DRAFT 2006 FDSN Regional Assembly Minutes

November 9, 2006
Bangkok, Thailand

FDSN Chair, Domenico Giardini, called the 2006 FDSN Regional Assembly to order at 8:35 AM. He requested that all attendees sign the attendance sheet. The agenda was reviewed and accepted.

2006 FDSN Chairman's Report (Domenico Giardini)

Chair Giardini indicated that copies of his talk would be made available. The FDSN was established in 1986. One of the primary functions of the FDSN is the establishment of a 300-station FDSN backbone. The FDSN coordinates activities on a global scale with a focus on station site selection, data exchange and standardization of instrumentation. The FDSN has no budget and relies on efforts by its member organizations to promote its causes. For instance the FDSN Archive is located at the IRIS DMC and is supported by US National Science Foundation funding. The FDSN promotes open data access, each member network is expected to contribute at least one station to the FDSN network and to promote sharing of data in real time. The FDSN also has some products that are openly available.

The FDSN structure consists of a chair and a secretary. There is also an Executive Committee that presently consists of the chairs of the FDSN working groups. The FDSN has a Steering Committee that has one representative from each FDSN member organization. The FDSN has annual assemblies, normally associated with a major international meeting. This is the first FDSN regional assembly. In general the FDSN has been very successful with 196 of the 300 FDSN stations having submitted data to the FDSN Archive.

Giardini described regional networks in the FDSN context. Regional networks tend to focus on monitoring and have different instrumentation requirements. Europe is an example where there are 46 countries, 800 broadband seismometers, 1800 short period instruments and more than 3000 strong motion sensors. In the area of data centers, Giardini showed a hierarchical system of data centers on local, national, regional and global scales.

It is likely that Gerardo Suarez will be the next FDSN chair with Torild Vaneck of ORFEUS the next Secretary. They will help the FDSN prioritize the FDSN activities for the 2007-2011 period. A copy of Chairman's presentation is available on the FDSN web site. (http://www.fdsn.org/FDSNmeetings/2006/reports.htm)

FDSN Working Group I & IRIS GSN (Rhett Butler)
Butler emphasized both the global and regional aspects of FDSN station siting. He displayed a map showing the existing global network distribution in terms of existing, backbone stations and planned stations. WGI works with the FDSN membership to help standardize instrumentation. A map showing the distribution of FDSN stations in SE Asia was shown followed by different regions in the world. The goal is to install 24 bit digitizers and it is now normal practice within most networks. Butler showed the kind of information that is tracked by the FDSN and what data center has which data implying the need to add two new columns to the FDSN station lists including real time data access and the data center(s) having the data.

Butler gave a brief update on GSN status and the most recent new stations that have been installed. He mentioned the satellite downlink at PTWC in Hawaii that greatly enhances real time data availability for Western Pacific stations especially in the tsunami context. (see attachment on FDSN web site).

FDSN Work Group II & FDSN Data Center (Tim Ahern)
Bernard Dost, Chair of working group II, was not able to attend the meeting so Tim Ahern presented WG II. WG II focuses on data distribution and data formats. The well-utilized Standard for Exchange of Earthquake Data (SEED) format is one of the major success stories of WG II. A variety of request mechanisms, software developments, quality control and FDSN products such as the FDSN Station Book were highlighted.

A summary of the time span of data at the FDSN archive was presented for temporary experiments, permanent networks and other types of data. Maps of global station distribution, types of sensor data managed and the effective movement into management of real time data within the FDSN were highlighted. More than 150 stations are now available in real time through FDSN data centers. Automated quality control, volumes of data at the FDSN archive, shipments of data and the concept of a virtual network were described or presented. More information is available on the FDSN web site.

The International Ocean Tsunami Warning System
(Masahiro Yamamoto)
Yamamoto presented an excellent summary of the current state of the tsunami warning system. The system is based on the open and free exchange of data and information and therefore is closely aligned with

the guiding principles of the FDSN. Examples of systems in Japan and what is needed for effective tsunami warnings were presented. The status of the new tsunami warning system in SE Asia and the Indian Ocean were summarized. Efforts in the Caribbean and in the Mediterranean were summarized. The need for the tsunami community to coordinate with the CTBTO and the FDSN was highlighted. Yamamoto's presentation can be found on the FDSN web site.

