LONG-TERM DYNAMICS OF CAESIUM IN FOREST

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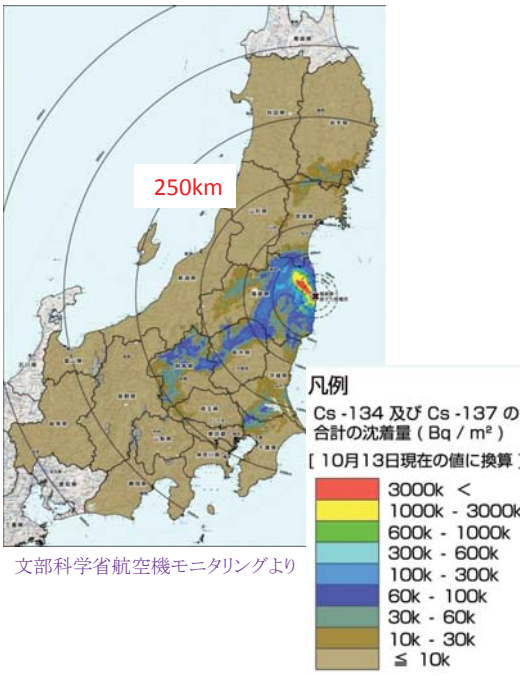
Problems involved in Fukushima contaminated forests

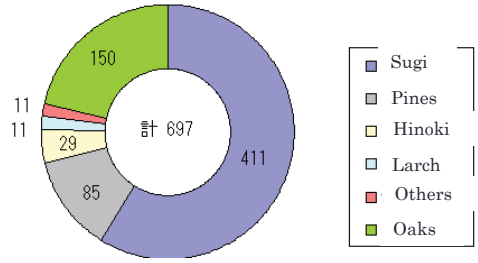


文部科学省航空機モニタリングより

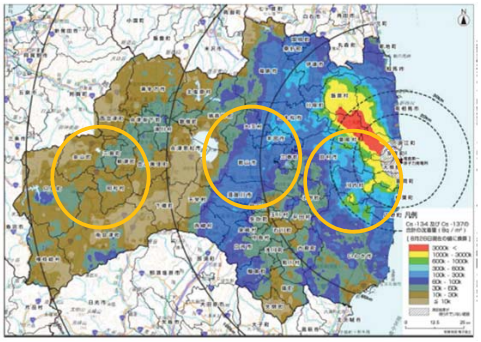
- Safety of timber and wood products
- Effects of radio Cs on multi-functional uses of forests
- Wide distribution of contaminated area in northern Kanto plain
- Cs dynamic in the forest ecosystem
- Modeling of Cs dynamics and wide area estimation of Cs distribution in east Japan.

Study strategy for the forests in Fukushima: comparison among Sugi forests with different contamination levels

Timber production in Fukushima (10^3 m3)



Fukushima is a timber production prefecture of the 7th place in Japan.

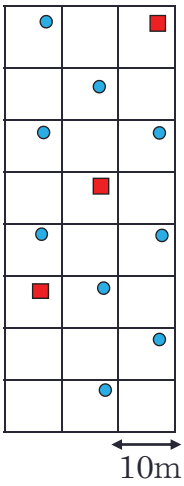


Study strategy: comparison among tree species and annual changes

Tree species:
3D structure of forest ecosystem

Methods: Study sites and sampling methods

Litter and soil



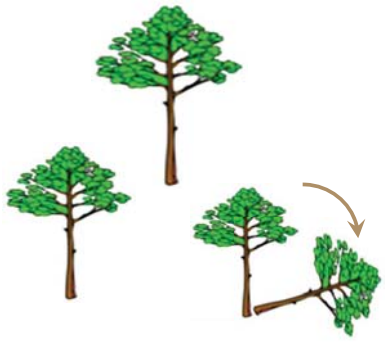
Plots
Kawauchi
0.16ha (20×80m)
Ohtama
0.24ha (30×80m)
Tadami
0.21ha (30×70m)

Ex. Pine forest at Ohtama

- Air dose rate (on the grids, 10cm and 1m)
- Litter (25x25cm) and soil (core sampling)

surface soil (0-5cm) deeper soils (0-20cm)

Trees



- Estimation of tree biomass and growth by tree enumeration
- Selection of felling trees with different sizes (tall, middle, short) for sampling
- Separation of tree organs; leaves, twigs, bark, and wood.

