

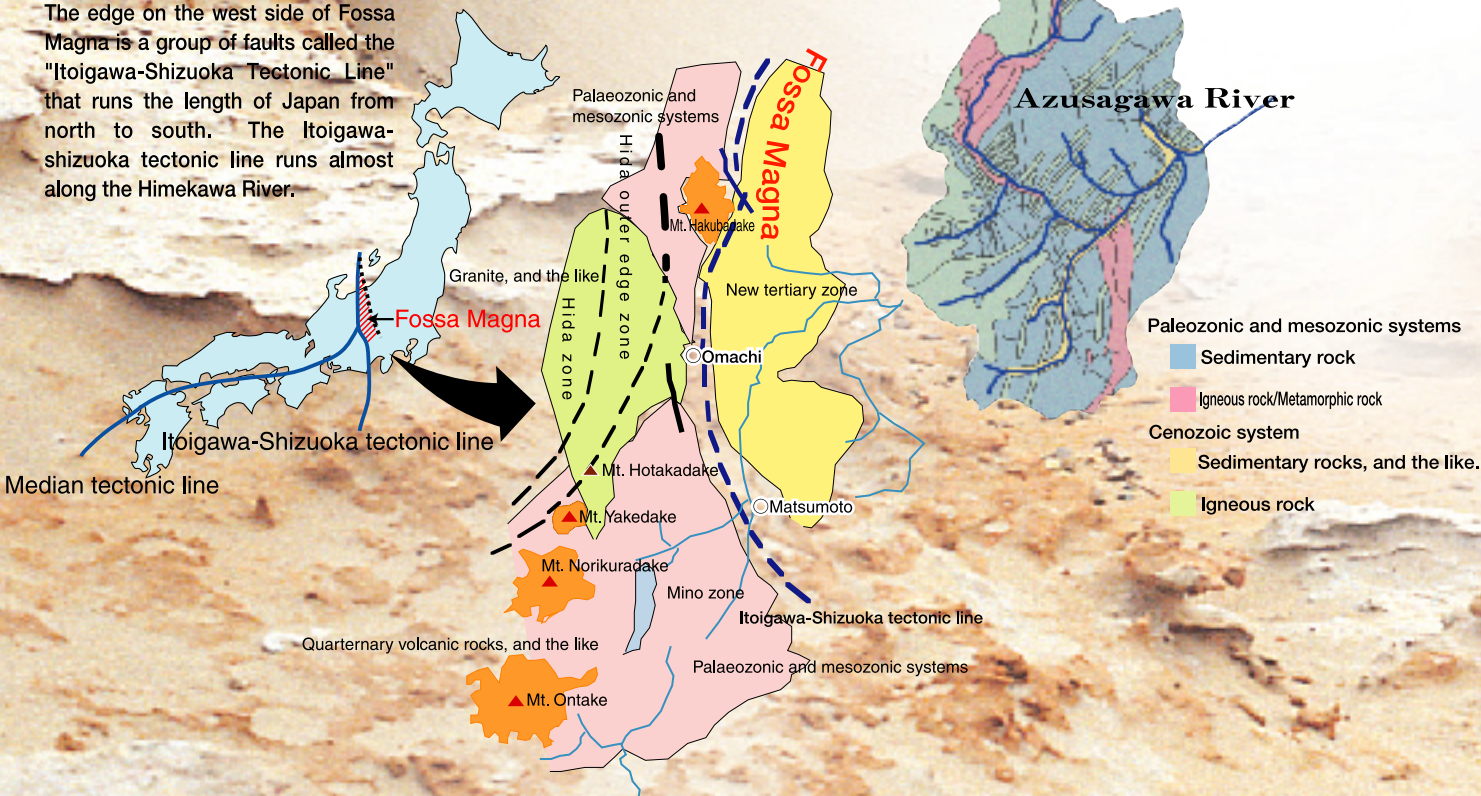
Complex and Brittle Geological Features Caused by Uplift, Great Fault, and Volcanic Activities

