

# Seismic Waveform data of 7 February 2021 Uttarakhand rockslide induced flood recorded by CSIR-NGRI

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## 1. Data Description

The data set contains seismic waveforms recorded by the 17 broadband stations of Uttarakhand network operated by CSIR-NGRI (Srinagesh et al., 2019) for a period of 3 hours each, covering the 7 Feb 2021 Uttarakhand landslide event (Rao et al., 2021). The stations are equipped with 24-bit Reftek Digital acquisition system 120 sec broadband Reftek sensor with sampling rate 100 samples per second (sps). The data was time tagged using GPS receivers at every station. This network was installed under the Focussed Basic Research Project MLP-FBR-005 (R & D Project) funded by the Council of Scientific and Industrial Research (Ministry of Science and Technology, Government of India) with the basic objective of understanding the earthquake Hazard of this region and also, mapping the crust mantle structure. The duration of this project is for 3 years (2020-2021). An attempt has been made by Cook et al., (2021) to demonstrate the robustness of the seismological detection and tracking of 7 FEB 2021 landslide induced flood that occurred in Uttarakhand, India.

### 1.1. Sampling method

The broadband stations are equipped with 24-bit **Reftek recorder** and **120 sec broadband Reftek sensor**. The data were sampled at 100 samples per second (sps).

### 1.2. Analytical procedure:

The network is serviced every 3 months and the data is manually brought back to CSIR-NGRI

and processed for its quality and further, processed for meeting the project objectives.

### 1.3. Data processing

The data from the stations listed in Table 1 were initially converted from Reftek to SAC format and then subjected to instrument correction using the Seismic Analysis Code (SAC) (Goldstein et al., 2003).

## 2. File description

Each data file in the SAC DATA folder is in '\*.SAC' format containing the single seismic trace of duration one hour. For each station, there are 9 files (3 components \* 3 hours) covering the time period 07-02-2021 04:00:00 UTC to 07-02-2021 06:59:59 UTC.

Each file was named in the convention STN.JDY.HH.MM.SS.CMP.SAC

- STN: Station name (acronym)
- JDY: Julian day of the year
- HH.MM.SS: Starting time (HH: Hour MM: Minute SS: Second)
- CMP: Component of the data (BHZ/BHN/BHE accordingly for Vertical/North/East) components.

Each SAC file contains the header information related to number of samples, sampling rate, starting time (Year, Month, Day, Hour, Minute, Second), Station name, Latitude, Longitude, Elevation etc., following the standard SAC header format.

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### **3. Citation**

**When using the data please cite:**

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**The data are supplementary material to:**

Cook, K.L., Rekapalli, R., Dietze, M., Pilz, M., Cesca, S., Rao, N.P., Srinagesh, D., Paul, H., Metz, M., Mandal, P., Suresh, G., Cotton, F., Tiwari, V. M., Hovius, N. (2021): Detection, Tracking, and Potential for Early Warning of Catastrophic Flow Events Using Regional Seismic Networks (Under review)

### **4. References**

Cook, K.L., Rekapalli, R., Dietze, M., Pilz, M., Cesca, S., Rao, N.P., Srinagesh, D., Paul, H., Metz, M., Mandal, P., Suresh, G., Cotton, F., Tiwari, V. M., Hovius, N. (2021): Detection, Tracking, and Potential for Early Warning of Catastrophic Flow Events Using Regional Seismic Networks (Under review)

Goldstein, P., D. Dodge, M. Firpo, Lee Minner (2003): SAC2000: Signal processing and analysis tools for seismologists and engineers. The IASPEI International Handbook of Earthquake and Engineering Seismology”, Edited by WHK Lee, H. Kanamori, P.C. Jennings, and C. Kisslinger, Academic Press, London. [https://doi.org/10.1016/S0074-6142\(03\)80284-X](https://doi.org/10.1016/S0074-6142(03)80284-X)

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**Table 1: Seismic Station Information**

<b>Station ID</b>	<b>Sampling Rate</b>	<b>Latitude</b>	<b>Longitude</b>	<b>RefTek Data Acquisition System/ Logger</b>	<b>Reftek Sensor</b>	<b>StartDateTime (UTC)</b>	<b>EndDateTime (UTC)</b>
AUL	100	30.538	79.566	130	151B-120	07-02-2021 04:00:00	07-02-2021 06:59:59
GHA	100	30.257	79.447	130	151-120A	07-02-2021 04:00:00	07-02-2021 06:59:59
NBR	100	30.145	79.376	130	151B-120	07-02-2021 04:00:00	07-02-2021 06:59:59
GDM	100	30.001	79.563	130	151B-120	07-02-2021 04:00:00	07-02-2021 06:59:59
BGS	100	29.887	79.673	130	151B-120	07-02-2021 04:00:00	07-02-2021 06:59:59
GAI	100	30.051	79.288	130	151-120A	07-02-2021 04:00:00	07-02-2021 06:59:59
MNRI	100	30.066	80.238	130	151B-120	07-02-2021 04:00:00	07-02-2021 06:59:59
RANS	100	30.588	79.141	130	151B-120	07-02-2021 04:00:00	07-02-2021 06:59:59
TRNR	100	30.639	78.975	130	151B-120	07-02-2021 04:00:00	07-02-2021 06:59:59
SAYL	100	29.82	79.21	130	151B-120	07-02-2021 04:00:00	07-02-2021 06:59:59
DUM	100	29.75	79.015	130	151B-120	07-02-2021 04:00:00	07-02-2021 06:59:59
BDKD	100	30.578	78.648	130	151B-120	07-02-2021 04:00:00	07-02-2021 06:59:59
JOS	100	30.721	78.436	130	151B-120	07-02-2021 04:00:00	07-02-2021 06:59:59
BAR	100	30.809	78.205	130	151B-120	07-02-2021 04:00:00	07-02-2021 06:59:59
TUN	100	30.933	77.845	130	151B-120	07-02-2021 04:00:00	07-02-2021 06:59:59
KAP	100	29.946	79.9	130	151-120A	07-02-2021 04:00:00	07-02-2021 06:59:59
NACH	100	29.905	80.165	130	151-120A	07-02-2021 04:00:00	07-02-2021 06:59:59