

The February 2013 “Uncertainties” Workshop at CEH (Lancaster, UK)



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Aims of the Workshop

Bring together scientists involved in environmental and laboratory studies of radiation effects to:

- discuss field based studies
- investigate the available radiation effects data
- discuss current methods for deriving numerical dose rate benchmarks
- consider uncertainties in dose estimation in the field
- start to understand the basis behind some of the contrasting results and interpretations
- agree future research priorities and mechanisms whereby data can be shared
- gain a greater understanding of the impacts of radiation on wildlife

Agenda and links to presentations

Monday 4th February 2013

Presentations on field based studies on radiation effects

Chernobyl

- [Internal and external doses and the effects of low-dose radiation](#) - Timothy A. Mousseau
- [Biological effects of chronic exposure to radionuclides in plant populations \(Chernobyl + Komi. S. Urals\)](#) - Stanislav Geraskin

Fukushima

- [Radioactive contamination of nest materials due to the Fukushima nuclear accident in passerine birds](#) - Shin Matsui
- [Fukushima-derived radionuclide exposure and effects on birds and frogs](#) - Christelle Adam-Guillermin
- [From molecules to men: Effects of low-dose radiation at Chernobyl and Fukushima](#) - A Møller

Others (Mayak., field irradiation)

- [Lessons learned from the small mammal field irradiator studies in Canada](#) - Steve Mihok
- [Issues concerning the measurement of Radioadaptation of small mammals in the East Urals radioactive trace](#) - Elena Grigorkina

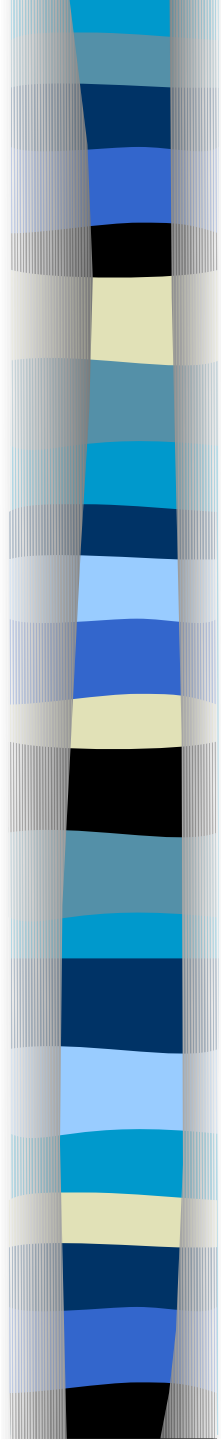
Tuesday 5th February 2013

- [Radiobiological evidences for effects of chronic low doses on wildlife, with a particular focus on field data](#) – Almudena Real
- [Application of screening values](#) – Jacqueline Garnier Laplace
- [Uncertainties in measurement of radiation doses to biota in the field](#) – Jordi Vives i Batlle
- [Comparison between data from lab and field](#) - Dave Spurgeon

Presentations were followed by breakout groups to discuss key uncertainties and what are the key research priorities.
(Chairs : Paul Whitehouse – EA & Claus Svendsen – CEH)

Wednesday 6th February 2013

- Breakout sessions and general discussion



Breakout Groups - Key Questions

- ▼ How much is known about the influence of confounding factors, other contaminants, weather, nutrition, stress ...
- ▼ How reliable are dose measurements, can field methods in particular be improved
- ▼ How to deal with spatial variability and species mobility
- ▼ Do laboratory tests reliably represent the field situation
- ▼ Do biomarkers / endpoints relate to population effects
- ▼ How much uncertainty is related to data selection in derivation of the SSD for radioactivity
- ▼ What is the real shape of dose-response curves at low dose rates, Is hormesis real / important
- ▼ What are the consequences of non-targeted mechanisms such as bystander effects and genomic instability



Initial conclusions

- ▼ *There is a currently unexplained discrepancy between adopted benchmark screening values and some effects data from field studies. There is an urgent need to resolve these issues in part as regulators are being questioned regarding the data they use in their assessments, current benchmark dose and dose rates are perceived as not being low enough*
- ▼ We need to work out how to address the situation and clarify what is contributing to the differences



Possible Actions

- ✓ Gathering more field data with careful consideration of the structuring of sampling
- ✓ Making data freely available via data portals with digital object identifiers (i.e. doi numbers) assigned to datasets
- ✓ Collaborating on data analysis
- ✓ Improving estimation of external and internal doses and dose rates in the field
- ✓ Independent testing / verification of key findings



Issues Discussed - where are we now ?

- ✓ Problems with laboratory versus field studies (multiple stressors, multiple generations)
- ✓ Gaps in effects databases (alpha/organisms/etc.)
- ✓ Realistic dosimetry (ICRP models, new field work)
- ✓ Knowledge gaps for transfer (new approaches)
- ✓ Guidelines for experiments (lab versus field)
- ✓ International co-operation, networks of excellence
- ✓ Sharing and exchange of data

STAR, COMET, MODARIA ...

Google Scholar entries since the workshop

- 2,360 publications with the term “radioecology”

Where do we need to focus now ?



Robustness of ecological radiation protection criteria

