



GLOBAL WORKSHOP ON ECOSYSTEM-BASED ADAPTATION (EBA)

*The interest of Natural Water Retention Measures
(NWRM)
for ecosystem-based adaptation*

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17th International Conference "Europe-INBO" 2019 Lahti - Finland - 17-20 June 2019 (v6)

Discussing the future of the European Water Directives and showcasing ambitions!

► Monday 17th June

09:00 Arrival of participants.
Registration of the participants.
10:30 Workshop on "Integration of Nature-Based Solutions (NBS) into WFD Programs of Measures (PoMs) for basin restoration with a focus on lakes: governance, implementation, assessment".
17:00 INBO World Liaison Bureau.

► Tuesday 18th June

20:00 Welcoming Cocktail.
08:00 Registration of the participants.
09:00 Official Conference opening ceremony.
10:00 Message of the DG Environment - European Commission.
10:30 Coffee break.
10:45 Presentation of the Water Governance in Finland.
12:15 Objectives and actions of INBO and "Europe-INBO" Group of European Basin Organizations.
12:45 Lunch.
14:00 Roundtable N° 1: Water quality: the objective of good ecological status and the challenge of microplastics.
15:45 Coffee break.
16:15 Roundtable N° 2: Agriculture and climate change : agroecology, non-point source pollution, water availability.

► Wednesday 19th June

20:00 Conference dinner.
08:15 Registration of the participants.
09:00 Roundtable N° 3: Towards a practical review of the WFD application: how to deal with exemptions and one-out all-out principle.
10:45 Coffee break.
11:15 Roundtable N° 4: Integrated management of basins and coastal waters: strengthening consistency.
13:00 Lunch.
14:30 Special Session: "International and transboundary cooperation (including under the framework of the WFD, between EU and non-EU Countries)".
16:00 Coffee break.
16:30 Official closing ceremony:

- Reporting of Workshop and Roundtables
- Invitation to "Europe-INBO" 2020
- Presentation of the candidacy to host "Europe-INBO" 2021
- Presentation of the Declaration of Lahti
- Concluding speeches by INBO World Presidency and Europe-INBO Presidency

► Thursday 20th June

18:00 Closing Cocktail.
09:00 Technical and cultural visit of Lahti.



With the support of:



register!



To participate,
Please register!

www.inbo-news.org

The interest of Natural Water Retention Measures for ecosystem-based adaptation

CONCEPT: What are Natural Water Retention Measures?

- NWRM are the Nature-Based Solutions of the water sector, “restoring or maintaining ecosystems as well as natural features and characteristics of water bodies using natural means and processes”* (ecosystem services).



It is not necessarily targeting a return to a near-pristine state!

The *Marais Poitevin*, Green Venice of the Poitou-Charente region (France). An man-made landscape of waterways, canals, meadows and fens that teem with wildlife

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CONCEPT: What are Natural Water Retention Measures?

- NWRM core function is to enhance the retention capacity of aquifers, soil, and aquatic and water dependent ecosystems with a view to improve their status.
- Obvious benefits when addressing water & climate change adaptation:
 - Reducing the vulnerability to floods & droughts (cf. *infra* the Elbe river dyke relocation near Lenzen, Germany,)
 - Limiting the impacts of pollution by both dilution and enhanced purification capacities of aquatic ecosystem services
- And an interest for climate change mitigation (vegetation cover as carbon sink)



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➤ **In practice, NWRM entail a wide range of measures...**

Type	Class	NWRM Measure
Direct modification in ecosystems	Rivers and connected wetlands	Restoration and maintenance of rivers, basins, ponds, and wetlands; floodplain reconnection and restoration, reconnection of hydraulic annexes, elimination of riverbank protection...
	Lakes and connected wetlands	Restoration of lakes
	Aquifers	Aquifer restoration
Change & adaptation in land-use & water management practices	Agriculture	Restoring and maintaining meadows and pastures, buffer strips and shelter belts, soil conservation practices (crop rotation, intercropping, conservation tillage...), green cover, mulching...
	Forestry and pastures	Afforestation of headwater areas/mountainous areas/reservoir catchments, targeted planting for “catching” precipitation, land-use conversion for water quality improvements, continuous cover forestry, maintenance of riparian buffers, appropriate design of roads and stream crossing, urban forests...
	Urban development	Green Roofs, rainwater harvesting, permeable paving, SuDS: swales, soakaways, infiltration trenches, rain gardens, detention basins, retention ponds, urban channel restoration...