Thai National Seismic Network (Burin Wechbunthung)
Wechbunthung presented the tectonic context for Thailand as well as a review of the seismicity experienced in Thailand. A summary of the seismic observatories in Thailand was given and the plans for future expansion were also presented. Flow of seismic data from stations in Thailand and the region was highlighted. Data exchange with JMA, NEIC and PTWC is already in place. A summary of the Thai Tsunami Early Warning System was given. Giardini asked how many of the stations will be open. Wechbunthung replied that it depends on technical support but he would like for all stations to be open. Wechbunthung's presentation is available on the FDSN Web Site.

GEOFON and is role in the Indian Ocean Tsunami Warning System (Joachim Saul)
Saul gave an overview of the Geofon network. 50 stations, mostly in Europe and in the Indian Ocean Region are in operation. GEOFON operates an Earthquake Information Service and operate a large data archive. It is the largest node in the European Virtual data center. He showed the aggressive and rapid growth of GEOFON supported network activity in SE. Asia. GEOFON focuses much of its effort in Indonesia. They have a goal of producing earthquake locations in 3 minutes. The audience expressed a need to open up station in Northern Africa. German policy is to give ownership of the equipment to Indonesia. Saul's presentation is on the FDSN web site.

Australian Efforts in the Indian Ocean (Spiro Spiliopoulos)
Spiliopoulos indicated that Australia would spend 69 million Australian dollars over a four-year period in support of the tsunami effort in the Indian Ocean region. They are looking for ways to build bridges to existing stations. They get data from 106 global stations and they have established a 24x7 operations center. Spiliopoulos' presentation is available from the FDSN Web site.

GEOSS and the FDSN (Butler)
After a coffee break, Butler gave a brief summary of GEOSS efforts as they relate to the FDSN. In GEOSS there are nine Societal Benefit

Areas with Disasters being the one that is most relevant to FDSN activities.

The GSN is now a GEOSS contributing system and the FDSN is officially registered as a Participating Organization of GEOSS. The FDSN represents seismology within the GEOSS framework. To a large extent seismology has been doing what GEOSS is attempting to do for many years. Giardini asked how many people in the meeting were familiar with GEOSS and only one was. Presentation is on the FDSN Web site.

Network Reports (various)
A large number of network reports were then presented as part of the FDSN. All of these presentations are on the FDSN web site at http://www.fdsn.org/FDSNmeetings/2006/reports.htm and interested parties should consult the presentations for details.

Presenter	Institution	Title of Presentation
M. Mokhtari	IIEES	Iranian Broad Band Seismic Network
M.R. Geitanchi	Tehran University	Iranian Seismic Network
M.R. bin Che Abas	Malaysian Meteorological Dept	Malaysian Seismological Network
B. Bautista	PHIVOLCS	The Upgraded Seismic Network of PHIVOLCS
-Giardini	National Environment Agency	Seismic Network in Singapore
H. Alakhali	Seismological Observatory Center	Yemen National Seismological Networks
Sunarjo	BMG	Indonesia Seismic Network

Special Notes from above talks.

Mokhtari. IIEES system has 17 stations operating (November 2006) with plans for 48 stations by 2010. Data are available for earthquakes of magnitude 4.1 to 4.4 and greater. They have a 25-station RAMP system with telemetry by satellite.

Geitanchi. Tehran University operates a total of about 10 networks in Iran. Most are in seismically active and populated areas. They have about 50 stations in total. They have some Guralp sensors to install in critical areas. They have good cooperation with IIEES. The networks in Mashhad have about 60 stations.

bin Che Abas. Malaysia is upgrading their system as a result of the tsunami. The sensors include tide gauges, ocean buoys and costal cameras. They have well-established links to PTWC and JMA. They have 14 stations 7 of which are broadband. They have open access to data both outgoing and incoming. They contribute data to the FDSN archive.

Singapore. Presentation made by Giardini. There was considerable mention of how well the data from Singapore were shared with the global community. Singapore contributes data to the FDSN Archive.

B. Bautista. Described the seismo-tectonic system in the Philippines. They use SRC data loggers and Teledyne short period sensors. They have 9 CMG-3T Broadband sensors. They have 30 stations telemetered using spread spectrum radios. They plan to open up data access for the 9 Broadband stations.

