



GISBLOOM Project

Hand in hand for healthy surface and coastal waters

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BACKGROUND

Eutrophication poses the biggest threat to the Finnish inland and coastal waters, with highest nutrient loads from agriculture.

Climate Change may the strengthen symptoms of eutrophication.

Resource efficiency and circulation of nutrients in agricultural production need to be optimized together with other river basin management measures.

Cost-efficient Implementation of River Basin Management requires participatory operations model and coherent monitoring and modelling tools.

The GISBLOOM project demonstrated

New tools and operations model to

- Conserve and restore ecological status of surface waters
- Improve cost-efficiency of river basin management
- Participate public in the monitoring and management
- 11 river basin plans

MAIN EU POLICY(IES) TARGETED

Water Framework Directive (2000/60/EC)

Marine Strategy Framework Directive (2008/56/EC)

PROJECT'S IMPLEMENTORS

Coordinating Beneficiary: Finnish Environment Institute

Beneficiaries (5): Arbonaut Ltd., Päijät-Häme Vesijärvisäätiö Foundation, The Association for Water and Environment of Western Uusimaa (LUVY), Zoological Station, University of Helsinki (Tvärminne), Centre for Economic Development, Transport and Environment in South Ostrobothnia.

Partners: Local management projects together with associated stakeholders.

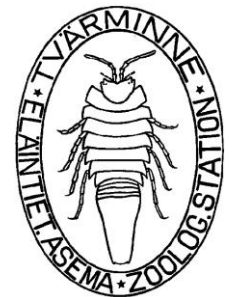


S Y K E

arbonaut



Association of
WATER and ENVIRONMENT
of Western Uusimaa



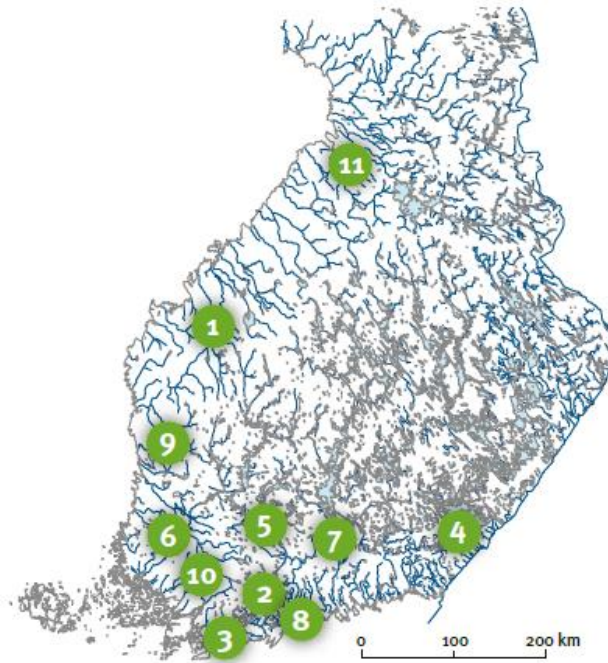
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Centre for Economic Development,
Transport and the Environment

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Demonstrations in eleven Finnish river basin management plans



The tools developed were tested in the following pilot areas:

- 1 The River Lapuanjoki
- 2 Lake Hiidenvesi
- 3 The Pohjanpitäjänlahti bay and the sea area off Tvärminne
- 4 Pien-Saimaa lake area
- 5 Lake Vanajavesi
- 6 Lake Pyhäjärvi in Säskylä
- 7 Lake Vesijärvi in Lahti
- 8 The River Vantaanjoki and the sea area off Helsinki
- 9 The River Karvianjoki
- 10 The River Paimionjoki
- 11 The River Temmesjoki

RESULTS

Environmental in long term:

- **Decreased** frequency and extend of algal blooms.
- **Adaptation of management** to climate change impacts.

