GEM
GLOBAL EARTHQUAKE MODEL
working together to assess risk

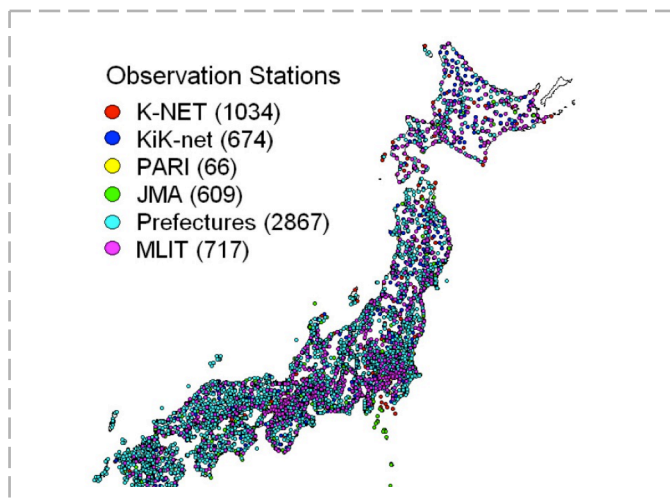# Database of Recorded Waveform

Report produced in the context of the Global Project
"GEM Ground Motion Prediction Equations"

Observation Stations
- K-NET (1034)
- KiK-net (674)
- PARI (66)
- JMA (609)
- Prefectures (2867)
- MLIT (717)

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Database of Recorded Waveform

GEM Ground Motion Prediction Equations

Version: 1.0.0

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www.globalquakemodel.org

ABSTRACT

This report summarizes a list of earthquake ground motion databases that are publically available. The databases include ground motions recorded in different parts of the world. This is Task 5 of the GEM Global GMPEs project coordinated by the Pacific Earthquake Engineering Research Center (PEER), University of California, Berkeley. Checking the accuracy of the databases was not part of the scope of Task 5; thus, the users of the databases are responsible to check the accuracy of the data and metadata.

Keywords: GMPE, database, ground motion, hazard

ACKNOWLEDGEMENTS

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This report addresses the links to access recorded waveform database for different geographical regions around the world.

GEM Regional Programs:

- SHARE database - http://www.share-eu.org/

- EMME database – will be available at: http://www.emme-gem.org/

USA:

- Pacific Earthquake Engineering Research, PEER Ground Motion Database: http://peer.berkeley.edu/products/strong_ground_motion_db.html

- CESMD: http://www.strongmotioncenter.org/

- NCSN: http://www.ncedc.org/ncsn/#data

- SCSN: http://www.data.scec.org/research-tools/waveform.html

- NGA 2010 beta version: refer to the PEER Ground Motion Database

- NGA-East: refer to the PEER Ground Motion Database

- NGA-WEST and NGA WEST2: will be available on the PEER Ground Motion

- EarthScope available through http://www.earthscope.org/data

- USArray available through IRIS http://www.iris.edu/data/seismograms/

- NOAA: http://www.ngdc.noaa.gov/hazard/strong.shtml

- National Strong Motion Program (NSMP), U.S. Geological Survey: http://agram.wr.usgs.gov/

- California Geological Survey: http://www.conservation.ca.gov/cgs/earthquakes/Pages/Index.aspx

- Pacific Northwest Seismic Network (PNSN), http://www.pnsn.org/seismograms/pnsn-data-products/waveform-data

CANADA:

- see notes for NGA-East

JAPAN:

