

ClimateWater Final Symposium

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WP 3.6 Strategies to combat climate change induced water pollution

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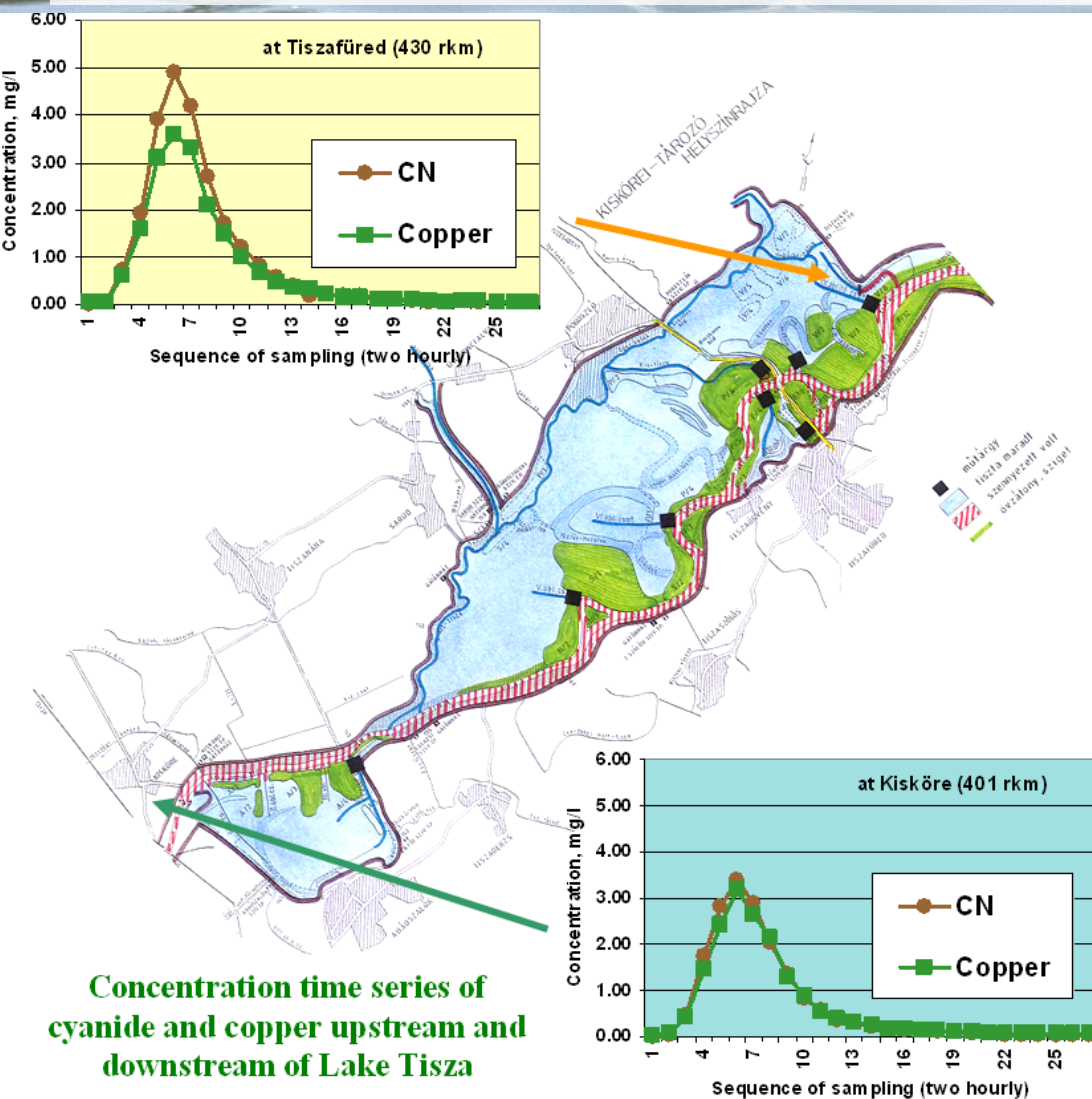
Having carried out a relatively careful literature and EU Project search for adaptation strategies in combating-counteracting climate change induced water pollution our attempts nearly failed in putting a finger on concrete advises. **Mostly very general advices were identified- and even so very few.**

