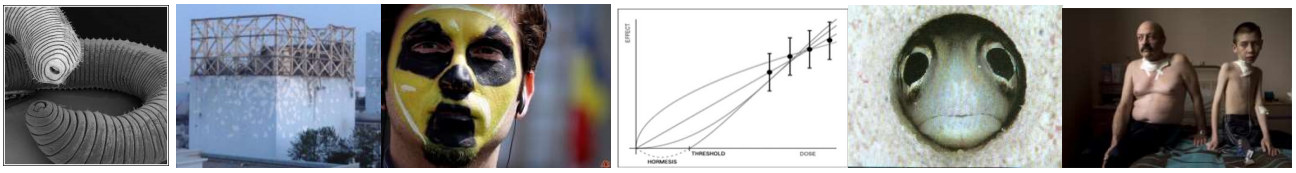
KJM360: Assessing Risk to Humans and the Environment

13-24th June 2022, NMBU, Norway

Organised by the Centre for Environmental Radioactivity (CERAD), Norwegian University of Life Sciences (NMBU) and supported by IUR



Course Aims and Overview

The aim of the course is to give students a grounding in the theory and skills needed to carry out environmental risk assessment for humans and non-human organisms. This will include hands-on training in the ERICA assessment tool. In addition to learning the basic theory and strengths of risk assessment and management, students are given insights into the assumptions, uncertainties and limitations of the tools and models. The central theme is environmental risk assessment, hence the main focus is the exposure of humans to radionuclides in the environment, as well as the exposure of non-human biota to ionising radiation. The course does not cover worker or medical exposures, although these themes are touched upon when the tools used are similar (e.g., radiation dose calculations and epidemiology). The course concentrates on the approaches used in radiation risk assessment and management, including for decommissioning and remediation, but it also compares these with approaches used in the assessment of other chemicals and stressors. This provides nuclear science and radiation protection students with important insights into similarities and differences in risk assessment and management of ionising radiation as compared to other stressors. Such comparisons make the course relevant to students working in other areas of environmental risk assessment. Topics covered include generic risk assessment approaches, international regulation and policy, risk communication and perception, and social and ethical aspects of risk management. It is open to students of environmental science, ecology and nature management, and nuclear sciences. Professionals may also attend all or parts of the course, for example to obtain certification in assessment tool training.

Teachers: Prof Deborah Oughton (CERAD/NMBU), Dr Yevgeniya Tomkiv (CERAD/NMBU), Dr Rani Lill Anjum (CERAD/NMBU), Prof Per Strand (CERAD/DSA), Prof Andrzej Wojcik (Stockholm Univ, Sweden); Prof Larry Kapustka, (Canada), Prof Paul Schofield (Cambridge Univ, UK), Prof Richard Wakeford (Manchester Univ, UK), Simon Carroll (Vattenfall, Sweden), Prof. Graham Smith (GMS Abingdon Ltd, UK), Prof Brian Wynne (Univ Lancaster, UK), Dr Justin Brown (DSA, Norway)

ECTS accreditation: Bologna Accredited 10 ECTS

Accommodation: Ranges from rooms in student residence halls to shared apartments and hotels. A limited number of accommodation support grants are available.

Extracurricular activities: Cultural activities, sightseeing and a Midsummer Barbeque will be organised

Application Deadline 27th May 2022

Further information and application: deborah.oughton@nmbu.no; yevgeniya.tomkiv@nmbu.no

photos: takethesquare.net; news.kievukraine.info

Detailed course contents and modelling/assessment tool activities:

The course is mainly lecture and case study based, with group work and two days dedicated to hands-on training in the ERICA risk assessment tool. All lectures NMBU SKP.

Day 1: Monday 13th June

Morning: Introduction to Human, Environmental and Ecological Risk Assessment (Deborah Oughton, Yevgeniya Tomkiv and Rani Lill Anjum, NMBU)

Content: *Aims, Approaches and Concepts of Risk Assessment Frameworks. Similarities and differences between Human, Environmental and Ecological Risk Assessment; Categorization of the different types of uncertainties associated with risk assessment (including group work);*

Afternoon: Assessing risks from ionising radiation: General Introduction to Radiological Protection (Prof Per Strand CERAD/DSA)

Day 2-3: Tuesday 14th and Wednesday 15th June

ERICA ASSESSMENT TOOL MODULE – IUR ACCREDITED

Introduction (Prof Per Strand, CERAD/DSA, Norway)

Content: *History behind Protection of the Environment from Ionizing Radiation; Controversy over field effects; UNSCEAR White paper on Environmental Effects of Ionising Radiation.*

ERICA Assessment tool introduction and training sessions (Dr Justin Brown, CERAD/DSA and Boris Alfonso, AFRY, Sweden)

Day 4: Thursday 16th June

Decommissioning (Simon Carroll, Vattenfall, Sweden)

Content: *Overview of decommissioning – what it is, why we do it, status worldwide. What you might need to consider in a decommissioning plan; Remediation /Completing a decommissioning project; Potential contamination – radiological, other hazardous materials; How clean is clean – determining what is needed and demonstrating outcomes; Release of sites; Sustainability and decommissioning - an evolving and challenging area*

Day 5: Friday 17th June

Morning: Decommissioning (continued)

Afternoon: Social and Ethical Aspects of Risk Assessment and Management (Deborah Oughton, Yevgeniya Tomkiv CERAD/NMBU, Norway; Brian Wynne Lancaster University, UK)

Content: *ERA Ecosystem Approach and Ecosystem Services; Risk Communication and Public Attitudes; Stakeholder and public involvement in decision-making; STS studies.*

WEEKEND: Oslo Trip

Day 8: Monday 20th

Assessing human radiation risk (Andrzej Wojcik, SU)

Content: Biological effects and Biomarkers; Case studies: Radon and multiple stressors

Day 9: **Tuesday 21st June**

Morning/Afternoon: Human Risk Assessment - Epidemiology (Richard Wakeford, Univ Manchester, UK)

Content: *General Introduction to Epidemiology; Bradford Hill Criteria; Cases from Cancer and Radiation Exposure (Hiroshima/Nagasaki, Radon, Nuclear Power, Fukushima, etc.)*

Social event: Midsummer BBQ

Day 10: **Wednesday 22nd June**

Morning: Data Collection, Treatment and Storage (Paul Schofield, Cambridge, UK)

Afternoon: Ecological Risk Assessment (ERA) case study mercury submarine (Deborah Oughton, CERAD/NMBU, Norway)

Day 11: Thursday 23rd June

Ecological Risk Assessment (ERA) (Graham Smith, Deborah Oughton, Yevgeniya Tomkiv)

Content: Criteria, Benchmarks and Screening Values: LNT controversy, Nuclear Emergencies and Legacy Sites

Day 12: Friday 24th June

Post-Normal Science: Complexity, Reproducibility and Conspiracy (Deborah Oughton, Yevgeniya Tomkiv, Rani Lill Anjum, CERAD/NMBU, Brian Wynne, Lancaster Uni, UK)

The ECTS exam is a course assignment to carry out a risk assessment on either human or environmental case (10 ECTS). This can be the choice of the student or an assignment provided by the course tutors. Students are expected to spend one week on research for the assignment and will be given tutoring (on distance) by the course teachers during this time.

Course Organisers: Prof Deborah Oughton, Dr Yevgeniya Tomkiv and Prof Per Strand (CERAD)