INTERNATIONAL MEUSE SYMPOSIUM

ORION

PROGRAMME DE COOPÉRATION TRANSFRONTALIÈRE
GRENSOVERSCHRIJDEND SAMENWERKINGSPROGRAMMA

Interreg

Cofinancé par l'Union Européenne
Medegefinancierd door de Europese Unie

France - Wallonie - Vlaanderen

Wallonie

Orion

Modelling the dynamics of microbiological and ecotoxicological pressures in transboundary water bodies using active sentinel species monitoring and mathematical models

Mélissa PALOS LADEIRO – melissa.palos@univ-reims.fr

UNIVERSITÉ DE REIMS CHAMPAGNE-ARDENNE

UNIVERSITÉ DE NAMUR

LIÈGE université

ACTALIA

ISSeP Institut scientifique de service public

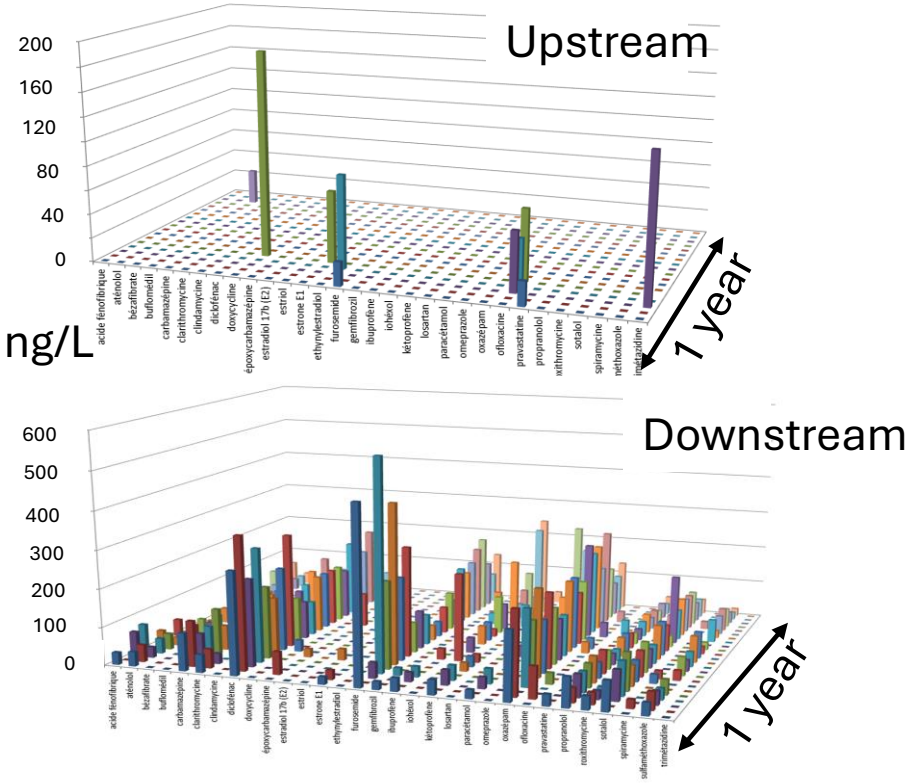
RÉPUBLIQUE FRANÇAISE Liberté Égalité Fraternité

INERIS maîtriser le risque pour un développement durable

The genesis of ORION

Assessment of transboundary water quality, with a focus on pharmaceuticals in the Meuse (DIADEM)

Findings



TRECOPOLEM project: Champagne-Ardenne Region
National Campaign 2012, Botta et al. 2014

