Geology and Mineral resources in Japan

1 Geology of Japan
2 Mineral resources of Japan
3 Examples of Mines in Japan

・Japan is geologically divided into Northeast Japan and Southwest Japan. SW Japan is subdivided into Inner Belt and Outer Belt.

・Many mines have been distributed in Japan. Some mines are still going.

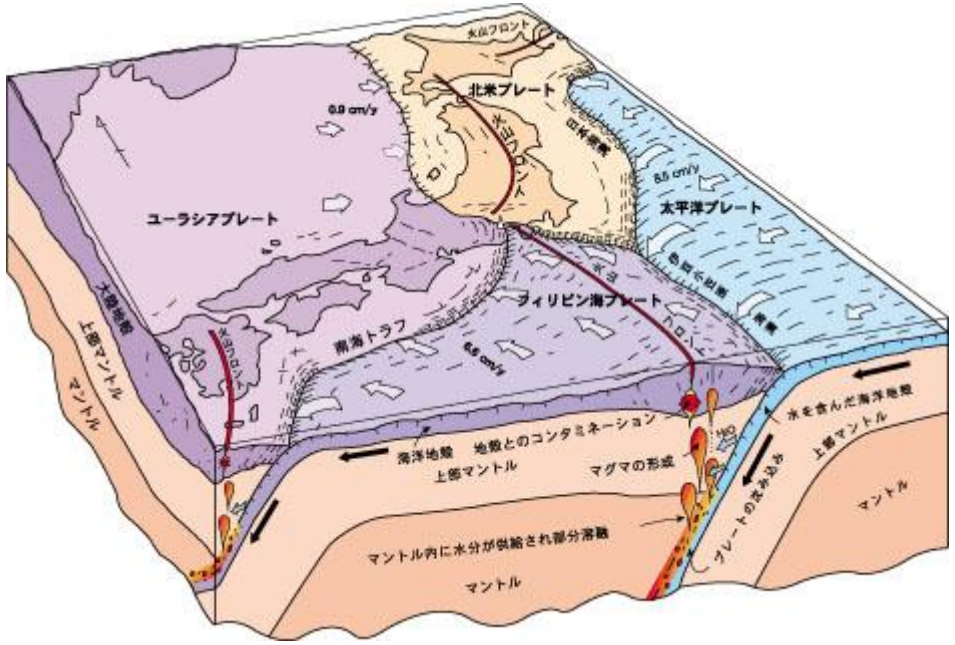
・Copper deposits and Manganese deposits have been developed until late Showa epoch.

Geology of Japan

Current Japan

Eurasia Plate, North America Plate, Pacific Plate and Philippine Plate are pushing each other near Japan.

Volcanic eruptions and Earthquakes are often happened in the area where the plate subducts.



Geologists Union HP
“Brittle Japan Islands”

