



## **Relationships between ecological and chemical status of surface waters - REBECCA**

In this REBECCA newsletter: report of the REBECCA mini-conference held in Delft during December 2005, and details of future meetings.



### **REBECCA Mini-Conference: Delft, The Netherlands, 14-15 December 2005.**

*David Boorman, REBECCA Dissemination*

Over 100 water scientists and managers attended the REBECCA mini-conference to hear what progress has been made within the project, and how this may be assist in WFD implementation. A full list of the presentations is given in the table presented on page 4. For many of these an abstract or PowerPoint presentation will be available for download from the public part of the project's document store; the web address is given at the end of the table.

The meeting generated much lively discussion after the presentations during the intervals and poster sessions, and no doubt later over a glass of beer. Below are brief highlights from the formal discussion sessions that followed the scientific presentations.

As with so many EU-wide research projects a number of more general issues were raised

relating to data availability (during and after the project), the lack of consistency between data from different sources, and how best to make effective links between scientists, policy makers and water managers. Experiences in REBECCA would feed through to the wider debate on addressing these issues.

In addition to participating in the conference, those attending made the most of the opportunity to enjoy the attractions of Delft, and especially the festivities associated with the turning on of the Christmas tree lights.

Many thanks to the WL|Delft team of Lenie van der Poel, Ellis Penning and Harm Duel for looking after us so well.

The next REBECCA conference would be held in Oslo during 2007; provisional dates May 21-24. A

list of other meetings associated with REBECCA

is on page 5 of this newsletter.

## Lakes

*Reported by Bernard Dudley, CEH, UK.*

Presentations on the lakes activity followed the structure of the REBECCA Work Package and were based on biological quality elements. Anne Lyche Solheim, leader of the WP, gave an overview presentation, which was followed by talks by Ana-Cristina Cardoso (chlorophyll-a), Tom Andersen (phytoplankton composition), Ellis Penning (macrophytes), Ken Irvine (macroinvertebrates) and Trygve Hesthagen (fish).

There were a number of questions relating to reference conditions. The designation of reference lakes in the REBECCA database has been done mainly from expert judgment, including consideration of pressures and impact criteria listed in the REFCOND guidance. The different data owners have been asked to quality check the designation, and this has led to elimination of some lakes from the original list of reference lakes. This quality checking will be done once again, to make sure that the remaining lakes designated as reference lakes in the REBECCA database actually are as close to true reference lakes as possible. Since the REBECCA data on reference lakes are used to set reference values and H/G boundaries for many of the intercalibration GIGs, this process is rather crucial.

## Coastal Waters

*Reported by Maria Vuorinen, Syke, Finland*

Pirjo Kuuppo's presentation on phytoplankton indicators led to a discussion on what constituted a good indicator. Some indicators might be good over a small pressure range, but of no use over the wider pressure range. This was a problem in extrapolating from localized data sets.

The problems of monitoring for algae bloom were raised by Alessandro Carletti's presentation. Traditional sampling, e.g. 2-weekly sampling, was likely to miss many events, but a possibility for better information was to use remote sensing.

## Rivers

*Reported by Amelie Deflandre, CEH, UK*

In his introduction to the session on rivers, Nikolai Friberg, leader of WP4, gave an overview of the role and importance of rivers within the wider environment. He then described the

How REBECCA could help with boundary setting was also discussed, although we had to remember that it is not the job of REBECCA to actually set boundaries. A number of ideas for possible boundaries were made e.g. where the proportion of tolerant species exceeds the proportion of sensitive species, or where there are sudden changes in species composition.

In response to questions about the uptake of nutrients by macrophytes, Ellis Penning replied that little data on nutrients in sediments was available, hence the use of concentrations in the water column when assembling large data sets.

Ken Irvine was asked about the use of macroinvertebrates as indicators of habitat quality and hydromorphological impacts. He agreed that macroinvertebrates were good indicators of these, but again noted problems in acquiring useful data at the European scale.

A more general question concerned the influence of isolation on a lake's characteristics. Could this be a factor in both the impact and recovery of a lake? This wasn't being studied in REBECCA; it was assumed that physical characteristics were covered within the typology.