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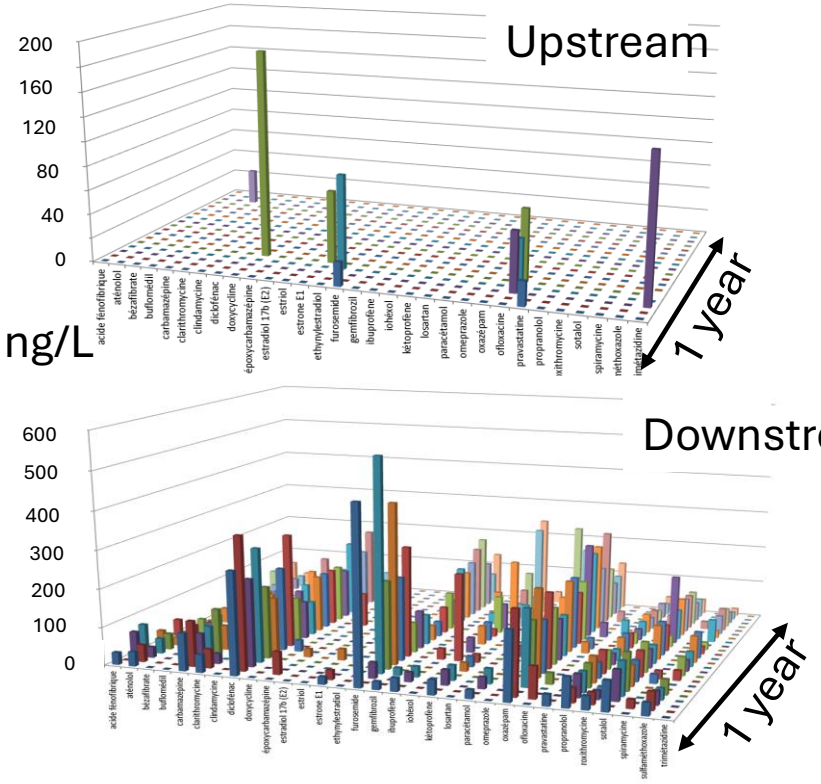
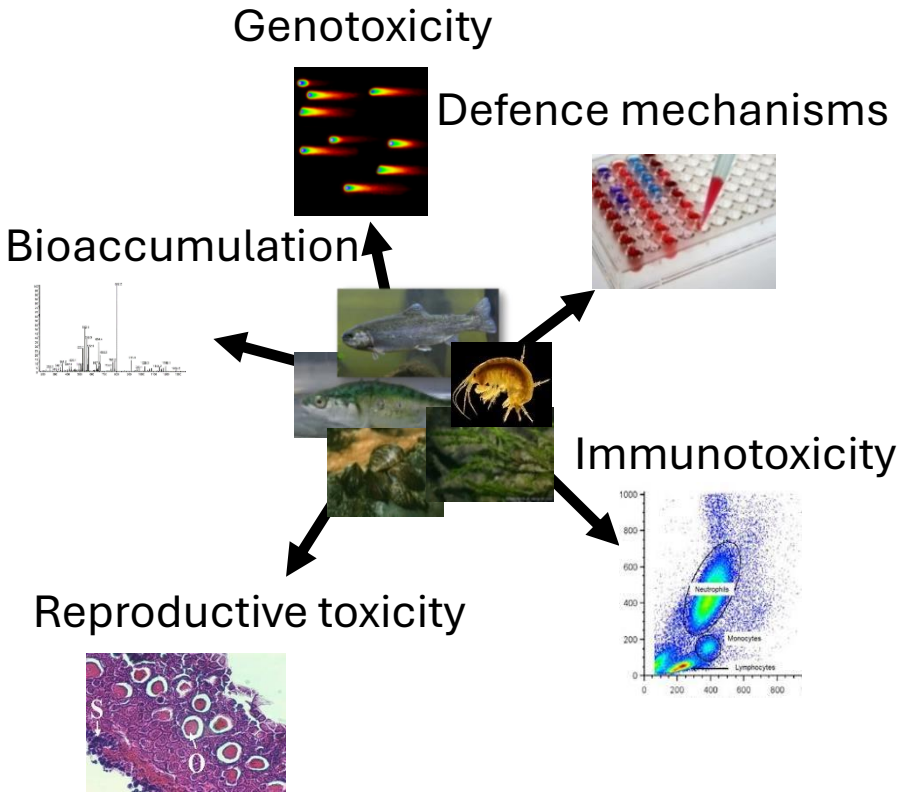


TRECOPOLEM project: Champagne-Ardenne Region
National Campaign 2012, Botta et al. 2014

Objectives

- Determine the presence and behaviour of pharmaceuticals in our rivers
- Assess the ecotoxicity of pharmaceuticals on species inhabiting our rivers: definition of predictive biomarkers
- Develop a monitoring toolbox



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Assessment of transboundary water quality, with a focus on pharmaceuticals in the Meuse (DIADEM)

Experimental strategy: active biomonitoring...
and a multispecies approach

- Based on the biota present in rivers
- Control of organisms + sampling location + exposure duration
- Enables assessment of contaminant presence + toxicity

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ELIDREO

A company spun out of academic research

Standardised bioassay for monitoring the chemical and microbiological quality of water

Who is it for?
Public and private water managers
Industries wishing to assess their impacts on water resources

