Status and Priorities of Soil Management in Japan

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NIAES

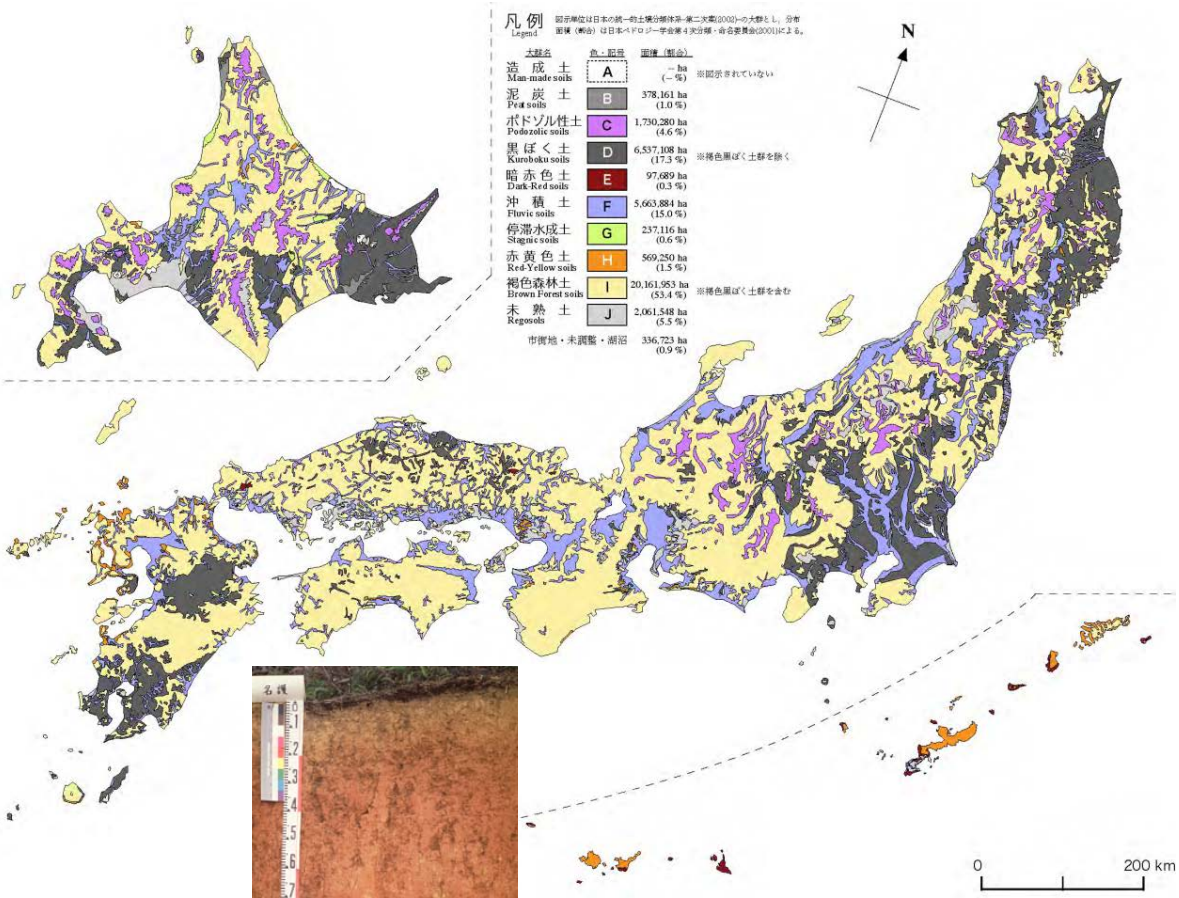
Japan: Geography and Climate

- Japan has a total of 6,852 islands extending along the Pacific coast of East Asia, lies between latitudes 24°-46°N.
- The climate of Japan is predominantly temperate, but varies greatly from north to south. Pacific summer monsoon brings warm and humid, while Siberian winter monsoon brings cold weather. The average winter temperature in Japan is 5.1 °C and the average summer temperature is 25.2 °C .
- About 66% of Japan's land is covered with forests, and 12% with agricultural lands.



