Water JPI

Thematic Annual Programming (TAP) Action

AQUATAP-ES
Who is Who

Water JPI
Thematic Annual Programming Action

Water Challenges for a Changing World
Joint Programming Initiative

The Thematic Annual Programming action (TAP) is a network of national projects focused on specific research needs.

It relies on the establishment of a network or cluster of excellence, creating a critical mass of research and technological excellence, the integration and sharing of knowledge, infrastructure, data and modelling tools, training and capacity building, as well as improved communication and networking with stakeholders and the scientific community.

The topic of the first Water JPI TAP action is on 'Developing Approaches for Assessing and Optimising the Value of Ecosystem Services'. This first TAP action will run for 24 months, i.e. from June 2019 until June 2021.

1 **Complex eco-evolutionary dynamics of aquatic ecosystems faced with human-induced and environmental stress**
University of Jyväskylä, Finland

2 **DRAINAGE : Design of a methodology to increase flood resilience compatible with improved status of water bodies and sustainable management of water resources**
University of Castilla–La Mancha, Spain

3 **ESDecide: From ecosystem services framework to application for integrated freshwater resources management**
University College Dublin, Ireland

4 **PAGW: Services and natural capital for the large Dutch water bodies**
Rijkswaterstaat, The Netherlands

5 **SPACESTREAM: Spatial and temporal flow intermittency in fluvial ecosystems: effects on structure, function and ecosystem services**
Fundació Institut Català de Recerca de l'Aigua Spain

6 **KelpRes: The diversity and resilience of kelp ecosystems in Ireland**
National University of Ireland, Galway, Ireland

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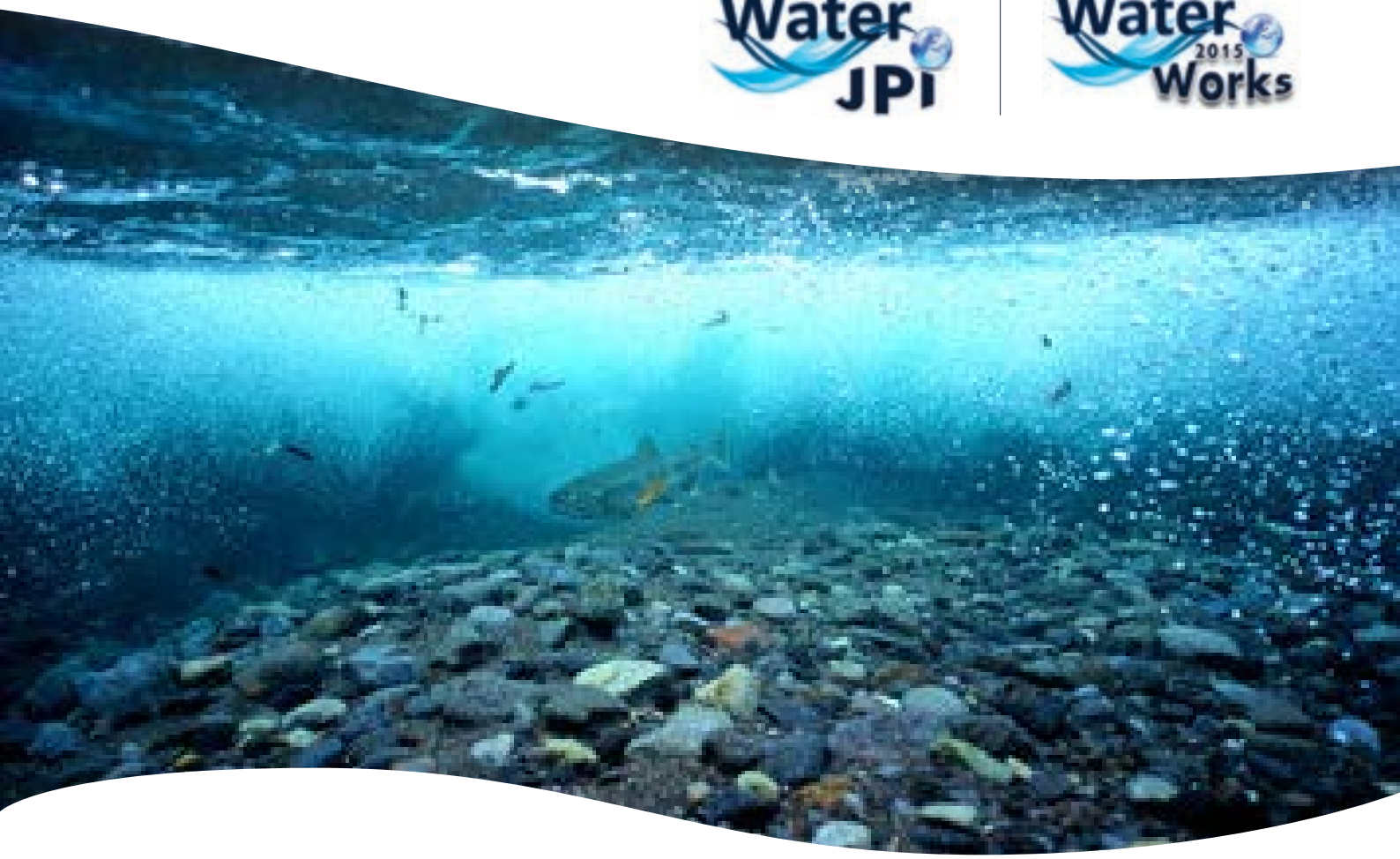
Complex eco-evolutionary dynamics of aquatic ecosystems faced with human-induced and environmental stress

