Autorità di bacino distrettuale delle Alpi Orientali

HIGH-SKILLED PLANNING ABILITY AT WFD'S SERVICE: THE RECENT EXPERIENCES OF EASTERN ALPS RBD

19th "EUROPE-INBO" INTERNATIONAL CONFERENCE
for the Implementation of the European Water Directives

Annecy, 26-29 September 2022

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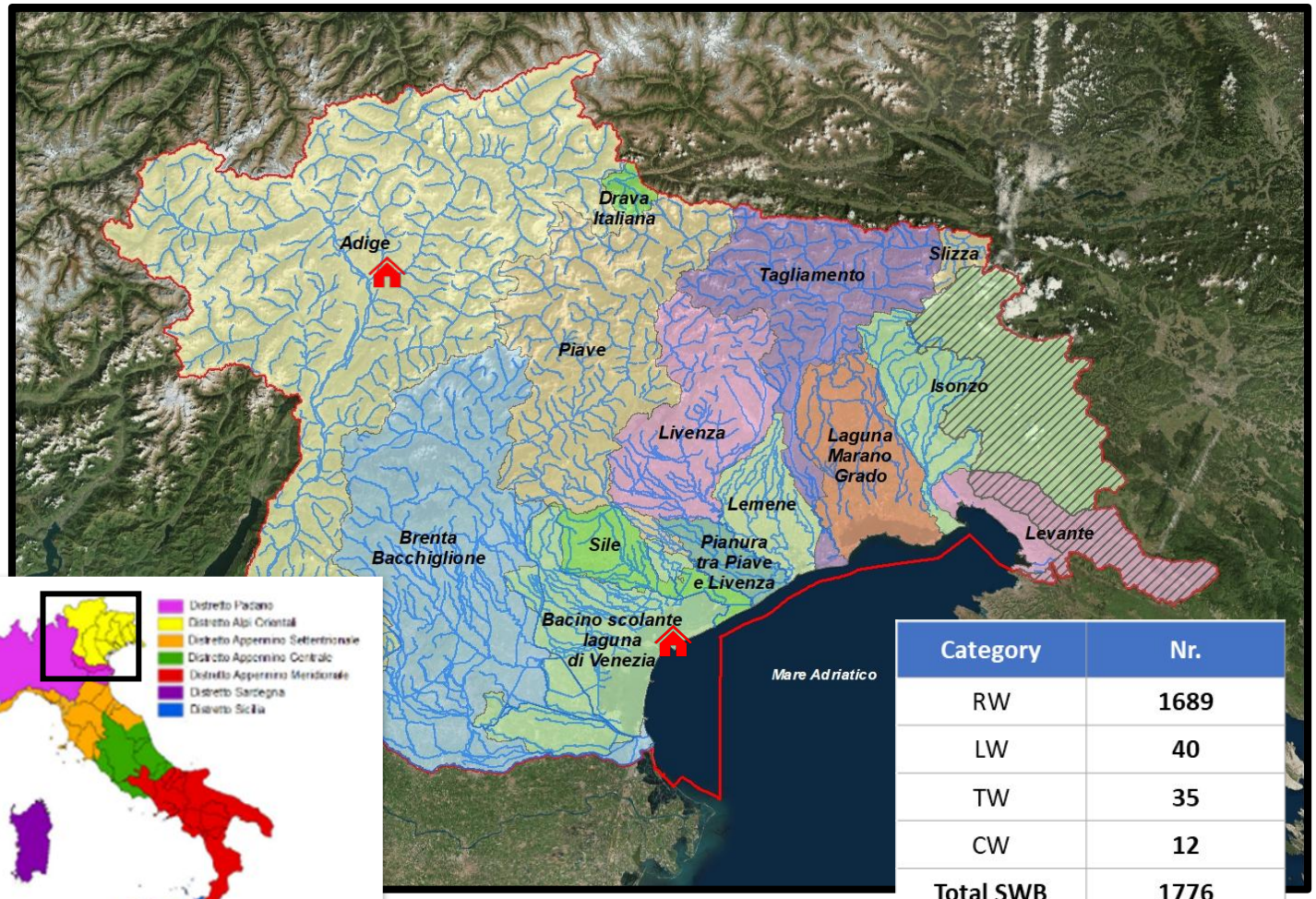
Eastern Alps River Basin District Authority (Italy)