Photos in the field, and separation of heartwood and sapwood for Cs analysis

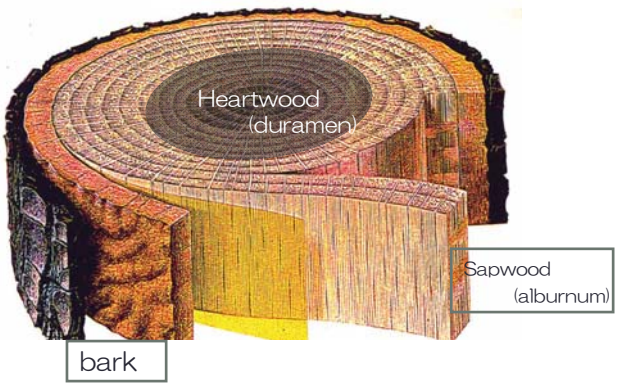
Measurement of air dose rate

Soil sampling

Analysis by germanium semiconductor detector

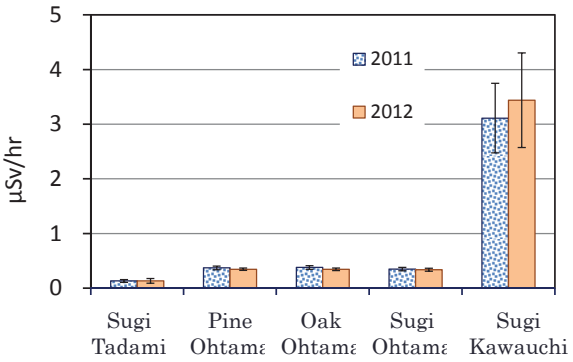
Cutting a tree

Sampling of wood after peeling of bark



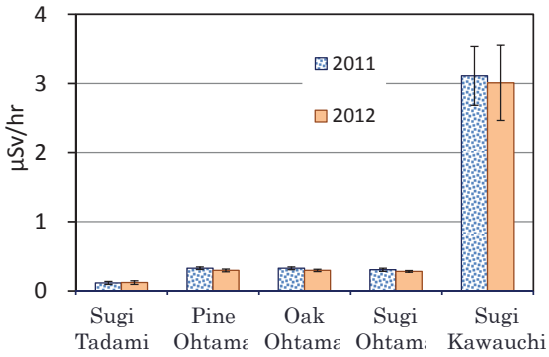
Comparison of the air dose rates in the plots between 2011 and 2012

Height: 10cm above the forest floor



	Sugi Tadami	Pine Ohtama	Oak Ohtama	Sugi Ohtama	Sugi Kawauchi
2012/2011	101%	93%	91%	92%	111%