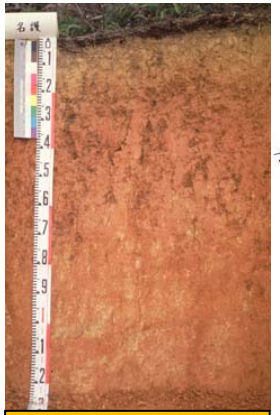

Japan: Distribution of Major Soils

B. Peat soil



D. Andosol

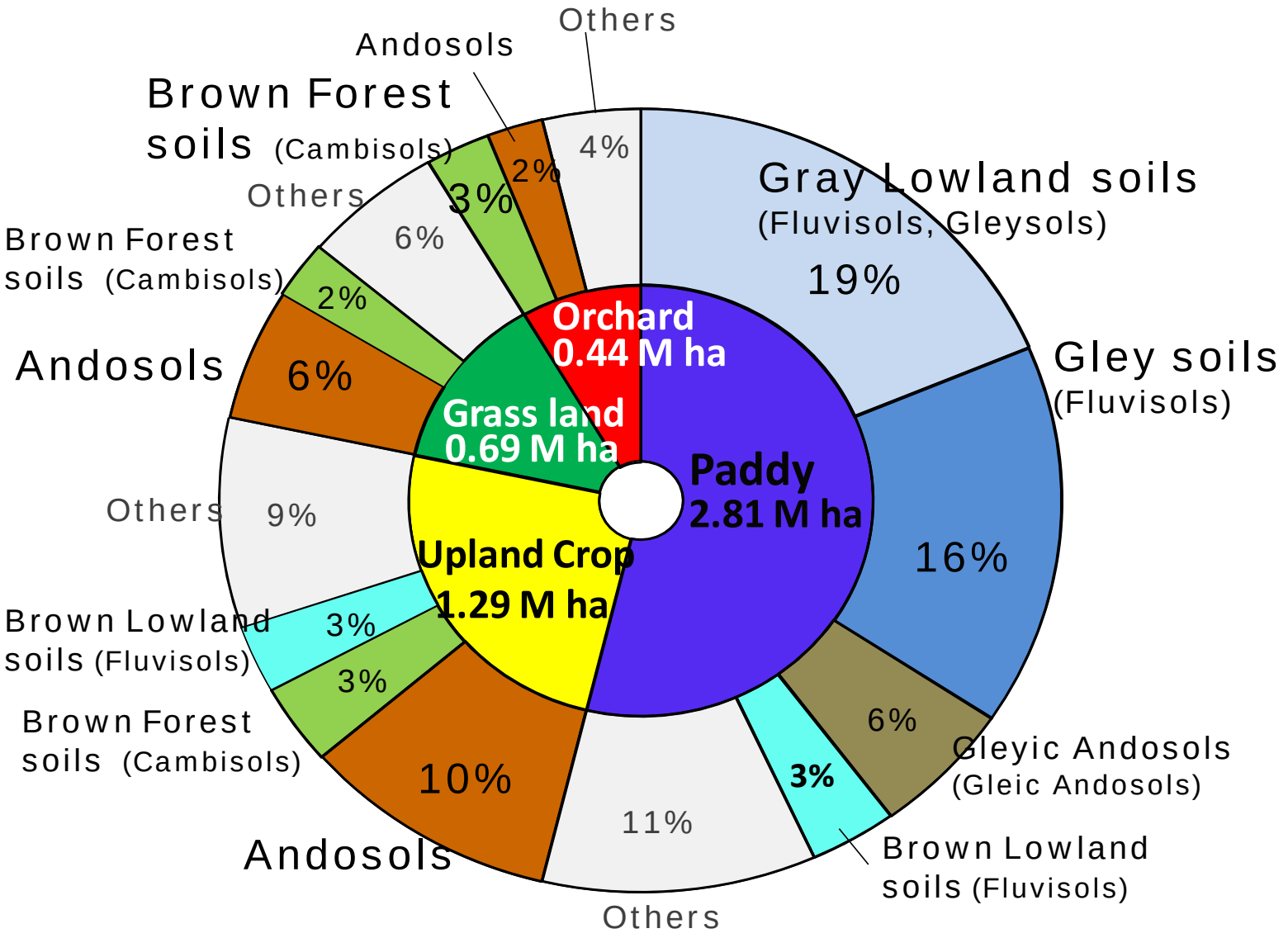
I. Brown forest soil



H. Red-yellow soil

F. Fluvic soil

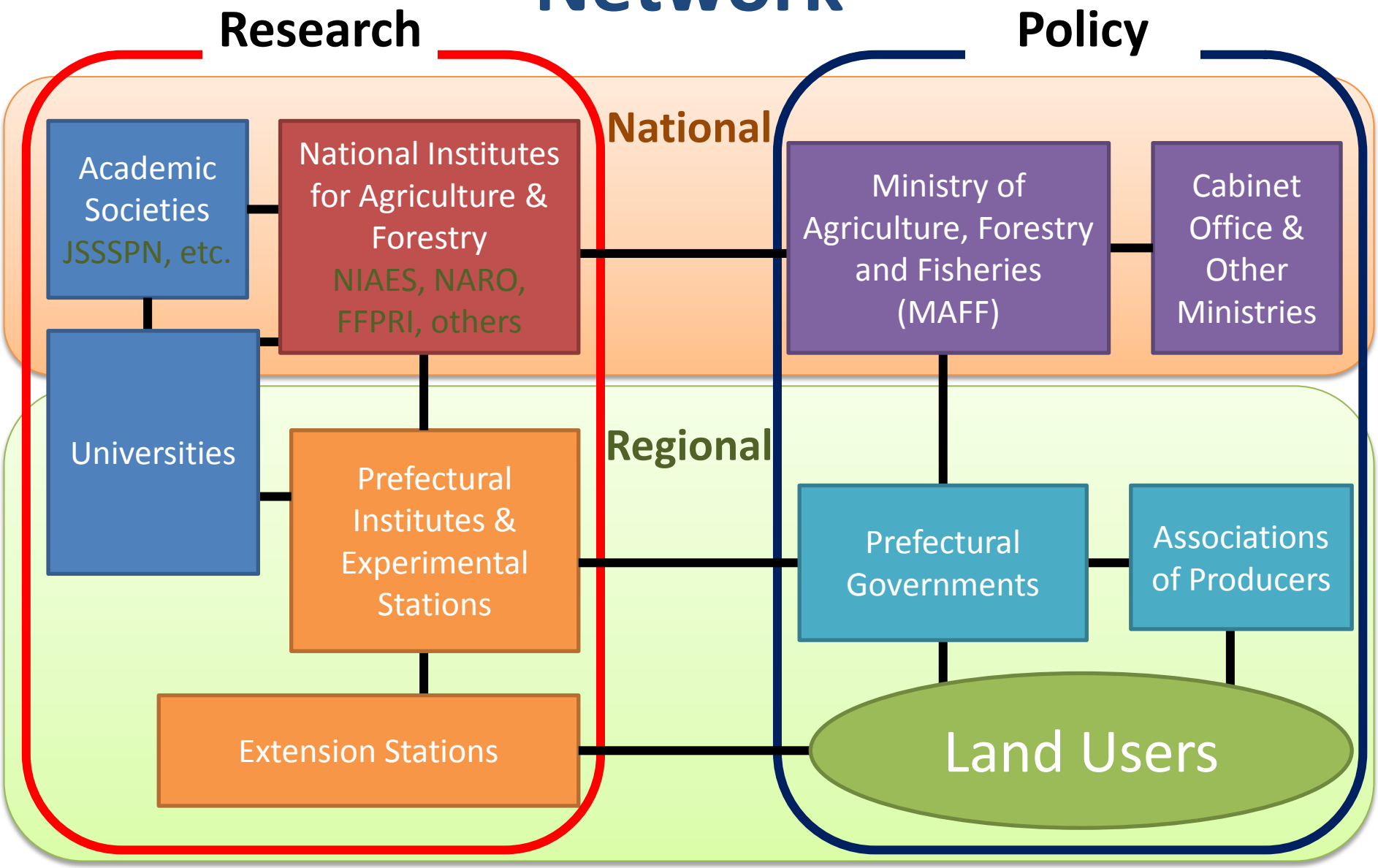
Japan: Distributions of Soil Types in Crop Lands



Japan: Priorities of Soil Management

- Soil fertility management
  - Sustainability of soil fertility
  - Soil management for quality and quantity of products
- Environmental assessment
  - Soil management for eco-farming
  - Contamination of pollutants (heavy metal, organic pollutants, radionuclides, etc.)
  - Soil C sequestration and GHG emissions
- Soil information for food security
- Capacity building and education

Japan: Research-Policy-Land Users Network



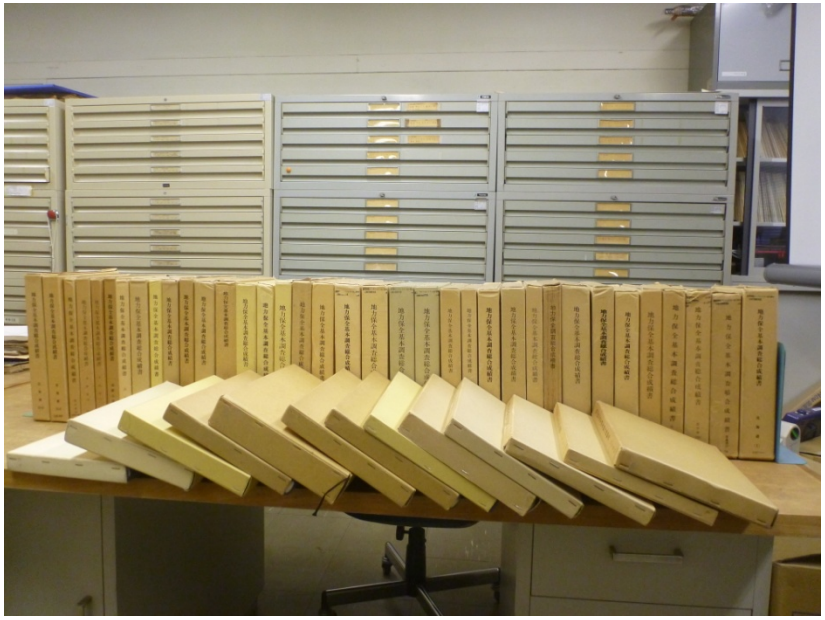
History of National Soil Survey Programs in Japanese Agricultural Land (1953-1978)