The Eastern Alps River Basin District (ITA), Italy



Category	Nr.
RW	1689
LW	40
TW	35
CW	12
Total SWB	1776
Total GWB	125

- 34.000 sqkm
- 7.000.000 inhabitants
- 5 Administrative bodies

  Regione del Veneto
  Regione Friuli Venezia Giulia
  Provincie Autonome di Trento e Bolzano
  Provveditorato alle Opere Pubbliche

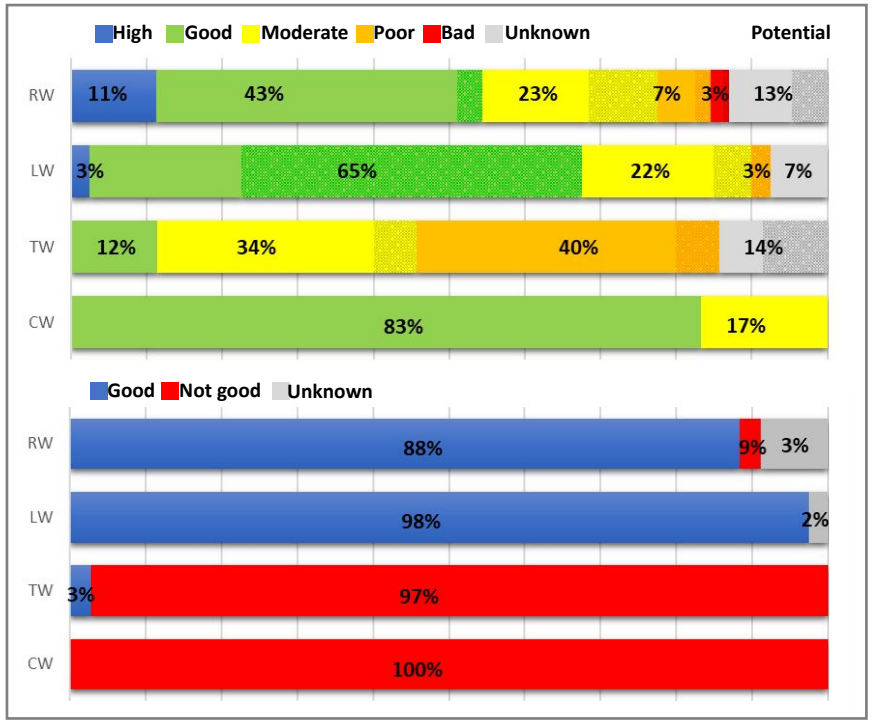
- 14 RBs, including 4 transboundary RBs

  CH (Drava Italiana)
  AT (Slizza)
  SI (Isonzo, Levante)

- Inland surface water, groundwater, transitional and coastal waters

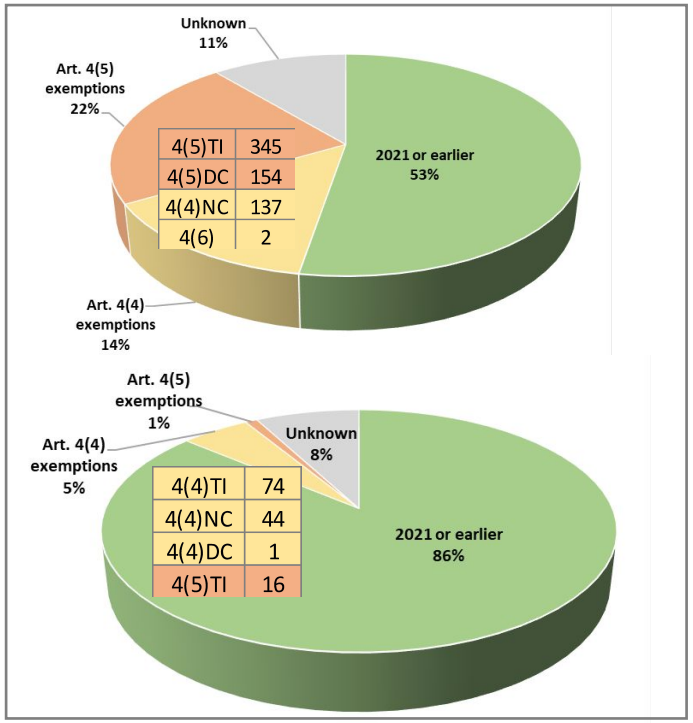
Conditions of ITA District surface waters (3rd RBMP)

