A climate change and radiation

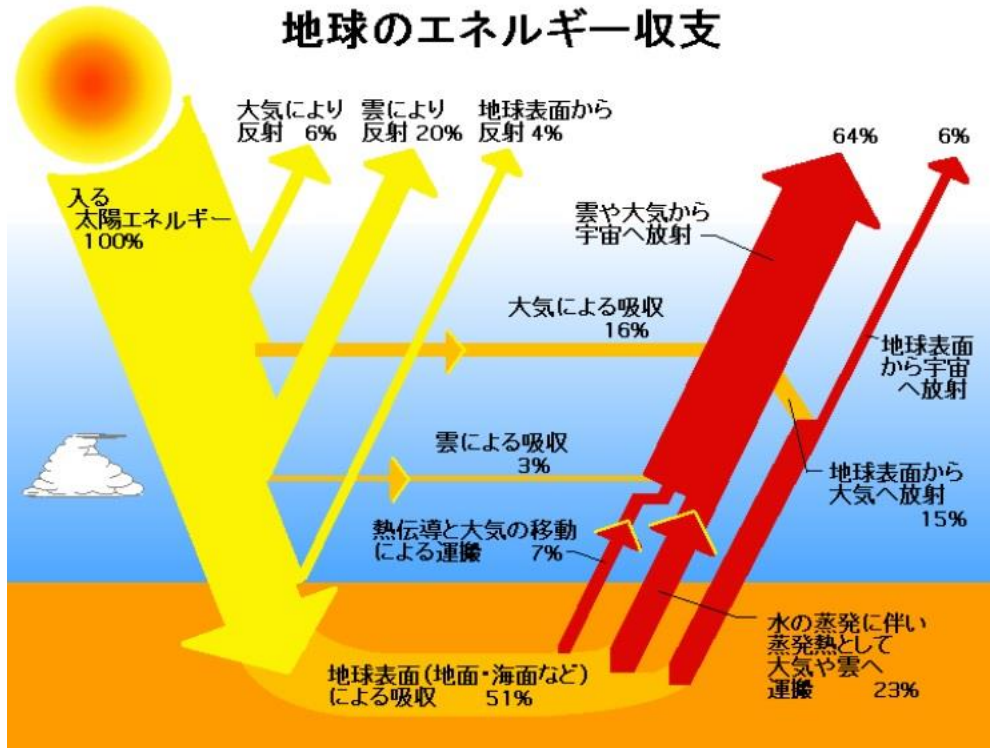
・The climate is influenced by the exchanges in the atmosphere and the ocean and the radiation from the space.

・Sv (sievert) is the unit of radiation dose which shows how much effect on the side to receive.