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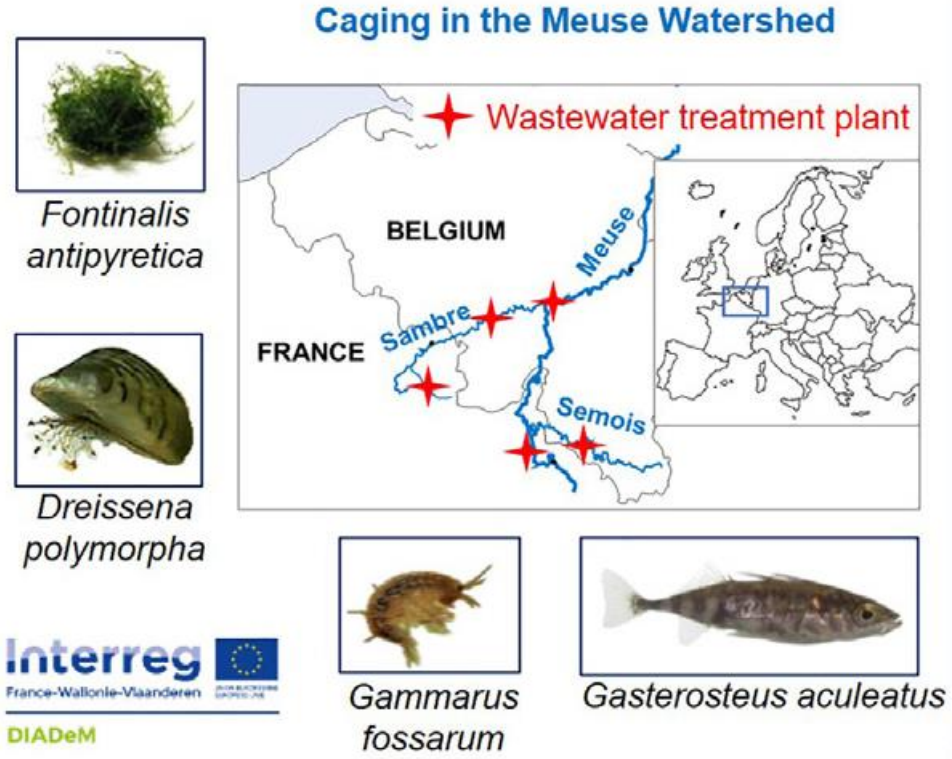

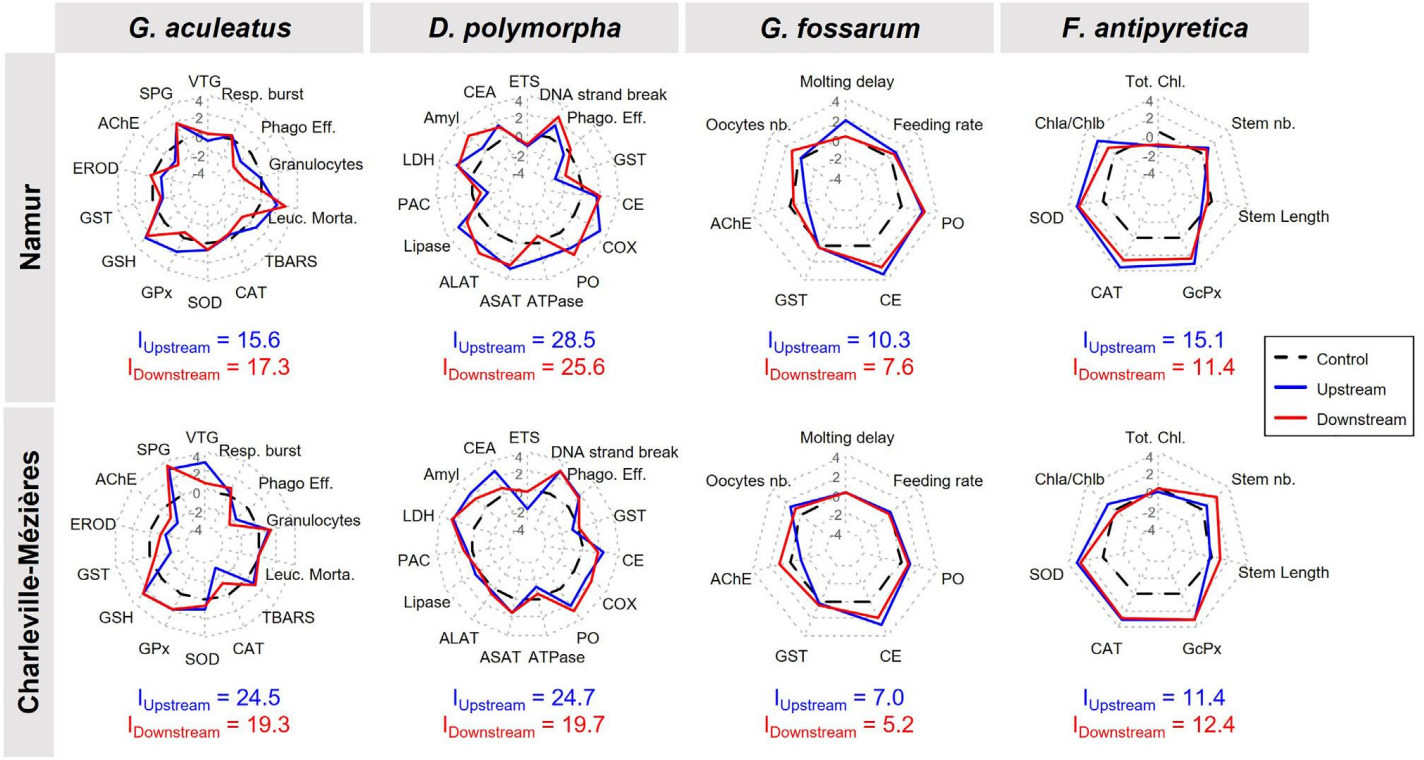

Catteau et al 2022. Interest of a multispecies approach in active biomonitoring: Application in the Meuse watershed. *Science of Total Environment 808:152148*