Framework of Japanese Islands

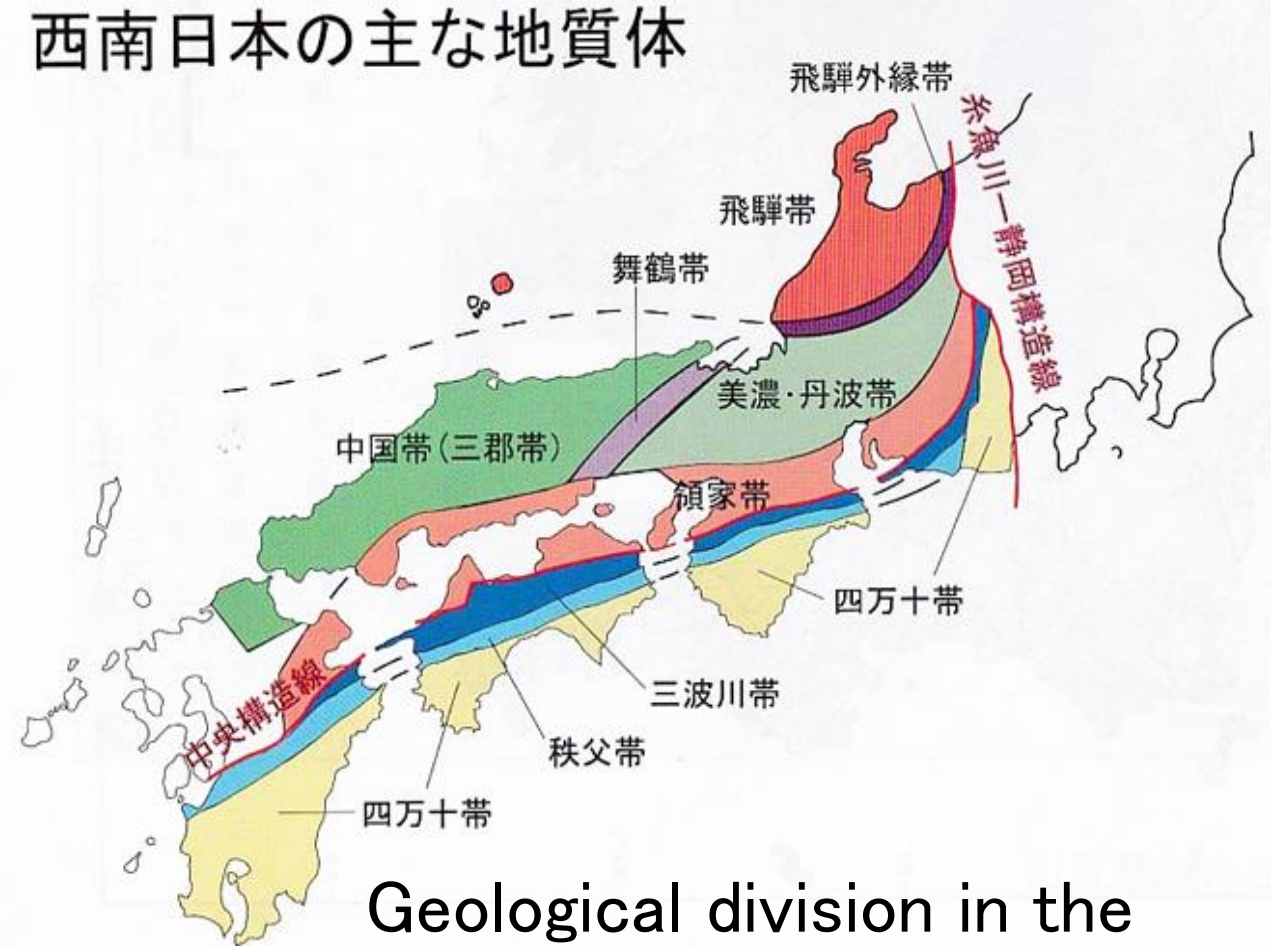
- The islands are geologically divided into the North East Japan and the South West Japan.
- The South West Japan is divided into the Inner Zone and the Outer Zone with the Median Tectonic Line.

Cited the MTL Museum HP

Hida belt: The continent in 400 Ma
Hida marginal belt: Accretional complex in 300 Ma
Mino–Tanba belt: Accretion complex in 200–100 Ma
Ryoke belt: Low P–High T metamorphic belt in 100 Ma, originally Jurassic accretion complex

– **Median Tectonic Line** –

Sanbagawa belt: Low T–High P metamorphic belt in 100 Ma, originally Jurassic accretion complex
Chichibu belt: Accretion complex in 200–100 Ma
Shimanto belt: Accretion complex in 100–25 Ma