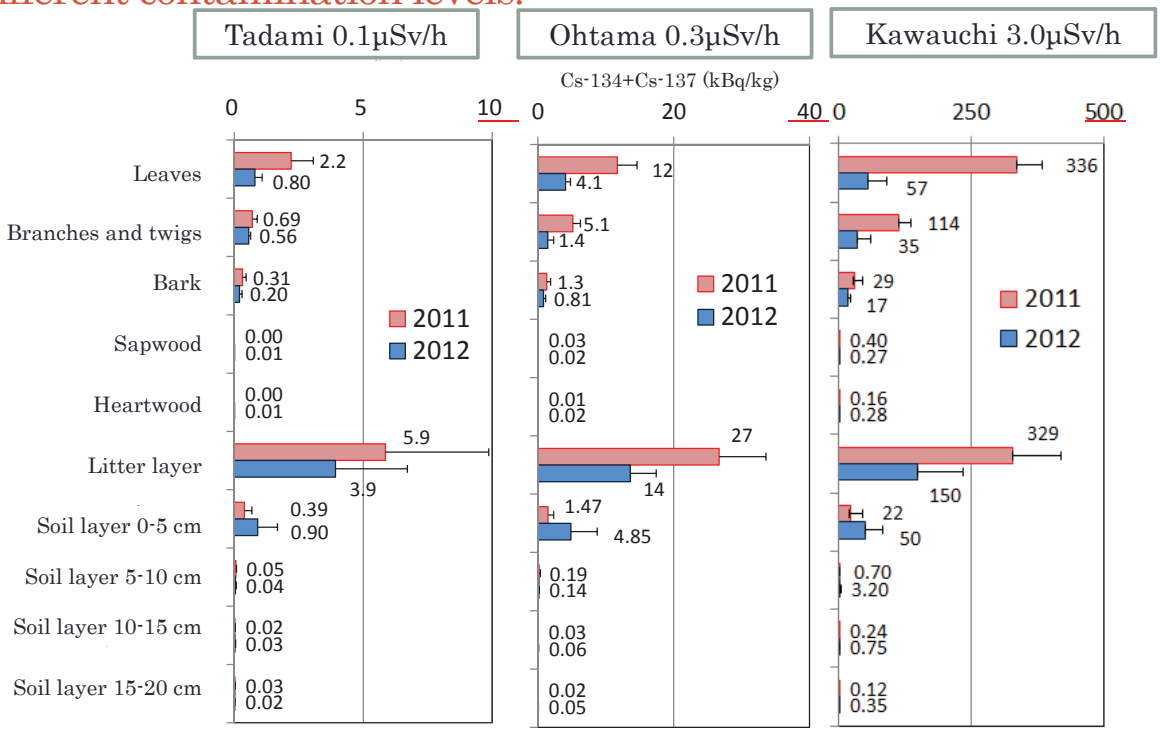
Height: 1m above the forest floor



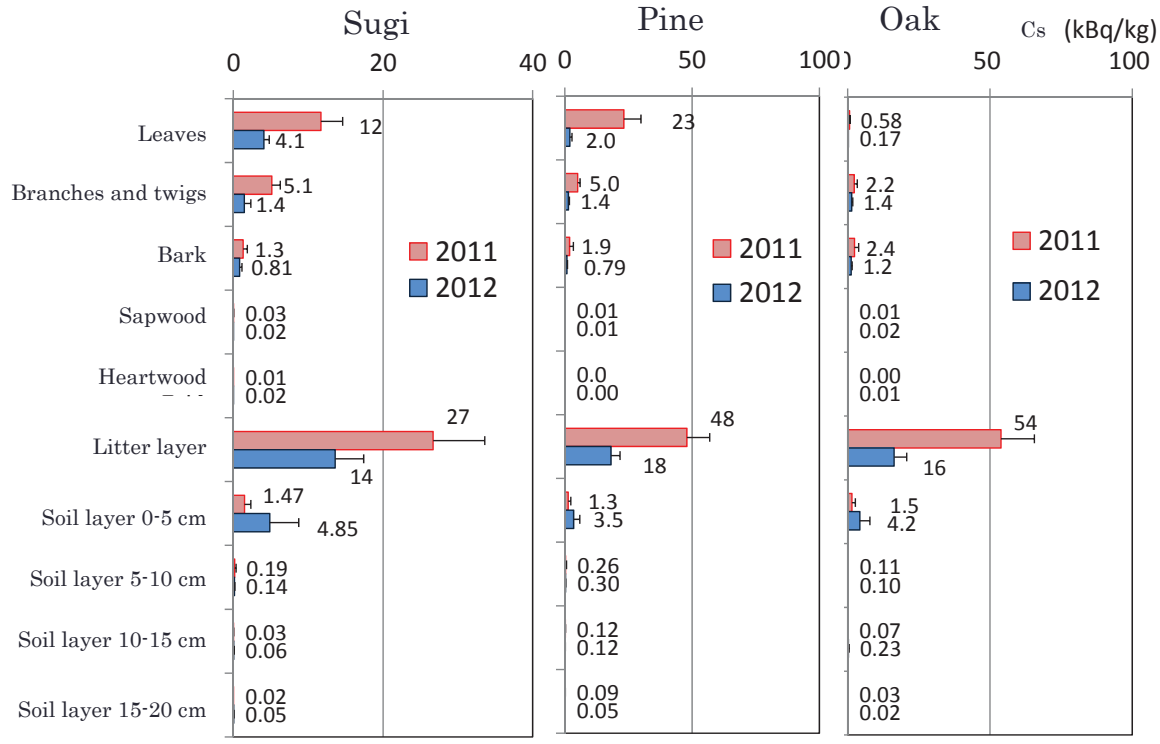
	Sugi Tadami	Pine Ohtama	Oak Ohtama	Sugi Ohtam	Sugi Kawauchi
2012/2011	104%	90%	91%	93%	97%

The air dose rates in 2012 were expected to decrease to 79% of the rate in 2011 according to the decays of Cs-134 and Cs-137 but the decreases were relatively lower than expected.