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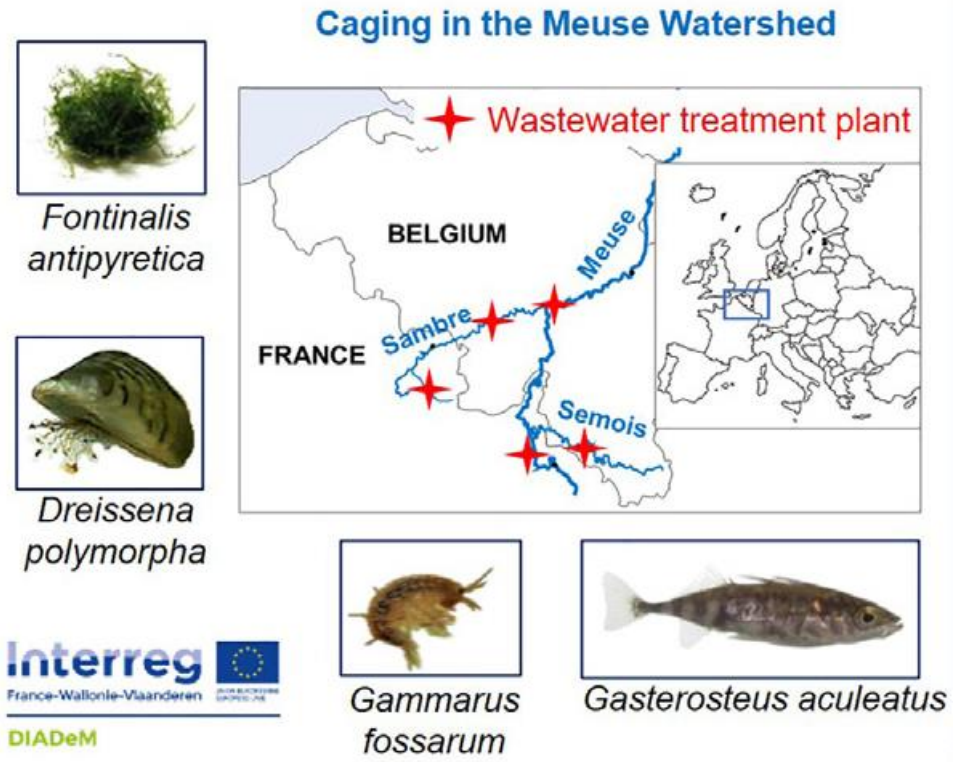

Namur

Charleville-Mézières

ELSEVIER

Journal of Environmental Management

Volume 341, 1 September 2023, 118049

Research article

Integrative biomarker response - Threshold (IBR-T): Refinement of IBRv2 to consider the reference and threshold values of biomarkers

Audrey Catteau [a], Antoine Le Guernic [a], Mélissa Palos Ladeiro [a], Odile Dedourge-Geffard [a], Marc Bonnard [a], Isabelle Bonnard [a], Laurence Delahaut [a], Anne Bado-Nilles [b], Jean-Marc Porcher [b], Christelle Lopes [c], Olivier Geffard [d], Alain Geffard [a]

