

January 28th, 2022

## Sudden Changes in Atmospheric Pressure due to Shockwaves from Tonga Volcanic Eruption Observed

### Atmospheric Pressure Data from Soratena Weather Sensors Offered to Researchers Free of Charge

Observation Network Comprising 3000 Locations Confirms Changes in Atmospheric Pressure Again on the 17th – Shockwaves Circle Back around the Earth?

[Weathernews Inc.](#) confirmed high-density observational of sudden changes in atmospheric pressure, believed to be due to the large-scale volcanic eruption near the Tonga archipelago, by its proprietary Soratena weather sensors that are installed in approximately 3,000 locations throughout Japan. Weathernews is providing the observation data on atmospheric pressure, free of charge, for the elucidation of the relevant mechanisms by researchers worldwide.

Temporary changes in atmospheric pressure were observed over a wide area due to the large-scale eruption of Hunga Tonga-Hunga Ha'apai near the Tonga archipelago at about 1:00 PM on January 15th (Japan time). The atmospheric pressure changes observed by Soratena at about 8:00 PM on the 15th are believed to be attributable to the shockwaves, or air vibration, caused by the eruption. Further, similar changes in atmospheric pressure were observed at about 9:00 AM on the 17th, indicating the possibility that the air vibration circled around the earth and returned to Japan.

Soratena is a proprietary weather sensor that observes the atmospheric pressure, temperature, humidity, and three other elements every minute. Installed in approximately 3,000 locations throughout Japan, the sensors comprise the largest high-density observation network in the country. Weathernews hopes that the use of its observation data in research will contribute to the elucidation of phenomena such as the occurrence of tsunami and air vibration due to eruptions.

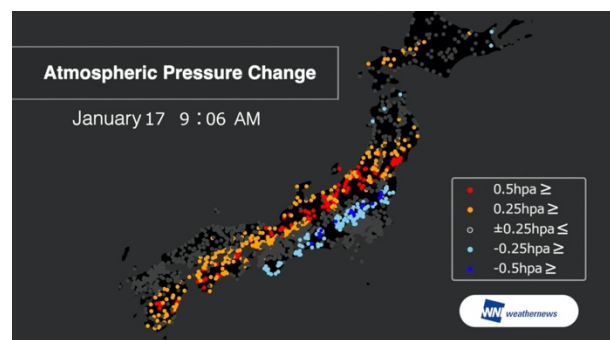
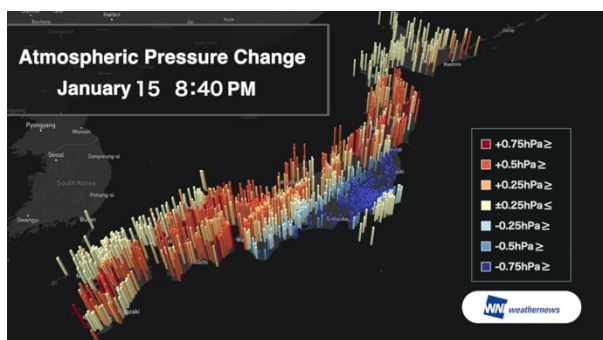
Please use the following link for inquiries on access to the atmospheric pressure data:

<https://global.weathernews.com/contact/inquiries-about-our-services/>

### Sudden Changes in Atmospheric Pressure Due to Shockwaves from Tonga Volcanic Eruption Confirmed

Weathernews' Soratena weather sensors observed sudden changes in atmospheric pressure throughout Japan on January 15th, 2022, from 8:00 PM to a little past 9:00 PM (Japan time). They are believed to have been caused by the shockwaves, or air vibrations, from the eruption of Hunga Tonga-Hunga Ha'apai in the periphery of the Tonga archipelago at about 1:00 PM on the 15th.

Observations by Soratena indicate an increase in atmospheric pressure followed immediately by a decrease, with the changes propagating in a concentric circle. The changes captured are presumably the compression (increase in atmospheric pressure) and decompression (decrease in atmospheric pressure) characteristic of shockwaves and are an indication of the magnitude of the volcanic eruption.