・Soil Survey for Improving Fertilizer application (1953-1961)

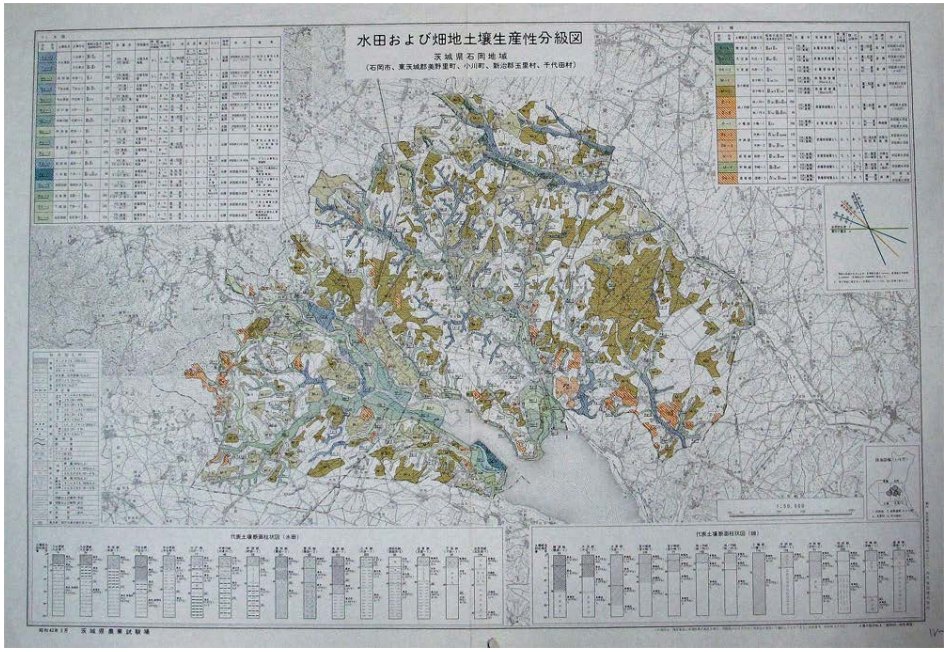
Mainly in paddy field, about 200,000 pedons were surveyed.

・Fundamental Soil Survey for Soil Fertility Conservation (1959-1978)

Mainly in upland field, the survey density was 500m.

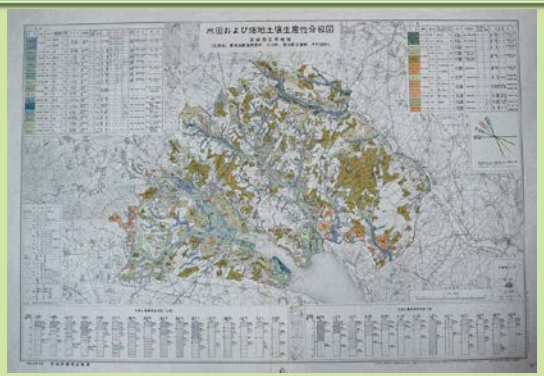


Summaries of Pedon dataset
(47 prefectures)



Cultivated soil maps (1:50,000)

Digitalized and updated cultivated soil maps (1: 50,000)

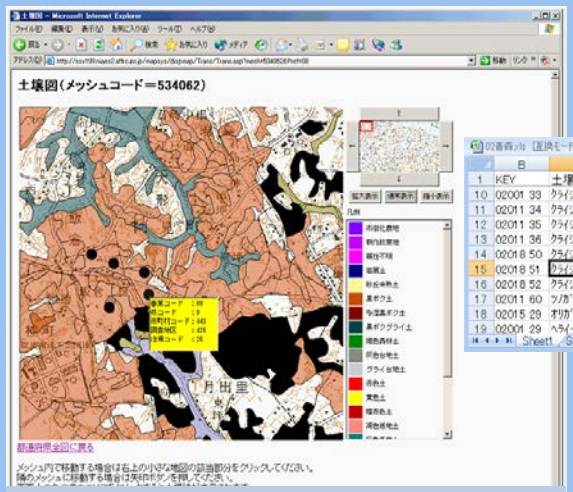


Cultivated soil maps (1:50,000)

Benchmarked soil dataset
(about 20,000sites)

- Soil Survey for Improving Fertilizer application
- Fundamental Soil Survey for Soil Fertility Conservation