University of Jyväskylä, Finland

Complex eco-evolutionary dynamics of aquatic ecosystems faced with human-induced and environmental stress

Keywords	food webs, resilience, recovery, life-histories
Start Date	01/06/2018
Project Duration	48/60
Lead Organisation	University of Jyväskylä
Other Partner Organisations	
Funding Agency (Country)	Academy of Finland, ERC
Short Abstract	Resilience and recovery ability are key determinants of species persistence and viability in a changing world. Populations exposed to rapid environmental changes and human-induced alterations are often affected by both ecological and evolutionary processes and their interactions, that is, eco-evolutionary dynamics. However, the feedback mechanisms, and the ways in which evolution and phenotypic changes scale up to interacting species, communities, and ecosystems, remains poorly understood. The objective of this project is to bridge and close this gap by merging the fields of ecology and evolution into two interfaces of complex biological dynamics. This will be done in the context of conservation and sustainable harvesting of aquatic ecosystems.
Expected Key Outputs from Project	Modelling tools for complex dynamics of aquatic food webs Identification of drivers of resilience and recovery ability Sustainable harvesting



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2

DRAINAGE: Design of a methodology to increase flood resilience compatible with improved status of water bodies and sustainable management of water resources

University of Castilla–La Mancha, Spain

Drainage

Keywords	Integrated Flood Management, Green Infrastructures, Ecosystem-based Management, Social Perception
Start Date	01/01/2018
Project Duration	36 months
Lead Organisation	University of Castilla-La Mancha
Other Partner Organisations	Center for Studies and Experimentation of Public Works (CEDEX), Geological Survey of Spain (IGME), University of Valencia (UV), University of Alicante (UA), Polytechnic University of Valencia (UPV), Autonomous University of Madrid (UAM), Complutense University of Madrid (UCM)
Funding Agency (Country)	Spanish National Plan for Scientific and Technical Research and Innovation (MINEICO/AEI/ FEDER, UE)
Short Abstract	Over the last 20 years there has been a paradigm change in how river flooding should be managed. The passing of the Water Framework Directive (Directive 2000/60/CE), and subsequently the European Floods Directive (Directive 2007/60/CE), has meant the adoption of integral management schemes and territorial planning in areas prone to flooding. The objectives are: i) to improve flood risk management; ii) to guarantee the good status of all water bodies; and iii) to help optimize the ecosystem services that floodplains provide. This project is carried out in the River Duero drainage basin. The general aim is to increase the resilience of urban areas in case of flooding and make this compatible with improving the status of water bodies. This will be done by applying new methodologies that allow a reliable characterization of risk based on characterization of all the processes involved, as well as on evaluation of the propagation of uncertainty. At the same time, social perception will be integrated into risk analysis and management. In order to reduce vulnerability and at the same time enhance the capacity of urban zones to adapt, management measures will be designed based on restoring the geomorphological capacity of the floodplains in order to bring flooding under control and retain water and sediment. In this way, the status of water bodies can be improved by facilitating the recuperation of river habitats. It will be demonstrated that such restoration is compatible with the implementation of sustainable growth models based on green economy. The project responds to the social demand for developing innovative measures of adaptation and risk prevention that are also compatible with the development of an economic model based on the protection and sustainable management of water resources.