This is rather strange, especially in the light of the conclusions of literature on water quality impacts, where non-point source pollution was reported to grow to high levels, and this is proven today (2010) by the catastrophic flooding and rainfall-runoff-washoff events

Adaptation strategies of pollution control fall into three main categories:

- 1/ Dilution (although not a solution to pollution)
- 2/ Tailoring waste- and sewage-water treatment technologies to Climate Changes induced situation
- 3/ Application of diffuse or non point source pollution control techniques, a very critical issue

Dilution, although not a solution to pollution, can really help sometimes



Impact of dilution on pollutant waves of the cyanide pollution that came from Baia Mare /Nagybánya (source: the FP 5 Tisza River Project)

The black squares are inflow gates from Tisza.

The story is also associated with the Accidental Emergency Forecasting system of the Danube Basin. Not working that time and neither since that time in lack of calibration and verification

Tailoring waste- and sewage-water treatment technologies to the altered climate change induced situation

Nearly all projects and documents analysed within Project ClimateWater mention the need for upgrading wastewater treatment technologies. However, this cannot be reviewed for all possible industries. The climate impact situation and the price of water, the charge on environmental load and the penalty-incentive systems of adaptation will surely bring the required technologies. This means that **technologies are already available and the non-technical legal-administrative means of adaptation shall take care for ensuring the application of the suitable ones.**

A related critical issue (see also WP2) is the inadequacy of sewer systems in draining the much increased and much flashier, urban storm runoff volumes. The overflow from combined sewer systems are causing serious health risks.

One of the reasons is that due to the Water Framework Directive (WFD) point sources of pollution are being rapidly eliminated (treated) all over Europe and thus the weight of non-point sources is increasing every

day.
The other one is the above also mentioned climate change induced growth of the severity on NPS runoff loads both in urban and in rural-agricultural environment. The highest ever daily precipitation and rainfall intensity, measured in many regions in Europe results in catastrophic washing away of all waste disposal sites and in the bursting out of waste water from sewers, which becomes extremely hazardous when combined sewers are involved and untreated sewage water flows over the streets.



Bursting sewer in Miskolc, Hungary, 2011

Application of diffuse or non point source (NPS) pollution control techniques

Regarding diffuse source control strategies, one of the problems is that although we know the NPS control techniques and several books have been written on them (also by the Co-ordinator of this project: see the separate literature collection) and even Best Available Techniques (BAT) are available in published guidance format, we still do not know (at design support level) their pollutant removal capacity and efficiency! This is because very few experimental data are available on real catchment-scale applications.

All the NPS techniques, together with the hydrological-hydraulic management techniques **can be called Ecohydrology**. We will return to this issue to also in the WP4 research chapters and finally in WP5, where ecohydrology and the related water and mass budgeting tools can be offered to bridge the “policy gap” in River Basin Management Planning (RBMP)

The essence of ecohydrology is:

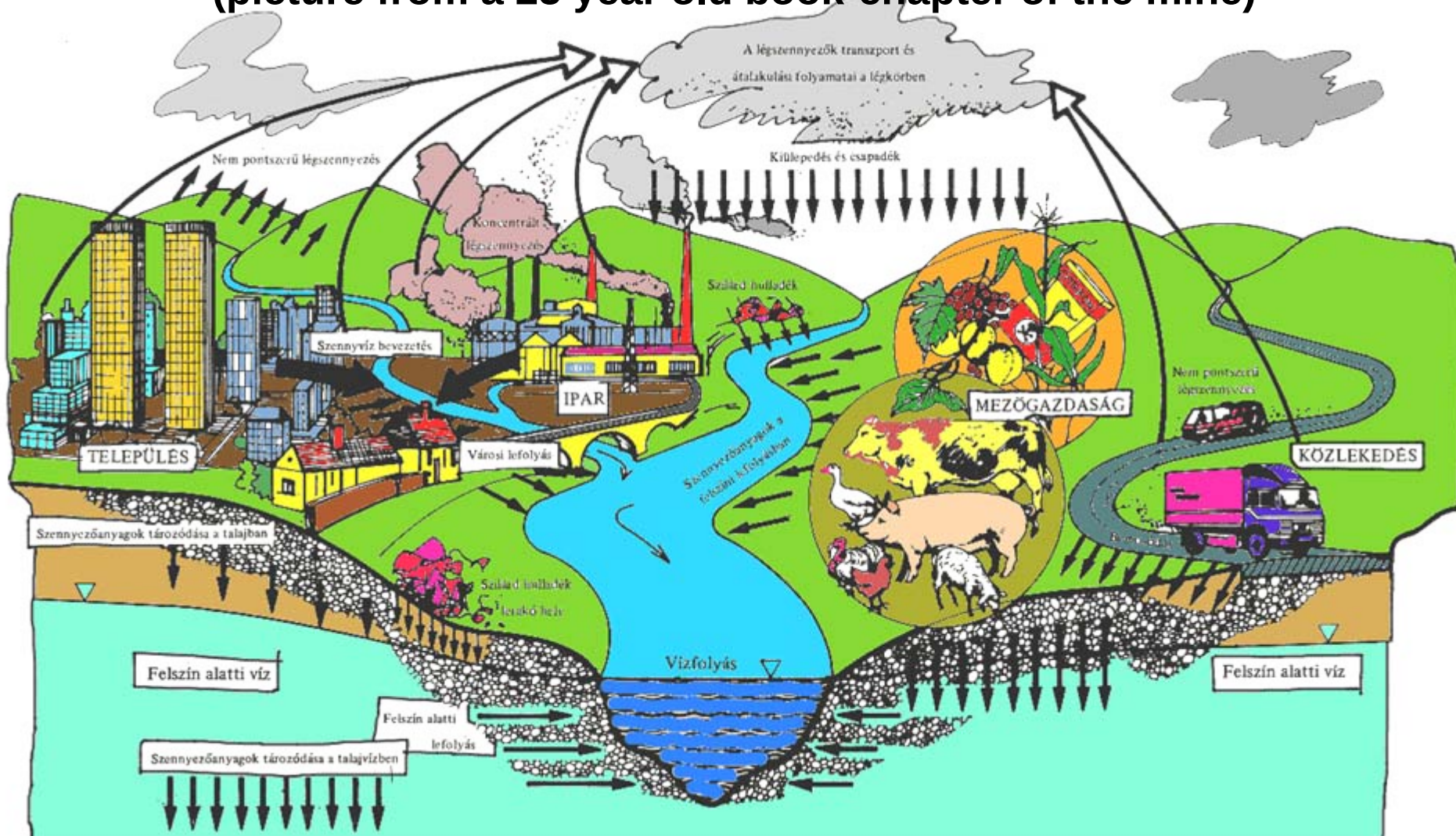


to save aquatic ecosystems by indentifying sources of degradation problems (sedimentation, excess nutrient loads, other pollutants, too little or too much flow) and **find hydrological and pollution control solution** (also by modelling), while **enhanced ecosystems will provide means of controlling flows and water quality.**

Research needs can also be summarized as those into ecohydrology (strategies of ecology, hydrology, hydraulic construction and pollution control of point and nonpoint sources)

And the situation has not been changed ever since!