Outputs:

- **Engagement of public to participatory monitoring and management**
- **Improved understanding and forecasting** of algal blooms
- **Plans of cost-efficient management measures**
- **Integrated operations model and web-based tools and services**
- **Demonstration** in 11 pilot river basins
- **New consultancy services** for river basin managers, stakeholders and public

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Tools for the big picture

- The tools which were put to the test are part of www.vesinetti.fi and the [GisBloom operations model](#)
- [Nutrient loading estimation tools](#) give an indication of the amount and type of nutrients water will pick up while flowing through a specific catchment area, depending on land use and other activities in the entire catchment.
- [Ecological status estimation](#), the [open-access Lake Load Response \(LLR\) system](#) helps predict the effect of phosphorus and nitrogen loading on the concentration of said elements as well as of a specific kind of chlorophyll in a given lake.

Tools ...

- Earth observation and automatic measurements further supported ecological classification. Based on information extrapolated from satellite images, the project drew up water quality maps. In addition, **automatic measuring stations** were established at four of the pilot sites to keep an eye on a number of variables such as nitrate concentration, oxygen, water temperature, and salinity that can play a role in algal blooms.
- Two socioeconomic estimation and decision-making tools help determine and compare the cost-effectiveness of a variety of individual mitigation measures and their combinations at catchment scale as well as the recreational value of water bodies when considering improved water quality.

Results and feedback ...

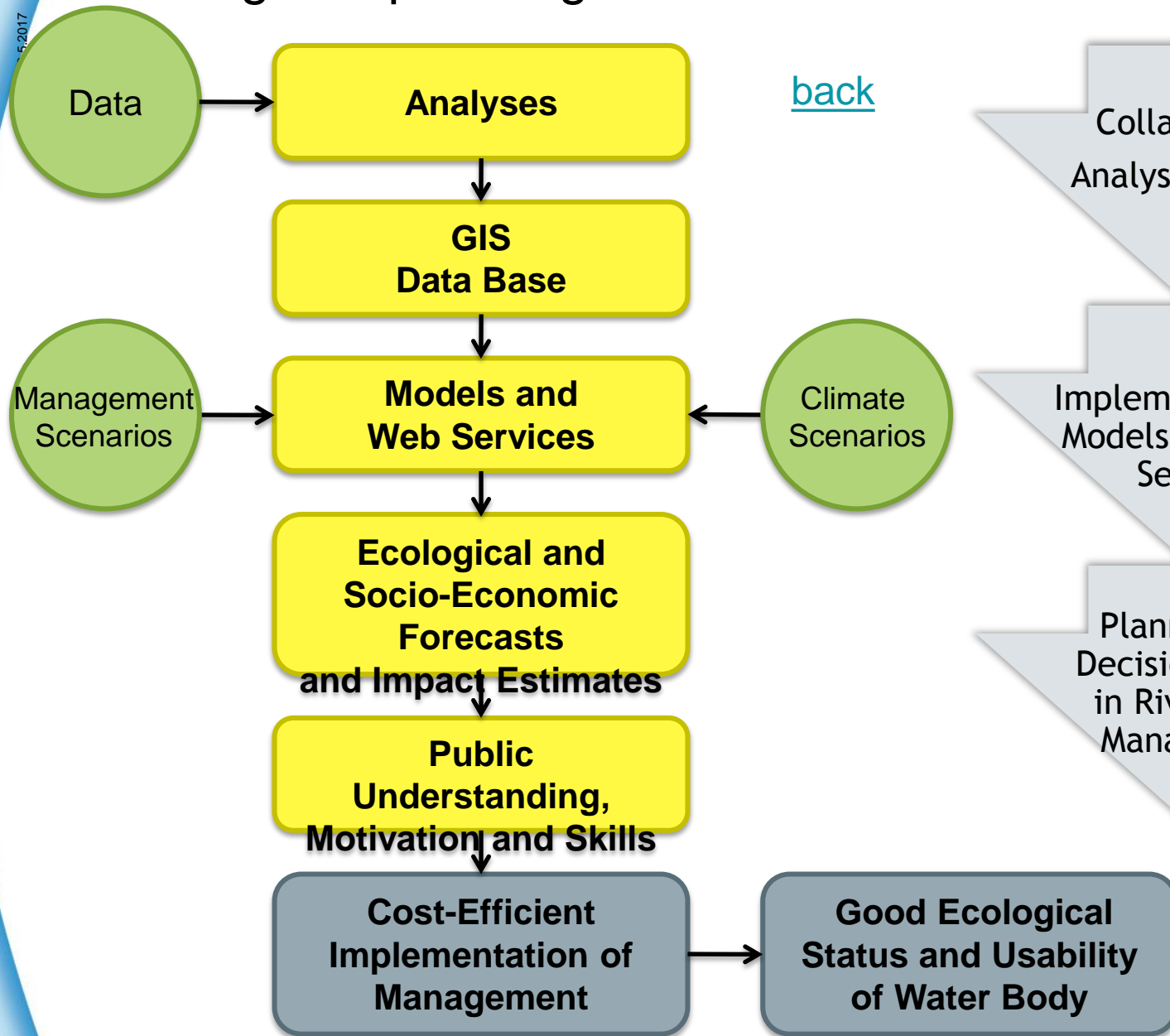
- The great success of **GisBloom's tools and operations model is proven** by the fact that they have been adopted in **Finland**. SYKE established a **consultancy service shortly after the completion of the project**, which continues to provide support to the Finnish Ministry of the Environment and other authorities and stakeholders.
- On going demonstrations: Integrated monitoring and management of **resources efficiency and circulation of nutrients in agriculture**
- The available **data and models are integrated into river basin management plans** and thus contribute to the environmental objectives of the EU Water Framework Directive (2000/60/EC), the Marine Strategy Framework Directive (2008/56/EC) and the Nitrates Directive (91/676/EEC).