Expected Key Outputs from Project

The DRAINAGE project is expected to have relevant impacts on various strategic aspects related to hydrological, territorial and environmental planning:

- Firstly, it will facilitate compliance with the WFD and with Spanish regulations that transposes its management objectives and associated measures. It will contribute to the improvement of the ecological status of water bodies by optimising the management of river dynamics and the hydraulic performance of floodable areas. At the same time, the results of the project will allow the restoration of various ecosystem services provided by the floodplains.
- It will allow progress to be made in complying with the Flood Directive. In particular, improving the resilience of urban areas to flooding. To do so, it will include methodologies for characterising the social perception of flood risk. It will also incorporate the design of communication strategies with the final objective of increasing of adaptability to flood events, by improving risk perception and awareness of management plans.
- As regards the management objectives related to the conservation of biodiversity and habitats in the fluvial environment, the results of DRAINAGE will allow an improvement in biodiversity by promoting ecosystem-based management in riparian areas. This will increase the ecological coherence and connectivity of spaces included in the Natura 2000 Network (cf. Article 10 of the Habitats Directive, 92/43/CEE).

In short, the DRAINAGE project will help the implementation of a change of paradigm for how flood risk management should be addressed that is at the same time compatible with the sustainable management of water resources and good status of water bodies. In addition, the proposal could stimulate a new culture of land management that connects risk mitigation with various development objectives at local and regional level. This would enable water resources management that promotes sustainable interactions between economic subsystems and the fluvial environment.

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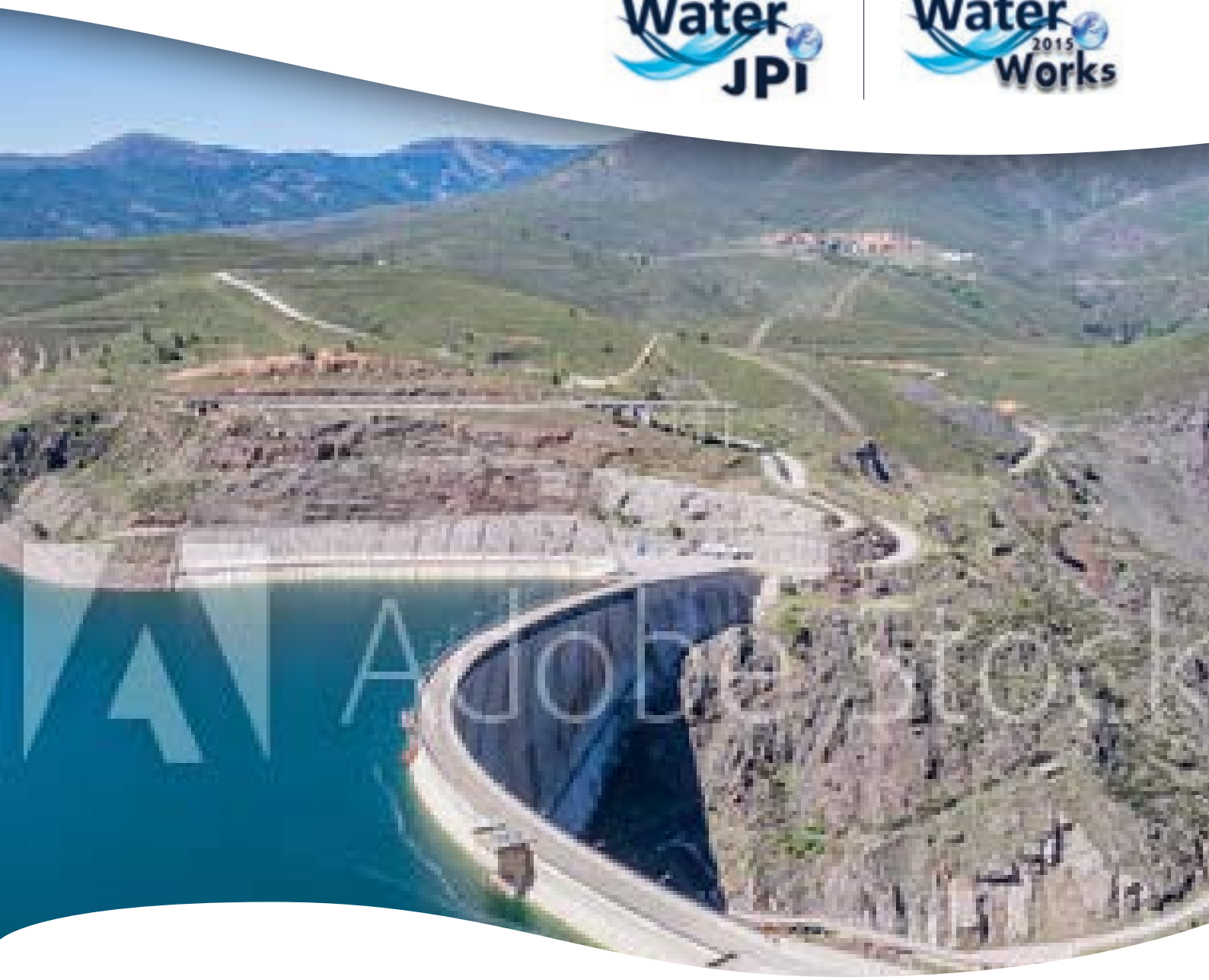

