FATE AND TRANSPORT OF CONTAMINANTS IN ENVIRONMENT

Overview

To fulfill the needs of unnatural lifestyle, mankind has unwisely contaminated environment with a large number of chemicals. Unfortunately, the environment's capacity to reduce concentrations to negligible levels by dilution and degradation only works for some chemicals. Certain organic chemicals that are persistent (P), have potential to bio accumulate (B), or are very toxic (T) are of greatest concern since such properties allow them to easily reach concentrations that can cause adverse effects on aquatic/ terrestrial wildlife and even humans. An added concern with some chemicals is their ability to migrate over long distances to contaminate unexpected or sensitive ecosystems. Such chemicals are commonly grouped under the list of persistent organic chemicals (POPs) and should be the target for more stringent regulation and control all around the world. The list includes both chemicals of historical concern, such as PAHs, organochlorine pesticides, as well as those of emerging concern such as brominated flame retardants and fluorinated compounds. POPs enter lakes, rivers and other water bodies by direct discharges, riverine inflow and atmospheric deposition. They then become subject to distribution and accumulation between the water column, suspended and bottom sediments and biota. It is, therefore, valuable to establish a steady-state or dynamic mass balance of chemical fate to provide a quantitative link between contaminant loadings and the resulting concentrations in water, sediments and biota, which comprise the receiving ecosystem. This has been demonstrated in several studies in the Canada – US Great Lakes Basin as well as many other parts of the world ~~-u~~sing relatively simple multimedia mass balance models. This approach may be of particular value in less developed or less affluent countries in which there are limited resources available for obtaining the input data required by the models.

The course will enable the participants to better understand and quantify the fate of chemicals greatest concern, such as POPs, in the natural environment and apply the knowledge gained in better management of environmental pollution. The course will present simple techniques for calculating how chemicals behave in the environment, where they accumulate, how long they persist and how this affects their fate and effect on the environment. The goal is to allow the participants to apply the techniques learnt to understand the basis for setting up multimedia mass balance models of varying complexity for regulatory use by government agencies or application to different real-life environmental situations. Many examples of such use from literature will be discussed. Participants will also download and learn to use many such models available for the Canadian Environmental Modelling Centre.

Modules	**Module A:**Fundamentals and Concepts of Multimedia Environmental Models June 13 – June 18 **Module B:** Application of Multimedia Mass Balance Models June 20 – June 25 **Number of participants for the course will be limited to fifty.**
You Should Attend If…	▪ you are a student (final year UG or PG) of Env. Engg., Civil Engg., Biotechnology, Chemical Engineering ▪ you are an Environmental Engineer, or research scientist interested in Mathematical Modeling ▪ you are a member of the Faculty of Environmental Engg., Civil Engg., Chemical Engg.,& Biotechnology from academic institutions ▪ you are an employee of Governmental Organizations such as PWD, BWSSB, KSPCB or ULBs ▪ you are from a consulting firm or organization
Fees	The participation fees for taking the course is as follows: **Participants from** • abroad : US $250 • Students from host institution : Free • Students from Academic Institutions: ₹ 2000 • Members of the Faculty from Academic Institutions : ₹ 3000 • Industry/Consulting Firms/ Research Organizations: ₹ 5000 The above fee include all instructional materials, computer use for tutorials, assignments and laboratory equipment usage charges.

The Faculty

Dr. Rajesh Seth is a Professor of Environmental Engineering at the University of Windsor, Ontario. He has a Bachelor's degree in Civil Engineering from University of Jabalpur, India. He completed his Master's from IIT, Kanpur, India and Ph.D. from the University of Toronto in the area of environmental engineering. Before joining the University of Windsor as an Assistant Professor in January, 2002, Dr. Seth spent a number of years in research and consulting in environmental engineering. He specializes in the development and application of environmental models to the partitioning behaviour, fate and transport of contaminants in the environment, both at regional and local scales.

Dr. K.S. Lokesh is currently working as Professor and Head, Department of Environmental Engineering, S J College of Engineering, Mysuru. He obtained his B.E., Degree in Civil Engineering from Bangalore Unviersity, M.Tech., from IIT Kanpur, Kanpur and Ph.D from University of Roorkee**,** Roorkee (currently IIT Roorkee). Prof. Lokesh joined SJCE, Mysuru during 1982. Prof. Lokesh has over 33 years of teaching and 28 years of research & consultancy experience. His current research areas are Environmental Biotechnology, Indoor and Ambient Air Pollutants' modeling, Advanced Wastewater Treatment, Water Quality Modeling& Ecological Sanitation. He is a recipient of British Council Fellowship (1999) and Mellon Foundation Scholar, USA (2009).

Course Co-ordinator

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