TOPICS Fukushima 30 Jan 2015 No.59

What should be done to support early return of evacuated residents to their homes?

Domestic and overseas experts discuss future countermeasures in Fukushima

Japanese and foreign experts attended a conference in Fukushima City in October 2014 to discuss progress in environmental remediation of areas contaminated by the March 2011 accident at Fukushima Daiichi Nuclear Power Station (“1F”) and, in particular, support for the return of evacuated residents to their homes as soon as possible. This “Caesium Workshop” focused on the influence of radiocaesium migration in the environment and is the second conference on this topic, following the highly successful first one held the year before. Special topics included volume reduction of soil generated by decontamination works and communication issues. This year, participants included thirteen researchers from overseas (UK, Switzerland, USA, Italy, Russia, and

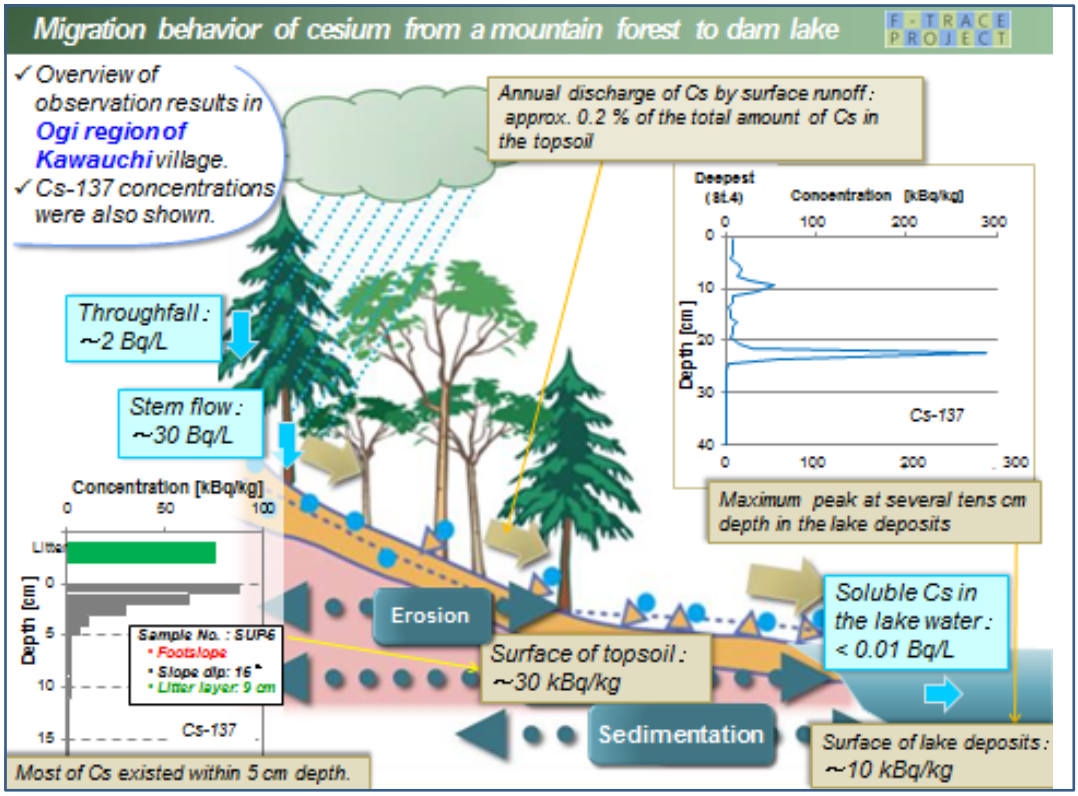
Ukraine) and fifty-two from Japan. Once again knowledge transfer was a key issue, utilising international experience gained in studies of radiocaesium in the environment over the last five decades.

Radioactive caesium self-cleaning

The impact of radiocaesium is now decreasing and the environment is gradually recovering because of the considerable progress in decontamination work and also natural self-cleaning. Although such decontamination is novel, caesium self-cleaning has been observed elsewhere – for example after the 1957 Windscale fire in England and after distant fallout from Chernobyl in 1986.