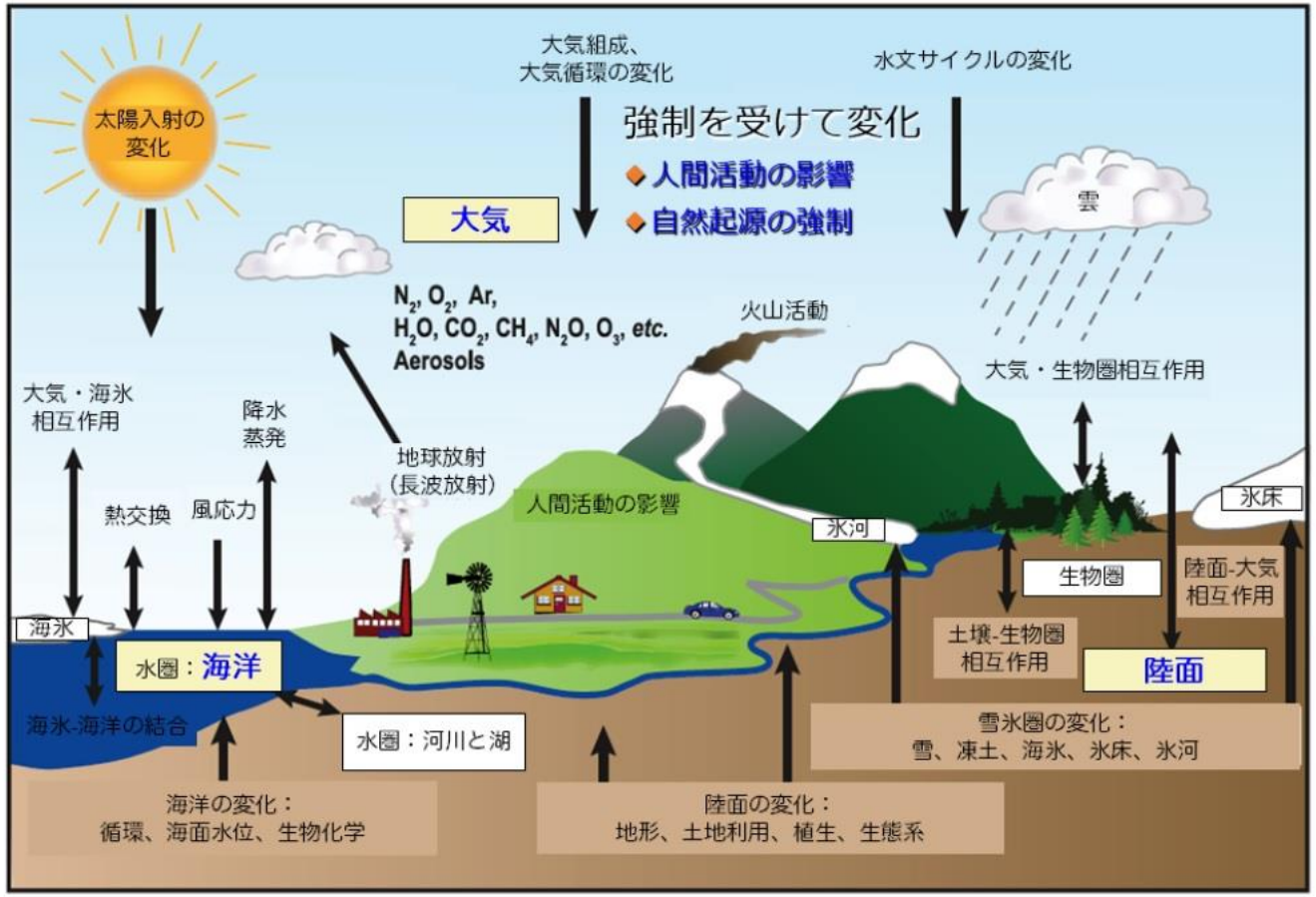
・The natural radiation dose around the university reflects the geological feature of measurements, <0.05 to 0.15μSv/h.

How is the climate fixed?

・Energy of 1370w/m2 comes to the Earth from the Sun.
・A quarter of it, 340w, arrives.
・100w is reflected and takes in 240w.
・It emits same 240w and becomes the remaining 0.
It becomes −18 degrees Celsius if no more action.
・There is a greenhouse gas on the ground and it becomes the moderate temperature of 15 degrees Celsius.



Climate system



・The energy to get changes by orbit of the solar activity and earth from the sun.

・When a volcano erupts, aerosol such as the gas sulfate is released and reflect sunlight.