Summary

- The collaboration of 70 researchers and experts from SYKE and numerous other partner organizations participating in GisBloom was very fruitful.
- During the project, the tools we developed were tested in real-life pilot areas across Finland.
- It was a good opportunity to demonstrate our methods and get feedback on them.
- This kind of integrated project is really difficult to fund.
- Therefore, it would have been impossible without LIFE.”

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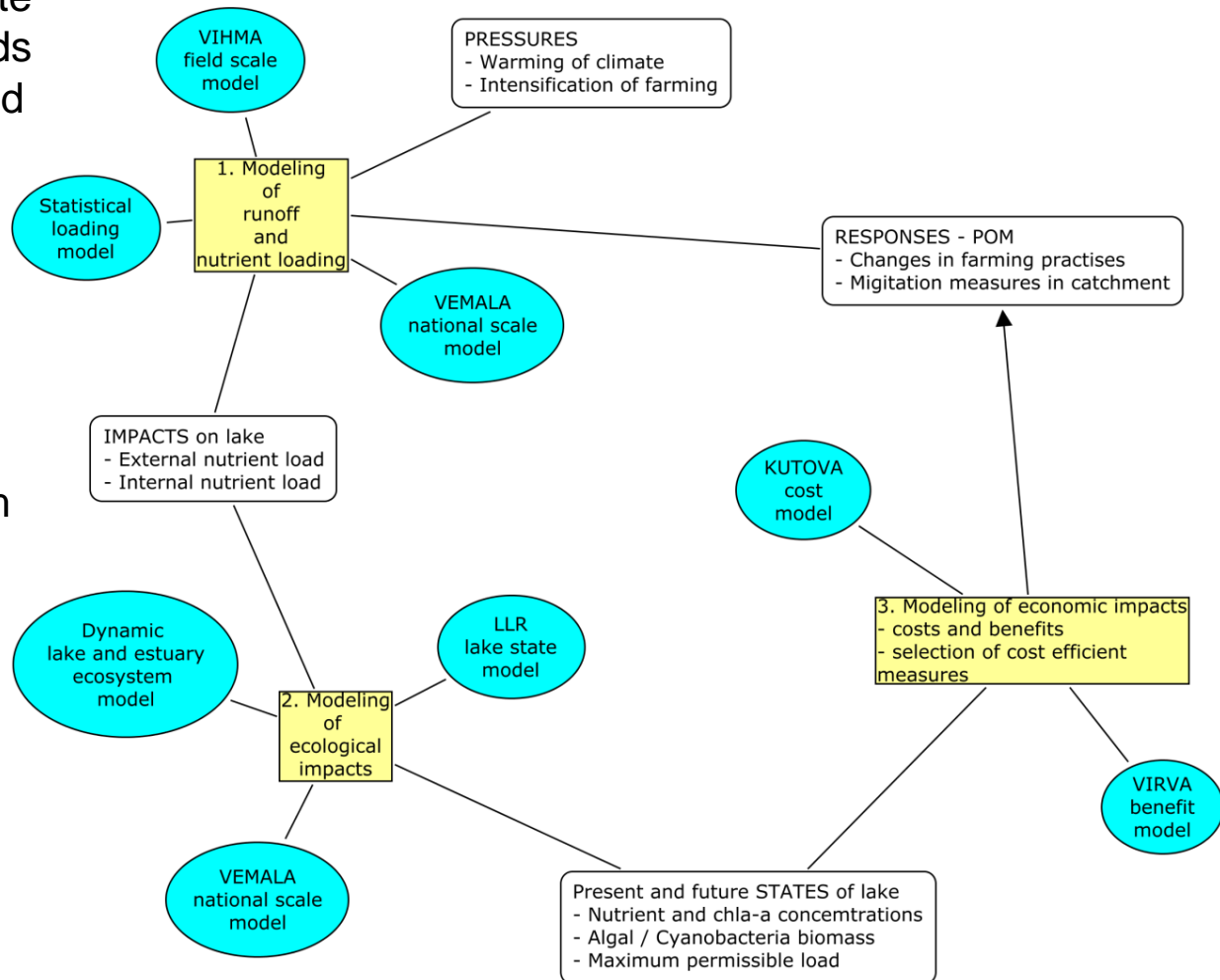
Modeling and planning of measures – General framework



Joint use of the models in river basin management planning -Tools for the big picture