Research on radiocaesium behaviour in forests, which occupy about 70% of the land area of Fukushima Prefecture, shows that annual release of radiocaesium is very small (about 0.2%-0.5% of the total inventory) as it is strongly bound to surface soil (mainly the top 5 cm of soil). However, careful monitoring for radiocaesium behaviour in rivers and reservoirs during the flood conditions in which soil is eroded will be necessary. If required, countermeasures such as dam management can reduce short-term impacts, while decay of radiocaesium and natural self-cleaning will reduce impacts in the long term.

For agricultural land, it was reported that potassium fertilisation at early growth stages is effective in reducing radiocaesium transfer to agricultural plants. In freshwater aquatic environments, it was noted that the radiocaesium concentration in fish is gradually decreasing. This understanding needs to be captured in more realistic biosphere models, which can not only guide sampling of the



environment but also evaluate radiation exposure for different lifestyles of returning residents, to ensure that they are not exposed to any health risks.

Continued investigation of forests

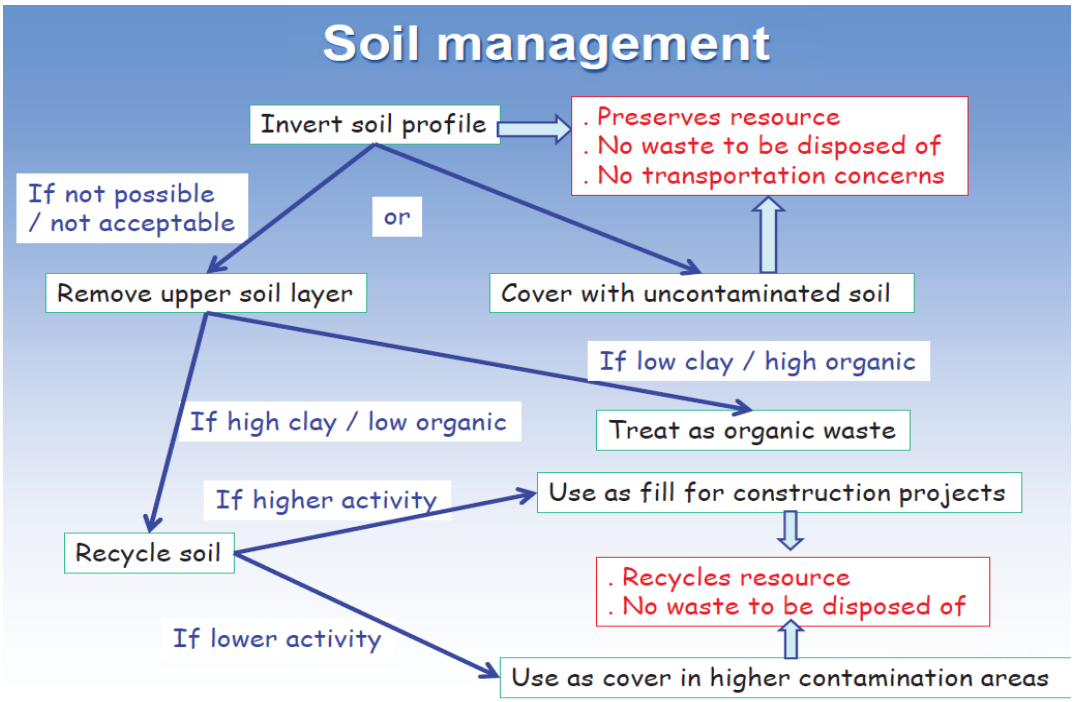
Continuance of forest research yields knowledge that provides guidance on the pros and cons of different forest management options, which need to be communicated to both foresters and local residents.

The results of such continued investigation indicates so far no absorption of radiocaesium in trees. Also the reports of Cs in tree heartwood compiled by research on the effect of Chernobyl accident were questioned as there is no obvious mechanism by which this can occur.

Radiocaesium in mushrooms was a special topic of discussion, as these are known to be capable of greatly concentrating this radionuclide. Cs deposition from Chernobyl in forested mountains (e.g. in Northern Italy) has shown very different accumulation of radiocaesium by different mushroom species, depending on the soil depth at which they access nutrients. It is clearly important that investigation procedures, e.g. sampling protocols, should be based on a good understanding of forest ecology in order to assess how returning residents can make safe use of forest resources. On the positive side, such biological "hyper-accumulators" of radiocaesium may provide an approach for longer-term decontamination of areas with higher dose rates.