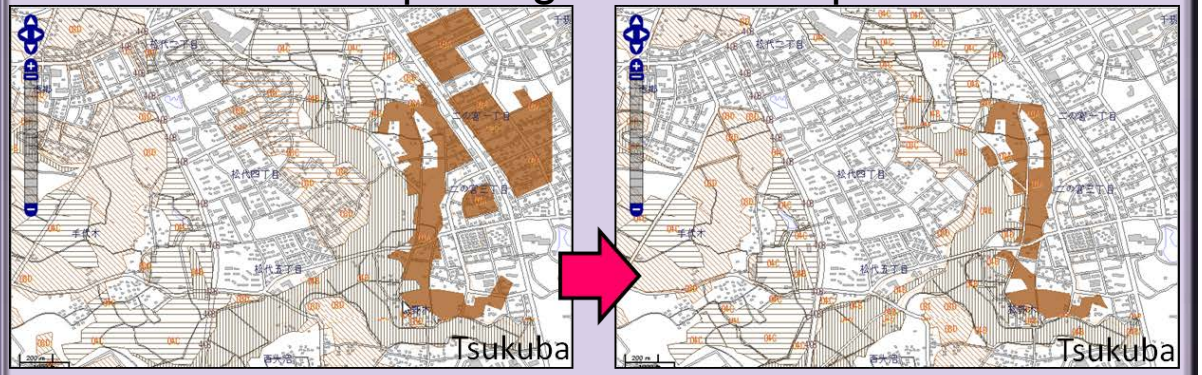
Digitalized soil inventory



Digital soil map

Benchmarked soil pedon database

Updating soil-land map



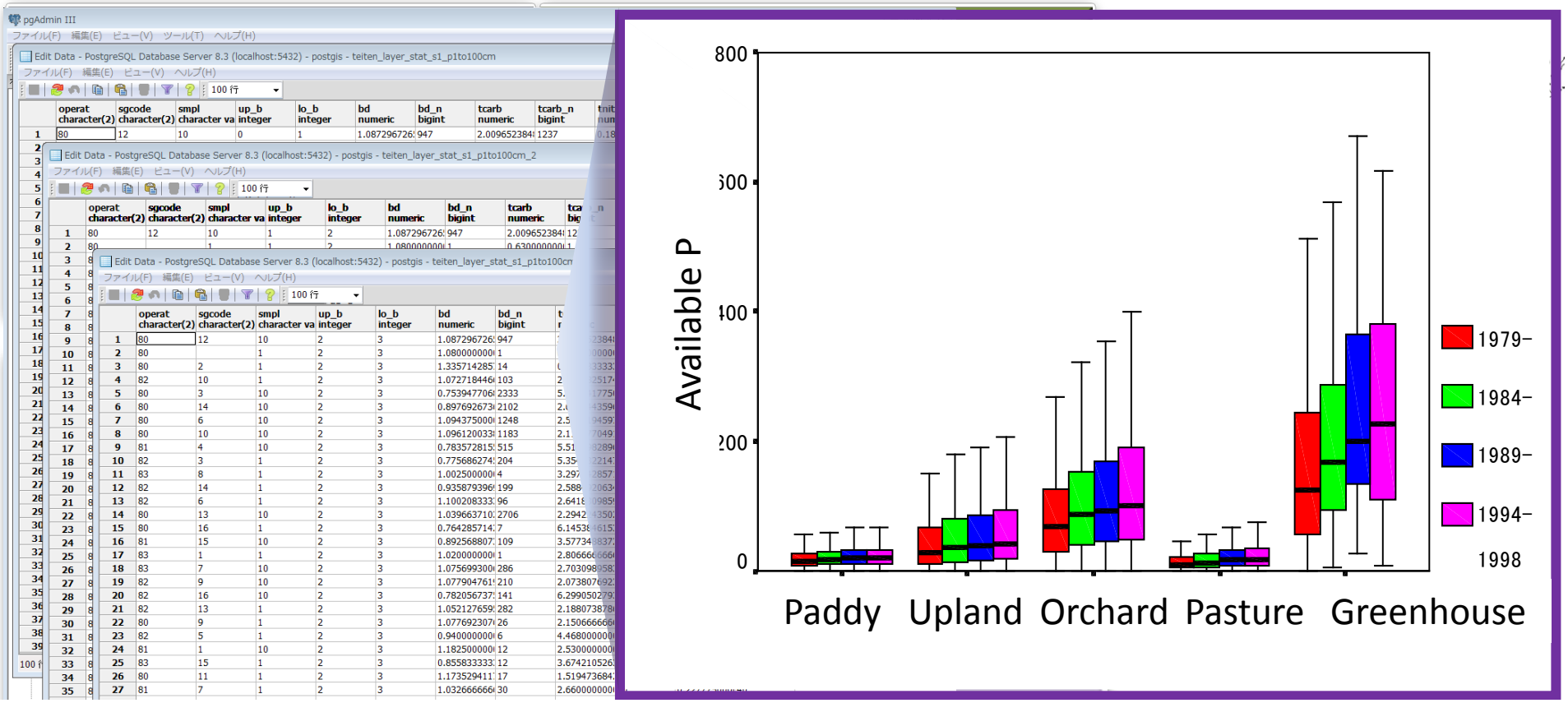
1992 version **2001 version**

Urban sprawl impacts on fertile soils

Basic Soil - Environment Monitoring

About 20,000 monitoring sites.

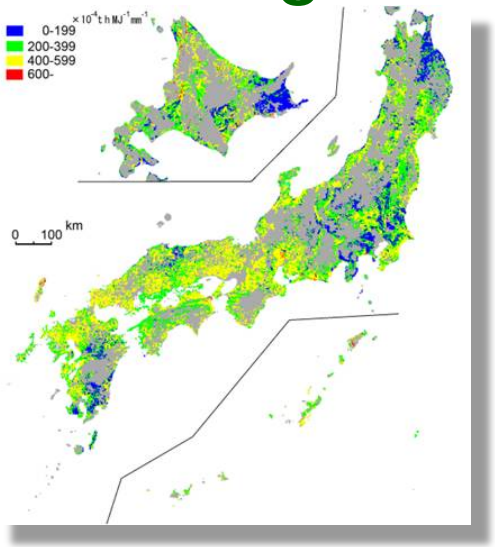
5-year-interval (Since 1979)



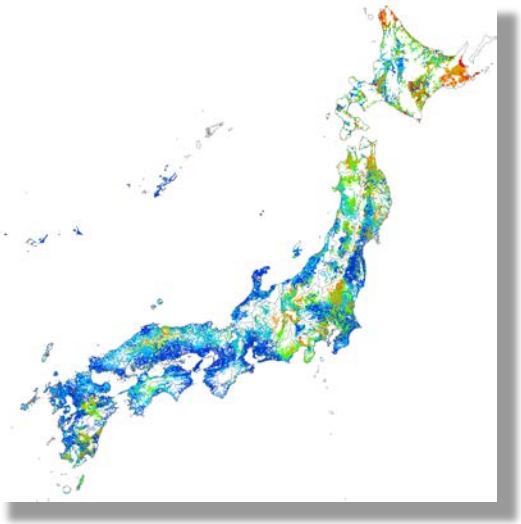
This soil database has been used for creating various agro-environmental indicators

Application of soil inventory in Japanese agricultural land 1

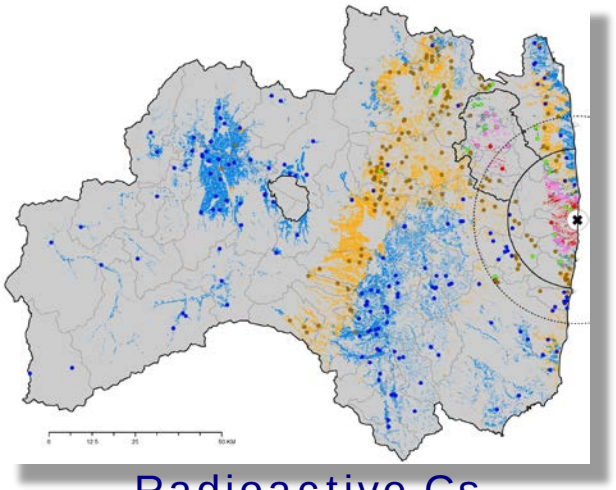
Agro-environmental indicators



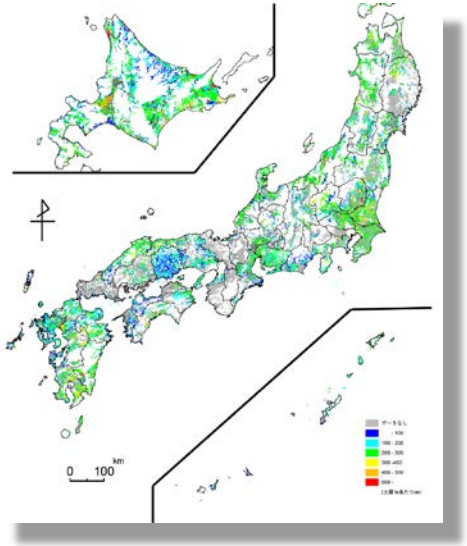
Soil Erodibility (K) factor Map



Soil Carbon Stock Map

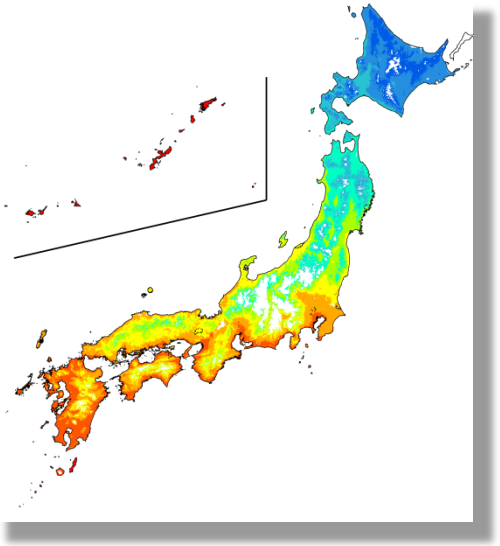


Radioactive Cs Concentration map (Aug. 2011)