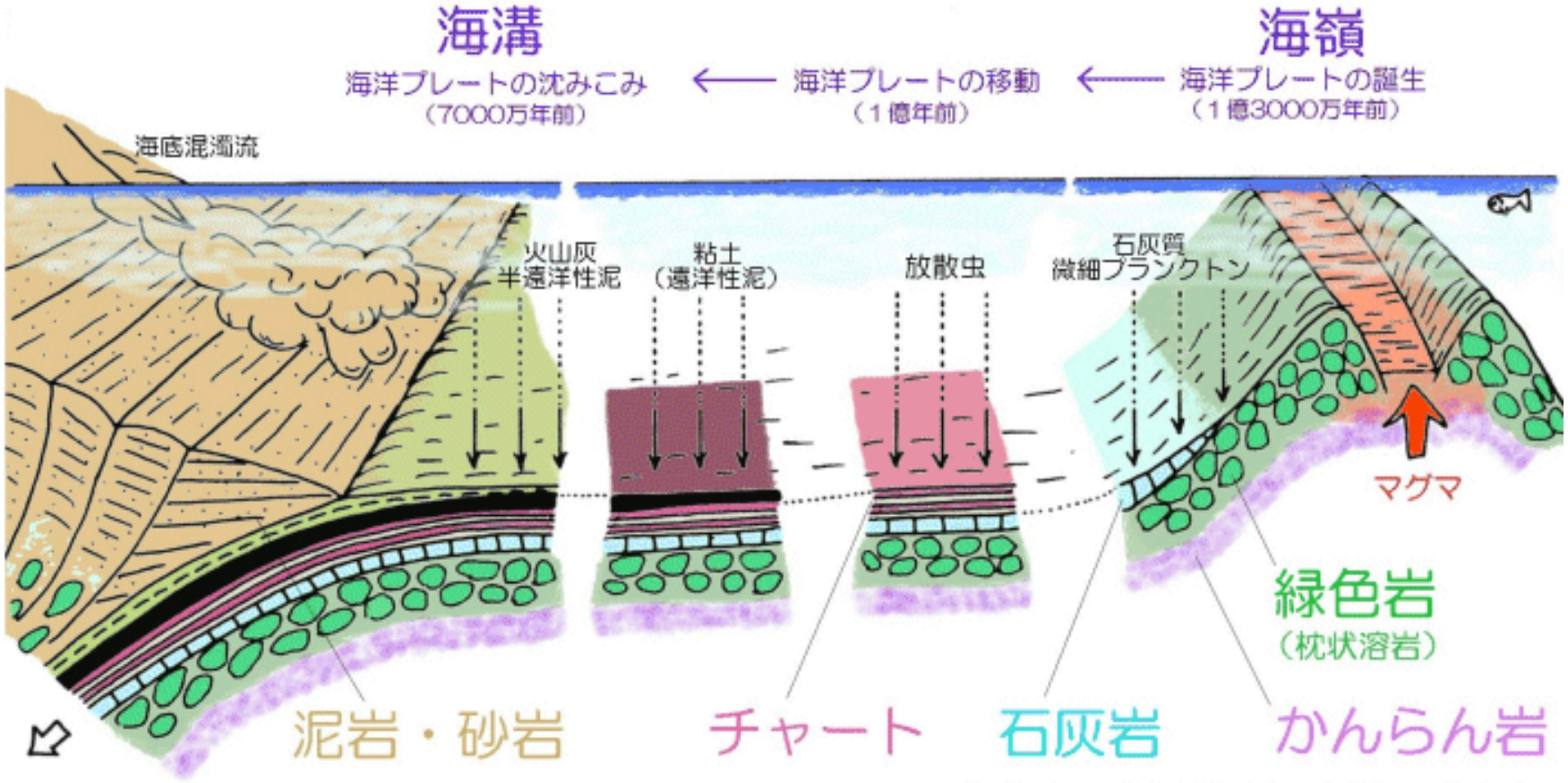


Geological division in the Southwest Japan

(Cited Yamaguchi University HP)

Accretionary complex

- Basalt (green), Limestone (blue) and chert (pink) are arriving at continental margin.
- Terrestrial sand and mud (yellow brown) flow to the rock materials above mentioned.
- They are piled up and form accretionary complex.