Meuse watershed. *Science of Total Environment 808:152148*

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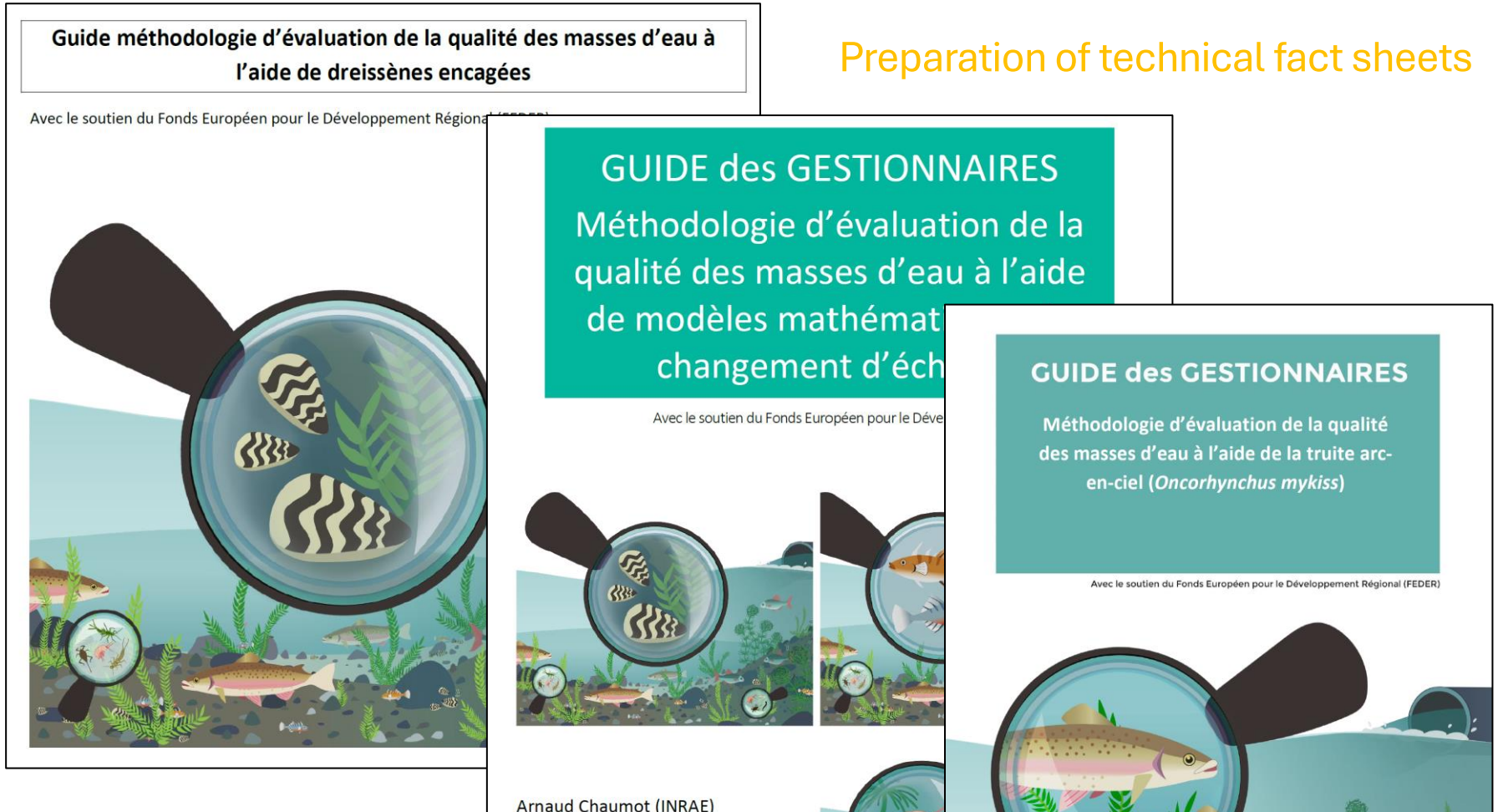
From research to operational tools outcomes



Preparation of technical fact sheets

Scientific publications

metabolites
an Open Access Journal by MDPI

toxics
an Open Access Journal by MDPI

New challenges: bathing waters

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8 LACS POUR LA BAIGNADE EN ARDENNES

Des plages de sable et une eau de qualité : 26 sites où se baigner en Wallonie pour profiter de la météo estivale

Les températures devraient grimper jusqu'à 30 °C ce samedi 20 juillet en Belgique. L'occasion d'aller vous rafraîchir dans les rivières et les lacs en Wallonie. Avec un total de 26 lieux contrôlés, vous avez l'embarras du choix.

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Plan d'accélération EAU 2021