Status/potential



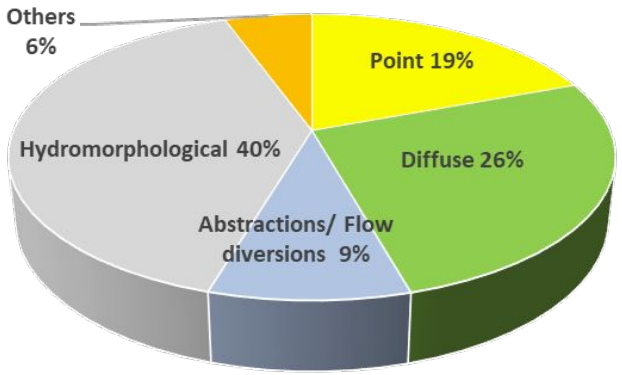
- **87%** ecological and **91%** chemical quality classified
- Eco: high/good for **62%** classified SWB
- Chem: good for **94%** classified SWB
- Nearly all TW-CW (46 out of 47) are failing good chem status (biota)

Objectives and exemptions



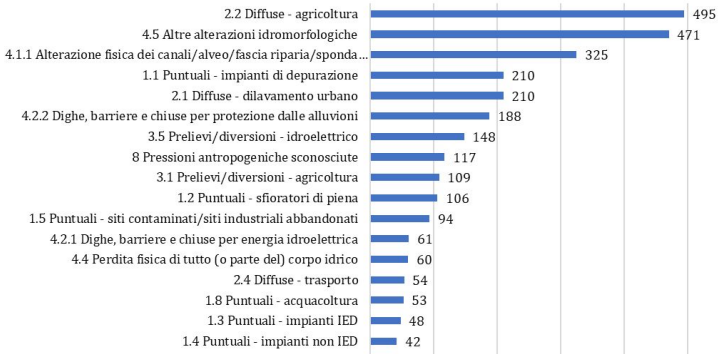
- **53%** SWB achieved eco objectives
- **86%** SWB achieved chem objectives
- Exemptions mainly set for eco objectives (art.4(5) due to tech. infeasibility and disproportionate costs)
- Chem exemptions mostly art.4(4) beyond 2027 due to:
  - Natural conditions
  - Broader time extensions allowed for 2013/39 substances

Significant pressures



3061 significant pressures (55% of SWB)

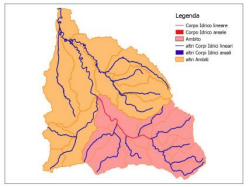
- 40% hydromorphological alterations
- 26% diffuse sources (mainly agriculture and urban runoff)



Progress and challenges in the 2nd cycle

2013/39 Directive application: new substances, **partial*** biota monitoring (2016→)

EC Decision 2018/229 application: new BQEs/boundaries, NISECI **test*** application (2016→)



Pressures-impacts analysis: application of 2018 national guidance (2019→)

HMWB, AWB full identification (2020 district metodology)

POTENZIALE ECOLOGICO	Colore convenzionale
Buono e oltre	
Sufficiente	
Scarso	
Cattivo	

+ **GEP (RW, LW):** application of 2016 national methodology

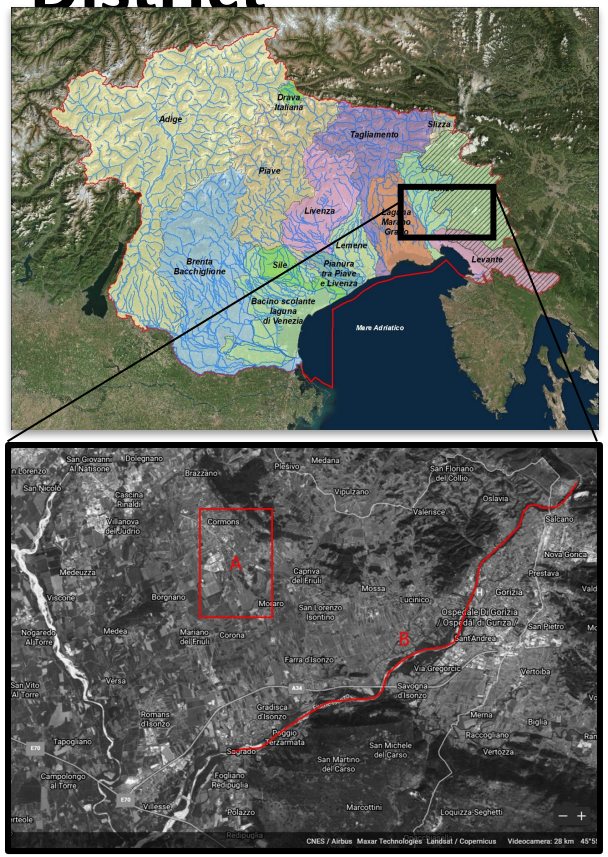
3rd River Basin Management Plan
December 2022

