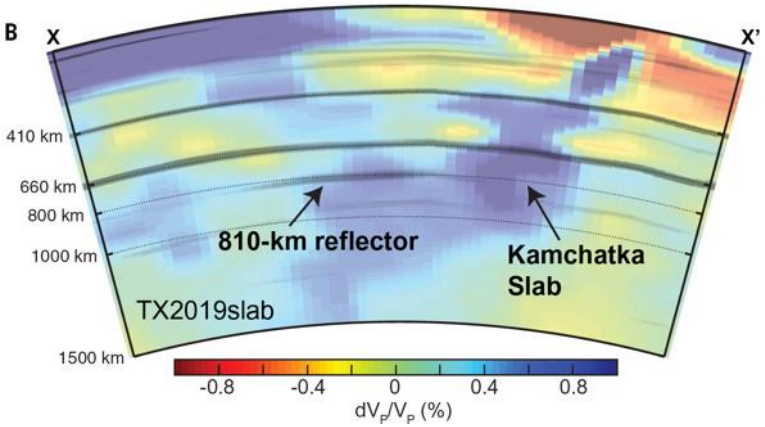
Oceanic plateau of the Hawaiian mantle plume head subducted to the uppermost lower mantle

Wei et al., 2020 in *Science*

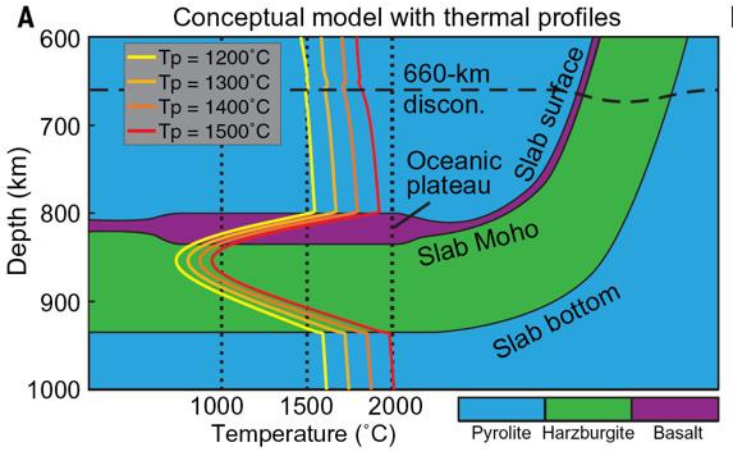
The authors stacked SS precursors from 45 years of global seismic data and found a strong reflector at 810-km depth west of the Sea of Okhotsk. This reflector indicates a major part of the oceanic plateau that was created by the Hawaiian mantle plume head ~100 million years ago and subducted 20-30 million years ago into the Kamchatka Trench.

Seismic Data used:

The authors used data from more than 60 seismic networks available at the IRIS Data Management Center. GSN contributes a significant portion of the data. *GSN network IDs were acknowledged in the paper.*