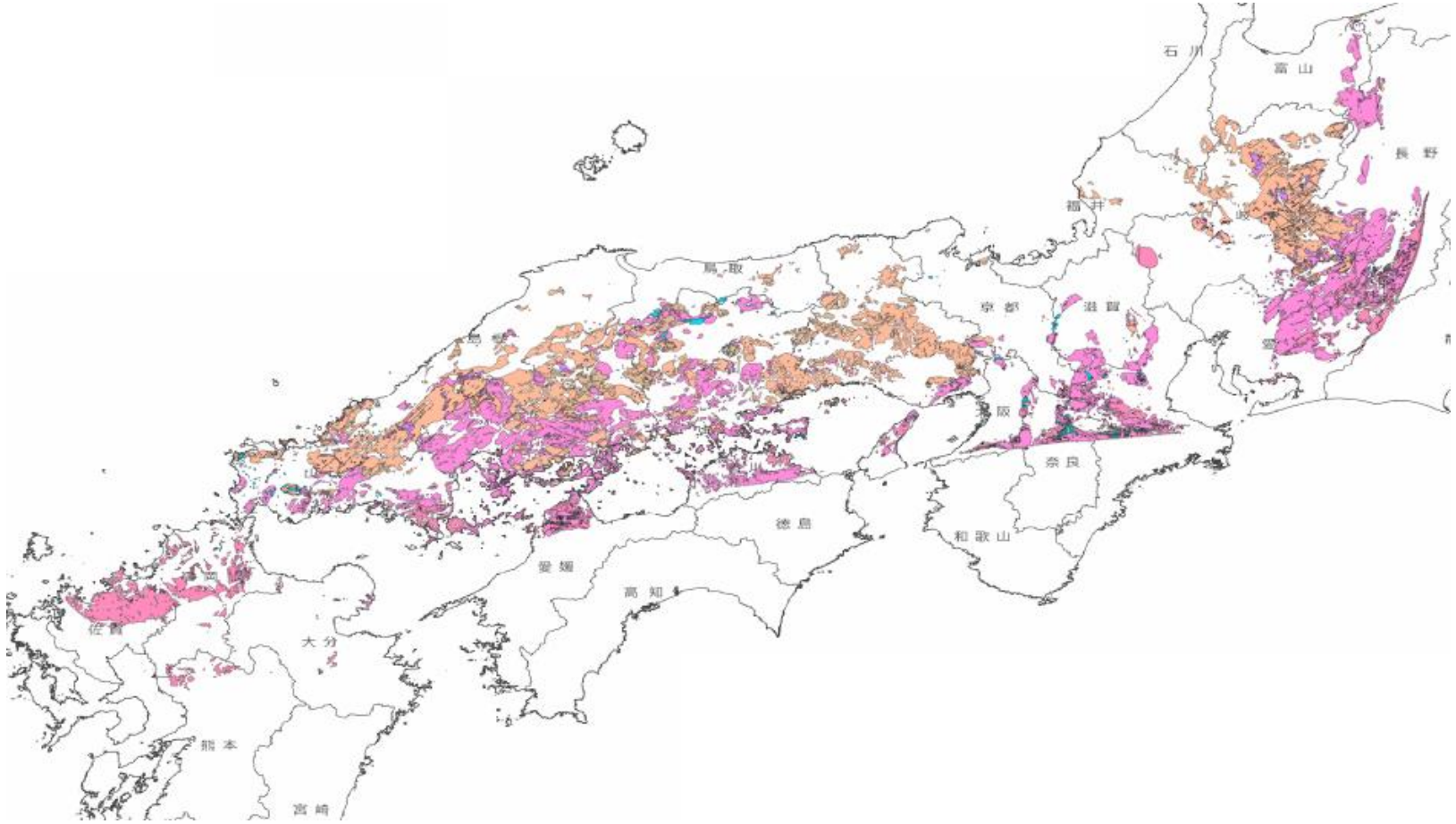
平 朝彦『日本列島の誕生』岩波文庫（1990）p63
図2-6白亜紀後期四万十帯の形成過程付加体形成に加筆改変

From MTL Museum H

- Granitic rocks are exposed about 13 % in Japan.
- Most of them are Cretaceous and Paleogene in age.
- Rhyolites are widely exposed in Chugoku and Chubu areas.

Pink colored part is granite and Orange colored part is rhyolite in the figure.

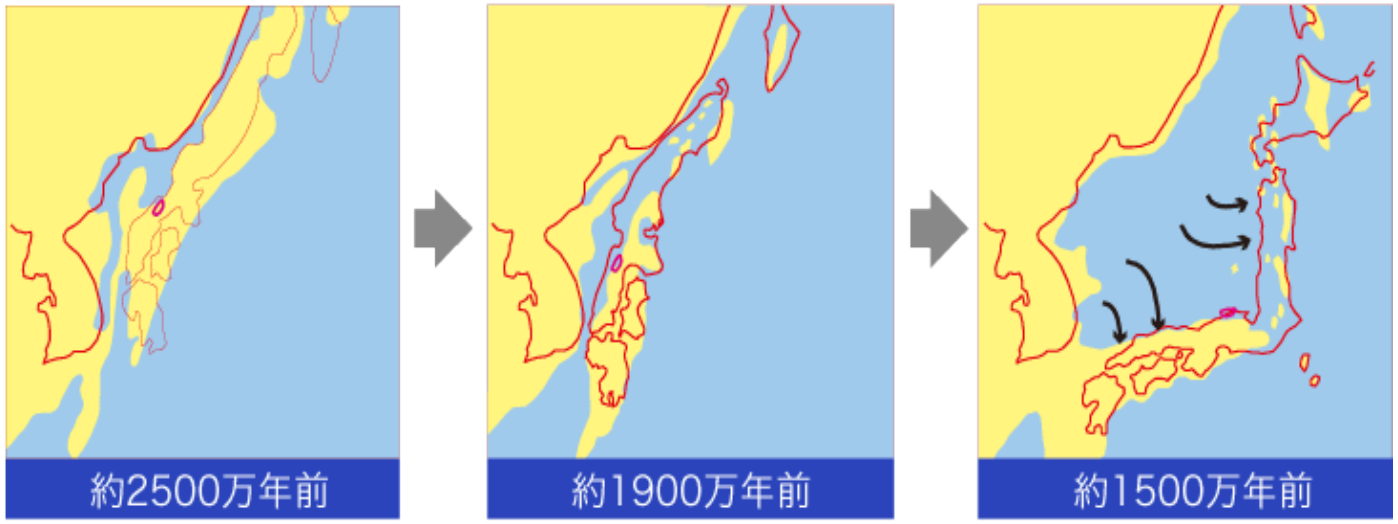
Cretaceous felsic magmatism (Granite and Rhyolite) From MTL Museum HP