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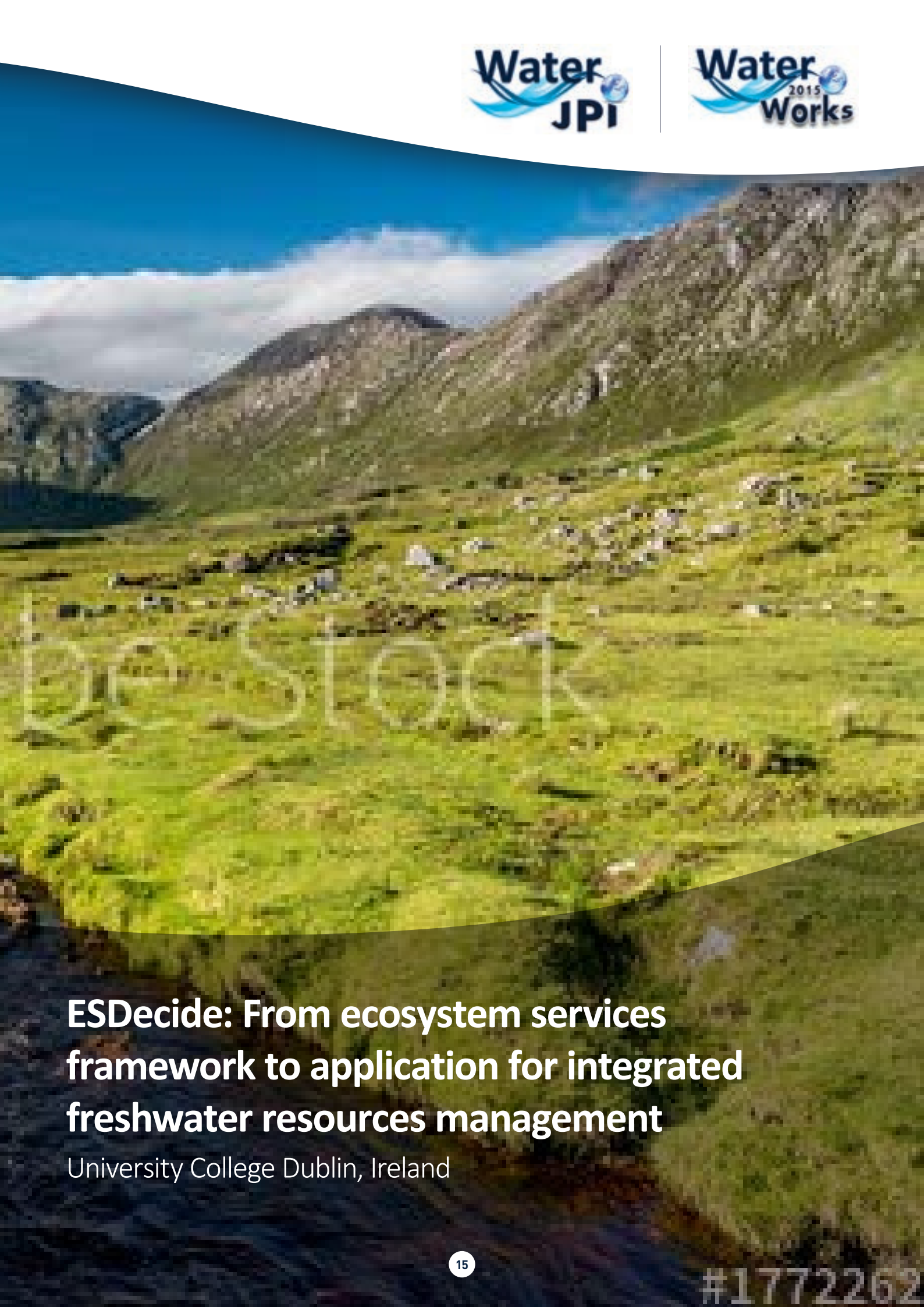

ESDecide: From ecosystem services framework to application for integrated freshwater resources management