USAGE OF MODELS IN RIVER BASIN PLANNING

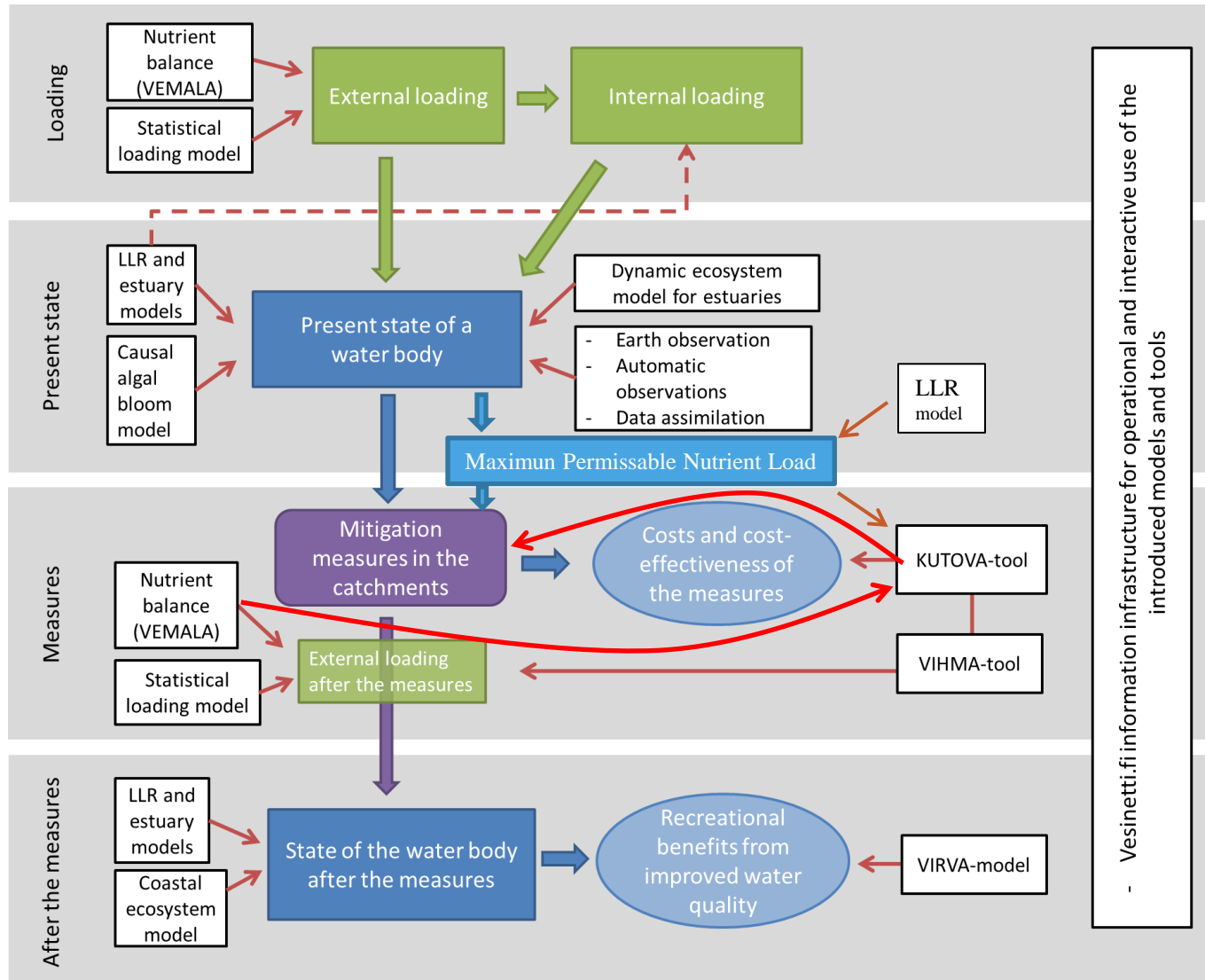
- Models are used to estimate
1. Runoff and nutrient loads
 2. Impacts on nutrients and algae in a lake
 3. Maximum Permissible Nutrient Loads (MPNL)
 4. Costs of measures to achieve MPNL and recreational benefits and to plan
 5. a cost efficient program of measures PoMs



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Operations model for river basin management planning.

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- Vesinetti.fi information infrastructure for operational and interactive use of the introduced models and tools

Web based map tools

- VESINETTI - <http://www.vesinetti.fi>
- GIS-based Web service for interactive use of the models and data
- The main users are river basin management coordinators, experts, private consultants and public.
- Materials like data, pictures and reports can be uploaded
- Results from GisBloom-project are available.

The screenshot displays the Vesinetti web-based GIS application. The browser window shows the URL <http://www.vesinetti.fi/?workspace=164>. The interface includes a map catalog on the left, a central map of a region with various water bodies and land use, and a legend on the right. The legend shows categories like 'Lakes (WFD) small scale' and 'Lakes (WFD)' with color-coded options for water quality (Erinomainen, Hyvä, Tyydyttävä, Välttävä, Huono, Ei luokitusta). The bottom status bar shows coordinates (E: 351966, N: 6691136) and the date 10.11.2013.

LakeLoadResponse (LLR) model

Calculates

- the amount of external nutrient loading reduction that is needed to achieve good ecological status in a lake.