(picture from a 25 year old book-chapter of the mine)



From the Biennial Report on Great Lakes Water Quality Ecosystem approach to land-use management for pollution control

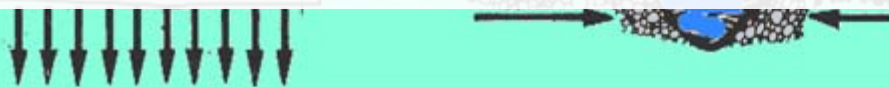
Short essence of the strategy: [Wise land use decisions](#) and effective land management are fundamental to implementing and progressing toward [the ecosystem approach](#) envisioned by the Great Lakes Water Quality Agreement, governments need to improve their institutional capacity to coordinate and integrate roles, responsibilities and decisions between and among all levels.

Comment: This proposal for an **ecosystem approach in land-use management is just the ecohydrological approach**, which is proposed by the partner making this review for strengthening the present practice of RBMP. A concluding statement of this well established and very large research and evaluation programme of the Great Lakes must represent a **real warning towards EU policy and decision makers** for coordinating and integrating roles.

A proven fact is that non-point sources represented the larger part of total annual load of water pollutants for many parameters (BOD, COD, TP, several micropollutants, etc) for the last few decades.

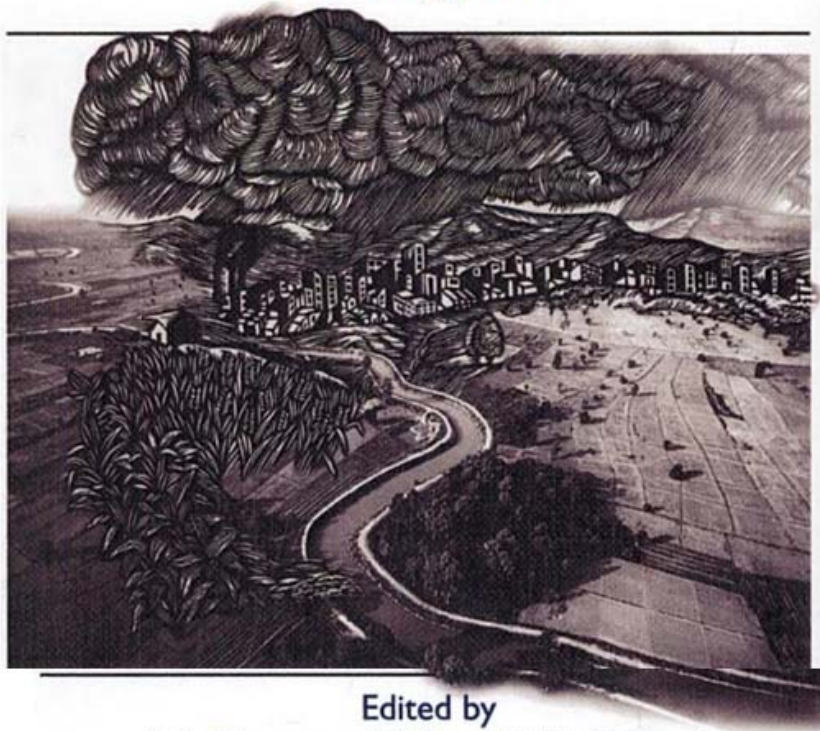
In Europe with the success and progress of WFD induced sewer and sewage treatment development this weight was dramatically increasing!

A **further increase is being experienced** with flashy, more fierce and intensive rainfall-runoff, **induced by Climate Change**



ASSESSMENT AND CONTROL OF
NONPOINT SOURCE POLLUTION
OF AQUATIC ECOSYSTEMS

A Practical Approach



Edited by

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One of the problems is that although we do know the NPS techniques, even BAT is available, we still **do not know (at design support level) their pollutant removal capacity and efficiency!!!!**

This is because **very few experimental data** are available.

And it is a very long story of what type of field studies must be made to learn the removal capacity. MUCH money is needed!!!!!!

Sometimes a poor „desk-researcher” also
finds his ways to the water

Köszönöm a figyelmet
Thank you for your attention