2nd River Basin Management Plan
December 2015

- Further improvement of chemical/ecological monitoring* (technical and economic limits!)
- Achieve full classification of WB status/potential
- Definition of substance-specific measures (es. PBTs)
- Improvement of Inventory of emissions, discharges and losses of priority substances and pollutants (art.5 Dir.2008/105/EC)
- Incorporating climate change is not easy (lack of feasible tools)

EU Pilot 7304/15/ENVI
EU Pilot 9722/20/ENVI

Modeling agricultural pollution: pilot-scale experiences in the ITA District



Interreg ITALIA-SLOVENIJA GREVISLIN

Progetto strategico co-finanziato dal Fondo europeo di sviluppo regionale
Strateški projekt sofinancira Evropski sklad za regionalni razvoj

UNIONE EUROPEA
EVROPSKA UNIJA

GReen VIpava/VIpacco, Isonzo/SOca and Livenza INfrastructure

Green infrastructures for the conservation and improvement of the state of protected habitat and species along the rivers

WP3. Development of modeling tools to assess the impacts of agriculture on surface waters: modeling of transport and fate of the most relevant **contaminants (pesticides, nitrogen)** in the study area

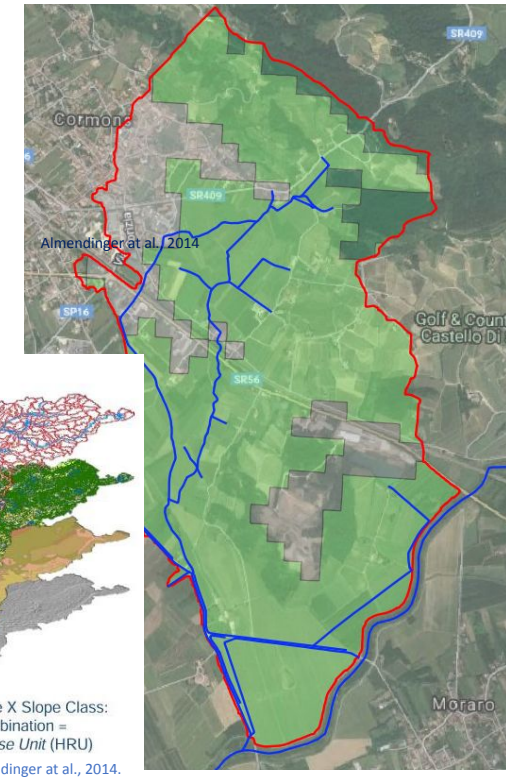
Context:
Agricultural land use (extensive vineyard) in a transboundary RB (Isonzo/Soča)

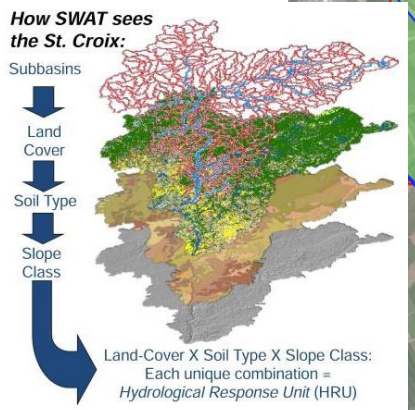
Objectives:

- Enhance knowledge on diffuse agricultural pressures (crop management, pesticides and fertilizers application)
- Provide tools to estimate contaminant reductions in water in response to simulated management practices

Two pilot projects:

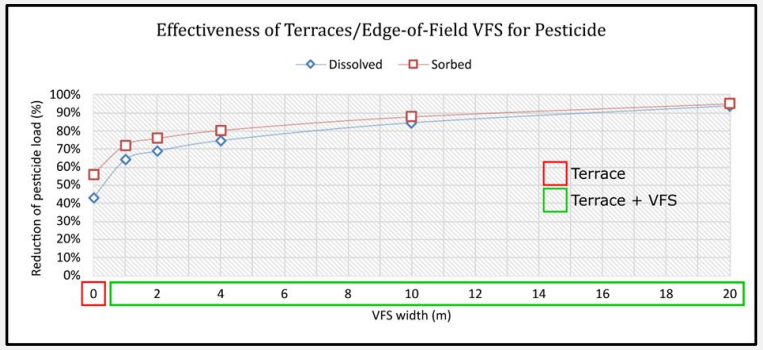
A. Assessment of impacts from agriculture on water quality through **SWAT model** application (Bisinta sub-basin pilot application)
B. Assessment of Isonzo/Soča self-remediation as a function of its water regime by means of our **ORGANICS** tool (available as free plugin for QGIS)

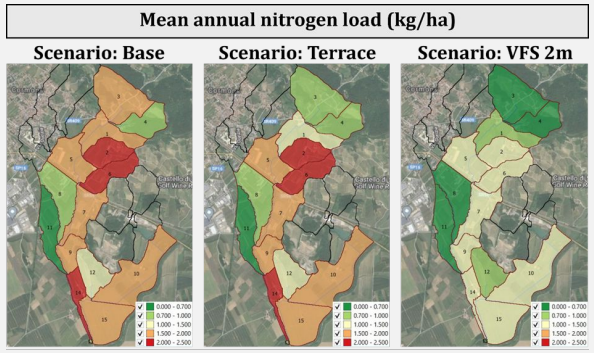


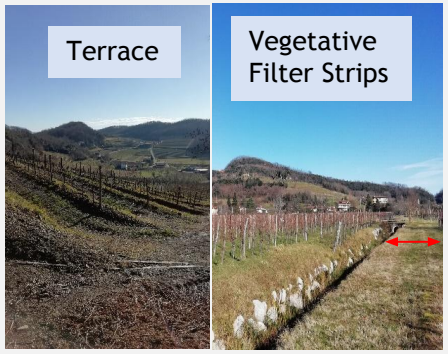


Almendinger at al., 2014.

GREVISLIN: main results





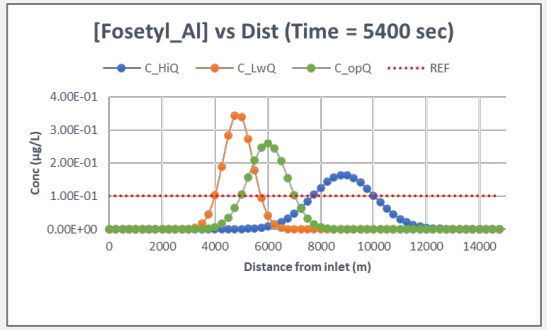


Pilot project A:

Significant reduction of average annual contaminant loads through management (Terrace/VFS):

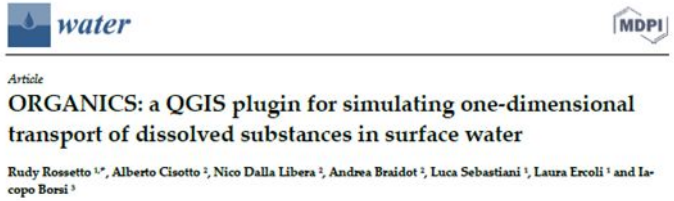
- 40-90% respect to «base» scenario
- 60-70% with 2m VFS + Terraces

Significant sediment, N and P reduction



Pilot project B:

- Self-remediation processes in the Isonzo river are based on advection-dispersion mechanism. Small contribute from reaction (long pesticides half life vs. short in-stream residence time)
- Lower river discharge causes higher contaminant concentrations, while higher river discharge allows self-purification and supports the improvement of water quality
- Estimated «optimum» river discharge for continuity restoration ensures both self-remediation processes and the good functioning of the river ecosystems


water

MDPI

Article

ORGANICS: a QGIS plugin for simulating one-dimensional transport of dissolved substances in surface water

Rudy Rossetto [1,*], Alberto Cisotto [2], Nico Dalla Libera [2], Andrea Braidot [2], Luca Sebastiani [1], Laura Ercoli [1] and Iacopo Borsi [3]