AGENCE DE L'EAU RHIN•MEUSE

New challenges: bathing waters

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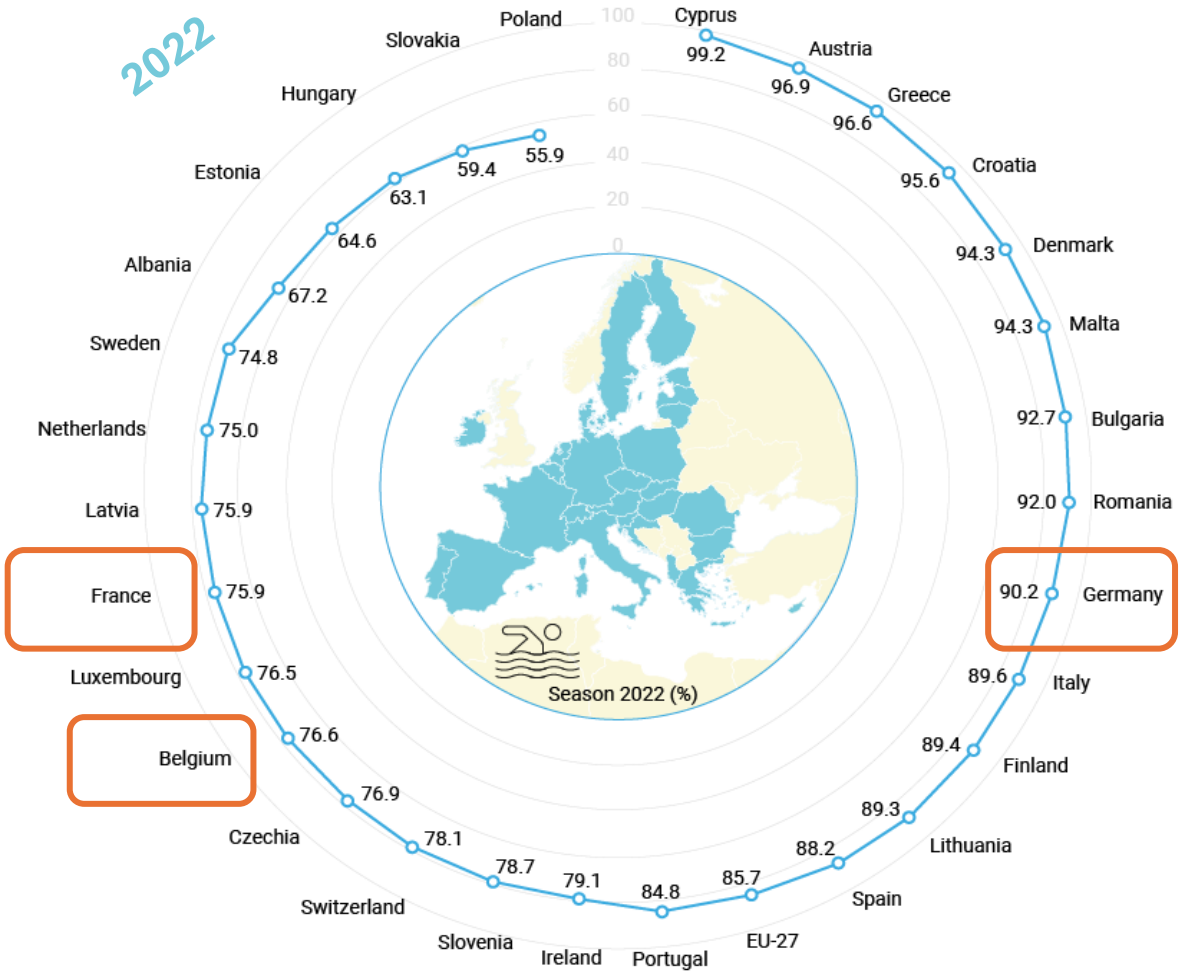