University College Dublin, Ireland

ESDecide: From Ecosystem Services Framework to Application for Integrated Freshwater Resources Management

www.ucd.ie/esdecide

Keywords	Ecosystem services, decision support, valuation
Start Date	04/03/2019
Project Duration	30 months
Lead Organisation	University College Dublin, Ireland
Other Partner Organisations	Trinity College Dublin Aberystwyth University, UK/ Blue Island Consulting University of Duisburg Essen Ecologos Consulting & University of York
Funding Agency (Country)	Environmental Protection Agency
Short Abstract	The overall aim of ESDecide is to develop an evidence-based decision support tool that will inform how Ecosystem Services (ES)/Nature's Contribution to People (NCP) change in response to multiple stressors and management interventions. This will be achieved by greatly extending the scope of the original ESManage project (www.ucd.ie/esmanage.ie) through the collection of new evidence and then incorporating this into a practical decision-support tool. The new evidence collected will include (i) models of the responses of ecosystems and associated ES to multiple stressors; and (ii) monetary and non-monetary values for river ES / NCP. This new evidence will feed into a Bayesian Belief Network (BBN) model of river systems, which will form the basis of the decision-support tool.
Expected Key Outputs from Project	Short synthesis report on the plurality of river NCP & knowledge gap Database on pressure stressor impact relationships & Bayesian Belief Model A decision-support diagnostic tool Guidance manual & training video on use of the diagnostic tool. At least 5 peer-reviewed papers in high impact journals Final technical and synthesis reports Project newsletters, blogs & tweets Infographic

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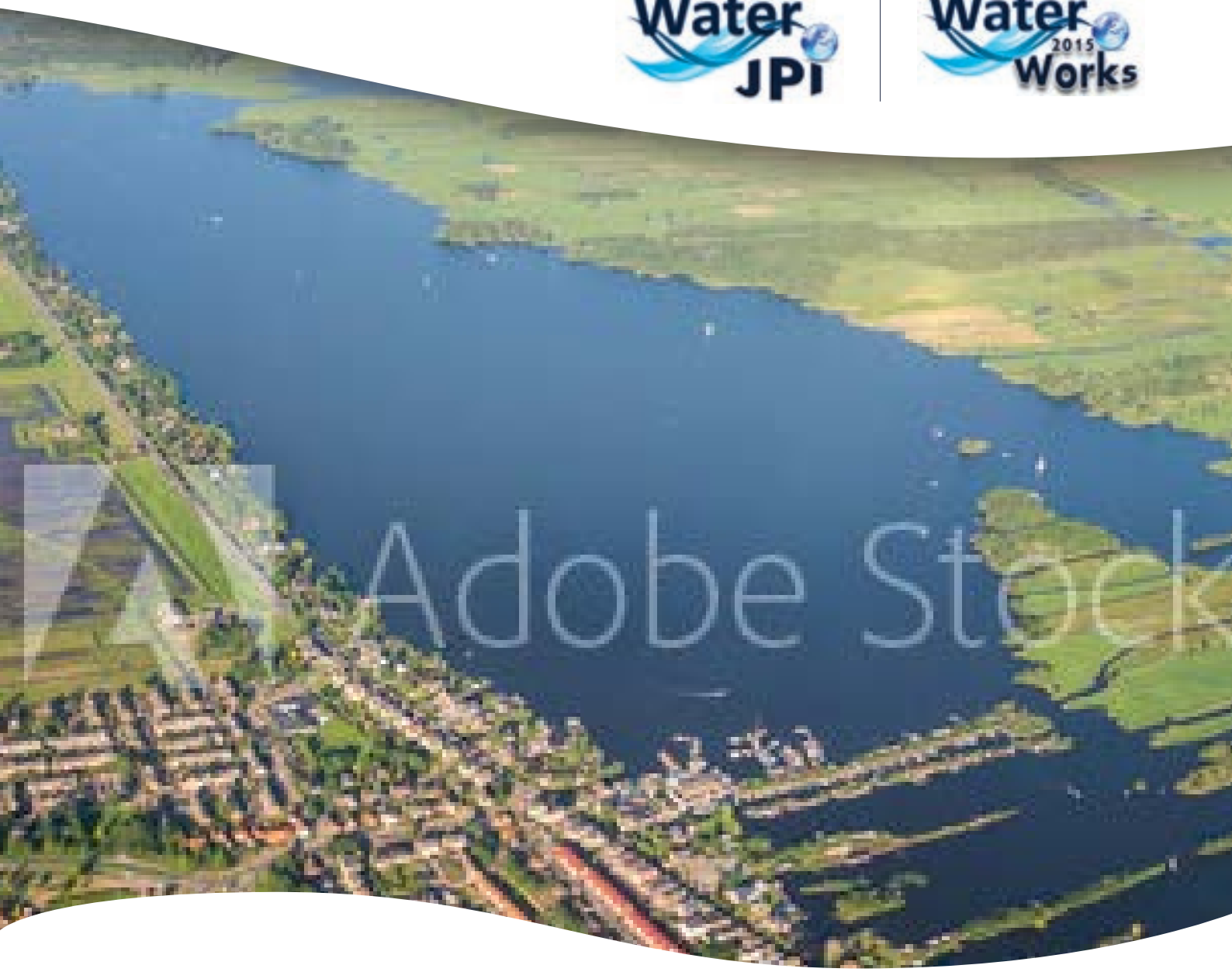
PAGW: Services and natural capital for the large Dutch water bodies