- K-NET, KIK-net: http://www.k-net.bosai.go.jp

- PARI: http://www.pari.go.jp/

- JMA: http://www.jma.go.jp/jma/index.html
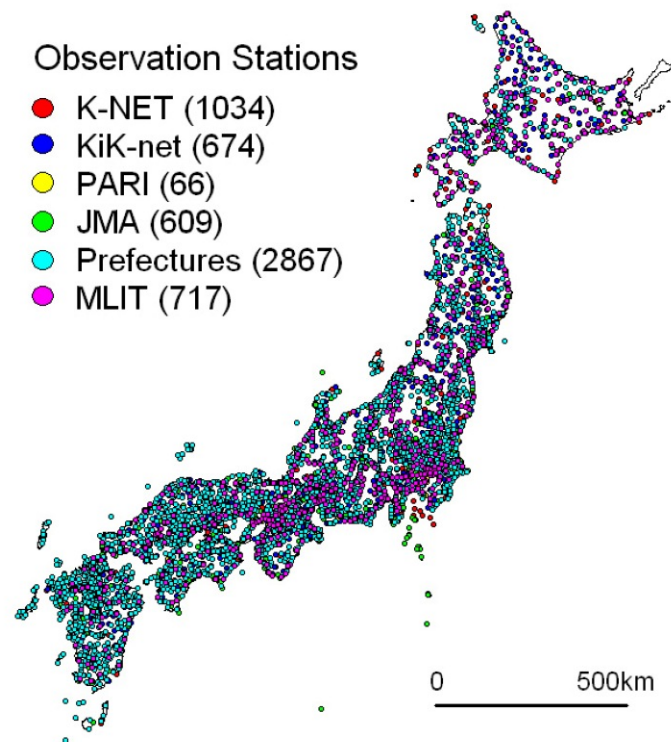
Figure 1. Locations of Strong Motion Sites of Nation-wide Networks

Figure 1.1 Nationwide networks and location of observation stations in Japan.

NEW ZEALAND:

- GeoNet : http://info.geonet.org.nz/display/appdata/

AUSTRALIA:

- Geoscience Australia and precedessor(e.g. AGSO): www.ga.gov.au/

SOUTH AMERICA:

- Guerrero Accelerograph Network, Mexico, Seismological Laboratory, UNR, and the Instituto de Ingenieria, UNAM, http://www.seismo.unr.edu/

EUROPE:

- Italy: http://itaca.mi.ingv.it/ItacaNet/ and http://www.geoscienze.units.it/

- Switzerland, Swiss National Strong Motion Network, Swiss Seismological Service: http://www.seismo.ethz.ch/index

- Turkey, SMA Network of Turkey, Earthquake Research Department: http://angora.deprem.gov.tr/

- Greece, Institute of Engineering Seismology and Earthquake Engineering, (ITSAK), http://www.itsak.gr/

- Macedonia: Seismological Observatory, Skopje, Macedonia,
http://seismobsko.pmf.ukim.edu.mk/

- Russia: Strong Motion Data Base (SMDB) of the Center of Geophysical Data Studies and
Telematics Applications (CGDS) of Joint Institute of Physics of the Earth (JIPE) Russian
Academy of Science

Integrated network http://www.seismicportal.eu/jetspeed/portal/aboutPortal.psml developed under the
NERIES project (http://www.neries-eu.org/), offers waveforms by a range of European observatories:

- Earthquake event data: the EMSC-coordinated observatories.

- Broadband waveform data: the Virtual European Broadband Seismic Network (VEBSN) and
the European Integrated Waveform Data Archive (EIDA), both coordinated within ORFEUS,

- Acceleration waveform and parameter data: the acceleration networks.

- Historical earthquake data: Archive of Historical Earthquake Data (AHEAD).

Table 1.1 List of institutions, organizations and observatories in Europe.

European-Mediterranean Observatories (mainly velocity sensors - seismographs)

Last update: March 12, 2012

This list maintained by ORFEUS and EMSC contains all known institutes, organizations, observatories, universities, etc which operate seismograph stations in the region. **NOTE:** Please, contact Torild van Eck or Rémy Bossu for improvements and/or comments.