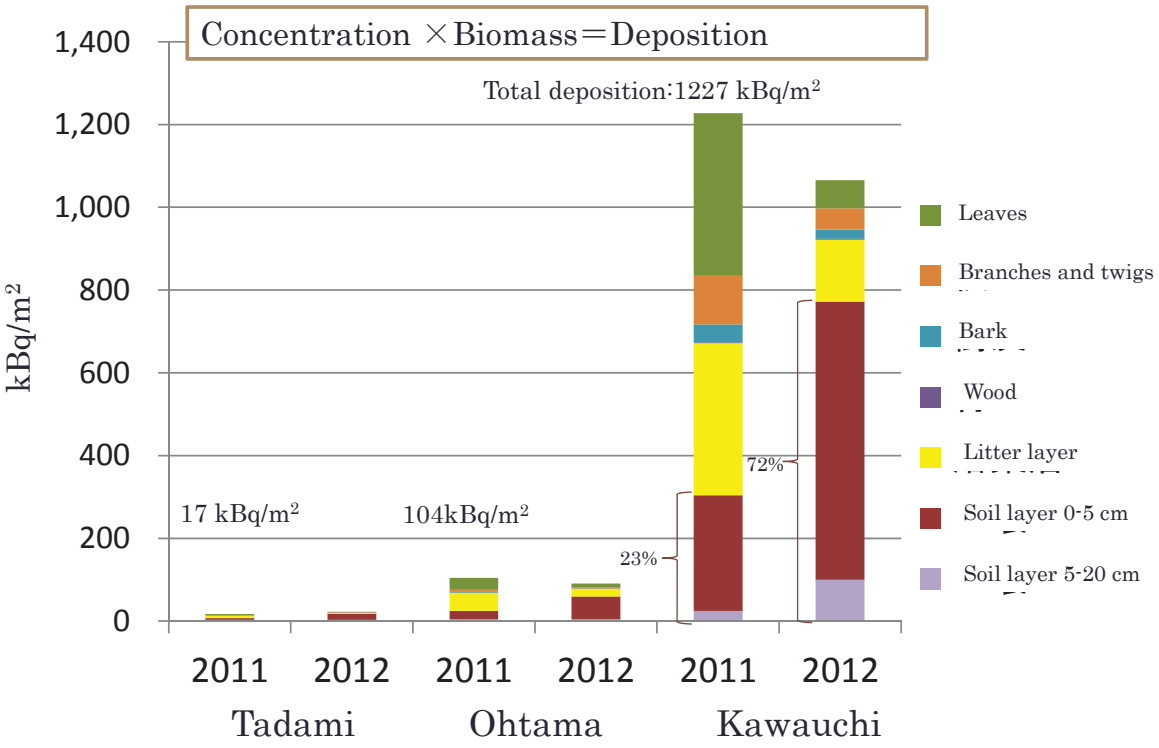
The concentration of Cs-134 + Cs-137 in different parts of tree organs and soil layers: comparison among the plots with different contamination levels.



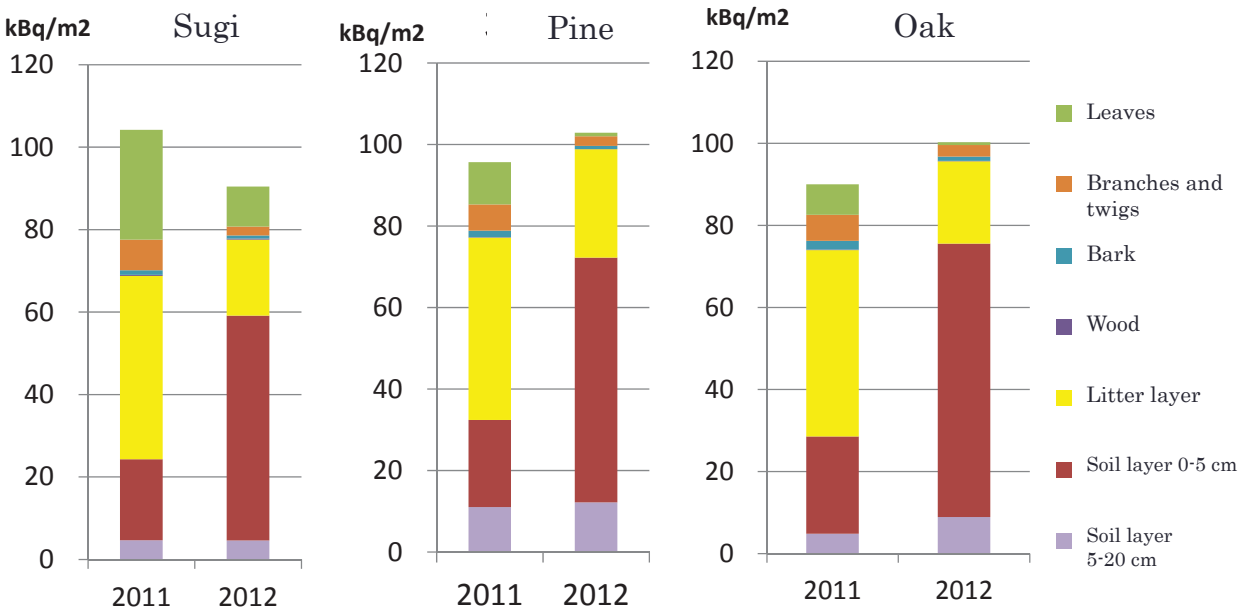
The concentration of Cs-134 + Cs-137 in different parts of tree organs and soil layers : comparison among different tree species.