Rijkswaterstaat, The Netherlands

PAGW: Ecosystem services and natural capital for the large Dutch water bodies

Keywords	Ecological restoration, resilience, ecosystem services, large water bodies
Start Date	01/01/2018
Project Duration	36
Lead Organisation	Rijkswaterstaat
Other Partner Organisations	Staatsbosbeheer, RVO
Funding Agency (Country)	Ministry of Infrastructure and water management and Ministry of Agriculture, Fisheries and Food Quality
Short Abstract	Next to investments in WFD and N2000 an extra impulse will be given to improve the ecological status of heavily modified large waterbodies in the Netherlands. From 2018 till 2050 at least 33 additional large infrastructural projects and management measures will be executed. Since humans are intricately linked to ecosystems - they rely on ecosystem services to sustain their societies and economy - the recovery of ecological processes and the relationship between processes within socio-ecological systems are the founding principles of the programme.
Expected Key Outputs from Project	33 large infrastructural projects and management measures will be executed to improve the ecological integrity of the Dutch large waterbodies.



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SPACESTREAM: Spatial and temporal flow intermittency in fluvial ecosystems: effects on structure, function and ecosystem services

Fundació Institut Català de Recerca de l'Aigua, Spain

Spatial and temporal flow intermittency in fluvial ecosystems: effects on structure, function, and ecosystem services (SPACESTREAM)

Keywords	temporary streams, carbon dynamics, decision-support systems, socio-environmental modelling
Start Date	01/01/2018
Project Duration	36
Lead Organisation	Catalan Institute for Water Research (ICRA)
Other Partner Organisations	University of Barcelona, University of Lyon, University of California – Berkeley.
Funding Agency (Country)	Ministerio de Economía, Industria, Competitividad (Spain)
Short Abstract	Climate and global change affect the availability of water resources for human needs, as well as for river ecosystems needs, which are affected by the increasing frequency and intensity of drought periods. SPACESTREAM aims to understand the effects of flow intermittency on rivers, considering the effects on ecosystems and their services. A socio-environmental model will be developed and calibrated in a Mediterranean river network, and this model will be then embedded into a decision-support system for river basin district authorities.
Expected Key Outputs from Project	• 8 scientific publications, 4 of them in the first quartile of Environmental Sciences "Miscellaneous". • 4 oral presentations in international conferences. • Decision-support system (DSS) for river basin district authorities to design management actions. • Implementation of the DSS in at least 2 river basin districts, and presentation at meetings of DG Environment.

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KelpRes: The diversity and resilience of kelp ecosystems in Ireland

National University of Ireland, Galway, Ireland

The diversity and resilience of kelp ecosystems in Ireland (KelpRes)

http://www.nuigalway.ie/kelpres/#d.en.228296

Keywords	Spore banks, population genetics, ecology
Start Date	07/1/2019
Project Duration	24 months
Lead Organisation	National University of Ireland, Galway
Other Partner Organisations	National Biodiversity Data Centre, Seasearch Ireland, University of Alabama at Birmingham
Funding Agency (Country)	EPA (Ireland)
Short Abstract	KelpRes is a timely research project that will enhance our understanding and capacity to monitor kelp forest ecosystem function and resilience along the coast of Ireland. The research will be performed in four work packages that focus on the dominant sub-tidal kelp species, Laminaria hyperborea, also known as Cuvie. Work will begin with an analysis of historical species distribution and associations in Ireland, combining disparate data records from academic and citizen science projects around Ireland. This will feed into two studies of resilience: i) populations genetics of L. hyperborea, which will determine the diversity of alleles within Ireland and in comparison to Europe and ii) 'spore banks' within established kelp forests in the southwest and northwest throughout a year (four seasons) to understand early life stage dynamics and recruitment in these ecosystems. Finally we will develop continued monitoring tools that can be used remotely (COPERNICUS) and in situ (SCUBA, snorkelers, fisheries, etc.) by stakeholders. As wild harvest of kelp forest begins in Ireland, and strong public opposition in the local community drives our need to better understand them.