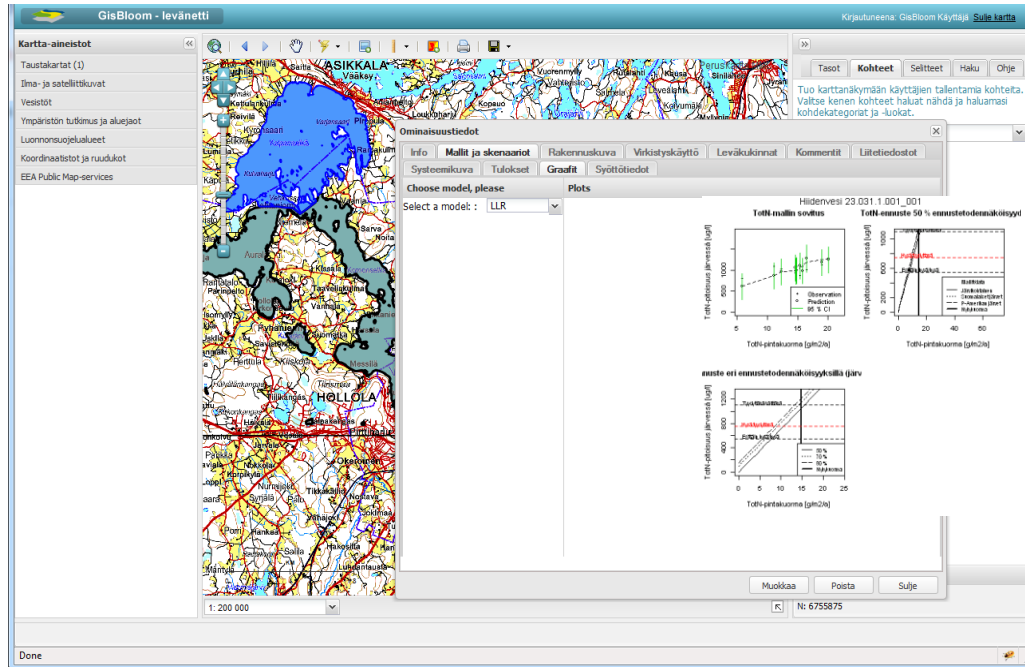
We can get realistic assessment of the uncertainty.

Helps identifying the needed cost-effective management actions.

Freely available in

- <http://www.vesinetti.fi>
- <http://lakestate.vyh.fi/>

LLR Lake model in <http://www.vesinetti.fi>



	Current load kg d ⁻¹	Target load kg d ⁻¹	Reduction kg d ⁻¹ %	
TP	23	15	8	35
TN	506	350	156	31

Evaluation - Planning and implementation

1. Methods and technics to be demonstrated
 - Integrated monitoring and management methods and tools
 - Too ambitious and wide content but in the end it was manageable
2. Demonstration character: environment and scale
 - River basin management scale in badly eutrophicated waters
3. Selection, contacting and networking of partners and stakeholders
 - Active, motivated, open minded, like-minded organizations and individuals were found from existing networks (regional environment authorities and associations)
 - As many as is justified – no more, no less

Evaluation - Planning ...

4. Negotiation and agreement on framing, outline, objectives, content and budget
 - Focus on innovation and demonstration characters
5. Writing of project proposal
 - Don't include more deliverables and milestones than necessary
6. Funding the down payment
 - Coupling with other funding
7. Submission of project proposal
 - Ask and be ready to interact with comission – they are willing to help
8. Project management, reporting and dissemination
 - Agree on a clear and manageable schedule
9. Auditing
 - Stay allert – keep on track of everything!
10. After Life plan
 - Ensure the real impact of your project

Summary - Participation and partnership

- Big change to improve and develop river basin monitoring and management
- Use state-of-the-art working methods, consultants and digital tools to participate
- Make it the integral part of demonstrations, dissemination and ... everything
- It will be a good measure of your success
- Ensure definite and commonly agreeable objectives and roles

Evaluation - Innovation

1. Challenges and problems
 - Coordination and nurture of innovations and synergisms
 - Lack of ambitiousness
 - Fear to fail
2. Solutions Identify connections between the work packages
 - Report and accept failures as an intergal part of demonstrations and learning
3. Impact and transferability
 - Considering and measuring thoroughly through out of demonstrations