

Seismological Observatories of India Meteorological Department (IMD)

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India Meteorological Department

India Meteorological Department (IMD) is the nodal agency of Government of India for monitoring seismic activity in and around the country. IMD had rendered more than a century of seismological service to the nation with the first seismological observatory of the country having been set up by the department at Kolkatta in 1898. The operational task of the department is to quickly estimate the earthquake source parameters immediately on occurrence of an earthquake and disseminate the information to all the user agencies including public information channels, press, media etc. and the concerned State and Central Government agencies responsible for carrying out relief and rehabilitation measures. The information relating to under-sea earthquakes capable of generating tsunamis on the Indian coastal regions is also disseminated to all concerned user agencies including the Indian National Centre for Ocean Information Services (INCOIS), Hyderabad for issue of tsunami related messages and warnings. The earthquake information is transmitted to various user agencies, including public information channels, press, media etc., using different modes of communication, such as SMS, fax, email, IVRS and also posted on IMD's Website (www.ind.gov.in).

Towards meeting the above stated objectives, IMD maintains a seismological network, consisting of a total of 82 observatories, spread over the entire length and breadth of the country (Figure 1 and Table 1). This includes: a) 16-station V-SAT based digital seismic telemetry system around National Capital Territory (NCT) of Delhi, b) 20-station VSAT based real time seismic monitoring network in North East region of the country and c) 17-station Real Time Seismic Monitoring Network (RTSMN) to monitor and report large magnitude under-sea earthquakes capable of generating tsunamis on the Indian coastal regions.. A Control Room is in operation, on 24X7 basis, at IMD Headquarters (Seismology) in New Delhi with state-of-art facilities for data collection, processing and dissemination of information to the concerned user agencies.

As part of early warning system for tsunamis established by the Indian National Center for Ocean Information Services (INCOIS), Hyderabad, a 17-station Real Time Seismic Monitoring Network (RTSMN) was set up by IMD to monitor and report large magnitude under-sea earthquakes capable of generating tsunamis on the Indian coastal regions. The ground motion data recorded at the 17 field stations is transmitted in real time through VSAT communication systems to the two Central Receiving Stations (CRSs) located at IMD, New Delhi and INCOIS, Hyderabad for processing. The

RTSMN system employs state-of-art auto-location software, called Response Hydra (v-1.2), to make preliminary estimates of earthquake source parameters immediately (within a few minutes) after the occurrence of an earthquake. The source parameters include the time of occurrence, location (region), magnitude and focal depth of the earthquake. For providing better azimuthal coverage towards detecting earthquakes of tsunami-genic potential, the RTSMN system has been configured to include about 100 global stations of IRIS (a consortium of Incorporated Research Institutions in Seismology), whose data is available freely through internet.

In addition, a number of seismological observatories are also being maintained by various State and Central Government organizations, Universities, Research institutions and other agencies in the country for specific purposes/as per mandate. These include:

1. National Geophysical Research Institute (NGRI), Hyderabad.
2. Wadia Institute of Himalayan Geology (WIHG), Dehradun.
3. North East Institute of Science & Technology (NEIST), Jorhat.
4. Institute of Seismological Research (ISR), Gandhinagar, Gujarat.
5. Geological Survey of India (GSI), Kolkata.
6. Maharashtra Engineering Research Institute (MERI), Nasik, Maharashtra.
7. Indian Institute of Technology (IIT), Roorkee.
8. Central Building Research Institute (CBRI), Roorkee.