- ✔ Improved knowledge about agricultural pressures and their mitigation
  - ✔ VFS are feasible and effective mitigation measures
  - ✔ Pesticide modeling provide knowledge to improve chemical monitoring programmes
- ✔ Provided basic modeling tools and skills at WFD's service to be further developed
- ✔ Reinforced IT-SI cross-border cooperation

Capitalizing at basin scale: SIMBA model

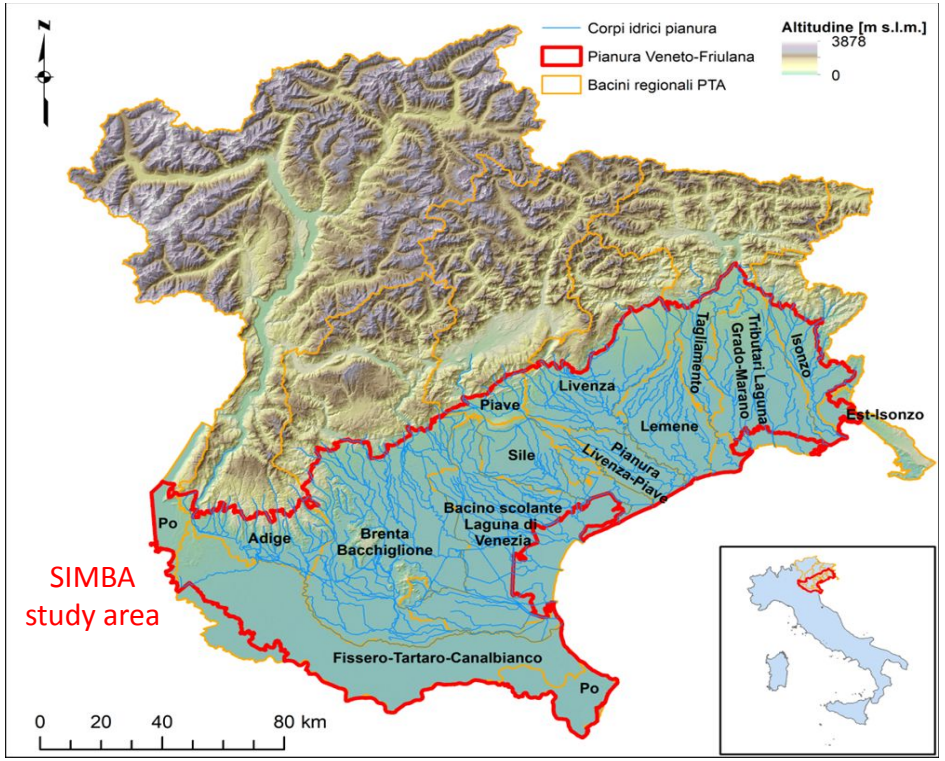
Autorità di bacino distrettuale delle Alpi Orientali · FSC Fondo per lo Sviluppo e la Coesione · Piano Operativo Ambiente · Ministero della Transizione Ecologica · Università degli Studi di Milano

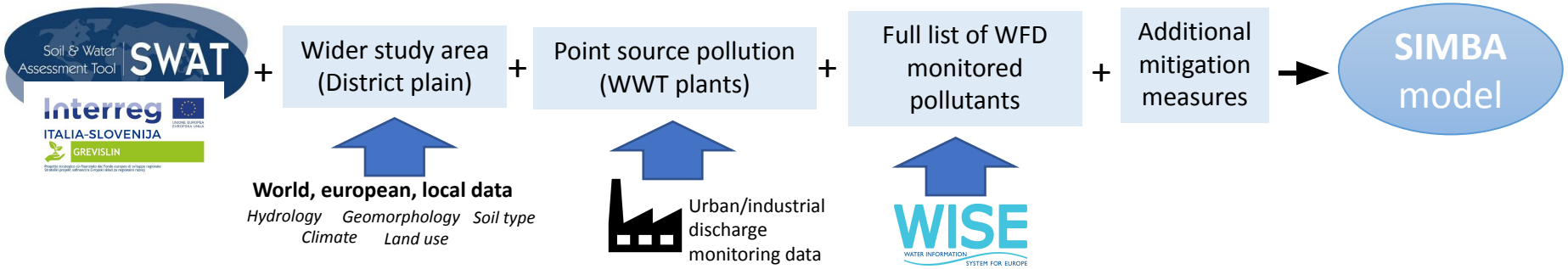
Development of a Mass Balance Model for nutrients and pesticides pollution in the ITA District (**SIMBA project**)