Expected Key Outputs from Project	The proposed research will further the understanding of kelp ecosystems' context, functions and processes, and use this information to safeguard natural resources for future generations by identifying measures to help the adaptation and reaction to current and future pressures on the aquatic environment. The development of parallel approaches to assess and monitor kelp forests into the future will provide a better understanding of the socio-economic aspects, governance and behavioural changes associated with kelp forest ecosystems, including important issues of preservation, restoration, and the demonstration of the economic value and social benefits which is currently lacking in these iconic coastal ecosystems. This research will result in steering committee and EPA reports which can be translated to policy makers and marine spatial planning (through the EPA DROPLET tool and otherwise). These reports will detail kelp forest population distribution and resilience. Two info-graphics will be created to describe research outputs and species records, accompanied by kelp forest literature (2-page summary from WP1-3), will be placed in national databases (NBDC). At least three open access, peer reviewed publications, and two international conference papers will present the project research to the scientific community.

Contact Information for the Water JPI TAP Action

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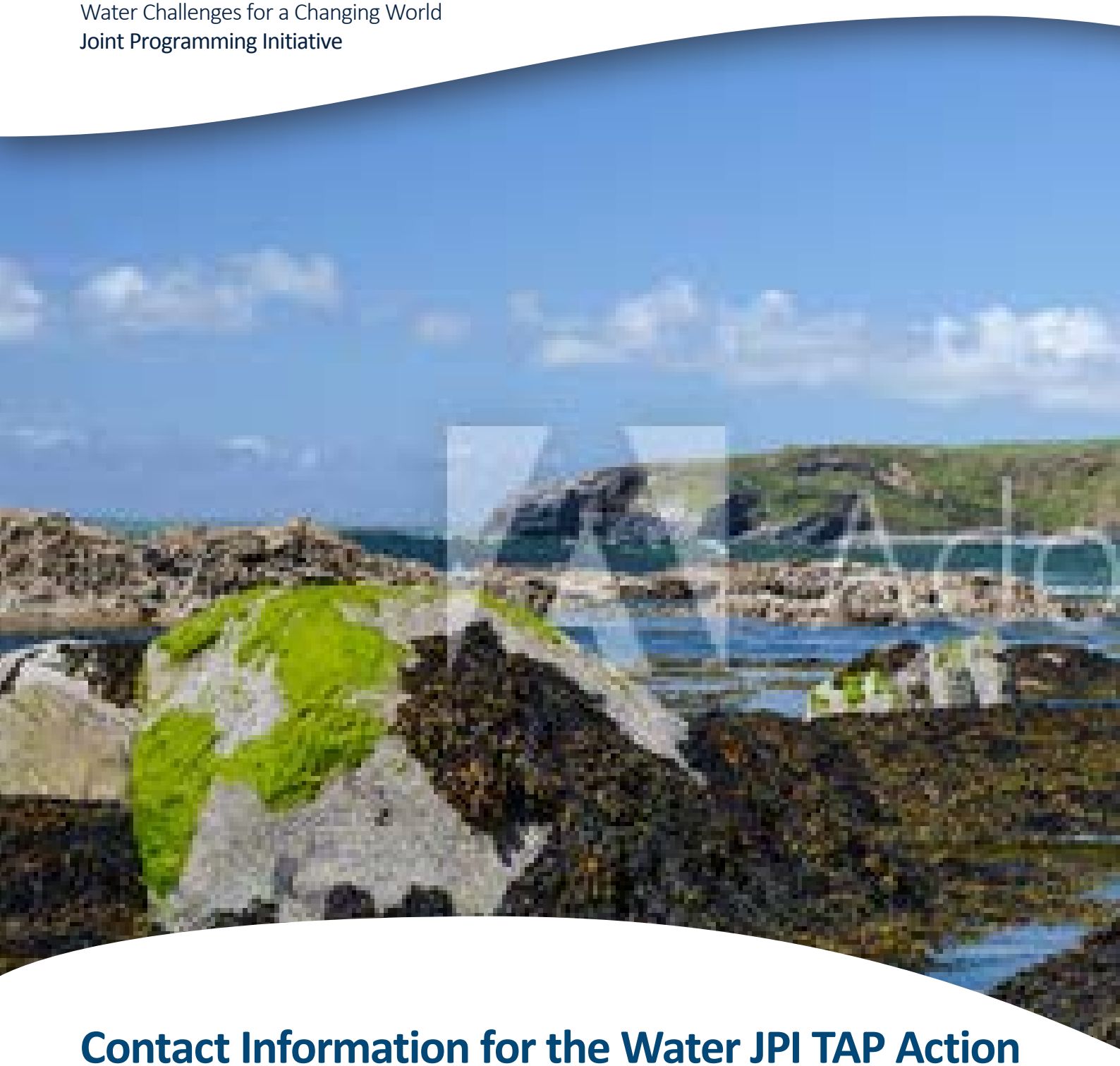