Hans Los's was asked how his dynamic modelling related to the statistical analyses described in the other presentations. His response was that it may be particularly useful in extrapolation to other regions. Integration of the two approaches had not yet been considered.

The discussion on Jens Kjerulf Pedersen's presentation highlighted the differences between lakes and coastal waters in terms of the magnitude of the pressures, the time-scales of biological responses, difficulties in monitoring, and the diversity of the marine environment..

pressure-based approach that had been adopted in WP4. This was followed by presentations by Jane Fisher (nutrients), Torleif Baekken (acidification and toxic substances), Morten Lauge Pedersen (hydromorphology), Andrea Buffagni

(organic pollution), and Jean-Gabriel Wasson (combined pressures and large scale analysis).

Jane Fisher was asked why her work focused on inorganic nitrogen (N) and phosphorus (P), and how the chemistry related to the biological sampling. She replied that N and P were generally considered the limiting nutrients, and therefore targeted for study. Other factors such as alkalinity were considered as convariables, but of course, only so much was possible. The focus inorganic nutrients was a practical constraint but also consistent with the idea that they are more relevant in terms on impacts. Diatom data were generally sampled in the summer and the corresponding chemical data were averages from all samples in the two months prior to diatom sampling.

Torlief Baekken was asked about problems of identifying the effects of individual toxic substances. He agreed this was a problem but it could be addressed using data sets from sites

## Conclusion

*Reported by Amelie Deflandre, CEH, UK*

Jorge Rodriguez-Romero (DG Environment) acknowledged the importance of REBECCA results to inform the decision of the intercalibration work on methodology and boundary settings. Both the GIGs and REBECCA have highlighted knowledge gaps, especially in term of availability and understanding of biological elements. They will serve as a basis for the FP7 call next year.

subject with only a single pressure, e.g. mine discharges in otherwise unimpacted rivers.

A similar concern was raised with Morten Lauge Pedersen, who agreed that it was sometimes necessary to include chemistry determinants as covariates in studies of hydromorphology.

Andrea Buffagni was asked about differences between macroinvertebrate samples taken from riffles and pools. He said it was extremely important that both were sampled and contributed to the assessment of a river.

Jean-Gabriel Wasson was asked how widely applicable was his conclusion that it was urbanization rather than agriculture that would have the greatest impact on achieving good status? Would it be true in the Netherlands? He thought perhaps more detailed information would be needed, e.g. on the intensity of agricultural activity, but that the methods were widely applicable.

Seppo Rekolainen, coordinator of the REBECCA project, welcomed the cooperation between scientists, researchers and policy makers in the water field, and hopes it will develop as had for air pollution. REBECCA showed that new valuable information could be extracted from old data when combining European data and human resources. However, the project also highlighted a need for more standard methods in data collection, a need for a more open access to public data and the need for new data and analysis for the remaining information gaps.