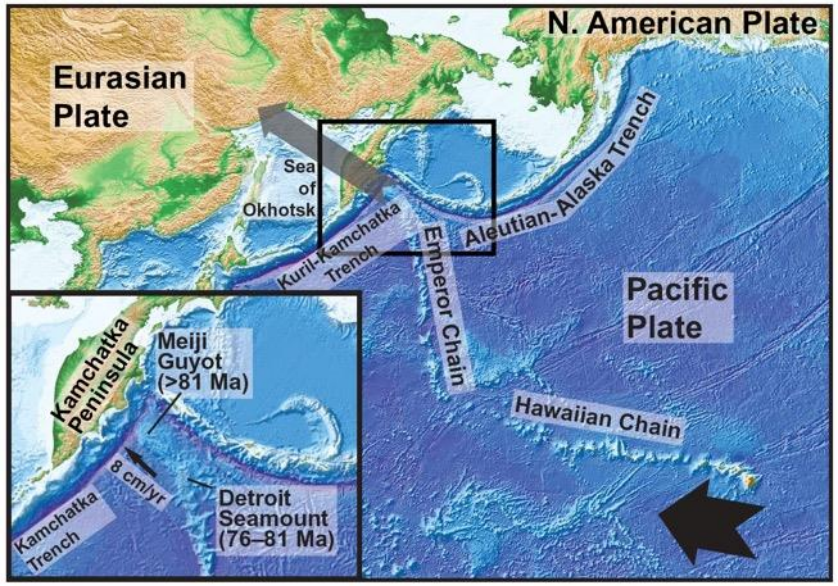


Stacked SS precursors image a strong seismic reflector at 810-km depth (dark streak) above the Kamchatka slab (blue anomaly).



The 810-km reflector can be only explained by a thickened oceanic crust (oceanic plateau) on a flat slab in the uppermost lower mantle.

The newly discovered oceanic plateau is on the trajectory of the Hawaiian-Emperor seamount chain.



This discovery provides spatial and temporal clues of the Hawaiian mantle plume's early history.

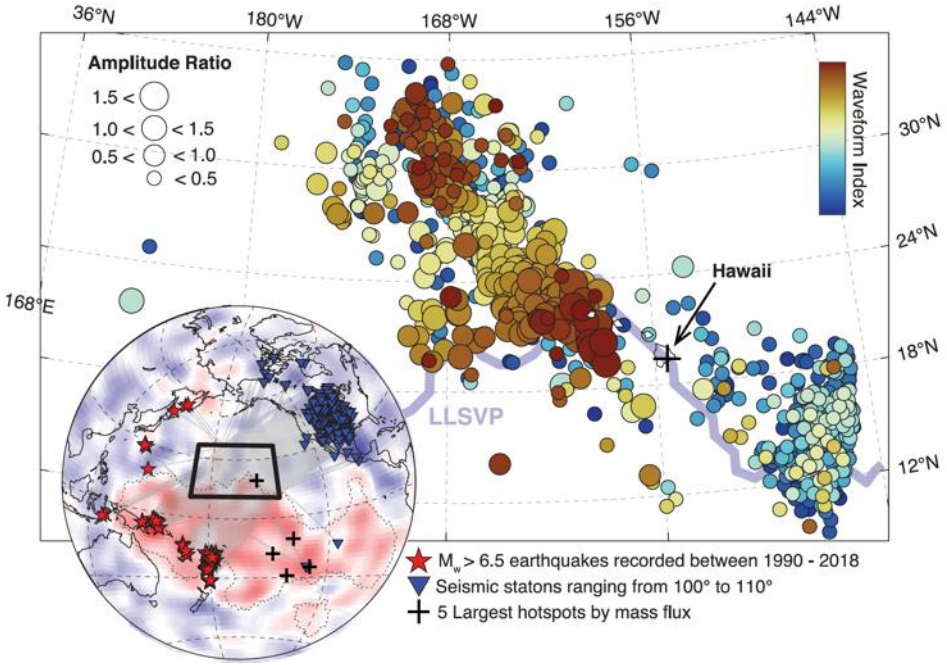
Sequencing seismograms: A panoptic view of scattering in the core-mantle boundary region

