

Geo factor of the 2016 Itoigawa City Station North Great Fire in Itoigawa Station, Niigata Prefecture

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1. Fossa Magna Museum

At about 10:20 a.m. on Thursday, Feb 22, 2016, a fire broke from the commercial stove of a ramen noodle shop north of Itoigawa Station. Carried by strong southerly winds, the fire quickly spread becoming the largest fire since 1954. It has been provisionally named the Itoigawa City Station North Great Fire (Fig. 1). The fire was first reported at 10:28 a.m. and 12 emergency response units (9 fire, 3 EMT) were dispatched by the Itoigawa City Fire Department. The firefighting activities continued, but because of the strong winds, leaping flames caused the fire spread, with the first leap recorded at 11:21 a.m (Fig. 2). The Itoigawa City Fire Department requested aid from neighboring communities which was answered by 31 units (25 fire, 6 other) and eventually 43 units were battling the fire. The local Itoigawa City Fire Department also dispatched all 50 units available in the city.

At 12:20 p.m., the City of Itoigawa ordered the evacuation of the Honcho and Omachi 2-chome districts and at 1:10 p.m. National Route 8 was closed to traffic along a 1.3 km section between the Teramachi and Yokomachi Intersections. At 1:46 p.m. the Itoigawa City Fire Department reported that the fire had spread to at least 50 buildings. At 4:30 p.m. the evacuation order was expanded to the Omachi 1-chome district. By the end, 744 people representing 363 households had been evacuated.

With regard to the firefighting activities, many fire engines from both Itoigawa City and neighboring municipalities were spraying water, overburdening the local water supplies. The city requested support as per a pre-established Disaster Agreement. The Itoigawa Regional Concrete Industrial Association provided mixer trucks to transport water and the National Ministry of Transportation Hokuriku Regional Office provided drainage pump cars to secure the water necessary for firefighting. The Prefecture of Niigata declared a State of Emergency and requested aid from the commander of the 12th Brigade of the Japanese Ground Self Defense Force stationed at Camp Soumagahara. 155 troops of the 2nd Infantry Regiment stationed at the nearby Camp Takada were dispatched at 1:30 p.m. the following day.

The fire was contained at 8:50 p.m. but fire suppression continued until 4:30 p.m. the next day when the last fire was extinguished. There were 17 injuries reported (2 general public, 15 emergency personnel), with one moderate injury and 16 light injuries. There were no casualties. The buildings damaged included Kaga-no-I Brewery, Niigata Prefecture's oldest sake brewery founded in 1651; 200 year old restaurant Tsurukiya; the historic Heiando Inn and more, totaling 147 buildings (120 completely lost, 5 half destroyed, 22 partially damaged). The fire covered roughly 40,000 square meters, Japan's largest fire in 20 years.

On the day of the fire, a low pressure area was moving east over the Sea of Japan along warm and cold fronts (Fig. 3). Before the cold front passed Itoigawa, a strong, dry southerly wind (Foehn wind) was produced. The Itoigawa City Meteorological Station recorded a wind speed of 13.9 m/s at 10:20 a.m. when the fire started and at 11:40 a.m. the Itoigawa City Fire Department reported momentary wind speeds of up to 27.2 m/s. The fire spread almost entirely in the direction of the wind. Therefore, one can suggest that this strong southerly wind is the cause of the fire's spread.

This fire expanded as quickly as it did because of this *Renge-oroshi* wind which formed because of the nearby mountains and canyon, so this fire can be said to have a geological element (Fig. 4).

On Dec 30, Niigata Prefecture announced that the fire, which normally would not be considered a natural disaster, would be covered by the *Act on Support for Reconstructing Livelihoods of Disaster Victims*. This is the first time that a wind-borne fire has been covered by this law and this is because the *Renge-oroshi* winds can be said to have caused what should otherwise have been a minor fire to expand out of control. For this reason, the fire is being treated as a wind disaster. This is through no small part of the activities of the Itoigawa UNESCO Global Geopark, which has worked to explain and clarify the atmospheric conditions and the geographical and geological factors involved to the Japanese administration.

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