Formation of the Japan Sea

Japan separated from the continent in early Neogene.

- Separation in 25 Ma.
- Active magmatism was common in 19 Ma.
- Cu–Pb–Zn mineralization was common in Tohoku Japan Sea side with magmatism. This formed Kuro-ko ore deposits.
- Japanese Islands bent in 15 Ma.



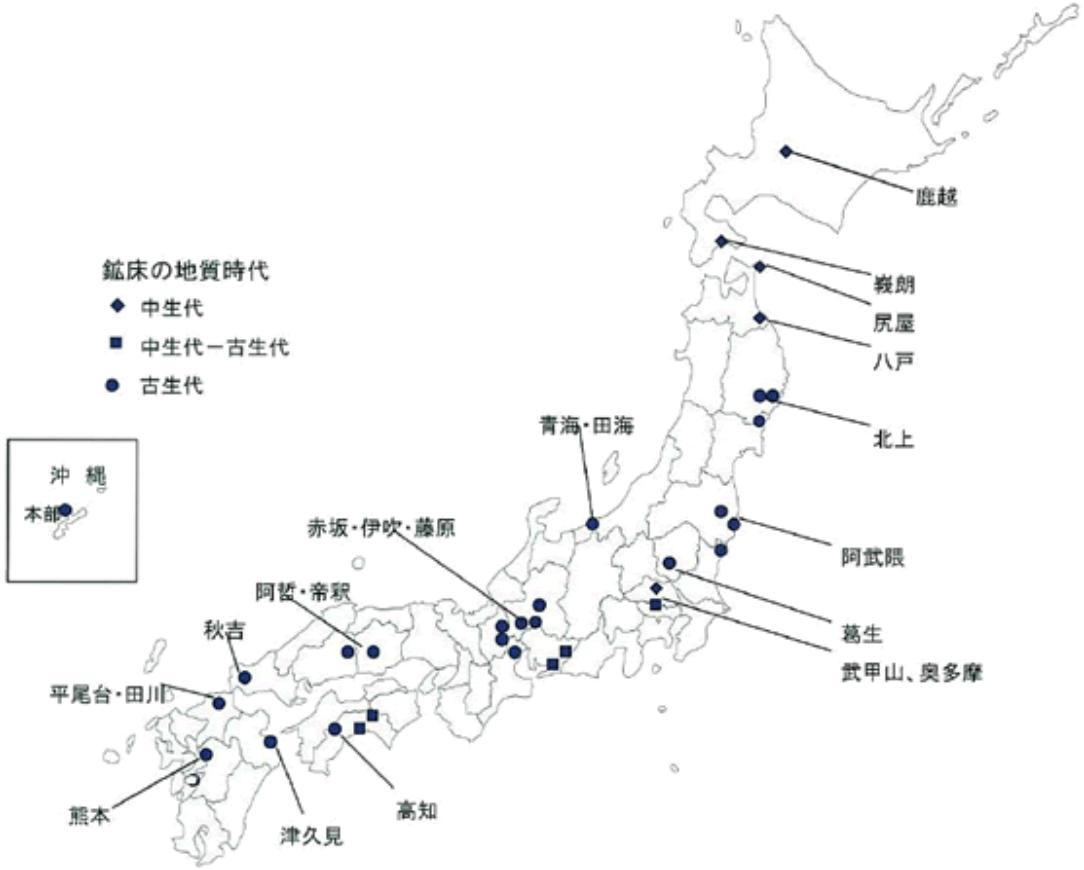
After San-in Geopark “Kami town” HP

Mineral Resources in Japan

The limestone Mines are working.

・Limestone is used for Cement, Aggregate and Steel industry.