Available Water Content

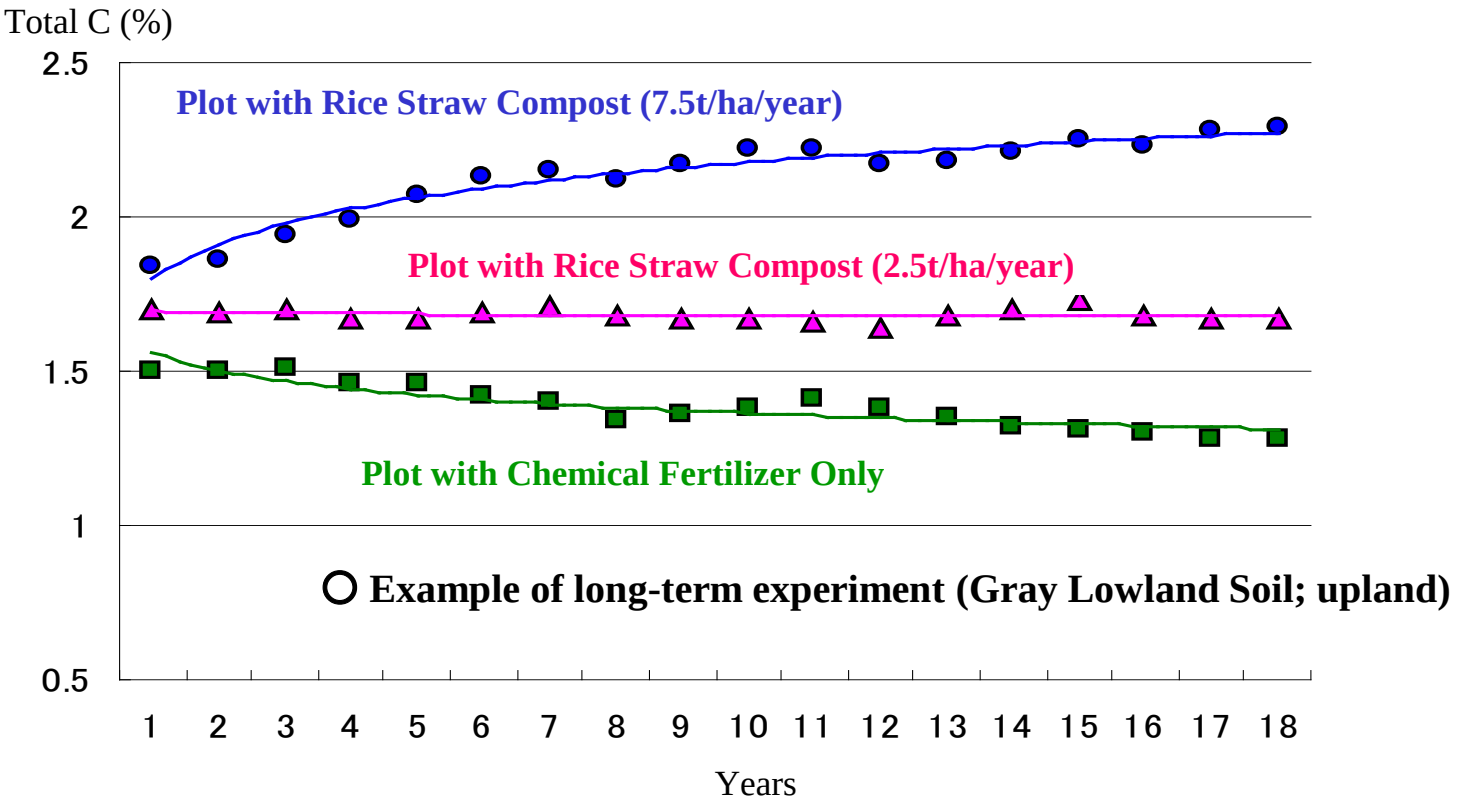
Soil Nitrogen Stock Map



Soil Temperature Map

Long-Term Experiments in Japan

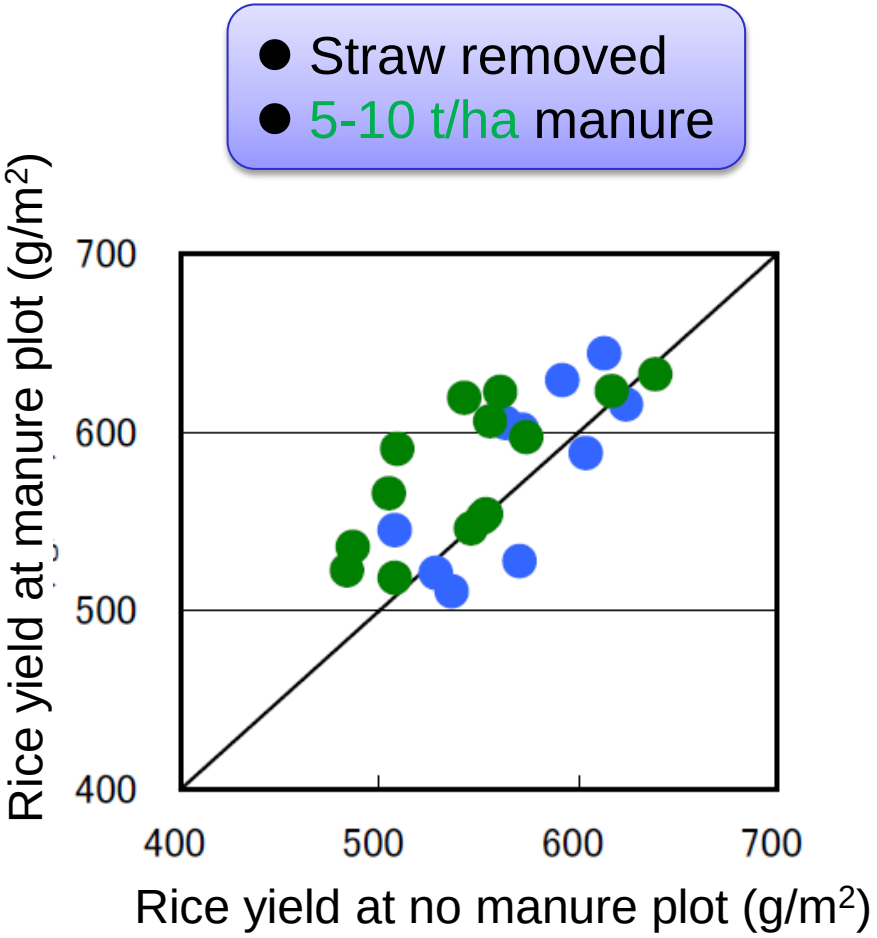
○ Since 1975, the MAFF has conducted long-term experiments with continuous organic matter application under typical soil type and cropping system of each prefecture (over 150 sites in total), which demonstrated that soil carbon stock increased through organic matter application such as compost.

