

The role of the WFD for River basin planning to achieve sustainable use of watercourses

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Work Group 2: Evaluation of strategies to monitor chemical and ecological water quality – Draft minutes

Participants

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Key questions

Main question: Does the chemical monitoring of water reflect the quality of the river basin?

1. How can we harmonise monitoring plans?
2. How can we interpret a relationship between chemical and ecological data?
3. Are sediments under the scope and necessary?
4. Is the holistic approach of the WFD realisable at the present state?

A long discussion started on the “Good ecological status” of the river, one target of the WFD. It was mentioned that this status is not clear enough defined in the WFD. It could have different meanings for different countries. Unclear seems to be:

- What does a “good ecological status” reflect?
- How is the relation between chemical and ecological data?
- What chemicals should be focussed on in the monitoring and analysis? What are the quality standards for those chemical analyses?
- How are the interactions between the chemicals and the environment, can “harmless” chemicals become “harmful” under specific conditions?

Jørgen Bidstrup explained the situation in Denmark. They have done a lot of modelling to see how to reach a good ecological status. A national broad monitoring programme on pesticides was carried out, with only low concentrations in surface waters as the result. The general monitoring was terminated because the ecological effects of pesticides were mainly due to peak concentration episodes. Substances under concern in Denmark are TBT and nutrients.

The question came up, why Germany does not have only one waterbody authority. It seems that, the federalism in Germany make political decisions on waterbodies difficult. For political decisions, there are too many ministries on Länder and federal level involved, to coordinate the analyses central and in a common way.

Burkhard Stachel explained that there is an office (FGG-Flussgebietsgemeinschaft Elbe) in the Ministry of Saxony Anhalt in Magdeburg existing, focussing on the whole river Elbe with close cooperation with the Czech Republic, Poland and Austria. In addition, the “Arbeitsgemeinschaft für die Reinhaltung der Elbe” focuses also on the chemical and

biological status of the river Elbe. A list of priority substances¹ has been prepared, on which 33 substances are defined to be under analysis. First the suspended material (SM) is analysed and after that, its meaning for the water body is calculated. At the moment the Ministry of Environment discusses what kind of substances need to be analysed in solid phases. The analyses for the priority substances are another issue and for 2 years now, a draft paper on analytical methods exists.

Another question came up: How to deal with other “harmless” substances as like nutrients or O₂? Moreover, the meaning of specific synthetic organic substances, e.g. the dioxins are not listed in the Annex X (*of the WFD*) or other frameworks. For example, dioxins are a problem in the river Elbe since some decades.

Additionally, the types of particles (colloids, nano-particles, contaminant bound particles) need also to be assessed and described. Currently, only little information about the uptake and behaviour of such kind of particles is available. Do those substances accumulate in high concentrations in organisms? If yes, a new list of substances seems to be required for the WFD.

Beside the analytical dimension, the question of sampling and preparation methods needs to be answered clearly. Sampling and analytical quality control (QC) is a part of the QC-group in the UBA², BLMP³-North and Baltic Sea. It should be addressed to freshwater systems. For working on EU level, the Round Robin test can be used to harmonize methods. The biological and toxicological tests are well defined for years now.

On the national level, the BSH⁴ has defined methods and they should be transmitted on Länder Level.

Another topic was the influence on water quality, both from point and diffuses sources. The atmosphere has a big influence on the quality of the water body, but the WFD seems to concentrate on point sources. The WFD is a political tool, with the main goal to reach the good ecological status in the surface waters and groundwater in the member states within the year 2015. But it seems to be a problem to take the diffuse sources also into account or deal with them.

Differences between Germany and Denmark are evidently in the presence or absence of dioxins and TBT. While Hamburg has a big problem with it, Denmark has no special problem with site specific contaminants except TBT since the industry is more located at the coast and not at the rivers. Therefore, regulations for this problem are not needed for Denmark.

René Schwartz added another topic to the discussion: The flood plains need to be considered as a part of the river and they need to be taken stronger into account by the WFD. It seems to be of high importance to find out, what will happen in flood events with contaminated sediments. After such an event, the good ecological status of a river can easily turn temporarily into a bad status. Burkhard Stachel remarked that the ARGE Elbe is focussing already on this problem.