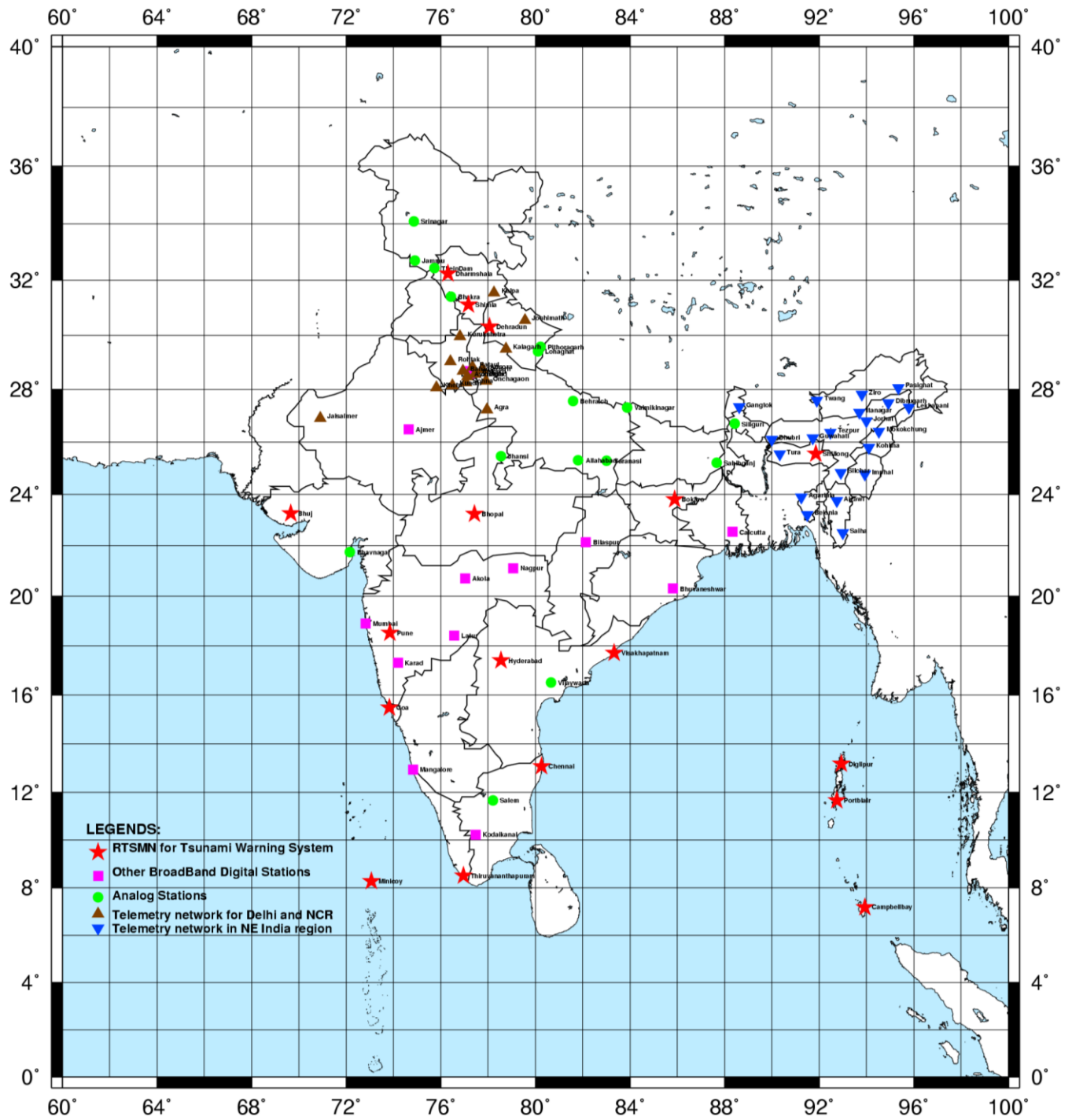


Figure 1. Seismological network of India Meteorological Department (IMD).

Table 1. List of Seismological Observatories Operated by IMD.