Kim et al., 2020 in *Science*

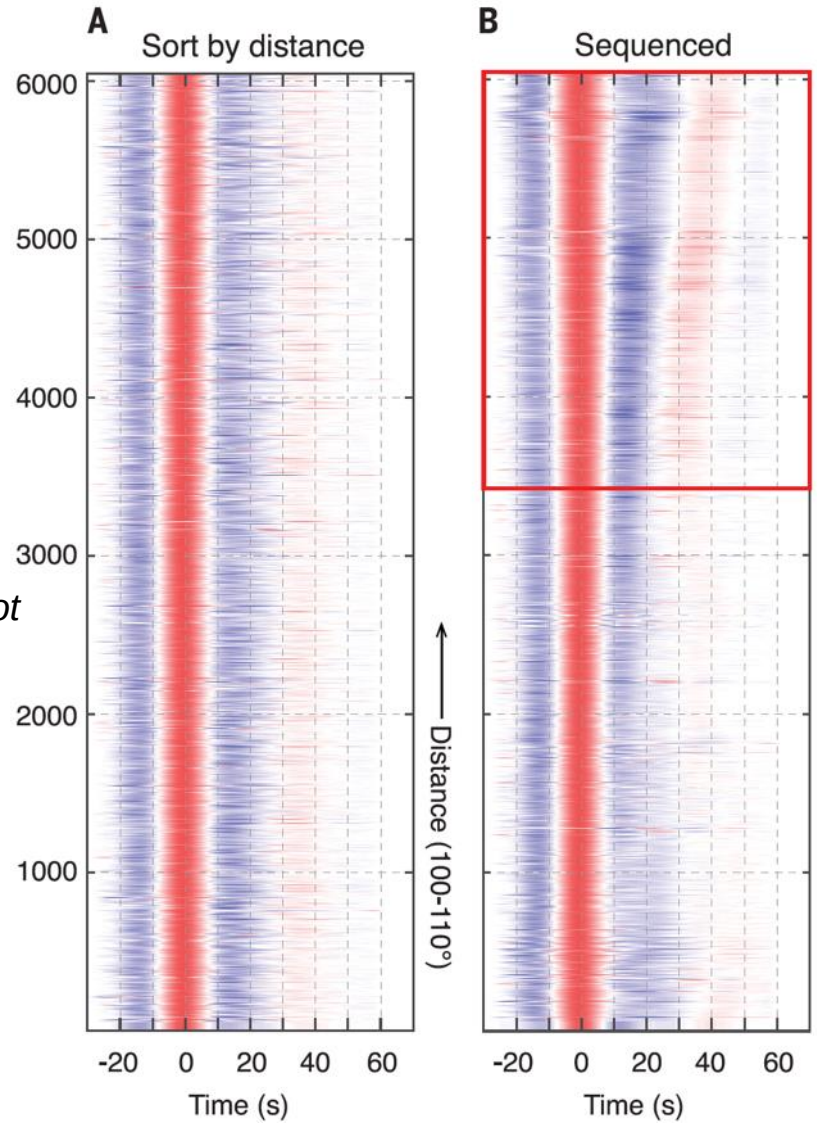
The authors used an unsupervised machine learning algorithm to analyze Sdiff waveforms, and detected seismic waves scattered by 3D structures near the core-mantle boundary.

Seismic Data used:

At least 1 GSN station was used in this study. *However, the authors did not metion GSN or even the station names in the paper.*



Sdiff postcursors sampling the Hawaii region. Inset shows the used earthquakes and seismic stations.



A comparison of the source deconvolved Sdiff waveforms of deep earthquakes between 100° and 110° epicentral distance sorted by (A) distance and (B) the Sequencer. Sequencer ordering enables the identification of a substantial (~40% of all waveforms) subpopulation of Sdiff postcursors [red box in (B)].

This study shows the power of unsupervised machine learning on studying the deep Earth. This method is only made possible to the free seismic dataset, including the GSN contributions.

COVID-19 Societal Response Captured by Seismic Noise in China and Italy

Xiao et al., 2020 in *Seismological Research Letters*

This is one of the first papers to study societal response related to the COVID-19 pandemic using seismic data.