H. Alakhali. They have 6 broadband stations operational. They use the SEISAN software system.

Sunarjo. Indonesia is very tsunami prone with a tsunami occurring every two years on average. In Indonesia, BMG issues the tsunami warnings. Sunarjo's talk described the tsunami warning system in Indonesia, the seismic network, communications system and information dissemination system. Several other countries are helping Indonesia enhance their seismic monitoring system. New stations are being installed with help from Japan (15 stations), China (4 stations), Germany (21-22 stations). BMG in Indonesia will have 48 stations. They will have a total of 80 BB stations in Indonesia by the end of 2006.

Closing Comments
Chairman Giardini indicated that all of the presentations would be made available on the web. He stressed the importance of data exchange and sharing data with the broader community. He encouraged groups to join the FDSN. Thanks were extended to all that attended the meeting.

Meeting Adjourned.

Minutes Respectfully Submitted

Tim Ahern
FDSN Secretary

FDSN Attendees, Bangkok Thailand, Nov. 2006

Last Name	First Name	Institution	email
Spiliopoulos	Spiro	Geosciences Australia	spiro.spiliopoulos@ga.gov.au
Engdahl	Bob	IASPEI	engdahl@iaspei.org
Yamamoto	Masahiro	IDC/UNESCO	masahiro.yamamoto@unesco.org
Saul	Joachim	GFZ Potsdam	saul@gfz-potsdam.de
Zhou	Gongwei	Inst. of Geophysics, CEA	zhou@cdsn.org.cn
Gee	Lind	USGS/ASL	lgee@usgs.gov
Lyons	Jim	NRCAN/GSC	jlyons@nrcan.gc.ca
Dangmuan	Sopana	Prince of Songkla Univ., Thailand	sopanary@yahoo.com
Setapong	Nawarat	Prince of Songkla Univ., Thailand	yui_2323@hotmail.com
Chen	Yuntai	Inst. of Geophysics, CEA	chenyt@cea-igp.ac.cn
Gupta	Harsh	National Geophysical Res. Inst.	harshgupta@nic.in
Duerrast	Helmut	Prince of Songkla Univ., Thailand	helmut.j@psu.ac.th
Wong	WT	Hong Kong Observatory	wtwong@hko.gov.hk
Cao	Theiu Dinh	Vietnam Inst of Geophysics	cdthieu@igp.ncst.ac.vn
Huang	Bor-Shouh	Inst. of Earth Sciences, Acad. Sinica	hwbs@earth.sinica.edu.tw
Razzaq	Nageeb A. A.	Yemen (no other info was provided)	
Bautista	Bartolome	Philippine Inst of Vol & Seismology	bart@phivoles.dost.gov.ph
Sutiwanich	Chinda	Panya Consultant Co Ltd, Thailand	chinda_s@panyaconsult.co.th
Wattanadilokkul	Danai	Dam Safety Dept, EGAT, Thailand	danai.w@egat.co.th
Le	Son Tu	Vietnam Inst of Geophysics	sonlt50@fpt.vn
Viroj	Chongchansittho	Port Authority of Thailand	viroj_c@port.co.th
Hussein	Alakhali	Seismological Observatory Ctr, Yemen	Hussein_farea@yahoo.com
bin Che Abas	Mohd Rosaidi	Malaysian Meteorological Department	rosaidi@kjc.gov.mg
Wechbunthung	Burin	Thai Meteorological Dept.	burin_tmd@yahoo.com
Warnitchai	Pennung	Asian Institute of Technology	pennug@ait.ac.th
Nguyen	Xuyen Dinh	Vietnam Inst of Geophysics, VAST	ndxuyen@gmail.com
Nguyen	Zung Quos	Vietnam Inst of Geophysics, VAST	zung@fpt.vn
Sunarjo	Sunarjo	Meteorological, Geophysical Agency, Indonesia	sunaryo@bmg.go.id
Butler	Rhett	IRIS	rhett@iris.edu
Gheitanchi	Mohammad Reza	Tehran University	mrghchee@ut.ac.ir
Buldan	Muslim	Bandung Institute of Tech, Indonesia	buldanms@yahoo.com
Ahern	Tim	IRIS	tim@iris.washington.edu
Giardini	Domenico	ETHZ	d.giardini@sed.ethz.ch