Country	Town	Institute	ORFEUS Contact
Albania	Tirana	Institute of Geosciences	Ismail Hoxha
Algeria	Alger	Centre de Recherche en Astronomie, Astrophysique et Géophysique (CRAAG)	Karim Yelles
Armenia	Yerevan	Institute of Geophysics, National Academy of Sciences of Armenia	
Austria	Vienna	International Data Center of the Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organisation (IDC-CTBTO)	Lassina Zerbo
Austria	Vienna	ZentralAnstalt für Meteorologie und Geodynamik (ZAMG)	Peter Melichar
Azerbaijan	Baku	Republican Seismic Survey Center of Azerbaijan National, Academy of Sciences (RSSC-ANAS)	Gurban Yetirmishli
Belarus	Minsk	The Centre of Geophysical Monitoring of the National Academy of Sciences of Belarus	Arkady Aronov
Belgium	Brussels	Royal Observatory of Belgium (ROB)	Thierry Camelbeeck
Bulgaria	Sofia	Seismological Department, Bulgarian Acadmy of Sciences (GI-BAS)	Dimcho Solakov
Bulgaria	Plovdiv	Geophysical Observatory Plovdiv (PLD)	Dragomir Gospodinov
Cape Verde	Praia	Laboratory of Engineering of Cape Verde	Joao Fonseca
Croatia	Zagreb	Department of Geophysics, University of Zagreb	Marijan Herak
Croatia	Zagreb	Croatian Seismological Survey	Kresimir Kuk
Cyprus	Nicosia	Geological Survey of Cyprus	Sylvana Pilidou
Czech Republic	Prague	Geophysical Institute, Academy of Sciences of Czech Republic (IG-CAS)	Jan Zednik
Czech Republic	Brno	Institute of Physics of the Earth, Masaryk University (IPE)	Jana Pazdirkova
Denmark	Copenhagen	Geological Survey of Denmark and Greenland (GEUS)	Peter Voss
Djibouti	Arta	Observatoire Géophysique d'Arta	Kassim Mohamed
Dubai, UAE	Dubai	Dubai Seismic Network, Survey Department, Dubai Municipality	Eman Ahmed Al Khatibi
Egypt	Cairo	National Research Institute of Astronomy and Geophysics (NRIAG)	Abuo El-Ela A. Mohamed
Estonia	Tallinn	Geological Survey of Estonia (GSE)	Heidi Soosalu

Ethiopia	Addis Abeba	Geophysical Observatory, University of Addis Abeba (AAU)	Laike Asfaw
Finland	Helsinki	Seismological Institute, University of Helsinki	Jari Kortström
France	Paris	GEOSCOPE Program (GEOSCOPE)	Eleonore Stutzmann
France	Strasbourg	Reseau National de Surveillance Sismique (ReNaSS)	Michel Granet
France	Bruyeres-le-Chatel	Laboratoire de Detection et de Geophysique (LDG)	Bruno Feignier
France	Bruyeres-le-Chatel	European-Mediterranean Seismological Centre (EMSC-CSEM)	Rémy Bossu
France	Grenoble	Observatoire de Grenoble (SISMALP/ReNaSS)	Francois Thouvenot
France	Grenoble	Observatoire de Grenoble (ROSALP/ReNaSS)	Olivier Coutant
France	Grenoble	French Accelerometric Network (RAP)	Denis Hatzfeld and Philippe Gueguen
France	Toulouse	Observatoire Midi-Pyrenees Serveur de Données Sismiques (OMP)	Jean-Francois Fels
France	Nice	Geosciences-Azur (RLBP, RAP, ReNaSS)	Tony Monfrett
Georgia	Tbilisi	Seismic Monitoring Centre, Ilia State University	Giorgi Basilaia
Germany	Hannover	Seismological Central Observatory (SZGRF) - Bundesanstalt für Geowissenschaften und Rohstoffe (BGR)	Klaus Stammler
Germany	Potsdam	Seismological Data Center (GFZ)	Winfried Hanka
Germany	Bensberg / Cologne	Erdbebenstation Bensberg, Geological Institute, University of Cologne	Klaus-Gunther Hinzen
Germany	Black Forest	Black Forest Observatory (BFO)	Rudi Widmer
Germany	Bochum	Seismological Observatory, Ruhr University (BUG)	Michael Jost
Germany	Freiburg	LandesErdbebenDienst Baden Württemberg (LED)	Wolfgang Bruestle
Germany	Hannover	German regional Seismic Network (GRSN)	Klaus Stammler
Germany	Jena	Applied Geophysics, University of Jena	Peter Malischewsky
Germany	Krefeld	Geologischer Dienst Nordrhein-Westfalen	Klaus Lehmann
Germany	Muenchen	Seismological Observatory Fürstenfeldbruck	Eberhard Schmedes
Germany	Muenchen	Erdbebendienst Bayern	Joachim Wasserman
Germany	Stuttgart	Institute of Geophysics, University of Stuttgart	Manfred Joswig
Greece	Athens	National Observatory of Athens, Geodynamic Institute (NOA-GI)	George Stavrakakis
Greece	Athens	Hellenic Seismological Broadband Network (HL)	Nikos Melis
Greece	Athens	Geophysical Institute, Athens University	Kostas Makropoulos
Greece	Chania, Crete	Technological Educational Institute of Crete, Seismological Network of Crete (HSNC)	Filippos Vallianatos
Greece	Patras	Laboratory of Seismology, University of Patras	A. Tselentis