Seismic Data used:

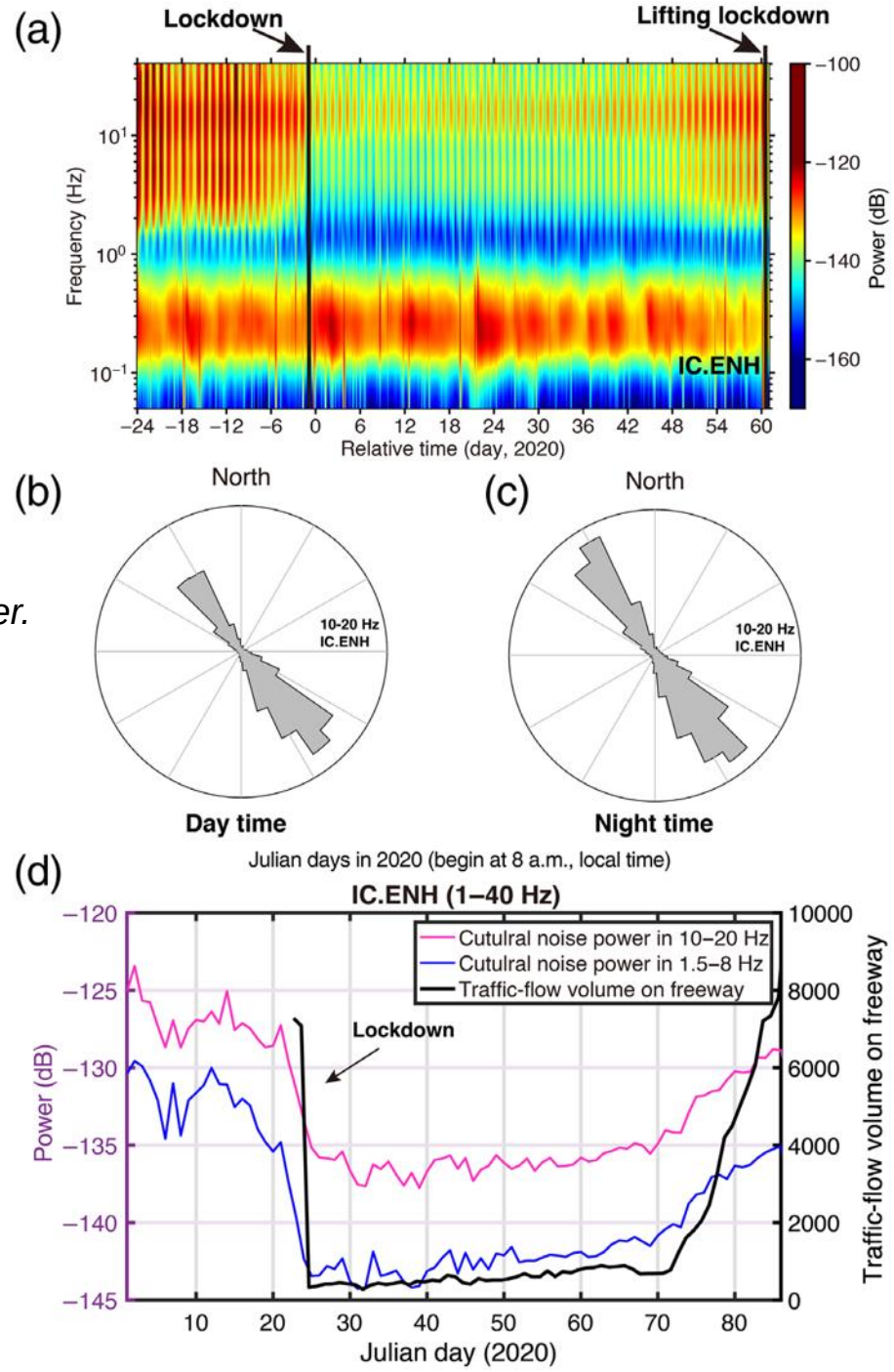
7 seismic stations were used, including 4 GSN stations in China.

However, neither GSN nor network IDs were acknowledged in the paper.