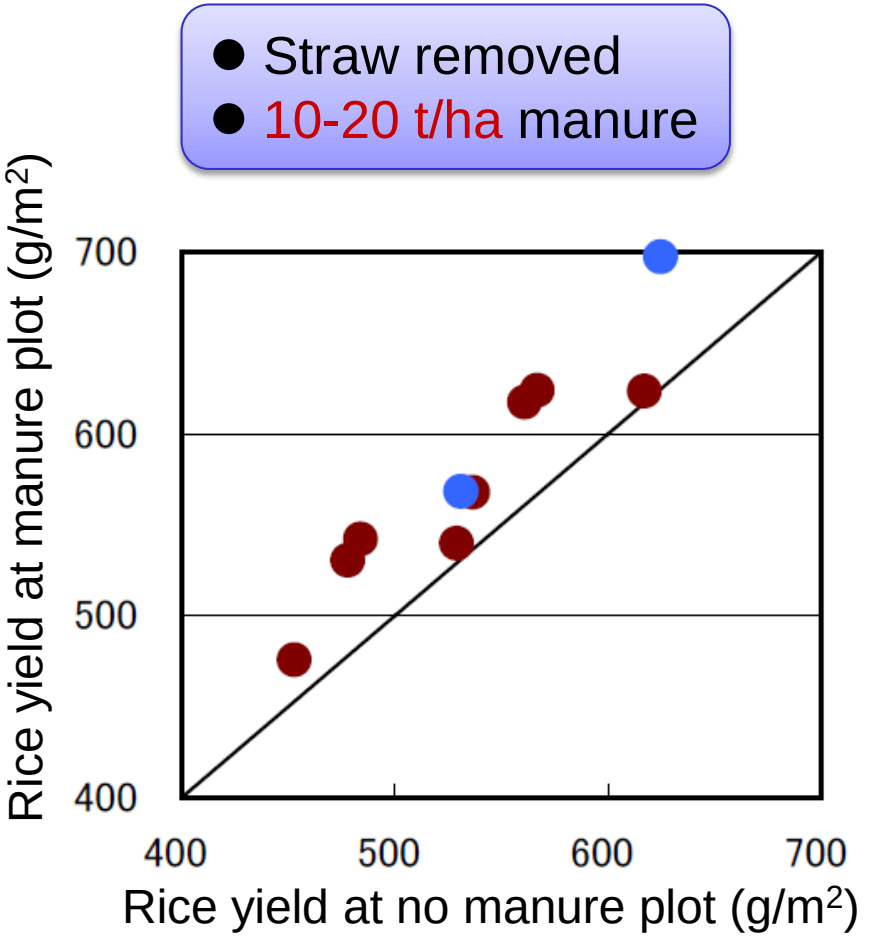


Data：”Basic Survey of Soil Environment (Benchmark Survey)” Yamaguchi Pref. Agricultural Research Institute. Figure for a year is the three-year average including the previous and the next year to that year.

Long-Term Experiments in Japan

Change of Rice Production

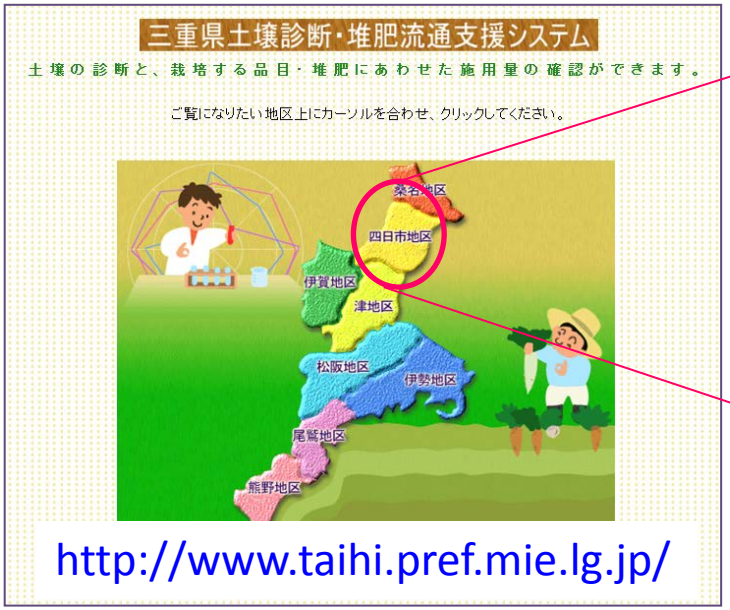




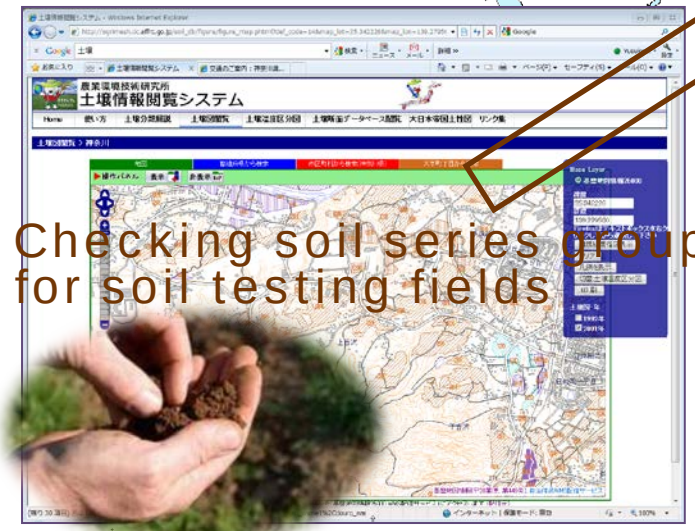
T. Ota, NARO (2011)

