COMET
COordination and iMplementation
of a pan European instrumenT for Radioecology

Issue 2
July 2015

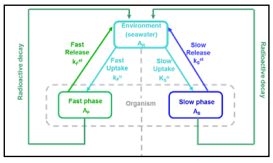
Welcome to the 2nd COMET project newsletter

Results discussed at the COMET Work Package 3 meeting

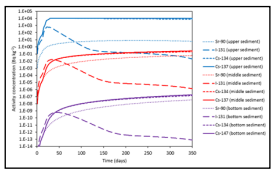
In January 2015, the first Work Package 3 meeting with new partners from RATE and FRAME was organised in Oslo, Norway.

27 participants from 12 European countries discussed the progress in the Initial Research Activities (IRAs) and the integrations of RATE and FRAME with respect to the IRAs on `Particle behavior` and `Marine modelling'. Both FRAME and the group working on 'Marine modelling' are focusing on the radioactive releases from the Fukushima Dai-ichi NPP and the subsequent dispersion and transfer in the marine ecosystems in Japanese coastal waters and the larger Pacific Ocean. So far, the highest concentrations of Cs-137 are in demersal fish, followed by invertebrates. Lowest concentrations are in pelagic fish (Vives i Battle, 2015).

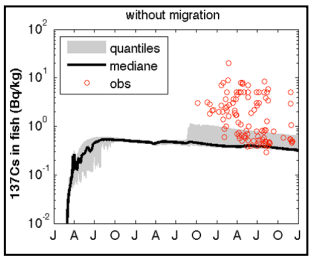
The 'Marine modelling' group is using several modelling codes: STERNE, NRPA marine box model, Pelagic trophic chain model & D-DAT. FRAME also uses D-DAT which includes a dynamic sediment sub-model in three layers. The Pelagic trophic chain model models transfer to marine organisms while taking account of migration patterns of fish.

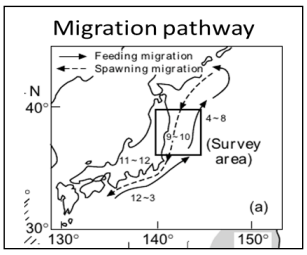


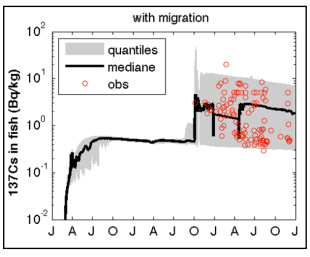
D-DAT model illustration



D-DAT modelling results from FRAME for I-131, Sr-90, Cs-134 and Cs-137 in upper, middle and bottom







Modelling results for concentrations of Cs-137 in sardines without migration (left) and with migration (right) compared to the observed values (red circles). The migration model is from Tameishi et al., 1996

The STAR project final dissemination event

The **S**trategy for **A**llied **R**adioecology (STAR) project had its final dissemination meeting in Aix-en-Provence, France from the 9-11 June 2015. The event presented the results of the 4.5 year research programme and the agenda was a mixture of presentations, posters and debate sessions. The topics were: The integration of radioecology at the European level; Protection frameworks for wildlife – advancing the underlying science through integrated research and The STAR toolbox: advancing radiation risk assessment and sharing knowledge.

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STAR & COMET 'Effects uncertainties workshop'

The international workshop on Transgenerational and Epigenetic Mechanisms of Radiation Toxicity at Chronic Doses in December 2014 Oxford, UK was organised by COMET and STAR as an integrated activity between related research fields. The meeting focused on theoretical discussions on epigenetics and on the role of epigenetics in (eco) toxicology and radioecology, including biological processes such as development, aging and neurological diseases, adaptation and the use of epigenetic endpoints as generalized or even stressor-specific biomarkers. World leading experts in each of the subjects attended the workshop. In total, there were 48 participants from 12 countries (Belgium, Canada, USA, Spain, France, Germany, Japan, Norway, Portugal, United Kingdom, Russia and Sweden). The report can be downloaded here.

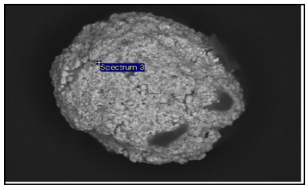
The workshop addressed a wide spectrum of questions related to long-term and transgenerational exposure. Discussion groups at the end of the plenary sessions addressed similar points on the role of epigenetics in radiobiology and ecotoxicology, but from a different perspective: (i) from an ecological an evolutionary biology viewpoint and (ii) with a focus on mechanistic issues and systems biology.