Management of soil from decontamination actions

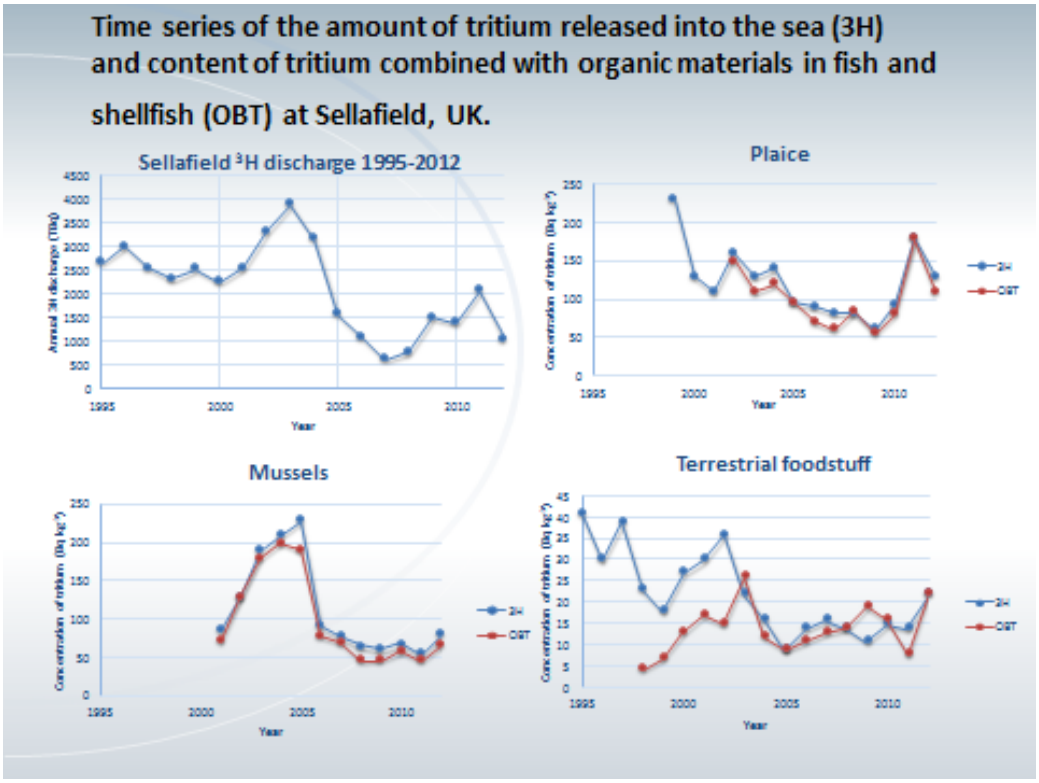
As a result of decontamination activities, a large amount of decontaminated soil may be generated. Discussions included approaches to reduce the volume of removed soil as much as possible. In



addition, possible methods for reuse of such soil depending on the content of clay and organic materials were considered. Nevertheless, even if technically possible, reuse of decontamination soil requires agreement of residents and modification of appropriate regulations. Disposal of a resource like soil should be considered only as a last resort for the most highly contaminated material.

Water contaminated with tritium can be safely released into the sea

Contaminated water stored on 1F site is a growing problem. Although current technology can remove dissolved contaminants, tritium remains as it is part of the water molecule. Large tritium releases to sea have been monitored in the UK for decades, giving confidence that this option presents no safety hazard and is much preferable to continued surface storage. Thus, it was recommended that concerned residents and stakeholders in the fishing industry are informed of the key scientific/technical facts supporting such an option.



Accurately communicate both benefits and risks

Communication with residents is a key issue that cannot be decoupled from technical aspects of environmental restoration. Benefits and risks of different cleanup strategies must be explained to stakeholders so that they can actively participate in

decision making. This may be helped by putting these in the context of past recovery from radiocaesium contamination: in some cases so successful that the original events are generally forgotten.

TOPICS Fukushima　No.59

Fukushima Administrative Department

Sector of Fukushima Research and Development

Japan Atomic Energy Agency (JAEA)

Address: Fukushima /NBF Unix Building 1F 6-6, Sakae-machi, Fukushima-shi, Fukushima 960-8031, Japan

Phone：(+81)-24-524-1060　Fax：(+81)-24-524-1073

HP：http://fukushima.jaea.go.jp/english/index.html