

Project proposal template
Graduate School studentships
March 2015

Project title

Radionuclide Transport in the Environment
- Chernobyl Fallout in Soils and Lake sediments of South-east Belarus

First Supervisor

Dr



Alan Flowers

Second Supervisor

Professor Gavin Gillmore

School

Geography, Geology and Environment



Other member of supervisory team
(no more than three KU supervisors in total)

Specific requirements
beyond 2:1 degree

Interest in quantitative analysis of radioisotopes and radioecology.

Project summary

(max 4,000 characters)

The accident at Fukushima in 2011 has highlighted the importance of understanding the movement of radioactive materials in the environment. Much valuable data on the long term effect of radionuclides in the environment is available from studies of the environmental impact of the fallout following the 1986 Chernobyl Nuclear Plant explosion.

Nearly 30 years later soils in SE Belarus and in the restricted area near the reactor in Ukraine and Belarus remain highly radioactive, and restricted zones exist up to 150 km from the reactor.

In the period 1992 to 2004 Kingston University conducted several sampling field trips to SE Belarus, into the more distant, but more easily accessible, restricted areas, and areas openly accessible on the restricted areas borders. Kingston University still holds the following Chernobyl fallout contaminated material:-

- Soil profile sets from 3 locations in Belarus, with repeats at same location 1996 and 2000.
- Lake sediment cores.
- Soil profiles at forestry sites.
- Surface samples in a region suspected to have actinide content at 200km from Chernobyl.

This proposal includes fieldwork, in cooperation with a local Belarusian University, to take soil profiles at sites where we already have good historical soil profile data. We intend to undertake a temporal comparison of transport results in undisturbed soils variously over 19 years (1996->2015,) 15 years (2000-2015) and 12 years (2003-2015), and take relative measurements using both the original (old) and new samples.

The focus for this project would be a study of lake sediments and soil from Southern Belarus. One aspect of this work would be hot particle degradation.

It is anticipated that this work will provide a significant understanding of the long term impact of nuclear reactor accidents on the environment, with an emphasis on the long lived radioisotopes of largest impact: Cs¹³⁷, and Sr⁹⁰,