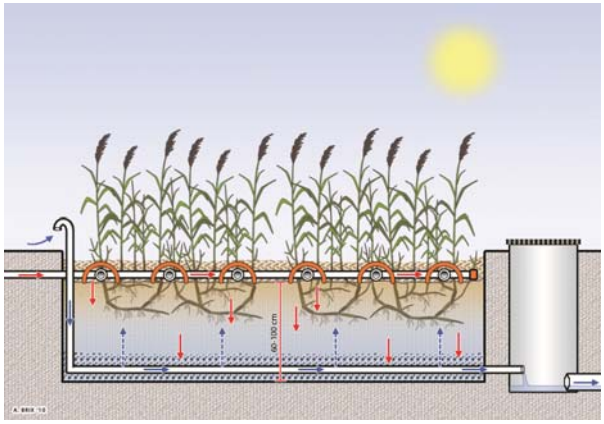
USE OF WETLANDS IN WATER POLLUTION CONTROL

Training-course, 19-26 June 2011
Aarhus University
Denmark

Aims
The aim of the course is to provide participants with
(i) a thorough understanding of the processes of importance for the transformation and removal of nutrients and various pollutants in wetlands,
(ii) an overview of different types of treatment wetland systems, their applicability and their limitations
(iii) tools to prepare conceptual designs of treatment wetland systems capable of achieving specific treatment goals
(iv) an overview of current research needs, methodologies and options.



Learning outcomes and competences
At the end of the course the participants will be able to:
(i) characterise biogeochemical processes of importance for nutrient removal in wetlands
(ii) describe the functional role of different types of plants in wetlands
(iii) describe different types of treatment wetland systems, their applicability and limitations
(iv) characterize the hydraulics of treatment wetland systems
(v) characterize pollutant removal pathways and removal kinetics
(vi) prepare conceptual designs of treatment wetland systems based on loading characteristics, site-conditions and effluent standards
(vii) identify research needs and research methodologies in various types of wetland systems

Contents
The course will provide an overview of the ecology of freshwater wetlands including hydrology, wetland soil biogeochemistry, and wetland plant ecophysiology. The processes responsible for the transformation of organic matter, nutrients and micropollutants such as pharmaceuticals and personal care products in the wetland environment will be described. The state-of-the-art in design techniques based on hydraulics and pollutant removal models in different types of treatment wetland systems will be demonstrated. Practical design guidelines and management aspects such as system layout, compartmentalisation, substrate selection, inlet and outlet structures, plant selection and planting will be presented.

Teaching curriculum
Teaching will be through lectures, seminars, theoretical exercises and plenary discussions of real case stories and scientific papers. The course is intensive and will require full-time attention. The participants will be required to prepare designs of wetland systems for the treatment of various types of contaminated water based on case-stories. Excursions to different types of full-scale treatment wetland systems and restored wetlands for removing of nitrate will be arranged. Systems dealt with include surface flow and subsurface flow treatment wetlands, vertical flow systems, evaporative zero-discharge systems, sludge treatment reed beds, stormwater treatment systems, and in-catchment agricultural runoff treatment systems.

Language
Teaching will be in English

Location
The course will be held at Molslaboratoriet about 40 km from Aarhus, Denmark.
(http://www.naturhistoriskmuseum.dk/molslab/index.html)

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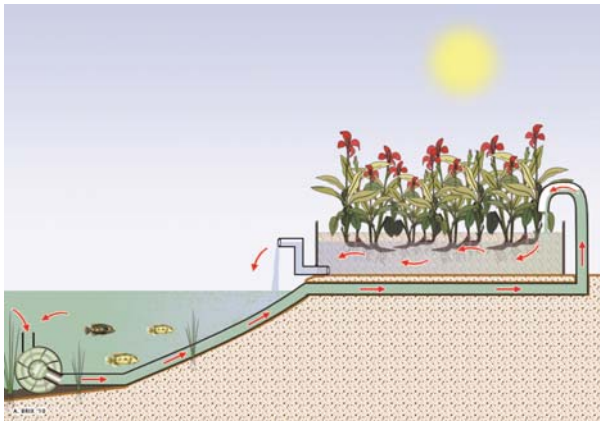
Evaluation
Pass/fail on the basis of satisfactory participation in the course and on the written report that has to be prepared and submitted one week after the course. Prior to the course, each participant will be asked to prepare a poster addressing the main parts of their own research.

Target group
The target group for the course is young researchers and Ph.D. students with projects related to processes in aquatic and wetland environments addressing environmental issues and ecological engineering options. First priority is given to AGSOS Ph.D. students.



Teachers
- Dr. Robert H. Kadlec, Prof. Emeritus of Chemical Engineering, University of Michigan (USA)
- Dr. Hans Brix, Professor in Plant Ecophysiology, Aarhus University (Denmark)
- Dr. Carlos A. Arias,
- Dr. Tom Headley, Ecological Engineering Scientist, Helmholtz Centre for Environmental Research (UFZ) (Germany)
- Dr. Brian K. Sorrell, Assoc. Professor, Aarhus University (Denmark)
- Dr. Carlos A. Arias, Research Assoc., Aarhus University (Denmark)
- Dr. Steen Nielsen, Orbicon (Denmark)
- Dr. Peder Gregersen, Centre of Recycling (Denmark)

Registration
Send application for participation to Dr Hans Brix (hans.brix@biology.au.dk) before 1 May 2011.The application must contain a short CV (name, postal/email address, university affiliation) and a brief (max. 200 words) abstract of the applicant's current research. Admittance list will be prepared medio May.

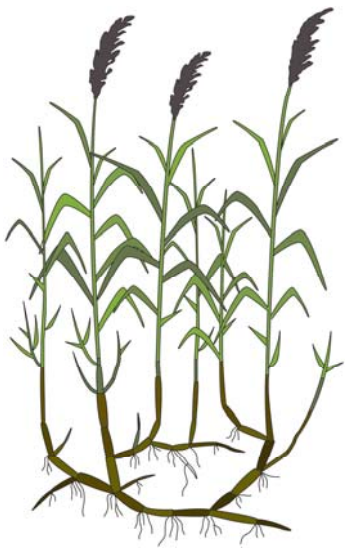
Course fee
6,500 DKK. The program fee covers tuition (including excursions), accommodation and all meals from Sunday 19th (dinner) till Sunday 26th (breakfast). Expenses for international and local transport to and from Molslaboratoriet are not included in the price.

Course credits
5 ECTS

Number of participants
Limited to 20

Course homepage
http://www.ferskvandsbiologi.dk/

Head of course
Dr Hans Brix, Department of Biological Sciences, Plant Biology, Aarhus University, Ole Worms Allé, Building 1135, 8000 Aarhus C, Denmark, email: hans.brix@biology.au.dk



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