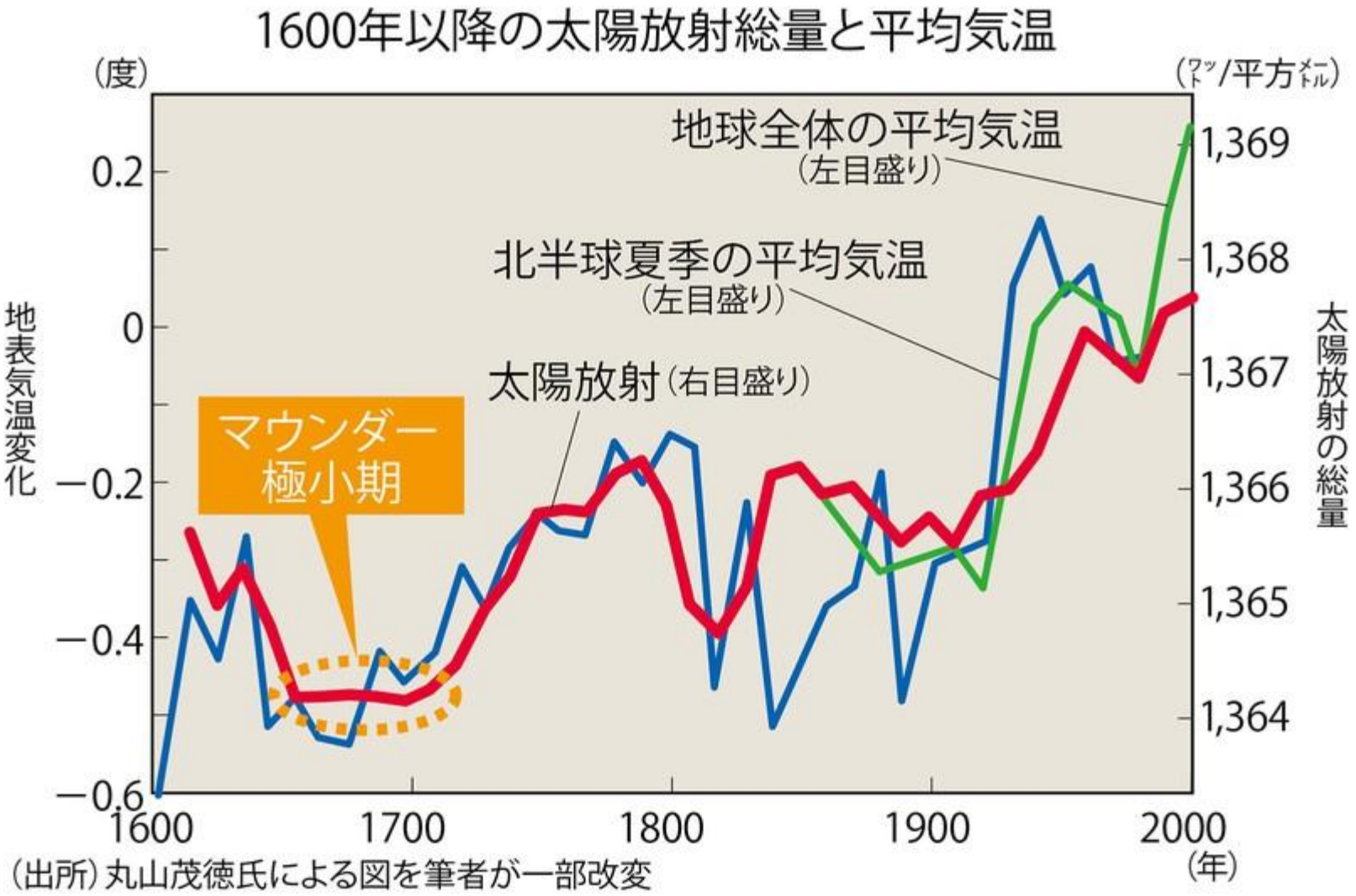
・Aerosol increases in the atmosphere by forest fire, a factory and the thermal power station.

・Atmospheric carbon dioxide increases by the industrialization and strengthens the greenhouse effect.

・Aerosol increases in the atmosphere by forest fire, a factory and the thermal power station.

Maunder Minimum

- When a lot of sunspots exist, enormous energy pours to the earth.
- In the around 17th century, there were few sunspots for a long time, and there was little solar energy. As a result, a lot of coming flying of cosmic rays came and it was chilly.



We try to measure a radiation dose in a simple dosimeter.

We check it changes in the geologic difference in step.

We measure a dose of radioactivity in the normal for the nuclear plant accident in the future.

The radiation from cosmic rays may be detected in our measure.

- Unit of side producing a radiation

Radioactivity: The number that an atomic nucleus decays for becquerel (Bq), one second.

- Unit of side radiation dose receiving a radiation

An absorbed dose: we express it how much gray (Gy) energy is absorbed.

Effective dose (equivalent dose of radioactivity): Sievert (Sv)

A unit to express how much effect a side to receive has.

A dose of radioactivity per dose rate (Dose rate) given period of time. Sv/h (Sievert every hour).

Millisievert (mSv, 1/1000 Sv), Microsievert (μ Sv = 1/1000000 Sv)

Radiation dose and life (mSv)

- Radiation (a year) from GallaParis in Brazil 10.
- Whole body CT scanning (once) 6.9.
- Radiation dose (the year, world average) 2.4 to receive from the natural world.
- Radiation dose (the year, national average of Japan) 1.5 to receive from the natural world.
- Mass radiography (once) 0.6 of the stomach.
- Flight (coming and going) 0.2 of Tokyo – New York.
- Mass radiography (once) 0.05 of the chest.

A geological feature and radiation dose

- Granite 0.05–0.08 μSv/h, Gabbro 0.02–0.04 μSv/h
- Ryolite 0.04–0.07 μSv/h, Andesite and Basalt 0.02–0.03 μSv/h

- West Japan：0.05–0.10 μSv/h Granite and metamorphic rocks
- East Japan：0.01–0.05 μSv/h Volcanic rocks are dominant

Survey around the University

- Imai: Gravel <0.05, Soft sandstone 0.05, Mt. Hatobuki: <0.05, 0.09
- Hachiso: Chert 0.05, Mt. Tsugao: Chert <0.05
- Mt. Otani: Sandstone 0.06, Mt. Miroku: Chert <0.05,
- Jokoji: Pond 0.09, Granite small exposture 0.12, 0.10,
- Mizuno: Granite 0.15
- Mt. Gongen: 0.14

In order of gravel layer, chert, soft sandstone, sandstone, granite, rhyolite, radioactivity dose becomes from less than 0.05 to 0.15.