S. No.	Name of Station	Latitude (In degree)	Longitude (In degree)	Height above m.s.l. (in meters)	Station category
1	Ajmer	26.479N	74.643E	540	Other Broadband digital
2	Akola	20.703N	77.015E	310	Other Broadband digital
3	Allahabad	25.309N	81.809E	107	Analog
4	Behraich	27.567N	81.583E	123	Analog
5	Bhakra	31.417N	76.417E	410	Analog
6	Bhavnagar	21.750N	72.143E	182	Analog
7	Bhopal	23.241N	77.425E	520	RTSMN
8	Bhuj	23.254N	69.654E	80	RTSMN
9	Bhubaneshwar	20.296N	85.806E	46	Other Broadband digital
10	Bilaspur	22.129N	82.132E	398	Other Broadband digital
11	Bokaro	23.795N	85.886E	282	RTSMN
12	Calcutta	22.539N	88.331E	6	Other Broadband digital
13	Chennai	13.068N	80.246E	15	RTSMN
14	Dehradun	30.323N	78.056E	682	RTSMN
15	Delhi	28.683N	77.217E	230	Other Broadband digital
16	Goa	15.492N	73.825E	58	RTSMN
17	Jammu	32.717N	74.900E	360	Analog
18	Jhansi	25.466N	78.540E	250	Analog
19	Karad	17.308N	74.183E	582	Other Broadband digital
20	Kodaikanal	10.233N	77.467E	2345	Other Broadband digital
21	Latur	18.416N	76.560E	620	Other Broadband digital
22	Lohaghat	29.417N	80.100E	1700	Analog
23	Mangalore	12.942N	74.823E	31	Other Broadband digital
24	Minicoy	8.282N	73.059E	2	RTSMN
25	Mumbai	18.896N	72.813E	6	Other Broadband digital
26	Nagpur	21.102N	79.062E	311	Other Broadband digital
27	Pithoragarh	29.583N	80.217E	1669	Analog
28	Portblair	11.656N	92.744E	79	RTSMN
29	Pune	18.530N	73.849E	560	RTSMN
30	Sahibganj	25.217N	87.667E	37	Analog
31	Salem	11.650N	78.200E	278	Analog
32	Shillong	25.567N	91.856E	1600	RTSMN
33	Siliguri	26.700N	88.417E	120	Analog
34	Srinagar	34.100N	74.850E	1587	Analog
35	Thein Dam	32.433N	75.717E	621	Analog
36	Thiruvananthapuram	8.508N	76.959E	64	RTSMN
37	Valmikinagar	27.317N	83.867E	100	Analog
38	Varanasi	25.300N	83.017E	88	Analog
39	Vijayawada	16.517N	80.650E	18	Analog
40	Visakhapatnam	17.721N	83.329E	82	RTSMN
41	Lodi Road	28.583N	77.217E	200	Other Broadband digital
42	Campbell Bay	07.192N	93.927E	10	RTSMN
43	Dharmshala	32.248N	76.307E	1995	RTSMN
44	Diglipur	13.178N	92.931E	30	RTSMN
45	Hyderabad	17.403N	78.552E	510	RTSMN
46	Shimla	31.128N	77.167E	2200	RTSMN
47	Bahadurgarh	28.688N	76.939E	214	Delhi Telemetry Network
48	Sohna	28.245N	77.063E	180	Delhi Telemetry Network
49	Bisrakh	28.571N	77.439E	200	Delhi Telemetry Network

50	Agra	27.231N	77.944E	169	Delhi Telemetry Network
51	Kurukshetra	29.962N	76.821E	250	Delhi Telemetry Network
52	Rohtak	29.033N	76.414E	220	Delhi Telemetry Network
53	Kalagarh	29.506N	78.754E	1814	Delhi Telemetry Network
54	Ausora	28.756N	77.772E	160	Delhi Telemetry Network
55	Rataul	28.832N	77.342E	223	Delhi Telemetry Network
56	Kundal	28.144N	76.489E	227	Delhi Telemetry Network
57	Ayanagar	28.482N	77.127E	220	Delhi Telemetry Network
58	Onchagaon	28.310N	77.910E	237	Delhi Telemetry Network
59	Khetri	28.074N	75.806E	320	Delhi Telemetry Network
60	Kalpa	31.546N	78.260E	2724	Delhi Telemetry Network
61	Jaisalmer	26.924N	70.903E	223	Delhi Telemetry Network
62	Joshimath	30.556N	79.558E	1889	Delhi Telemetry Network
63	Dhubri	26.020N	89.995E	33	North East Telemetry Network
64	Mokochong	26.321N	94.516E	1353	North East Telemetry Network
65	Agartala	23.889N	91.246E	18	North East Telemetry Network
66	Jorhat	26.743N	94.251E	79	North East Telemetry Network
67	Belonia	23.248N	91.447E	20	North East Telemetry Network
68	Gangtok	27.319N	88.601E	1348	North East Telemetry Network
69	Kohima	25.720N	94.108E	1353	North East Telemetry Network
70	Imphal	24.831N	93.946E	792	North East Telemetry Network
71	Aizwal	23.738N	92.690E	969	North East Telemetry Network
72	Silchar	24.781N	92.803E	18	North East Telemetry Network
73	Lekhapani	27.333N	95.846E	139	North East Telemetry Network
74	Ziro	27.526N	93.850E	160	North East Telemetry Network
75	Tezpur	26.617N	92.800E	83	North East Telemetry Network
76	Itanagar	27.144N	93.722E	214	North East Telemetry Network
77	Tura	25.517N	90.224E	406	North East Telemetry Network
78	Guwahati	26.193N	91.691E	88	North East Telemetry Network
79	Dibrugarh	27.468N	94.911E	90	North East Telemetry Network
80	Tawang	27.594N	91.867E	297	North East Telemetry Network
81	Pasighat	28.061N	95.326E	167	North East Telemetry Network
82	Saiha	22.50 N	93.00 E	729	North East Telemetry Network