TABLE 1
List of Seismic Stations Analyzed and the Lockdown Period in the Different Cities

City	Seismic Station	The Timing of the Lockdown (yyyy/mm/dd)	The Timing of the Lifting Lockdown (yyyy/mm/dd)
Enshi (Hubei Province, China)	IC.ENH	2020/01/24 (Julian days 24 in 2020)	2020/03/25 (Julian days 85 in 2020)
Beijing (China)	IC.BJT	No official declared lockdown	—
Mudanjiang (Heilongjiang Province, China)	IC.MDJ	No official declared lockdown	—
Qiongzhou (Hainan Province, China)	IC.QIZ	No official declared lockdown	—
Milan (Lombardy Province, Italy)	IV.MILN	2020/03/08 (Julian days 68 in 2020)	2020/05/18 (Julian days 139 in 2020)
Torino (Piedmont Province, Italy)	IV.MONC	2020/03/10 (Julian days 70 in 2020)	2020/05/18 (Julian days 139 in 2020)
Rome (Lazio Province, Italy)	IV.RMP	2020/03/10 (Julian days 70 in 2020)	2020/05/18 (Julian days 139 in 2020)

There have been many studies using seismic data to monitor COVID-19 societal response. This is the first study directly monitoring a city in Hubei Province, the epicenter of the COVID-19 outbreak, thanks to the real-time data available at the GSN station IC.ENH.



A GSN station IC.ENH in Enshi is the closest seismic station with open data to Wuhan, the epicenter of the COVID-19 outbreak. The cultural noise decreased dramatically after the government lockdown.

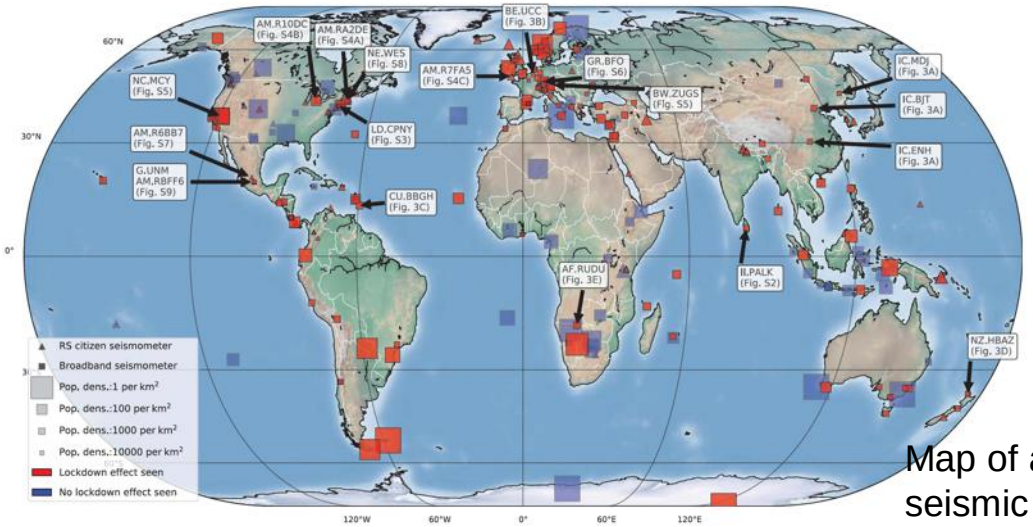
Global quieting of high-frequency seismic noise due to COVID-19 pandemic lockdown measures

Lecocq et al., 2020 in *Science*

Following the previous work, more GSN stations contributed to a global seismic study of societal impacts of COVID-19.

Seismic Data used:

The authors used data from 268 global seismic stations, including 25 GSN stations. Note that certain countries (e.g., China, Pakistan, Ethiopia) were only sampled by GSN stations. *However, neither GSN nor network IDs were acknowledged in the paper.*



Map of analyzed seismic stations.

This is the longest and most prominent global anthropogenic seismic noise reduction on record.

Global temporal changes in seismic noise.