The two discussion groups outlined key issues that unified studies across the two areas, such as how the revolution in understanding of epigenetic mechanisms has provided researchers with a wealth of new methods and tools. Developing such partnerships is important to help move the field forward and this meeting was a step in this direction.

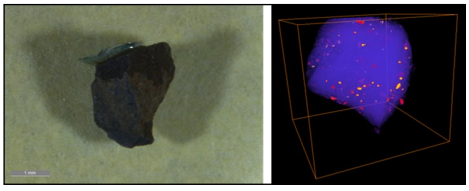
A highlight from the COMET-RATE project

The 1st milestone report "Preliminary overview of particles available for transformation studies" has been completed; it provides information on 32 hot-particles from Palomares, Thule, Semipalatinsk, Chernobyl, Australia tests sites, Dounreay and NORM sites. Characterization of the particles is ongoing and includes radiometric and advanced solid state speciation techniques. A database has been created to collate the characteristics of the nanometre-millimetre size particles from anthropogenic and naturally occurring sources, representing different historical sources and releases scenarios. The data will be very useful for the prediction of ecosystem transfer of particle-associated radionuclides. The preliminary database will be available at the end of August and will be expanded during the project.

In April 2015, a meeting of RATE partners was held in Palomares, Spain; hosted by CIEMAT. During this meeting, the partners agreed a common protocol for conducting abiotic experiments on the particles. The first of these experiments has now commenced.



SEM image of a Palomares particle



Light microscope (left) of an alun shale fragment (NORM material) with heterogeneous distributions as demonstrated by Nanotomography (right)

RATE Members visiting areas affected by the Palomares accident

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The Radiological Roadmap and topical Working Groups

A radioecology Strategic Research Agenda (SRA) was developed in 2012 by the STAR project. The SRA highlighted three Scientific Challenges with 15 associated Research Lines. COMET (with STAR) has produced a preliminary roadmap which has also been endorsed by the ALLIANCE. Radioecology research within the roadmap is focused on strong interactions with two other pillars of radiation protection: emergency response and management of post-accidental situations covered by the NERIS platform and low dose risk research represented by the MELODI platform. The overall objective of the research is to sustain/support/reinforce human and environmental protection and to better understand effects from low doses of radiation to wildlife. This preliminary roadmap serves as a basis for the development of a 5-year implementation plan for a limited number of priority Research Activities. Currently 6 topical Working Groups have been launched dealing with: marine radioecology, NORM sites, forest radioecology, human food chain modelling, inter- and intra-species radiation sensitivity and transgenerational effects.

A 7th Working Group on atmospheric radionuclides and transfer processes is being developed.

ICOBTE conference & COMET workshop, Japan. 13-19 July 2015

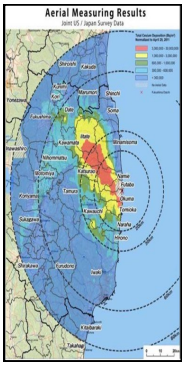
A special session at the ICOBTE conference at Fukuaka was organised by COMET on 'Understanding and mitigating the environmental behavior of radiocaesium after the Fukushima accident' which was chaired by Fukushima University and CEH. There were over 70 abstracts submitted, with most being given as oral presentations and >20 given as posters.

After the conference an excursion to the Fukushima contaminated area took place which was then followed on the 18th-19th July by a COMET workshop organised by Fukushima University.

The workshop was attended by Fukushima university and prefecture scientists as well as scientists from national Japanese organisations. The speakers were selected to cover a range of topic areas and summarized current key findings and issues.

Programme

A report from the workshop will be available soon.



Training Course: 7-10 Sept 2015, NORM in the Environment

An intensive, 4 day COMET training course will take place in Poland. It will focus on most aspects of environmental radiation impact and risks associated with enhanced natural radioactivity released from different sources and accumulated in the environment. The course will include theory (lectures) and training in the lab (radiochemistry and radiation measurements) and training in the field (dosimetry and sampling) at sites contaminated by NORM.

Preliminary programme

Course information

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