How the “Soil Information Web Viewer” is to be used by prefecture office

Fertilizer prescription program of Mie Prefecture



http://www.taihi.pref.mie.lg.jp/

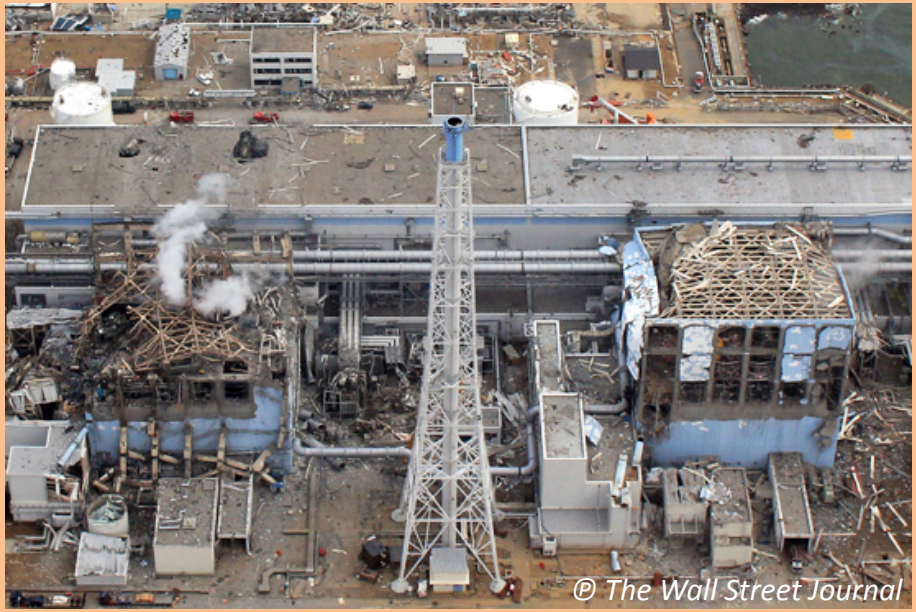


Checking soil series group for soil testing fields

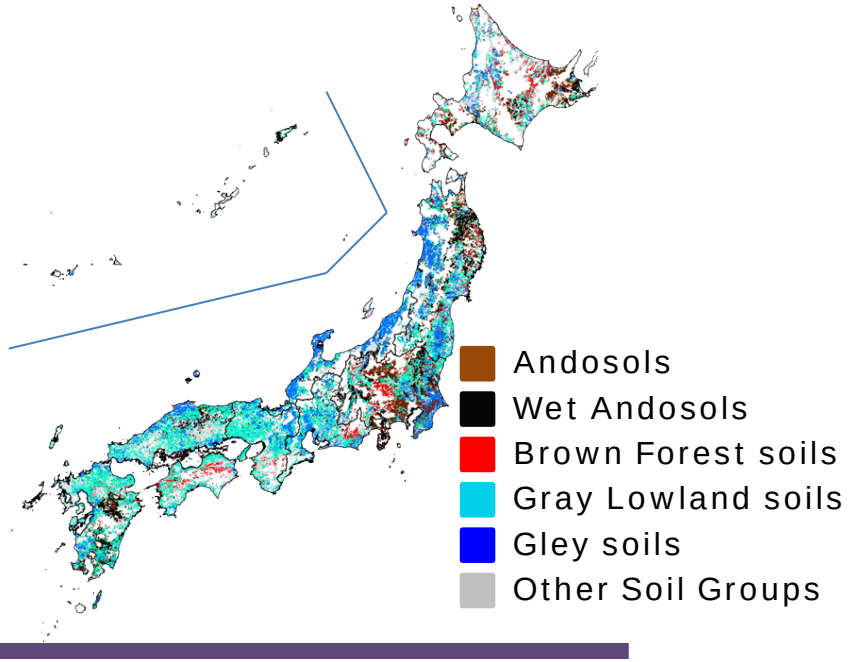
Soil Information Web Viewer

Soil series group

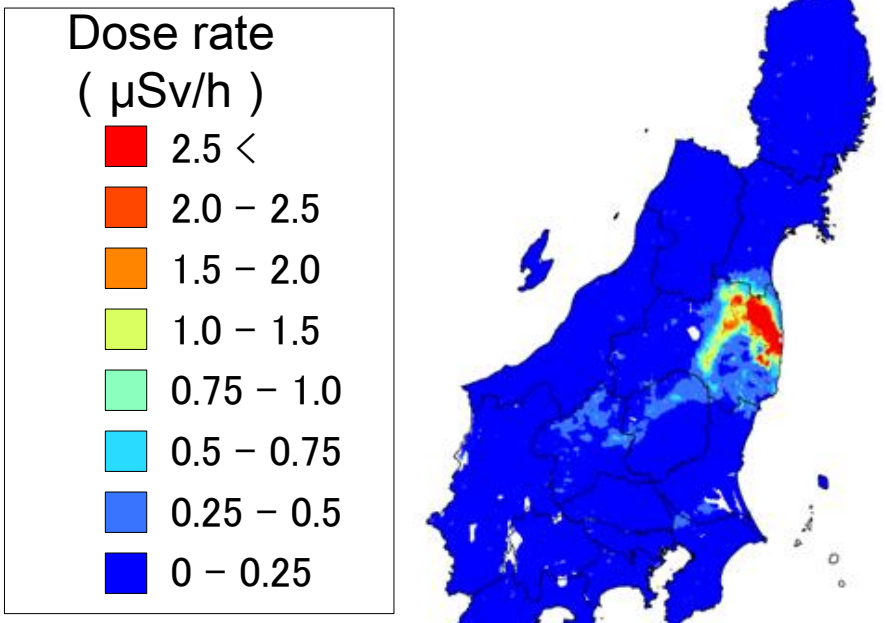
Fukushima nuclear accident



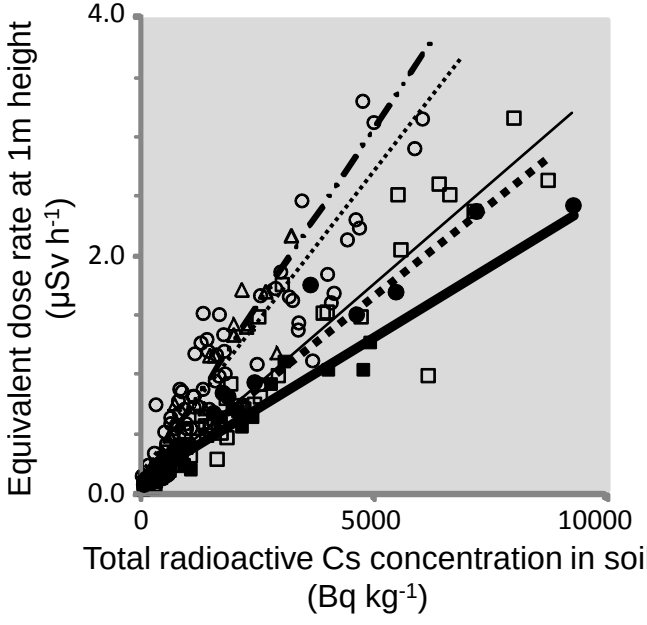
Cultivated Soil Map (1:50,0000)