➤ **...divided into 4 sectors:**

Agriculture



Urban



Forest



Hydro Morphology



Examples and associated benefits

(complete list on the [catalogue](#)):

Intercropping (Agriculture)



Benefits: slow runoff, increase infiltration, reduce erosion, filtrate pollution, reduce floodrisks, protect ecosystems...

Green roof (Urban)



Benefits: slow and store runoff, Increase evapotranspiration, climate change adaptation and mitigation, flood risk reduction, aesthetic and cultural value...

Land use conversion (Forestry)



Benefits: slow and store runoff, Increase evapotranspiration, increase infiltration, reduce pollutant sources, intercept pollution, reduceerosion...

Re-meandering (Hydro-Morphology)



Benefits: slow river water, intercept pollution, reduce erosion, create aquatic and riparian habitat, natural biomass production, biodiversitypreservation...

NWRM: THE INTEREST OF MULTIPLE BENEFITS

- As compared to grey infrastructures, NWRM have little negative impacts & provide multiple functions and benefits.
- Beyond climate change adaptation (and mitigation), NWRM benefits include:
 - Natural water purification processes (e.g. use of artificial wetlands to remove excess in nutrients)
 - Soil conservation (e.g. reducing runoff with swale= erosion control; flooding plains= richer soils)
 - Biodiversity conservation (e.g. retention ponds or buffer strips= creation of water related habitat)
 - Recreation!
- Making best use of scarce financial resources has become a driver to policy making, so addressing multiple benefits through relatively cheap measures is a plus.
- This also explains why “room for nature” and “soft measures” are gaining momentum to make policy operational.



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FROM A CONCEPT... TO ITS LIMITS!

- NWRM are no magic bullets! As compared to grey infrastructures, green infrastructures may be considered as less effective.
 - Less effective to store water than a reservoir-dam,
 - Less effective to drain water than drainage pipes.

Kouris dam,
*Cyprus**



*Sources: Thulborn-Chapman

Drainage pipes



Why do NWRM hardly ever seem to be cost-effective...

... even when they are? (Ashton Eaton vs. Usain Bolt, a parable by Carlos M. Gómez)



Bottom line // a fair comparison between a specialist and a multipurpose measure should be based on more than one criterion.





Traditional cost-effectiveness analysis uses only one environmental benefit (7) and just one economic criterion (2).

Economic Benefits

- 1 Green Job Opportunities
- 2 *Reduced infrastructure Cost*
- 3 Reduced Pumping and Treatment Cost
- 4 Increased Property values

Social Benefits

- 5 Improved quality of Life and Aesthetics
- 6 Improved Green Space

Environmental Benefits

- 7 *Captured stormwater runoff*
- 8 Reduced pollutant loads
- 9 Increased Groundwater recharge
- 10 Reduced Carbon Emissions
- 11 Reduced Energy Use for Cooling
- 12 Improved Air Quality

And then it ignores 10 of the 12 benefits of any sustainable urban drainage system.

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FROM CONCEPT TO IMPLEMENTATION: the NWRM project (DG-Env, IOWater)



- Increased interest in NWRM, but little experience and no guidance.
- In order to bridge the gap, DG ENV financed a project (Sept. 2013-Nov. 2014):

Pilot Project - Atmospheric Precipitation - Protection and efficient use of Fresh Water: Integration of Natural Water Retention Measures in River basin management