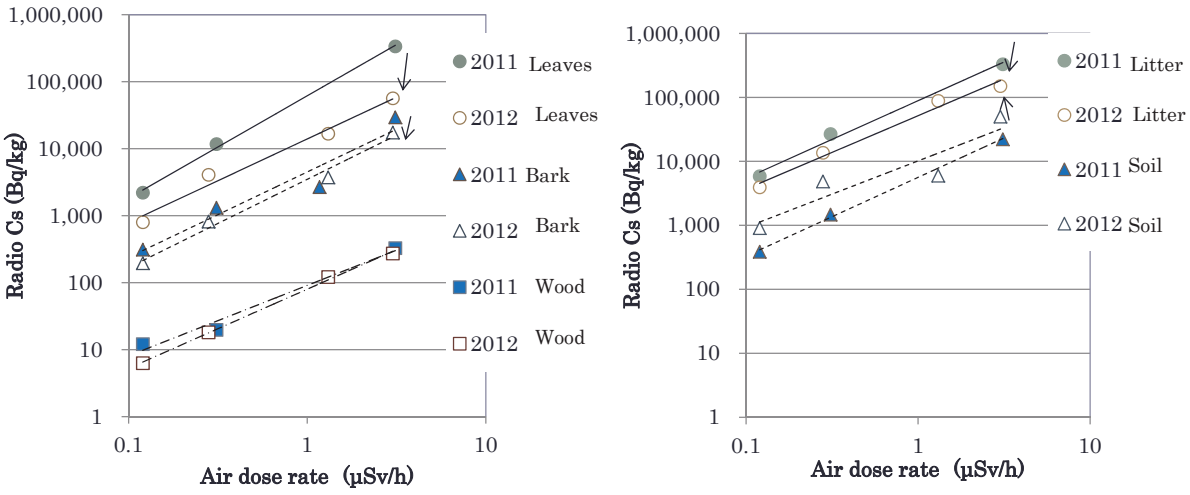
Deposition of radioactive Cs in the components of Sugi forests



Deposition of radioactive Cs in the components of forests with different species



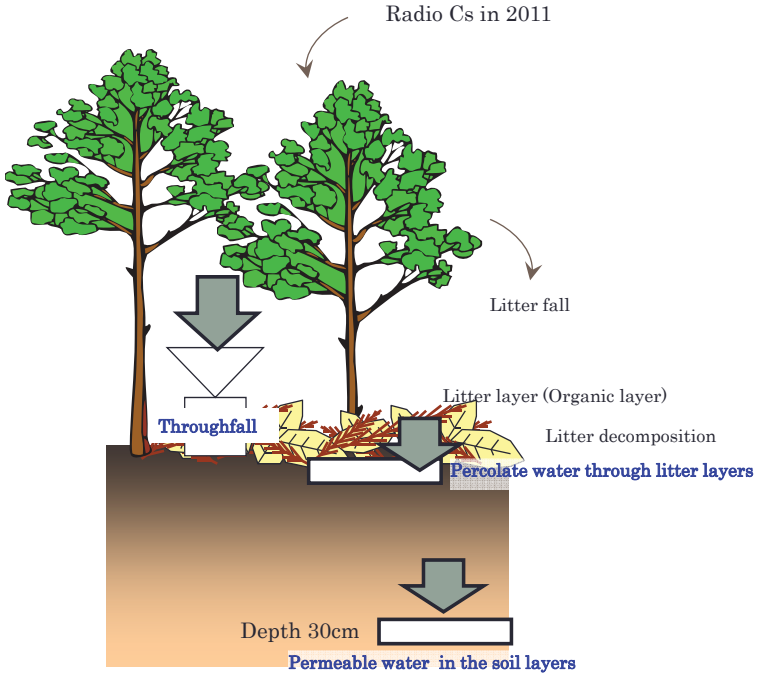
Relationship between air dose rate and radio caesium concentration