*The coordinator initiates a discussion on the objectives of the meeting.*

<b>INTRODUCTION</b>	
Welcome address	Huib de Vriend (WL   Delft Hydraulics, Netherlands) Seppo Rekolainen (SYKE, Finland)
REBECCA: recent progress	
<b>LAKES</b>	
	<b>Chair: Marcel van der Berg</b>
Overview of activities of Working Group on Lakes with focus on results of high relevance for the intercalibration process	Anne Lyche Solheim (NIVA, Norway)
Chlorophyll a – total phosphorus reference conditions and relationships in different GIG-types	Ana-Cristina Cardoso (JRC)
Phytoplankton taxonomic composition indicators and their response to eutrophication pressure	Tom Andersen (NIVA, Norway)
Macrophyte indicators and response to eutrophication	Ellis Penning (WL   Delft Hydraulics, Netherlands)
Macroinvertebrate indicators for acidification and eutrophication	Kenneth Irvine (TCD, Ireland)
Fish indicators for acidification and eutrophication	Trygve Hesthagen (NINA, Norway)
<b>COASTAL WATERS</b>	
Applicability of marine phytoplankton indicators to assess ecological status and impact of eutrophication	Hanne Kaas (DHI, Denmark)
Relationships between phytoplankton biomass and nutrients: case studies from European marine waters	Anna-Stiina Heiskanen (JRC)
Indicators of changes in phytoplankton composition caused by eutrophication in marine waters	Pirjo Kuuppo (SYKE, Finland)
Modelling phytoplankton response to eutrophication pressures for marine waters	Hans Los (WL   Delft Hydraulics, Netherlands)
Dose-response relations between eutrophication related factors and benthic flora and fauna	Jens Kjerulf Pedersen (NERI, Denmark)
<b>TOOLS AND APPLICATIONS</b>	
Ecological Quality Ratios: theory and practice	Wouter van de Bund (JRC)
REBECCA Toolbox	David Boorman (CEH, UK)
Modelling framework for Toxic Pressures and Responses: OMEGA-WFD	Frank van der Ende (RIZA, Netherlands), Harm Duel (WL   Delft Hydraulics, Netherlands)
WFD Explorer: tool to support river basin managers during the process of the development of River Basin Management Plan according to the requirements of the WFD	Egbert van 't Oever (Water Board Vallei & Eem), Ad Jeuken (RIZA), Herman van der Most (Netherlands)
<b>RIVERS</b>	
	<b>Chair: Roger Owen</b>
Why are rivers in Europe so important? Introduction to relationships between biological quality elements and different pressures	Nikolai Friberg (NERI, Denmark)
Diatom indices and biotypes: responses to inorganic nutrients for European rivers	Jane Fisher (CEH, UK)
Relationships between river biota, heavy metals and acid water	Torleif Baekken (NIVA, Norway)
Using biota as indicators of physical stream degradation and changes to hydrologic regime	Morten Lauge Pedersen (NERI, Denmark)
Impact of organic pollution on macroinvertebrates: interactions with the physical environment	Andrea Buffagni (IRSA, Italy)
Large scale models: how land use pressures determine ecological status across European countries and hydro-ecoregions	Jean-Gabriel Wasson (CEMAGREF, France)
<b>PRACTICAL USE AND FUTURE DEVELOPMENTS</b>	
	<b>Chair: Harm Duel</b>
Testing the practical use of the REBECCA results: case study Lake Veluwemeer	Ellis Penning, Simon Groot & Harm Duel (WL   Delft Hydraulics, Netherlands)
End users' view on practical use of REBECCA results and output	Ursula Schmedtje (Oberbayern, Germany)
<b>CONCLUSION</b>	
Notes on REBECCA so far and future	Jorge Rodriguez-Romero (DG Environment)
Final comments and closing conference	Seppo Rekolainen (SYKE, Finland)

Note: Presentations will be available shortly at <http://www.rbm-toolbox.net/rebecca/>

## REBECCA meetings

A programme of meetings facilitates the REBECCA research activity. REBECCA also participates in a number of externally organized conferences.

Date	Title	Venue
<b>2006</b>		
February 22-24	Rivers: Joint GIG/WP4 meeting	Paris, France
April 21	WP3 Lakes: Chlorophyll	Edinburgh, UK
March 15/16	ECOSTAT	Ispra, Italy
March 17	WP7 Dissemination	Italy
April 10/11	Rivers: WP4 meeting	Lyon, France
April 12/13	Validation on rivers: WP6/WP4	Lyon, France
May 8-12	WP3 Lakes: Publication workshop	Italy
May 12	Project Board	Italy
June 7-9	Validation	Finland
June 14/15	ECOSTAT	Ispra, Italy
June 16	Advisory Board	Ispra, Italy
September	Rivers: WP4 meeting	tba
October 31	Project Board	Helsinki, Finland
<b>2007</b>		
May 21-24	REBECCA : Users' Conference, WPs, Project & advisory Boards	Oslo, Norway

Nb. Some meeting dates are provisional. Many project meetings are closed – identified contacts can provide information.

## REBECCA web site

Further information about the REBECCA project is available through the project web-site at: <http://www.environment.fi/syke/rebecca>.

## REBECCA newsletter

To be placed on the mailing list for further news about the REBECCA project send an e-mail to [dbb@ceh.ac.uk](mailto:dbb@ceh.ac.uk) with the subject 'REBECCA mail list'.

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REBECCA is jointly funded by the EC 6<sup>th</sup> Framework programme as a Specific Targeted Research or Innovation Project (Contract number SSPI-CT-2003-502158) and the research programmes of the collaborating organizations.



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