Duration: 24 months (Oct 2021 – Sep 2023), collaborating with Università degli Studi di Milano
Funded by Italian Ministry of Environment

Objectives:

- Provide a modeling tool to assess nutrients and pesticides fate and transport in the District (point and diffuse source pollution from agriculture and urban development)
- Support pressures-impact analysis and prioritization of mitigation measures
- Support the improvement of Dir. 2008/105/EC inventories
- Simulate future scenarios (including different land/water uses and climate change)

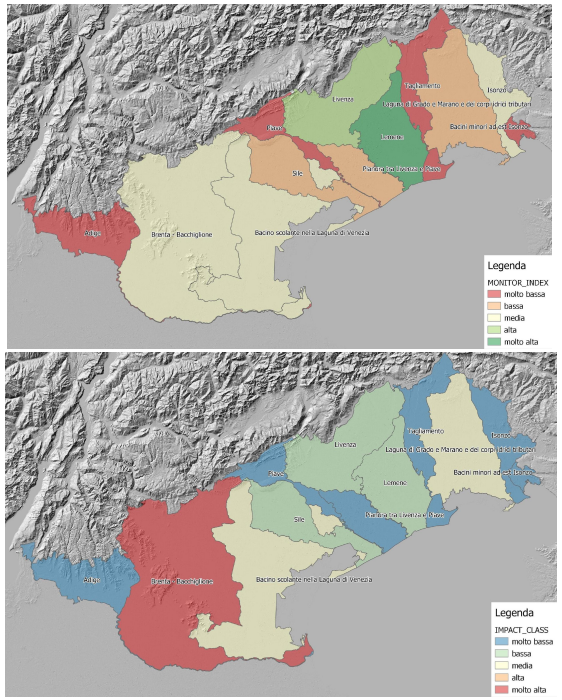




Phase	Duration (months)	Target/Output
0	2	Preliminar study
1	4	DB geo-database implementation
2	**6**	**Pollutant clustering** **Model setting** **Preliminary simulations**
3	6	Model implementation and calibration
4	5	CC scenario implementation Training & Dissemination

SIMBA: preliminary results and skills at WFD's service

Preliminary results from phases 0-1-2



- SWAT model is suitable to be implemented in the whole ITA plain area
- Single basin modeling is an appropriate approach to fit at best local conditions and data availability
- Lack of quali/quantitative monitoring data for calibration in highly-impacted basins
- Clustering of substances need to be basin-specific in order to be fit for local monitoring information

…and lessons learned:

Advanced skills to improve pressures and impact analysis

*Information on **where** and **how** extend WFD quali-quantitative monitoring networks (No result is anyway a result!)*

CC Scenarios assimilation

Measures prioritization for the updating of RBMP PoM

Clearer «beyond 2027» sight

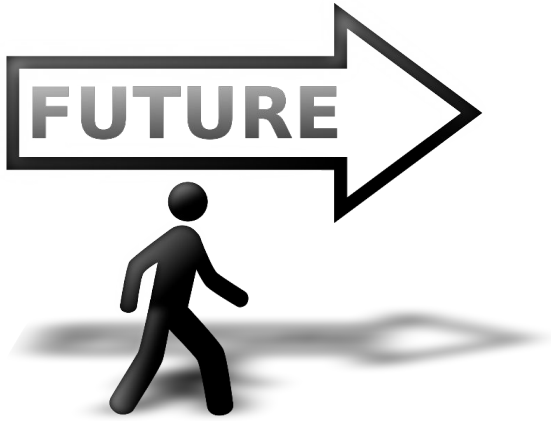
4th River Basin Management Plan

Next steps (Phases 3-4) and expected outcomes

- Full model implementation and calibration
- Land use, water use, climate change scenarios simulations

Conclusions

- Improving DPSIR framework is a fundamental way to improve WFD implementation
- Useful tools can be developed through the capitalization of results from pilot-scale experiences (role of European and national projects)
- Understanding primary shortcomings allows to prioritize improvement actions
- **"What to do beyond 2027?"** Key-elements to work on in the 3rd cycle:
  - ✔ Strengthen pressures analysis for heavily impacting pressures (e.g. agriculture)
  - ✔ Simulate water and land use scenarios and the effect of specific mitigation measures
  - ✔ Assimilate climate change scenarios



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Thank you for your attention!

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