(Photo and Figure are cited from Limestone Mining Association)



Question

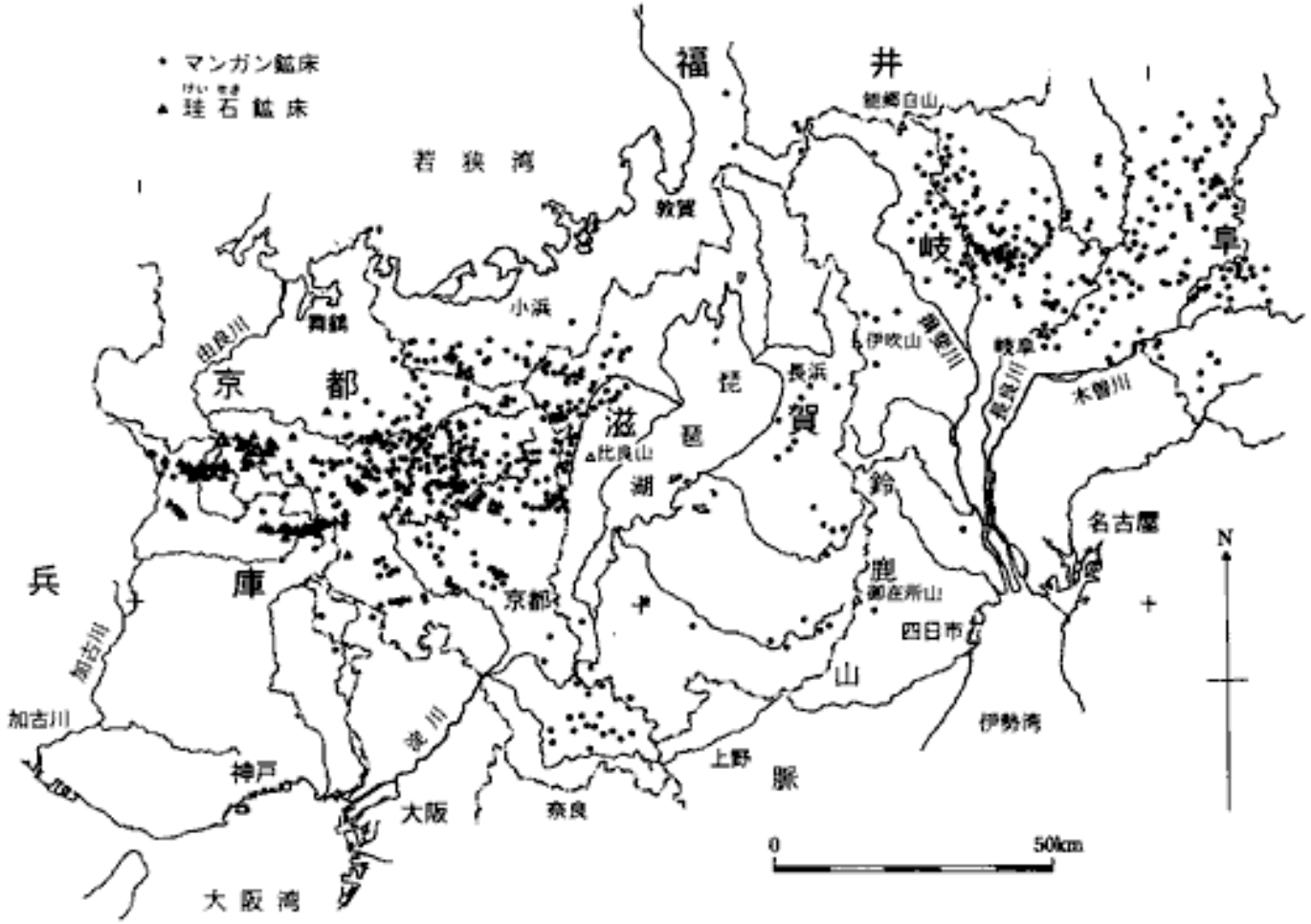
Find the limestone mines in Gifu and Mie Prefectures.

Manganese ore deposits in Mino–Tamba belt

Manganese deposits were dug in Mino–Tamba belt.

The deposits are formed in accretionary complex sediments which are mainly composed of cherty rocks.

In Middle Jurassic, the manganese oxides were precipitated by supply of oxygen in the sea water which contain manganese ions.



Video

Video (2min 26sec) in Japanese Akiyoshi dai Geopark (Limestone, Coal, Copper)
https://www.youtube.com/watch?v=UiukAyhv81s

Video (2min 18sec) Gold Mine, Nevada

https://www.youtube.com/watch?v=4-DN8-USf74