¹ Annex X of the EU-WFD

² Umweltbundesamt = Federal Environment Agency

³ Bund/Länder-Messprogramm für die Meeresumwelt von Nord- und Ostsee

⁴ Bundesamt für Seeschifffahrt und Hydrographie = Federal Maritime and Hydrographic Agency

The question on the good ecological status came up again: What does it include: Biodiversity, Distinct community, etc.?

What are the reasons for the absence of a high biodiversity for example? And how does biodegradation influence the bound contaminants of the Benthos.

Could the analysis of animals work as an instrument for good ecological status? Is the human consumption the indicator for good water quality? Or is the fertilization rate the better instrument for it?

What are the goals of quality standards? Is a model needed or realistic, in which you put all data (biological, chemical, physical) and as a result you have a solution for a complex problem? Wolfgang Ahlf suggested that perhaps a risk assessment model could work as a solution.

Beside the problems of analysing, it is not easy to communicate the results to politicians as well as to the public.

There were some needs identified, we need

- An open list of priority substances (for management and public motivation) and for the geochemical status
- standards for particulate matter
- levels for fresh sediments
- view on old sediments
- consider connections between river and floodplains

In the past we had combined biological and chemical approaches to reach a better quality status (improvements of filters, fish tests, algae test). The WFD has no strategy to combine both. Does that mean, if the ecological status is fine, the chemical status does not need to be controlled so much?

- LUNCH -

After Lunch we looked again at the key questions:

1. Harmonize monitoring plans:

As it is done in Denmark, a central authority for the quality assurance seems to be helpful for Germany as well, and the WFD could work as a motor for that. Even if LAWA is working on the harmonization on Länder level, a federal strategy could be useful for frequency and standards of sampling.

2. The relation between chemicals and ecological data is very close, but hardly visible. Some substances have specific effects on animals (residues) and on the ecological status (nutrients) and therefore can be described on the cause-effect basis. Statistical methods could be useful to find the relation between chemical and ecological data.

3. The sediments are necessary and need to be taken more into account under the WFD. The sediments illustrate, that the borders of a river can differ very much:

- For nature-orientated landscapes, the floodplain and the ground water connections decide. Distance sediments, which are affecting the river due to extreme flood events, have long term effects on the river on a long time scale.
- But in artificial landscapes, the dikes are the end of the river basin for many processes, since the sediment exchange is cut off or reduced. This landscape can be divided into two kinds of flood plains: Firstly the recent floodplain, which can be actually inundated during high water events and secondly the relict flood plain, which can not be inundated because of the dike.

4. Holistic approach:

It is an important target to look at the quality although it is difficult on such a big scale. To make it more practicable, samples are collected not on every small river systems. It is also a question of money if you analyze 250 substances. Denmark analyzes for that reason only the peaks and not the priority substances, this was a controversial item of the discussion, as some thought, the WFD is demanding it.

To demonstrate the importance of the holistic approach, Jørgen Bidstrup made a quick presentation on one WFD-target for Denmark. The distribution of eel grass in the Limfjord has decreased for over ten years. Fields of eel grass are important for ducks and other animals, so the goal was to stop the decreasing. But until today there is no solution to the problem. That means that you have to understand what is happening in an ecosystem in detail!

Conclusions:

- We need a definition for “good ecological status”.
- The essence of reliable measurement system for “good ecological status”.
- The parameters of quality status are not well described by the WFD.
- We need more knowledge on the impacts of chemicals on the environment.
- Management is difficult; communication is needed to convince people.
- Assessment is a difficult scientific problem.
- We need a long term quality control. Extreme and discontinuous events (e.g. heavy rain, extreme floods) have to be included in the monitoring plan (e.g. Saxony in the catchment area of the Elbe
- We need the same methods.
- Harmonization is important, but even more important is the biological and chemical quality control.
- We need a national authority in Germany. WFD should be used to build such an institution.
- Indicators for the relation between ecological and chemical data need to be identified.
- A detailed description of the habitat is important.
- The nutrient status and the specific effects of substances are known and must be included.
- Sediments together with the alluvial soils of the floodplains are necessary to be under scope. In connection to that, managing concept of old mining sites has to be addressed.
- If the “good ecological status” is not reached it has to be explained why and solutions and means for reaching it have to be found.