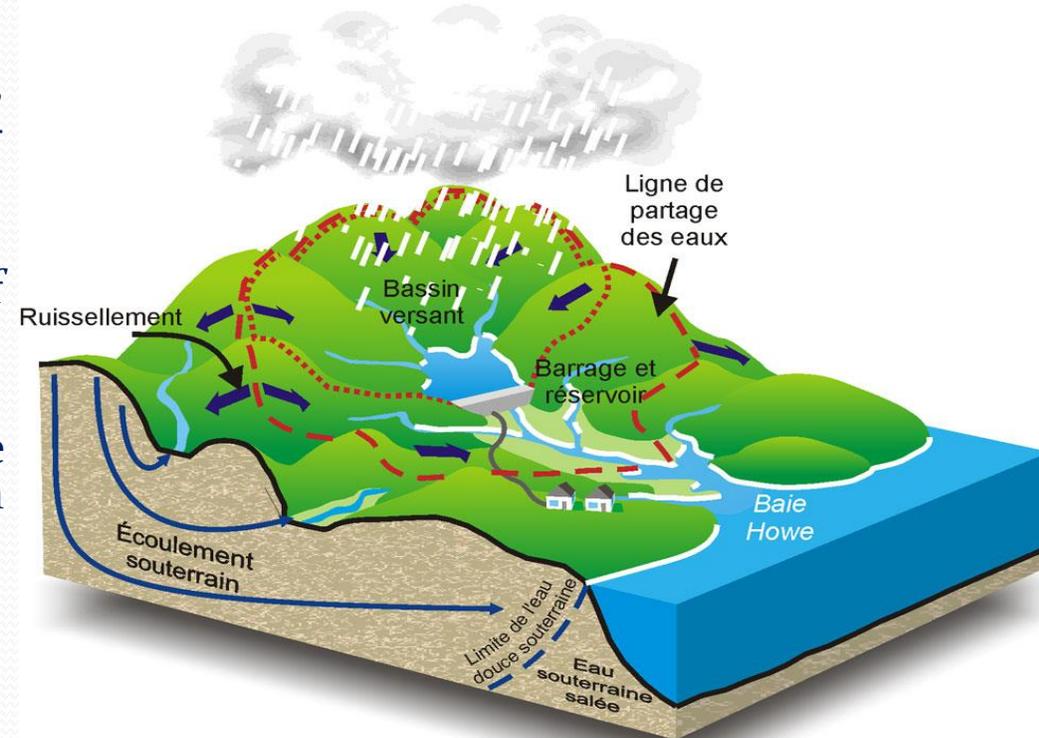
- Two objectives:
 - A knowledge base on NWRM, developed within the Water Information System for Europe
 - An active European “community of NWRM practitioners” (experience sharing between regional networks, production of practical manual supporting NWRM design & implementation)

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BASIN MANAGEMENT APPROACH: the NWRM project (DG-Env, IOWater)



- The project followed the most important principle of IWRM: **water knows no boundaries!**
- NWRM, as any other feature of water resources management, should be planned at the most relevant scale: basins and sub-basins.
- This basin approach encompasses rivers, lakes and aquifers of the hydrographic basin, either national or transboundary.
- This approach was adopted for the implementation of the project. Four regional networks facilitated by consortium partners were established as part of the EU NWRM initiative:
 - The Danube river basin,
 - The Mediterranean sea region,
 - Northern Europe/the Baltic Sea,
 - Western Europe.



RESULTS OF THE NWRM PROJECT (DG-Env, IOWater)



