SETAC Africa 6th Conference, Lusaka, Zambia

Short Courses + Summer school prior to the conference

Short course	Length/Date(s)	Main Lecturer	Additional Information	Cost/participant (US$)
Higher-tier risk assessment tools: species sensitivity distributions and model ecosystems	Full Day (01/09/2013)	Michiel Daam	Participants to bring own laptop to the course	110 $
Computer based methods in toxicology	Full Day (01/09/2013)	Barry Hardy		45 $
Wastewater microalgae identification and application	Half Day - AM (01/09/2013)	Patricia Harvey		14 $
Microalgae for wastewater treatment: A prospective approach for clean environment and renewable energy	Half Day - PM (01/09/2013)	Mohammed Ismail Abdel-Hamid		14 $
Ecosystem Services and its application in environmental risk assessment	Half Day - AM (01/09/2013)	Silke Bollmohr		14 $
ANCAP Summer School on Bioassay Bioindicators and Biomarkers in Pesticide Analysis	29/08/2013 to 01/09/2013 (4 days)	Robison Mdegela		150 $

AM = 08:00 – 12:30   PM = 13:30 – 18:00   Full day = 08:00 – 17:00

More details on the courses on the following pages.

Higher-tier risk assessment tools: species sensitivity distributions and model ecosystems

Instructor: Michiel Daam (Technical University of Lisbon, Portugal)

Course Length: full-day

Course Level: Introductory - Intermediate

Abstract: The ecological risk assessment of pesticides normally consists of a relatively worst-case first-tier assessment, followed by more realistic higher tier assessments if unacceptable risks are indicated. The initial use of a lower or first tier, i.e. an effect assessment based on laboratory bioassays with a limited number of standard test species, allows substances that do not present a risk to be eliminated from the risk assessment early. Subsequently, this allows the focus of resources and expertise on more problematic substances in a higher-tier evaluation using, for example, species sensitivity distributions (SSDs) or model ecosystem experiments.

The SSD is defined as a cumulative distribution function of toxicity data of a greater number of taxa than merely the standard test species, thus lowering the uncertainty in the risk estimation. Model ecosystems (microcosms and mesocosms) are man-made experimental ecosystems that are made up of / enclose parts of natural ecosystems, e.g. an aquarium or tank. Very few model ecosystem studies have been conducted so far in the tropics. Experience gained from studies conducted in Thailand will be discussed and will cover a detailed explanation of methodologies applied, a discussion of results obtained, and indications for research needs in (Afro-) tropical countries. This short course intends to introduce and equip participants with the basic skills necessary to conduct SSDs and model ecosystem experiments, with emphasis on tropical settings.

Course objectives:
Provide an introduction into SSDs: advantages, shortcomings and case-studies
Enable participants to construct SSDs though a practical
Explain methodology for conducting model ecosystem studies in tropical settings
Discuss future research needs for (afro-)tropical higher tier experiments

Participants to bring their own laptop to the course:
Yes, where possible. Participants may perform the practical in groups of 2-3 on one computer on which ETX software may be pre-installed through:
http://www.rivm.nl/rvs/Risicobeoordeling/Modellen_voor_risicobeoordeling/ETX_2_0

Hands-on application of computer based approaches in predictive toxicology

Instructor: Barry *Hardy, OpenTox Project Coordinator, Douglas Connec*t, *Zeiningen , Switzerland*

Course Length: full-day

Course Level: Introductory - Intermediate

This one day workshop will provide practical guidance on the use of predictive toxicology applications with an emphasis on Open Source-based software tools and Internet resources (1,2). Users will learn about concepts and methods, and apply them in practice with a hands-on approach to exercises.

The workshop is aimed to provide a set of stimulating problem-solving activities using latest advanced modelling and analysis techniques and case studies of relevance to research scientists, modellers, and risk assessors, needing to predict the toxicities of chemical compounds. Workshop participants will study problems with hands-on examples using leading-edge methods and software and discuss complex issues highlighted by examples presented by the instructor.

Software and databases will be used by instructors and participants to work through predictive toxicology problems. Participants should bring their own computer to the workshop and will be provided with free software to install. Participants will also have ample opportunity to work in small groups on problems and case studies and to discuss their perspectives and criticisms of the cases and methods studied.

The topics covered will include:
- The OpenTox Framework
- Using Internet-based Toxicology Resources
- Searching and integrating existing chemical and toxicology data
- Chemical Categories and Read Across in Risk Assessment
- Evaluating the impact of Chemical Modifications on Toxicities
- Modelling Biokinetics of Toxicants
- Exposure Prediction for Risk Assessment

(1) OpenTox - An Open Source Predictive Toxicology Framework, funded under the EU Seventh Framework Program: HEALTH-2007-1.3-3 Promotion, development, validation, acceptance and implementation of QSARs (Quantitative Structure-Activity Relationships) for toxicology, Project Reference Number Health-F5-2008-200787 (2008-2011). More information at www.opentox.org