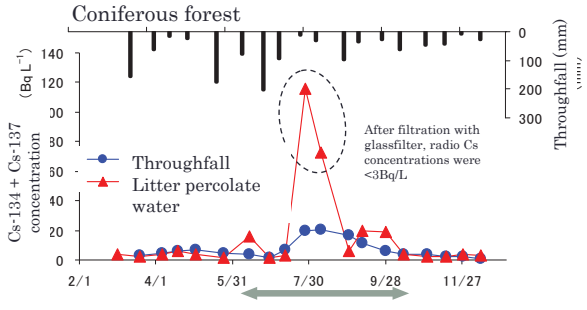
Cs cycling and dynamics in a sugi and ork forests in Koriyama.

Coniferous forest
(Sugi-hinoki)

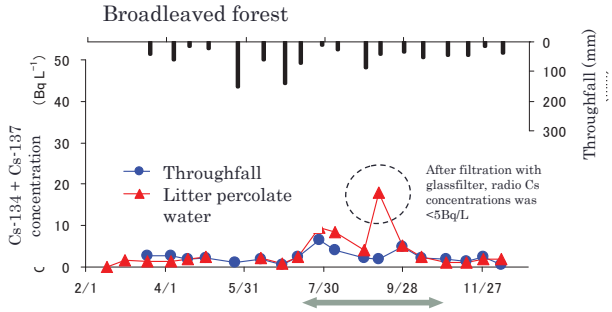
Broadleaved forest
(Oak)



Concentration of radioactive Cs in throughfall and percolate waters of litter and soil layers.

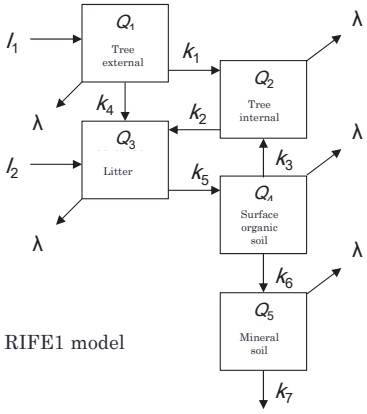


No radioactive Cs was detected in the water collected from 30 cm depth in the soil (detection limit: 0.03Bq L^{-1})



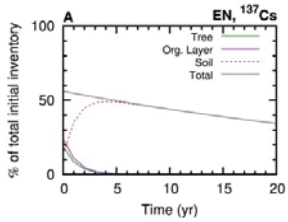
No radioactive Cs was detected in the water collected from 30 cm depth in the soil (detection limit: 0.03Bq L^{-1})

Spatio-temporal dynamics of radio Cs in the forests contaminated

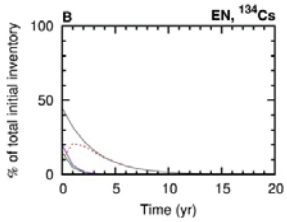


RIFE1 model

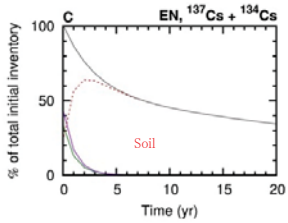
^{137}Cs

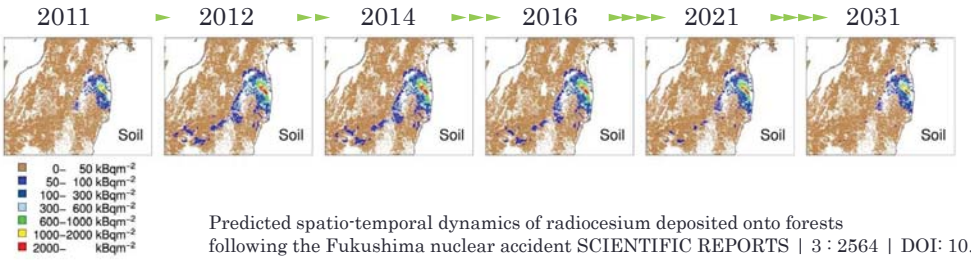


^{134}Cs



^{137}Cs + ^{134}Cs





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