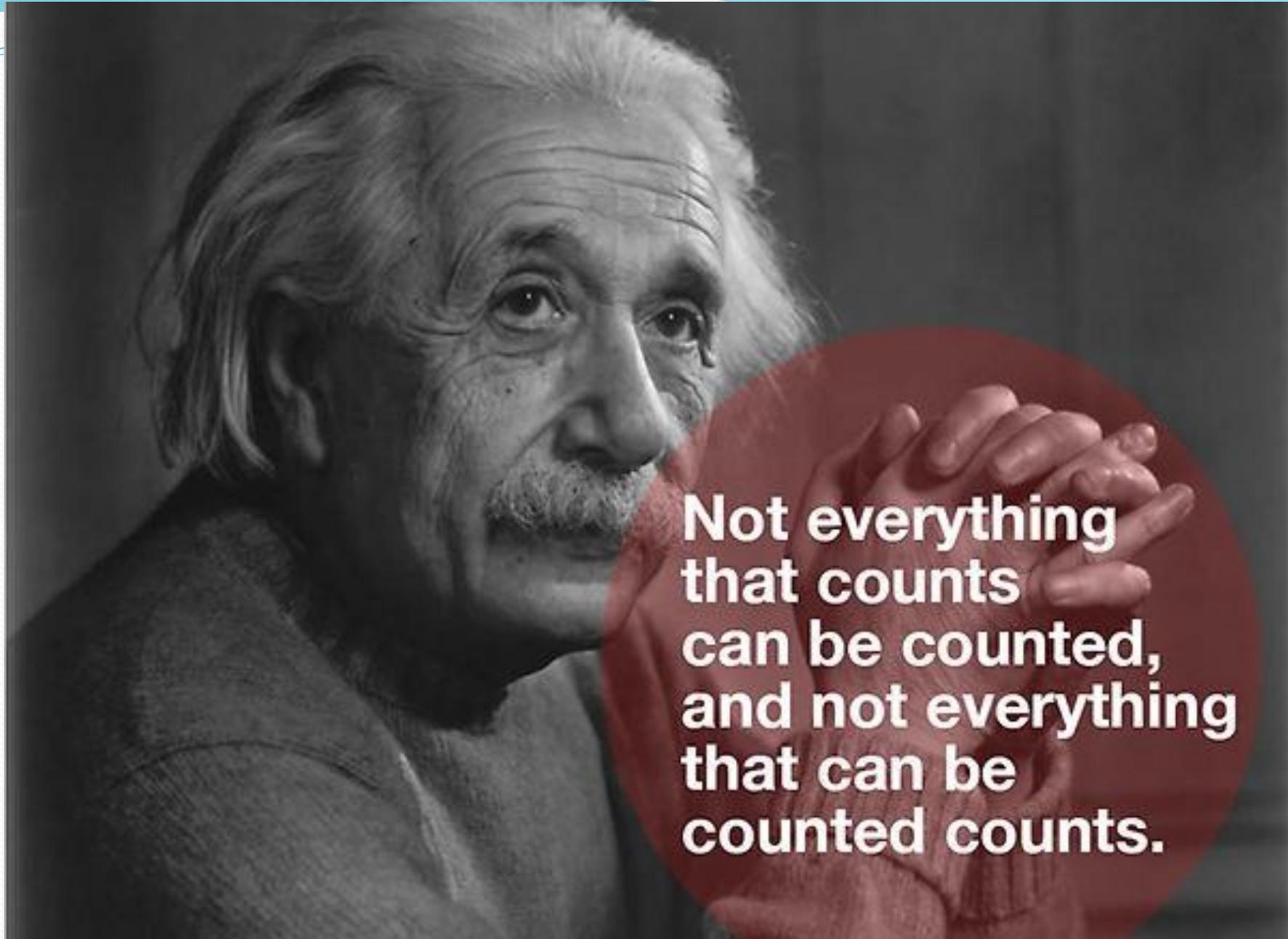
- By the fall of 2014, IOWater (coordinator of this project) has developed, with 10 other European partners, a web platform (www.nwrm.eu) providing guidance on NWRM through:
 - A catalogue of 53 measures covering four sectors (Forestry, Urban area, Agriculture and Nature / Hydromorphology),
 - Case studies on best practices,
 - A practical guide translated into the 14 languages of the European Union.
- Dissemination of the results among a wide range of water actors, including in:
 - the working groups of the WFD Common Implementation Strategy,
 - the EUROPE-INBO annual General Assembly (Bucarest, Nov. 2014)
 - The Conference on Water in Mountainous regions (Megève, Oct. 2014)

"NWRM" partners:

- International Office for Water 
- ACTeon Environment 
- Baltic Environment Forum 
- I.A.CO Environmental & Water Consultants 
- Instituto Madrilenó De Estudios Avanzados 
- Regional Environmental Center 
- Regionális Energiagazdasági Kutatóközpont 
- Scotland's Rural College 
- Swedish University of Agricultural Sciences 
- ENV'ECO (environmental economics consultancy) 
- AMEC Environment & Infrastructure UK 

Conclusion & recommendations

- NWRM are a highly relevant contribution to climate change adaptation
- NWRM deliver multiple benefits beyond climate change
- Such benefits can be greatly expanded when NWRM are implemented following a basin approach
- An EU-financed, IOWater-coordinated NWRM project has recently :
 - Set up a community of practitioners exchanging experiences and best practices in the field of NWRM
 - Delivered valuable guidelines to assist in implementing NWRM