The Hida mountain range commonly known as the “North Alps” with the tall and sharp rocks, crests, and snow patches stretching all the way deserves exactly the name of the “Alps” given to it in appearance. From the geological viewpoint, the granite and the porphyrite that are the igneous rocks penetrate the sedimentary rock that was created during the palaeozoic era, which is in part covered with the ejecta from a volcano. The beautiful ridges were made by gradual weathering of a group of its isolated mountains through the action of volcanic activities added after the fierce uplifting movements during the palaeozoic era and the mountain-making movements of the great fault. The North Alps is still undergoing an uplift although it is not noticeable. In the meanwhile, the brittle soil such as the weathered sedimentary rock and metamorphic rock is collapsed into earth and sand, and continues to be transported downstream. Besides, Yakedake that is the only active volcano in the North Alps grows through the volcanic activities, and is, so to speak, a mountain made through the accumulation of lava flow, pyroclastic flow, and debris flow. Therefore, you have to be on alert for the brittle and collapsible ground at all times.

Fossa Magna and Itoigawa-Shizuoka Tectonic Line

Fossa Magna refers to the “Great Crevasse” in Latin. Its godfather was Dr. E. Nauman, a German geologist who was offered a position by the Meiji government. About 30 million years ago, energy erupted from under the Asian continent, and lava started to overflow the continent, while the origin of the present Japanese Islands started to become separated from the continent. It appears that the southern Japan was split into a lump, while the northeastern (Tohoku) area of Honshu was presumably split into some fragments. It is considered that Fossa Magna appeared when they were regrouped into the Japanese Islands later on. Along this border, Japan is divided into the southwest Japan (Eurasia plate) consisting of the ancient strata/rocks (the granite in the palaeozoic/mesozoic systems and the old tertiary zone) and the Fossa Magna area (North American plate) consisting of the new strata (the sedimentary rock and volcanic rock in the new tertiary zone). The sediment extends over some 10km along Fossa Magna, which is a factor contributing to the sediment-related disaster, too.

The edge on the west side of Fossa Magna is a group of faults called the "Itoigawa-Shizuoka Tectonic Line" that runs the length of Japan from north to south. The Itoigawa-shizuoka tectonic line runs almost along the Himekawa River.



The earth that breathes - the North Alps



Collapse of Mt. Hieda

In the drainage area of the Urakawa River that flows into the Himekawa River, there are distributed a collapsed area of Mt. Hieda known as one of the three greatest collapses in Japan and many slide areas. It is recorded that the collapse of Kanayamasawa on Mt. Hieda in the 11th year of the Kyoho era (1726) and the great collapse of Mt. Hieda in the 44th year of the Meiji era (1911) dammed up the Himekawa River, and caused a flood. The latter, in particular, was a great disaster, and twenty-three lives were lost. It was a disaster brought about by a large-scale collapse because of the brittle geological features of Mt. Hieda.



Sediment produced without intermission

The geological features in the North Alps are divided roughly into the sedimentary rock, igneous rock in the new tertiary zone of Fossa Magna to the east and the granite in the old tertiary zone to the west along the border of Fossa Magna. The majority of the geological features that form the drainage area of the Takasegawa River is on the granite.

The granite made of coarse grain is vulnerable to weathering, and is the root of sediment production when the conditions are added: complicated faults, weathering through the hot spring, and area of rocks exposed beyond the forest limit, etc. The soil that flows without intermission poses a threat of sediment disaster to the drainage area.



Mt. Yakedake that produces volcanic soil

Lava and ashes spewed out from Mt. Yakedake that repeats an eruption become piled up, and forms an extremely brittle ground. Apart from the damages caused by the fumes and ash fall, the sediment flows out of the devastated mountain streams endlessly, and a large quantity of sediment is piled up in the upper reaches of a river. Mt. Yakedake is a violent mountain with the geological features that cause the disasters such as collapse, debris flow, and flood.