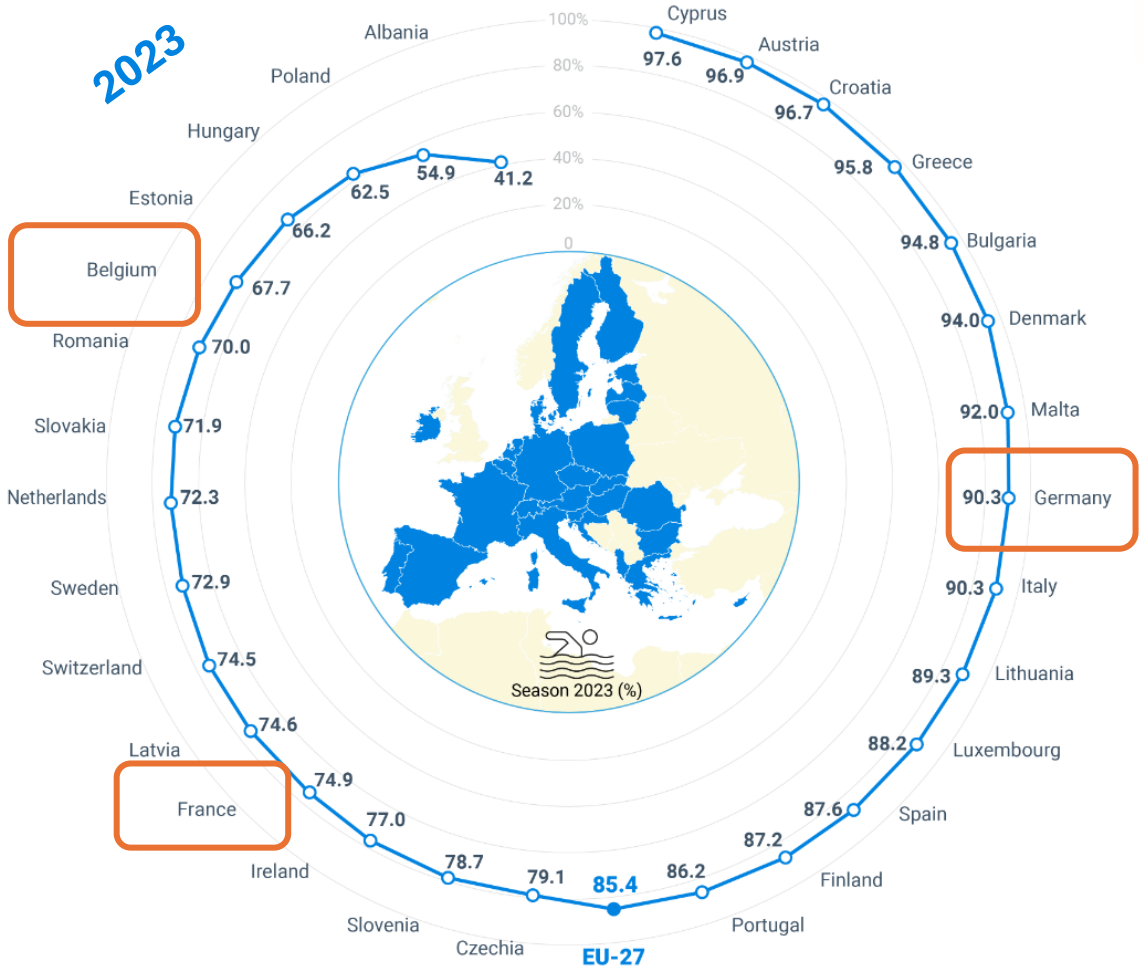

Source: WISE bathing water quality database (data from 2022 and 2023 annual reports by EU-27 Member States, Albania and Switzerland).

New challenges: bathing waters

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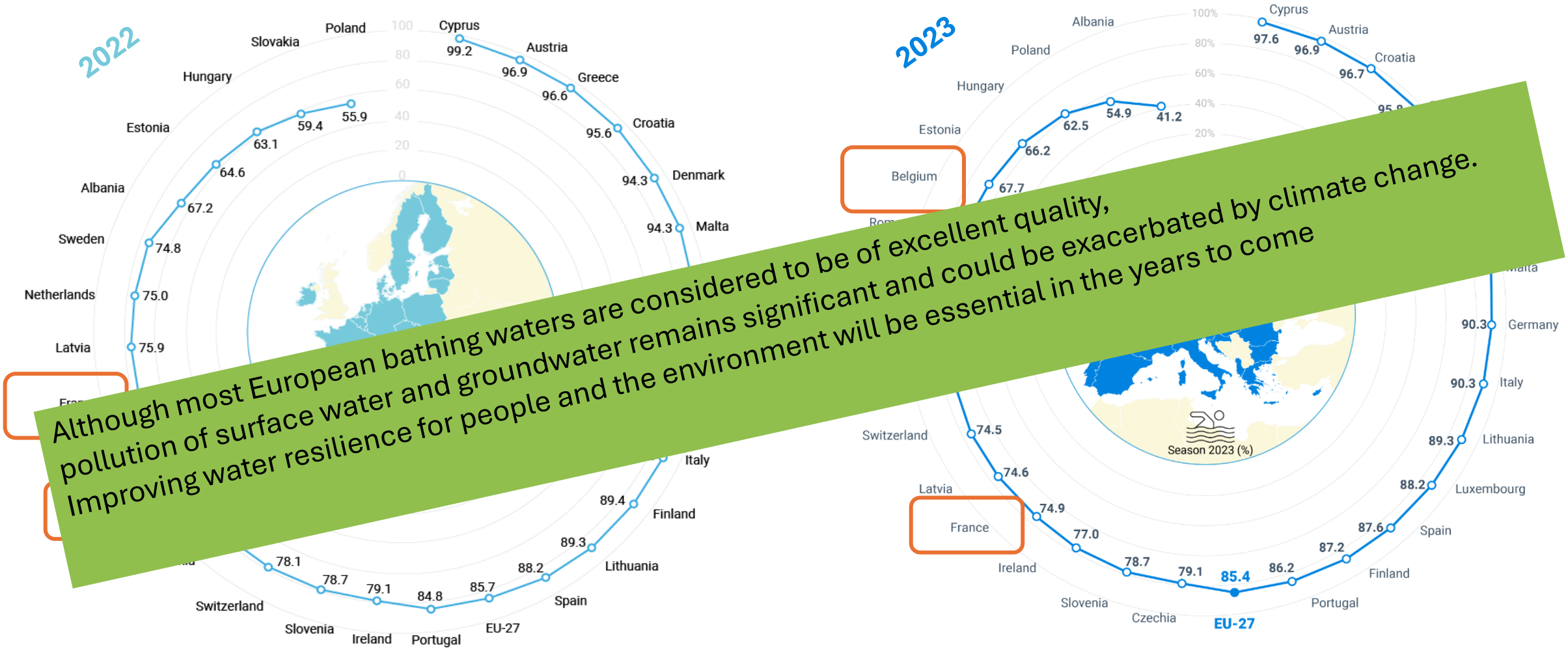