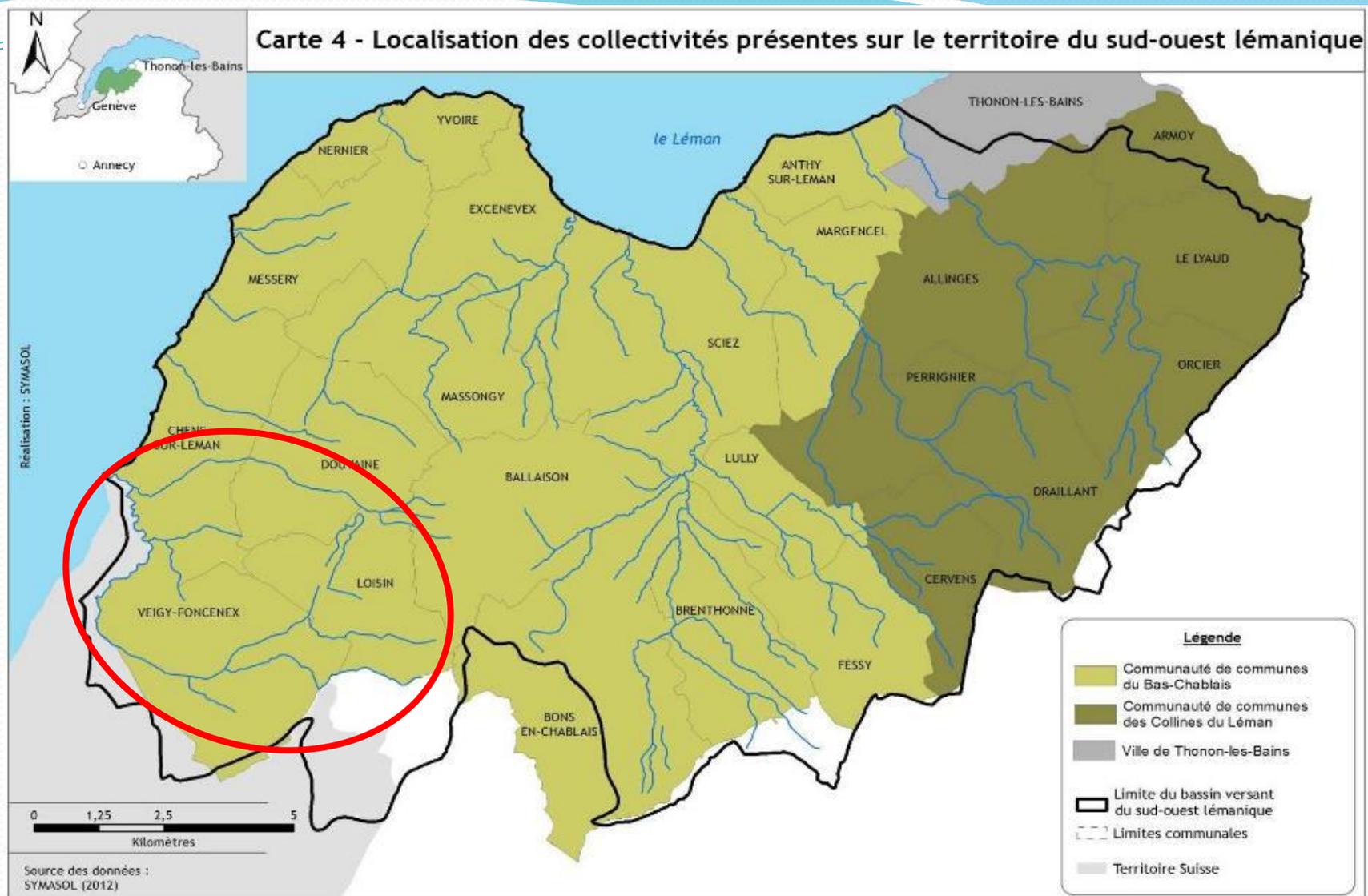
**Not everything
that counts
can be counted,
and not everything
that can be
counted counts.**



Thanks for your attention!

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CC du Bas-Chablais : 17 communes et 35 310 habitants



CC des Collines du Léman : 7 communes et 10 000 habitants

COMPETENCES SYMASOL :
gestion milieux aquatiques,
Natura 2000, Charte forestière

Before



✓ Aquatic ecosystems

- Channelization of the river -> remeandering the rivercourse
- No riparian vegetation coverage -> restoring river banks
- Very few habitats/poor biodiversity -> planting different plant essences, reconnecting floodplains
- No ecological continuity -> removing concrete obstacles

✓ Banks

- Collapsing banks & eroding soils -> restoring vegetation coverage along the banks (and around, as buffer)

✓ Floods

- Vulnerable urban areas & impervious soils -> conversion of land-use to NWRM measures where possible.
- « out of sight out of mind »: very little awareness of the flood risks.

✓ Social and landscape aspects

- Very little attractiveness of the riverside
- Artificial border between the two riparian cities





Before



After



During