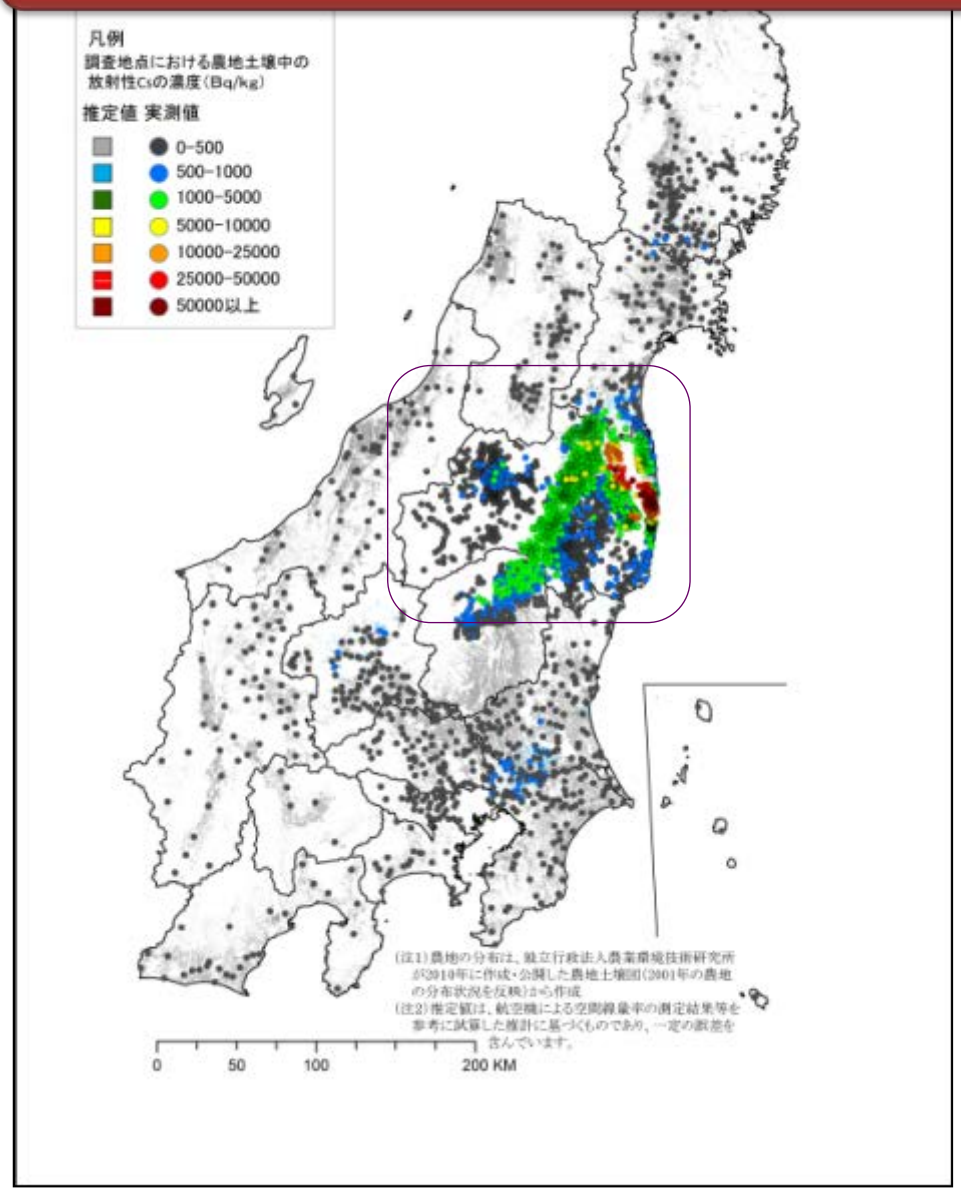
Radioactive contamination



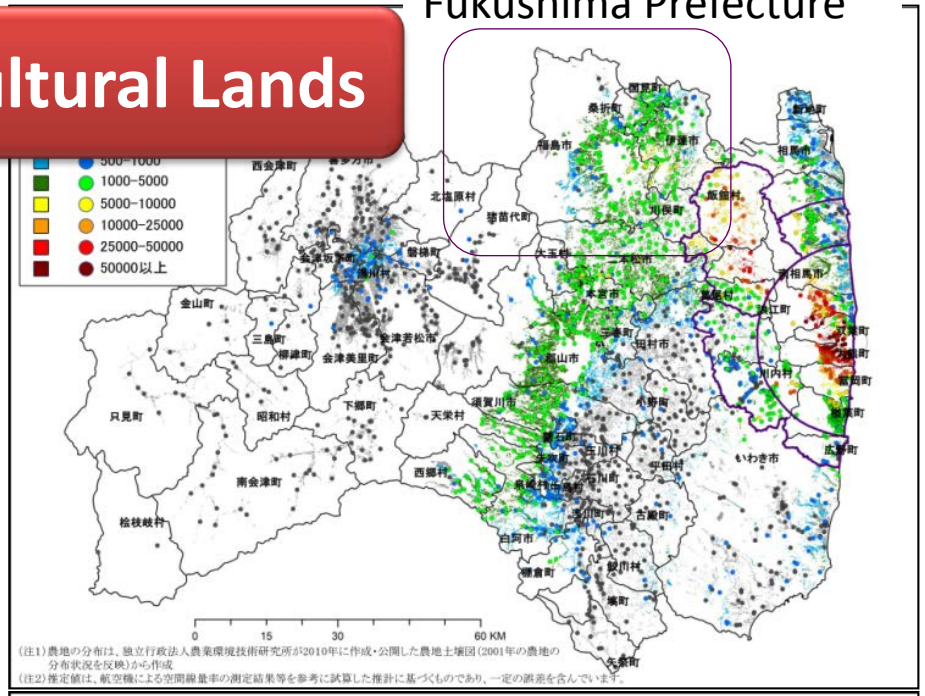
Relationship between dose rate and Cs concentration in soil



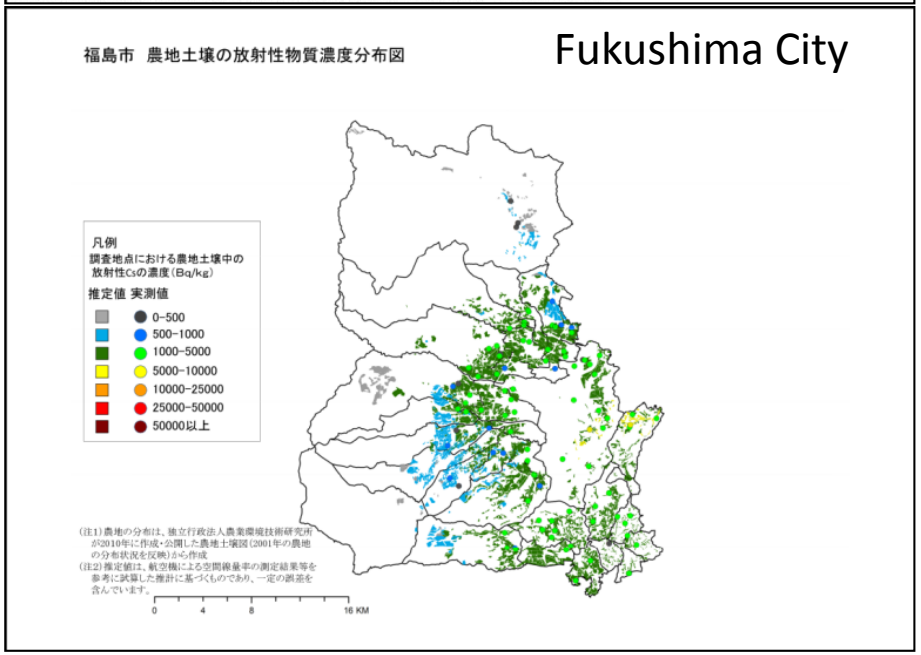
Radioactive Cs Map for Agricultural Lands



Fukushima Prefecture



Fukushima City



Ministry of Agriculture, Forestry and Fisheries Research Council http://www.s.affrc.go.jp/docs/map/240323.htm

Japan: Challenges of Soil Management

- To develop measures decreasing environmental risks, especially of climate change, nutrient imbalance, and contamination of radionuclides and heavy metal
- To sustain soil fertility and productivity in the systems of environmentally-sound agricultural
- To improve soil information system for public use
- To inherit soil knowledge to the next generation

Asia Soil Partnership (ASP)

- February 2012: A regional conference on soil information was held in Nanjing, China, and the participants signed the Nanjing Communiqué to establish the "Asian Soil Partnership" to support the vision and mission of the Global Soil Partnership.
- September 2012: An ad-hoc meeting of ASP was organized in Tsukuba, Japan, to define a road map that was consolidated through the Tsukuba Statement.


風にきく 土にふれる
そしてはるかな時をおもい
環境をまもる
Conserve the environment by listening to wind,
observing soil and thinking of our future
NIAES