Greece	Thessaloniki	Department of Geophysics, University of Thessaloniki	Takis Hatzidimitriou
Hungary	Budapest	Seismological Observatory, Hungarian Academy of Sciences (SO-HAS)	Peter Monus
Iceland	Reykjavik	Department of Geophysics, Icelandic Meteorological Office	Steinunn S. Jakobsdottir
Iran	Tehran	Institute of Earthquake Engineering Seismology (IIEES)	Moshen Ghafory-Ashtiany
Iran	Tehran	Iran National seismic Network, University of Tehran	Mohammed Reza Gheitanchi
Ireland	Dublin	Dublin Institute for Advanced Studies (DIAS)	Alan Jones
Israel	Lod	Seismology Division, Geophysical Institute of Israel (GII)	Rami Hofstetter
Italy	Trieste	Istituto Nazionale di Oceanografia e di Geofisica Sperimentale (OGS)	Marino Russi
Italy	Bari	Osservatorio Sismologico, Universita di Bari	Gildo Calcagnile
Italy	Genoa	Genoa University Seismic Network (DipTeRis)	Claudio Eva
Italy	Macerata	Osservatorio Geofisico Sperimentale di Macerata	Giancarlo Monachesi
Italy	Naples	Osservatorio Vesuviano (OV)	Giuseppe De Natale
Italy	Rome	Mediterranean Very Broadband Seismographic Network (MedNet)	Marco Olivieri
Italy	Rome	Italian National Seismic Network (INGV)	Giulio Selvaggi
Italy	Sicily	Sistema POSEIDON	
Italy	Trieste	Dipartimento di Scienza della Terra, Universita di Trieste (DST)	Giovanni Costa
Italy	Udine	OGS: Dipartimento Centro di Ricerche Sismologiche (CRS)	Enrico Priolo
Jordan	Amman	Jordan Seismological Observatory (JSO)	Tawfiq Al-Yazjeen
Kazakhstan Republic	Almaty	Kazakhstan National Data Center, Institute of Geophysical Research (KNDC)	Natalia Mikhailova
Kuwait	Safat	Kuwait Institute for Scientific Research (KISR)	Jasem Al-Awadhi
Libanon	Beyrouth	Centre National de Recherches de Géophysiques	Alex Sursock
Lithuania	Vilnius	Geological Survey of Lithuania (LGT)	Andrius Pacesa
Macedonia	Skopje	Seismological Observatory	Lazo Pekevski
Malta	Msida	Seismic Monitoring and Research Unit, University of Malta	Pauline Galea
Montenegro	Podgorica	Montenegro Seismological Observatory (MSO)	Branislav Glavatovic
Morocco	Rabat	Departement de Physique du Globe (SGPM)	Ben Aissa Tadili
Morocco	Rabat	Centre National de Coordination et de Planification de la Recherche Scientifique et Technique, Geophysics Laboratory (CNR)	Jabour Nacer