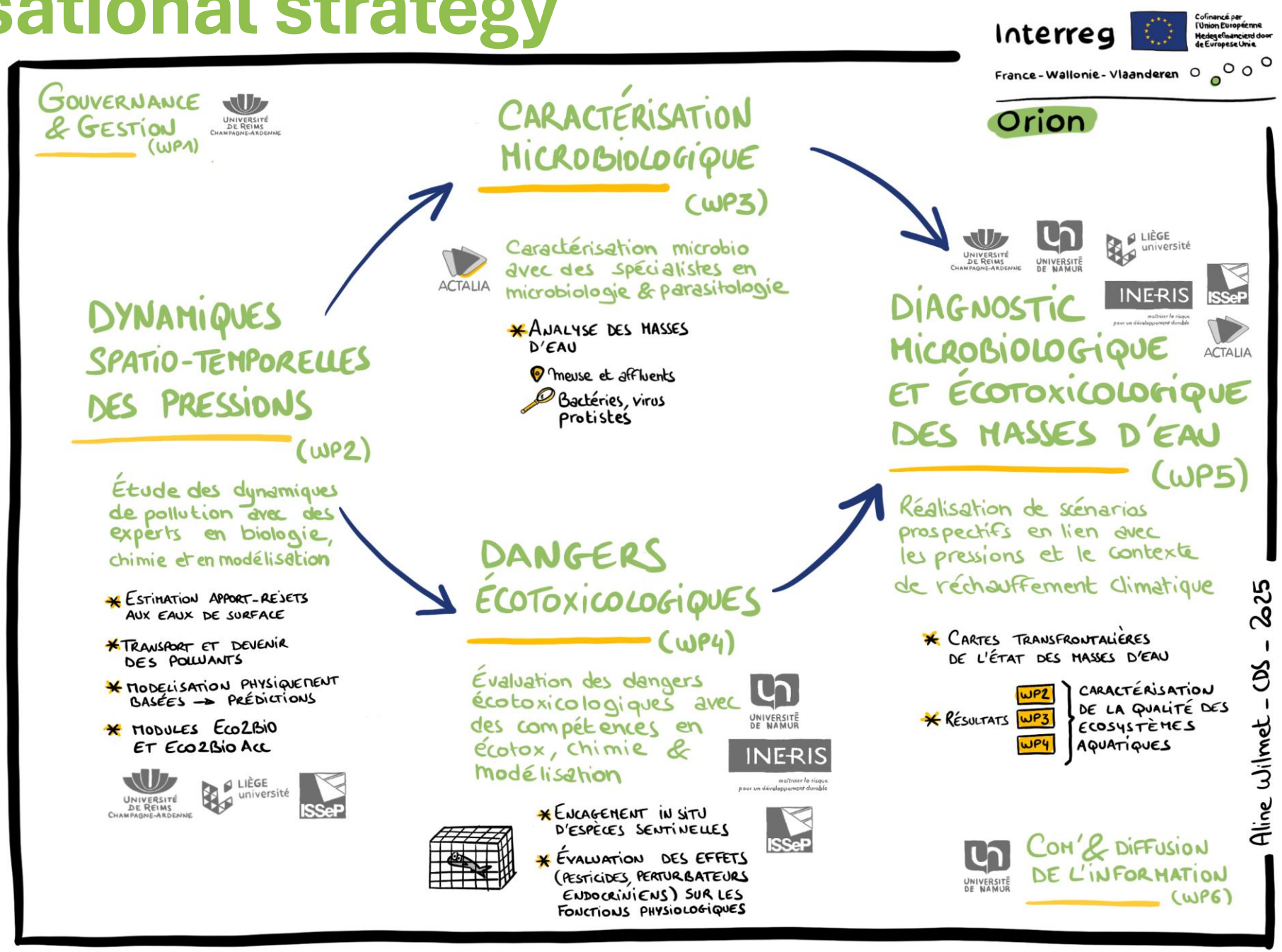
Although most European bathing waters are considered to be of excellent quality, pollution of surface water and groundwater remains significant and could be exacerbated by climate change. Improving water resilience for people and the environment will be essential in the years to come

Source: WISE bathing water quality database (data from 2022 and 2023 annual reports by EU-27 Member States, Albania and Switzerland).

ORION’s ambitions

Holistic view of pressure dynamics affecting the Meuse transboundary aquatic ecosystems
Assess the vulnerabilities and resilience capacities of the Meuse International River Basin District, according to water uses
Describe and project the state of aquatic environments under current or scenario-based conditions

Organisational strategy



A strong partnership

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Lead partner:

Université de Reims Champagne-Ardenne

Sebio UMR-I 02 Stress Environnementaux et BIOsurveillance des milieux aquatiques

6 Operators:

Université de Reims Champagne-Ardenne

Sebio UMR-I 02

ESCAPE UR 7510

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ACTALIA

Université de Namur

Confluent des Savoirs Université de Namur

LIÈGE université

ISSeP

9 Associated partners:

République Française Liberté Égalité Fraternité

Agence de l'Eau Artois-Picardie

République Française Liberté Égalité Fraternité

Agence de l'Eau Rhin-Meuse

Société Publique de Gestion de l'Eau SPGE

Wallonie agriculture SPW

Wallonie environnement SPW

Contrats de rivière de Wallonie

Vlaamse Milieumaatschappij

Thank you for your attention

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More information about the Mussel Bioassay used:

Audrey Catteau
Founder of ELIDREO

Email: a.catteau@elidreo.com