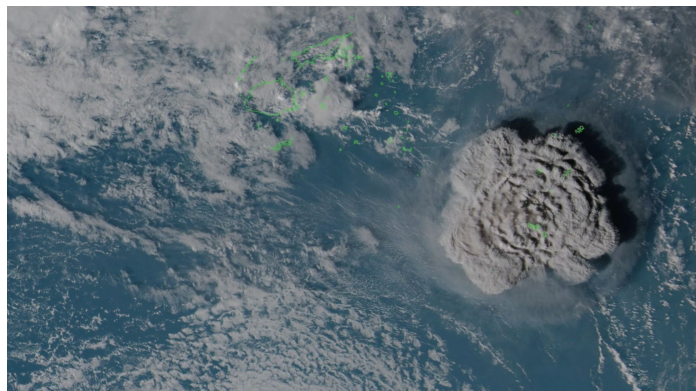
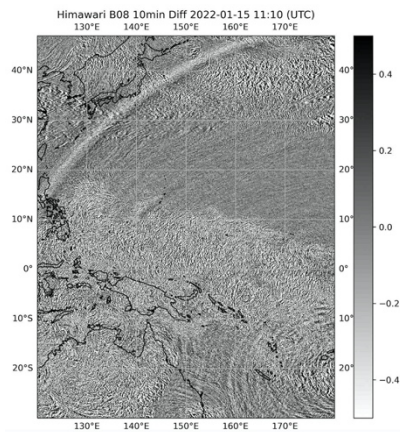
\* Video segments of the observations are available in the online press release <https://global.weathernews.com/news/16551/>

### **-Air Vibrations Circle around the Earth to Return on the 17<sup>th</sup> -**

Changes in atmospheric pressure were observed throughout Japan again on January 17th from shortly before 9:00 AM to a little past 10:00 AM. Data from Soratena indicate the atmospheric pressure rising and then falling immediately, progressing in concentric circles from southeastern side of the Japanese archipelago including the Kanto region and the Izu Islands. The pressure changes observed were approximately 2 hPa on the 15th, while even the more significant changes observed were only about 1 hPa on the 17th.

The changes in atmospheric pressure are believed to be attributable to the shockwaves caused by the eruption on the 15th, which conceivably circled around the earth and returned shortly before 9:00 AM on the 17th. The timing essentially coincides with the expectation that the shockwaves will return to Japan at about 9:00 AM on the 17th after circling around the earth, assuming that their velocity remains constant.

In addition, air vibration circling around the earth from the opposite direction is believed to have passed by Japan at about 5:00 to 6:00 PM on the 16th, resulting in the observation of minute changes in atmospheric pressure during this time period.



### **Atmospheric Pressure Data from Soratena Weather Sensors Made Available for Research**

According to Professor Fumihiko Imamura of the Tohoku University International Research Institute of Disaster Science, there is a possibility that air vibrations attributable to the large-scale volcanic eruption in Tonga triggered and magnified the tsunami in Japan and other pan-Pacific areas.

Weathernews is providing observational data on atmospheric pressure from the Soratena weather sensors, free of charge for research purposes only, so that they may be used effectively in studies related to the elucidation of various phenomena as well as disaster prevention. Researchers who wish to have access to the data are invited to contact Weathernews via the Inquiry Form, clearly indicating how they intend to use the data.

▼ Please use the following link for inquiries on access to the atmospheric pressure data:

<https://global.weathernews.com/contact/inquiries-about-our-services/>

### **Specifications of the Data Provided**

Data Type	Local atmospheric pressure
Unit:	hPa
Period Covered:	10:00 AM January 15 – 1:00 AM January 17, 2022 (UTC)
Temporal Resolution:	1 minute
No. of Locations:	Approximately 1,600 locations in Japan where valid data were obtained
Provision Format:	CSV file