Netherlands	De Bilt	Observatories and Research Facilities for EUropean Seismology (ORFEUS)	Torild van Eck
Netherlands	De Bilt	Royal Netherlands Meteorological Institute (KNMI)	Bernard Dost
Netherlands	Utrecht	Network of Autonomously Registrating Stations (NARS)	Hanneke Paulssen
Norway	Kjeller	Norwegian Seismic Array (NORSAR)	Hilmar Bungum
Norway	Bergen	Institute of Solid Earth Physics	Jens Havskov
Oman	Oman	Earthquake Monitoring Center, Sultan Qaboos University (SQU)	Zuhair H. El-Isa
Poland	Warsaw	Institute of Geophysics, Polish Academy of Sciences (PAS)	Pawel Wiejacz
Portugal	Lisbon	Instituto de Meteorologia, Seismologia	Fernando Carrilho
Portugal	Lisbon	Instituto Superior Tecnico (IST)	Joao Fonseca
Portugal	Lisbon	Geophysical Centre of the University of Lisbon (CGUL)	Miguel Miranda
Portugal, Azores	Ponta Delgada	Instituto de Meteorologia, Azores University (SIVISA)	Maria Luisa Senos
Romania	Bucharest	National Institute for Earth Physics (INFP/NIEP)	Constantin Ionescu
Russia	Apatity	Kola Regional Seismological Center, Russian Academy of Sciences (KRSC)	Igor A. Kuzmin
Russia	Irkutsk	Baikal Branch Geophysical Survey of the Siberian Branch Russian Academy of Sciences (BB GS SB RAS)	Oleg Masalsky
Russia	Novosibirsk	Geophysical Survey of the Siberian Branch Russian Academy of Sciences (GS SB RAS)	Aleksey Emanov
Russia	Novosibirsk	Altay-Sayan Branch Geophysical Survey of the Siberian Branch Russian Academy of Sciences (ASB GS SB RAS) (GS SB RAS)	Aleksey Emanov
Russia	Obninsk	Seismic Network of the Russian Academy of Sciences (GSRAS)	Alexei Malovichko
Russia	Obninsk	Teleseismic network of Russia (RTSN)	Dmitry Y. Mekhurushev
Russia	Obninsk	Northern Caucasus Regional Seismic Network (NCRSN)	Dmitry Y. Mekhurushev
Russia	Obninsk	Dagestan Local Seismic Network (DLSN)	Marat G. Daniyalov
Russia	Obninsk	Caucasus Mineral Waters Local Seismic Network (CMWLSN)	Dmitry Y. Mekhurushev
Russia	Yakutsk	Yakutia Branch Geophysical Survey of the Siberian Branch Russian Academy of Sciences (YaB GS SB RAS)	Sergey Shibaev
Saudi Arabia	Riyadh	King Abdulaziz City for Science and Technology (KACST)	Mohammed Al-Amri
Serbia	Beograd	Seismological Survey of Serbia (SRB)	Slavica Radovanovic
Slovakia	Bratislava	Department of Seismology, Geophysical Institute, Slovak Academy of Sciences (GPI-SAS)	Peter Labak

Slovenia	Ljubljana	Environmental Agency of the Republic of Slovenia, Seismological Office (EARS)	Mladen Zivcic
Spain	Barcelona	Insitute d'Estudis Catalans, Lab. d'Estudis Geofisics "Eduard Fontsere" (IEC)	Antoni Correig
Spain	Barcelona	Geological Survey of Catalonia, Geological Institute of Catalonia (IGC)	Antoni Roca
Spain	Ebre	Observatori de l'Ebre	Arantza Ugalde
Spain	Granada	Instituto Andaluz de Geofisica (IAG)	Jose Morales
Spain	Madrid	Instituto Geografico Nacional (IGN)	Emilio Carenno
Spain	Madrid	Universisdad Complutense, Department of Geophysics and Meteorology (UCM)	Elisa Buforn
Spain	San Fernando	Royal Naval Institute and Observatory (ROA)	Antonio Pazos
Sweden	Uppsala	Geophysics Department, Uppsala University	Reynir Böðvarsson
Switzerland	Zürich	Swiss Seismological Service (SSS)	John Clinton
Syria	Damascus	Syrian National Seismic Network (SNSN)	Ibrahim Al Tahhan
Tunisia	Tunis	Seismological Service, Institut National de la Meteorologie	Mohamed H'faiedh
Turkey	Ankara	Disaster and Emergency Management Presidency (DEMP) - Turkisch National Seismological Observation Network	Tuğbay Kilic Sami Zunbul
Turkey	Ankara	Disaster and Emergency Management Presidency (DEMP) - Turkish National Strong Motion Observation Network	Ulubey Ceken
Turkey	Istanbul	Kandilli Observatory and Earthquake Research Institute (KOERI)	Mustafa Erdik
Turkey	Istanbul	National Broadband Seismic Network (KOERI)	Dogan Kalafat
Turkey	Gebze-Kocaeli	Tubitak Marmara Research Center	Sedat Inan & Onur Tan
Turkey	Erzurum	Earthquake Research Centre, Ataturk University (ERC)	Mehmet Ozyazicioglu
UK	Edinburgh	British Geological survey (BGS)	Brian Baptie
Ukraine	Lviv	Carpathian seismoactive region	Sergey Tarasovich
Ukraine	Kiev	National Academy of Sciences, National Center for Seismological Data	Alex Kendzera
Ukraine	Kiev	Crimean seismoactive region (Simferopol)	Yuri Volfman
Uzbekistan	Tashkent	Institute of Geology and Geophysics	Bakhtiar Nurtaev
Uzbekistan	Tashkent	Institute of Seismology of the Academy of Sciences (ISAS)	Alisher Ibragimov
Yemen	Dhamar	National Seismological Observatory	Jamal M. Sholan

Some of these institutes maintain observation stations also in other continents outside Europe (e.g. Geoscope project