(2) Collaborative Development of Predictive Toxicology Applications Barry Hardy, Nicki Douglas, Christoph Helma, Micha Rautenberg, Nina Jeliazkova, Vedrin Jeliazkov, Ivelina Nikolova, Romualdo Benigni, Olga Tcheremenskaia, Stefan Kramer, Tobias Girschick, Fabian Buchwald, Joerg Wicker, Andreas Karwath, Martin Gutlein, Andreas Maunz, Haralambos Sarimveis, Georgia Melagraki, Antreas Afantitis, Pantelis Sopasakis, David Gallagher, Vladimir Poroikov, Dmitry Filimonov, Alexey Zakharov, Alexey Lagunin, Tatyana Gloriozova, Sergey Novikov, Natalia Skvortsova, Dmitry Druzhilovsky, Sunil Chawla, Indira Ghosh, Surajit Ray, Hitesh Patel and Sylvia Escher Journal of Cheminformatics 2010, 2:7 (31 August 2010)
Full text and supplementary information available in Open Access at: www.jcheminf.com/content/2/1/7

Microalgae for wastewater treatment: A prospective approach for clean environment and renewable energy

Instructor: *Mohammed Ismail Abdel-Hamid, University of Mansoura , Egypt*

Course Length: half-day

Course Level: Introductory – Intermediate

Algae are recognised to play a central role in the natural self-purification of contaminated waters. Algae based wastewater treatment processes have been gaining tremendous attentions since 1960s. All the essential macronutrients (e.g., N and P) and micronutrients (e.g., Fe, S,) are available in domestic and agricultural wastewater. Major nutrients such as N and P alone contribute to ~10–20% of production cost of algae biomass. It became evident that certain microalgae species maintain incredible adaptation to thrive in and to treat domestic and agricultural wastewater with manifest massive growth. The resultant algal biomass has been proven to be excellent feedstock for clean biofuels. The power to treat wastewaters and the massive aquatic biomass production seems a double edged beneficial process for cleaning the environment and ensuring renewable clean bio-energy. Algae-based biofuel production holds future promise for developing countries. It represents a new industry, generating jobs, enhancing GDI (Gross Domestic Income) and may lead to energy independence. Environmental factors and resources are unique for mass production of algal biomass in Africa. Algae are the most efficient biological transformers of light energy to chemical energy through photosynthesis. The chemical energy is mainly stored in oils and carbohydrates which are the feedstock of biodiesel and bioethanol respectively. The highly energetic components, produced and stored in algal cells, attract current immense international concern considering algae the magic solution for the expected fuel crisis. In Egypt, intensive research activities were focused on the feasibility of some freshwater microalgae as realistic feedstock for biofuels. Algal isolates with reasonable content of crude lipids suitable for biofuel production, maintaining relatively higher growth rates, and accommodating wide fluctuations in growth controlling environmental factors, were selected for laboratory and outdoor trials of mass production. Three models of open ponds were designed for scaling up and optimizing the process of mass production. The open ponds include a bench top mode (0.2 m^2), field incubation and seeding pond (10 m^2), and a large raceway open pond (1000 m^2). Photobioreactors were used to raise some microalgae with incredible yield of hydrocarbon biofuel but require specific and well controlled growth conditions including light regime, temperature and composition of the nutrient medium. Intensive scientific researches are currently carried out to use microalgae for wastewater treatment and to benefit form the algal biomass as renewable and feasible feedstock of biofuels.

Wastewater microalgae identification and application

Instructor: *Patricia Harvey, University of Greenwich, UK; Keith Cowan, Rhodes University South Africa; Blahos Marsalek, Masaryk University Brno; and Mohammed Hamid, University of Mansoura, Egypt*

Course Length: half-day

Course Level: Introductory – Intermediate

More information to follow.

Ecosystem services and its application in environmental risk assessment

Instructor: *SilkeBollmohr (Hamana, Pretoria, South Africa)*

Course Length: half-day

Course Level: Introductory – Intermediate

In making decisions regarding potential environmental impacts associated with actions that can affect the environment, stakeholders must be able to balance the risks, benefits, and tradeoffs associated with a variety of alternative actions. Whilst the underpinning science and practical tools are still evolving, we provide potential approaches that can be used to formally quantify the effect of potential actions on ecosystem services. This course aims to show the differences and similarities of ecosystem service assessment in Africa (focusing on rural areas) and elsewhere.
Different case studies will show different approaches how to apply the concept of ecosystem service to environmental risk assessment procedures.

Objectives:
1. Provide overview of ecosystem services : definition and evolution
2. The resource economics of ecosystem services. Provide an overview of ecosystem service quantification and valuation
3. Where should we be heading? Review the goals of a wide range of regulatory programmes
4.Discuss practical applications of ecosystem services in environmental decision making frameworks
5.Provide case study presentations including discussion of ecosystem service analysis in Africa and elsewhere
6. Interactively discuss potential barriers to incorporating ecosystem services into environmental decision making in Africa

Program for 29 August to 1 September 2013

Summer School on Bioassays, Bioindicators & Biomarkers organised by ANCAP

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