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Water Challenges for a Changing World
Joint Programming Initiative


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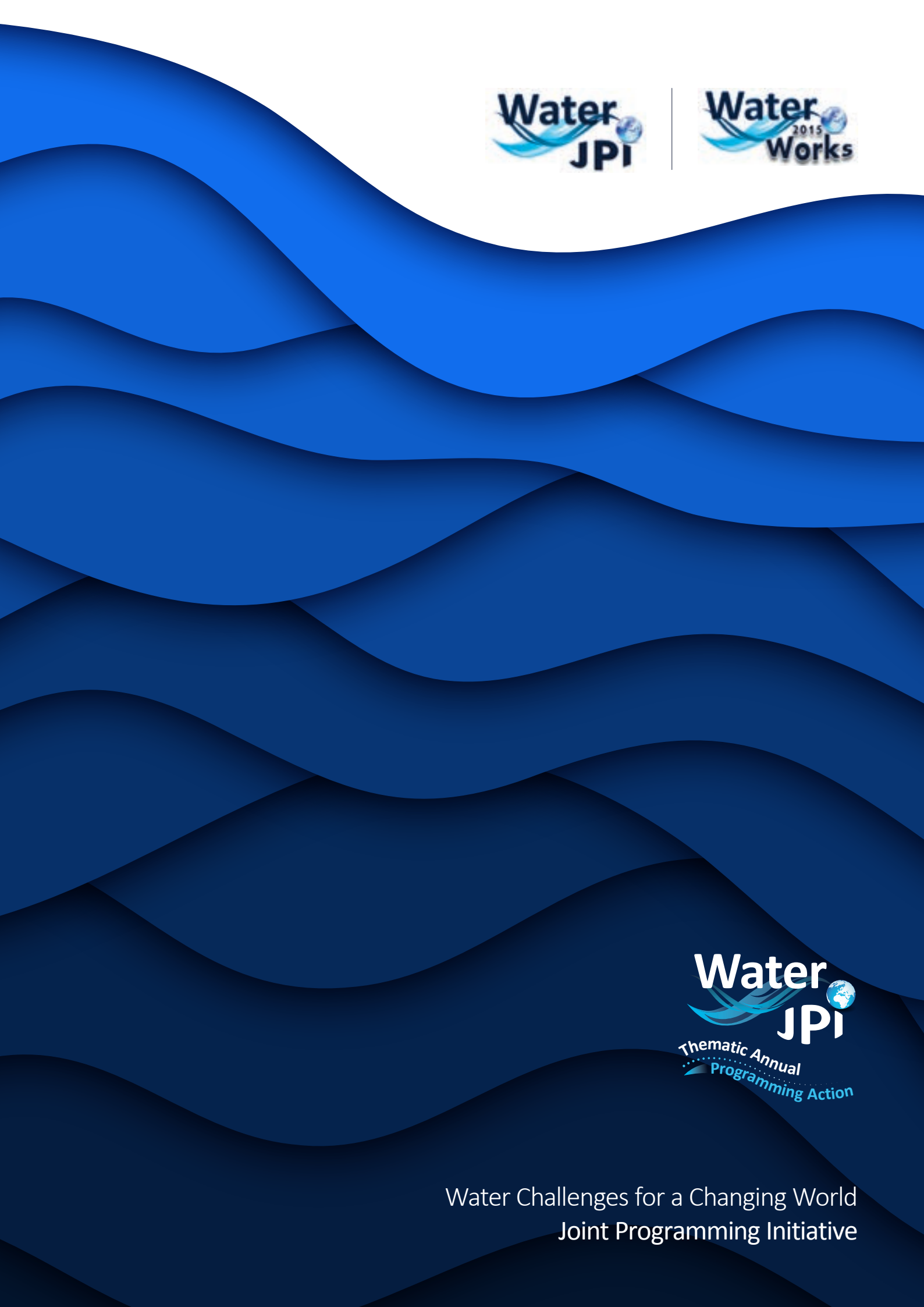
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