hydrosystems in the face of global changes, and promote more reasoned and integrated approaches and uses. ● Promote trade-offs between human needs and resources, in quantity and quality, to ensure the adaptability and resilience of socio-hydrosystems. ● To identify the key conditions for adaptability and resilience ● Characterize the barriers and levers to promote a sparing and optimal use of the resource, including the circular economy ● Determine viable, equitable and sustainable solutions.

Cross-cutting Challenge 5 - Support the socio-ecological transition towards a new governance of resources, for a sustainable and resilient society ● Develop a renewed management of water resources and their uses by re-examining the models and systems established to make them evolve. ● To co-produce innovative governance models considering water as a common good. ● Develop original tools and approaches for a socio-ecological transition including the different uses and protection systems of water resources. ● Rely on the science of sustainability for a real paradigm shift.

Cross-cutting Challenge 6 - Share, make accessible and understandable by all the water data for knowledge and action ● Support strategies and decision-making through knowledge through the organization and sharing of data from different sources. ● To build on the knowledge acquired, re-examine it and promote new ones if necessary. ● Support the appropriation of data and services by the different actors (from the scientist to the manager...) ● Make the data easy to find, accessible, interoperable and reusable (FAIR). ● Propose a single platform dedicated to "water" data.

Impacts of OneWater

Transformative, this program will have **direct and significant impacts** on the development of societies and territories:

- *Socio-economic*: support for actors in the transformation of their practices with innovative solutions, deployment of the circular economy.
- *Environmental*: produce adaptation solutions, preserve biodiversity and aquatic ecosystems, and alert pollutions and risks to water resources.
- *Health and social*: improve the quality of life and health of populations, access to quality water and sanitation.
- *Socio-cultural*: evolution of practices through the integration of water values, develop integrated tools for the management of data and treatments for a holistic approach, priority of sectoral policies in the short, medium and long term.
- *Scientific*: international recognition, support for socio-economic sectors and European actions, emergence of a virtual water platform.

Implementation modalities

OneWater proposes a national strategy (Metropolitan, overseas territories) adapted to the needs of living and water users associating the water sector and local actors to consolidate the **French global leadership**. It makes it possible to **finance innovative and structuring research** to strengthen interdisciplinary and multi-stakeholder dialogues, thanks to different tools:

- **Calls for projects open** to the entire French scientific community, to stimulate new transdisciplinary approaches and collaborations and remove the barriers related to challenges and their interactions: 1) calls for projects by challenges and inter-challenges 2) specific inter-challenge calls to support transitions: "Wall-free Labs" that mobilize "clusters" of researchers, including doctoral and post-doctoral students, from complementary disciplines, to develop integrated and systemic approaches around a shared, wicked issue.
- **Dedicated projects** on topics considered as priorities to structure common, practical tools and develop protocols that can be shared by as many people as possible. Set up at the beginning of the program, these projects rely on operational teams involved in the program (e.g. demonstration actions, development of tools in the process of maturation, beginning of data structuring to create the OneWater virtual platform, etc.).
- **Equipment** for 1) complete the existing and respond to the new issues raised; 2) have sufficient storage capacity for the One Water data platform while limiting its environmental footprint.
- **Education through research** actions to train and organize a generation of "OneWater" students who have acquired a strong disciplinary expertise and interdisciplinary culture, accompanied by **shared research-actor schools**, for integrated approaches with new tools.
- Actions at national, European and international level associated with existing initiatives to promote the programme's approach, leverage and increase its visibility.

Gouvernance

The CNRS, BRGM and INRAE co-pilot OneWater and rely on ten partners with complementary and recognized skills: IFREMER, IRD, Météo France, University of Bordeaux, Claude Bernard Lyon 1 University, University of Montpellier (I-MUSE Site Strategy), Grenoble-Alpes University, Rennes 1 University, Strasbourg University, Toulouse Midi-Pyrénées Federal University. They will be represented in the **institutional strategic committee**, in conjunction with the **three institutional pilots**. The team of three co-directors also relies on a program committee organized around challenges, an **international scientific committee** and a **Think Tank** composed of stakeholders to respond to these major issues and generalize the notion of water as a common good.

Partenaires

IFREMER, IRD, Météo France, Université de Bordeaux, Université Claude Bernard Lyon 1, Université de Montpellier (Stratégie de site I-MUSE), Université Grenoble-Alpes, Université Rennes 1, Université de Strasbourg, Université Fédérale Toulouse Midi-Pyrénées.

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OneWater, an exploratory PEPR of the Investments for the Future Plan (PIA4)

Priority research and equipment programmes (PEPR) aim to build or consolidate French leadership in scientific fields considered to be priorities at national or European level and linked to a large-scale transformation. "Exploratory" PEPRs target emerging sectors with research whose fields of application may still fall under working hypotheses. It is a question of exploring scientific fields whose expected benefits can be multiple.



The logo for OneWater features a blue water drop icon to the left of the text "OneWater" in a large, bold, blue sans-serif font. Below "OneWater" is the phrase "Eau Bien Commun" in a smaller, blue sans-serif font.