Jokoji station SW

Survey date 2024/05/18

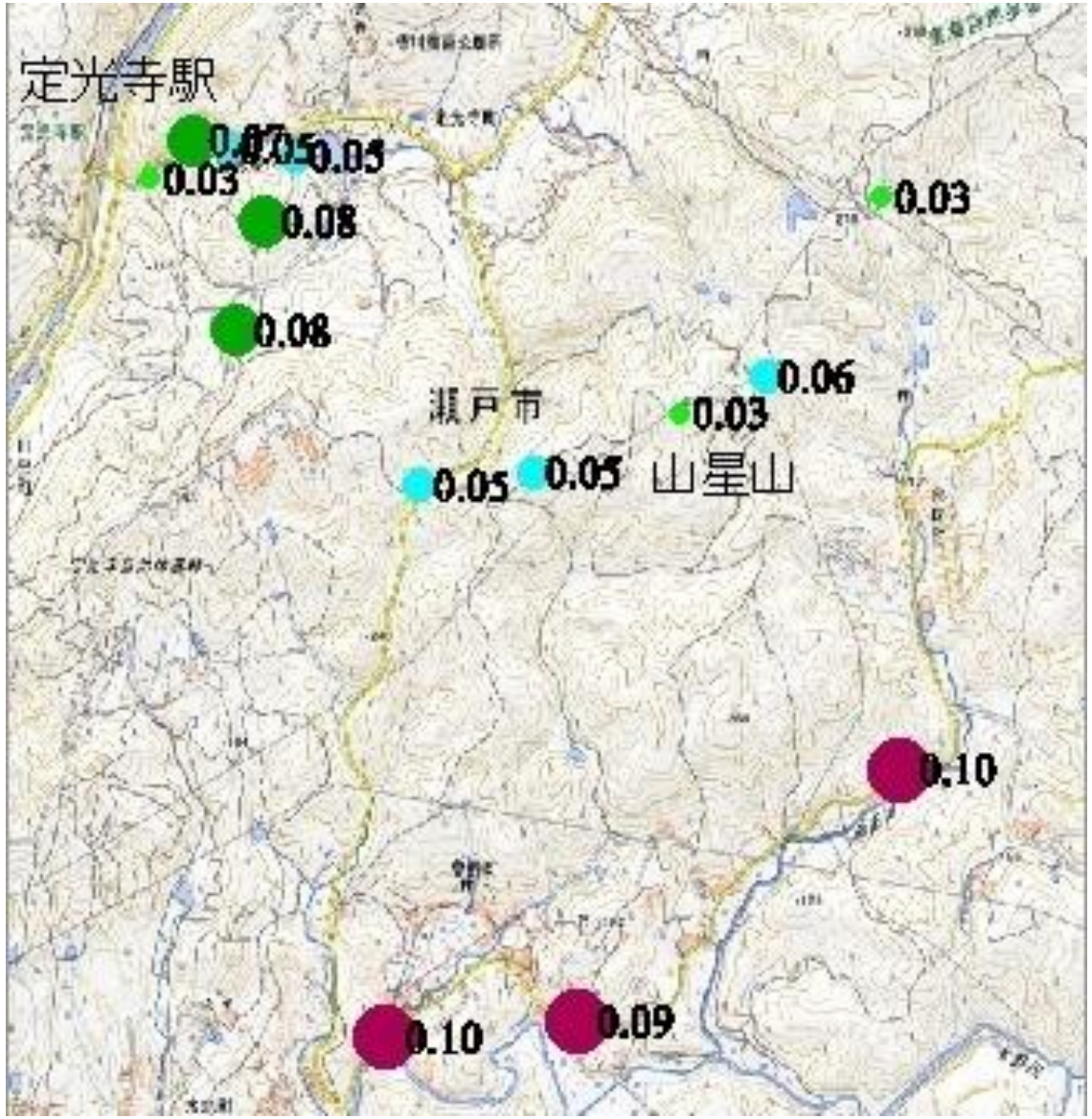
μSv/h

<0.05(0.03) green (small)

0.05–0.06 blue

0.07–0.08 green (large)

0.09–0.10 red



Relation to geology

Geologic map is reffered to Geological Survey of Japan.

Dos value is high in granite (Kgr) area,