

Sequence of the 1822 AD Eruption and Management for Hazard Mitigation of Usu Volcano, Hokkaido, Japan

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The 1822 AD (5th Year of the Bunsei Era) eruption of *Usu* Volcano, was reviewed based on chronicles of the Buddhist priests and local government *Samurai* officials. The sequence of the eruptions which occurred before instrumental monitoring systems were equipped, are reconstructed based on documents and drawing by the eyewitness. Two native villages *Usu* and *Abuta*, each of which had 350 residents, were located 4 to 4.5 km from the central part of *Usu* volcano. The eruption in 1822, the second biggest among ten historic eruptions of the volcano, caused more than 80 casualties.

Earthquake swarm started at 0200 hour on March 10. The director of the local officials *SHIGEMATSU Ban-uemon* recognized that this seismic activity could be a precursor of an eruption, based on the experience of an old native of *Abuta*. He suggested residents and priests of *Zenkoji* Temple in *Usu* to prepare for an eruption and evacuation. 60 hours later, the first explosion commenced at 1400 hour on March 12. He ordered to evacuate from neighboring villages to *Furebetsu* and *Benbe* villages, without delay. In the early morning on March 19, pyroclastic surge and pyroclastic flow covered the flank of the volcano. Ash fell 15cm in thickness in *Muroran* (22 km SE of the volcano), and teacup size pumice fell in *Shiraoui* (42 km E). Because of heavy rain in the evening on March 22, many (native) refugees returned their home. These residents and others who did not follow the order of the officials were staying in *Abuta*.

At 0700 hour on March 23, pyroclastic flow and surge attacked *Abuta* village and fall-out ash reached as far as *Akkeshi* (330km E). Local officials rescued the sufferers since the afternoon, but more than 80 were killed including government horse herdsman, merchants as well as natives. The officials made inspection of the devastated area on March 24, 27, and 29, to identify and recover casualties, closed the traffic of southwestern foot of the volcano since March 24.

Fall-out ash at the place of refuge *Benbe* and *Rebunge* on April 5 to 7 made drinking water unavailable. While *Ban-uemon* arranged young and elder refugees to move farther safer shelter, he also arranged fishermen to stay in *Rebunge* and continue their work.

According to the report that *Ban-uemon* recorded 4 months period, explosive eruptions occurred on April 25-26 (fall-out ash reached 230km SSE), May 8 (pyroclastic surge), June 2, 18 (ash reached 140 km SSW), and July 3 (ash reached 220 km S).