Report from the
FDSN Archive for Continuous Data
at the IRIS DMC

2005 FDSN Meeting
2-4 October, 2005
Santiago, Chile
by
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(prepared 20 September 2005)

Introduction:

Data from several FDSN networks routinely flow into the FDSN Archive located at the IRIS DMC. At the IRIS DMC, these continuous data are archived. Additionally SPYDER® and FARM Products are routinely generated and made available through tools such as WILBER, the Data Handling Interface (DHI) and jWeed.

The DMC continues to ship large amounts of seismological data to researchers around the world. This report will summarize current activity at the FDSN Archive for continuous data at the IRIS DMC in Seattle, Washington.

In the following summary the FDSN membership is still considered to be the 26 networks that had joined prior to the 2004 FDSN meetings. The graphics have not been updated yet to account for the large number of networks that joined in the past year.

FDSN Data Flow into the IRIS DMC

Data are now flowing into the FDSN archive in real time from 13 of the 26 FDSN networks and discussions are now under way with the New Zealanders and we expect real time data flow very soon. Data from Canada flows to the DMC with one-day latency. FDSN networks sending data in real time include Australia, China, Czech Republic, Geofon, IRIS, MedNet, ORFEUS, Russia, Switzerland, Taiwan, Caltech, ANSS/NEIC, and Puerto Rico.

During 2005 we have received data from 17 different FDSN networks including,

Country	Organization or Network	Network Code	Latest Data	Real Time
Australia	GA	AU	Sep05	Y
Canada	GSC	CN	Sep05	N-1
Chile				X

China	NCDSN	IC	Sep05	Y
Czech Replublic	IG/CAS	CZ	Sep05	Y
Denmark				X
France	Geoscope	G	May05	N
Germany	Geofone	GE	Sep05	Y
Germany	Grafenberg	GR	Aug05	N
Israel	GII			X
Italy	MedNet	MN	Sep05	Y
Japan	Pacific 21	PS	Jan03	N
Japan	NIED			X
Mexico				X
Netherlands	ORFEUS	NL	Sep05	Y
New Zealand	GNS			*
Portugal		LX	May04	N
Portugal	IST			X
Russia	OME	IU & II	Sep05	Y
Switzerland	ETH	CH	Sep05	Y
Taiwan	BATS	TW	Sep05	Y
UK	SEIS-UK	temp	Feb05	N
US	PRSN	PR	Sep05	Y
US	IRIS GSN	IU & II	Sep05	Y
US	ANSS	US & IM	Sep05	Y
US	SCSN	TS & CI	Sep05	Y

* discussions started X No data at FDSN Archive
N No real time data Y Real Time data

Countries that joined the FDSN in 2004 have in general not yet identified stations to be part of the FDSN backbone network and therefore have not yet started data flow to the FDSN archive.

Country	Organization	Network Code	Latest Data	Real Time
Austria	ZAMG			X
Bulgaria	GI			X
Croatia	IRB			X
Egypt	NRIAG			X
France	ReNaSS			X
Georgia	GGS			X
Greece	IG-NOA			X
Hungary	GGRI			X
Iceland	INDSN			X
Norway	NORSAR	testing	Sep05	Y
Poland	IGFPAN			X
Romania	NIEP			X
Slovakia	GISAS			X
Slovenia				X
Sweden				X

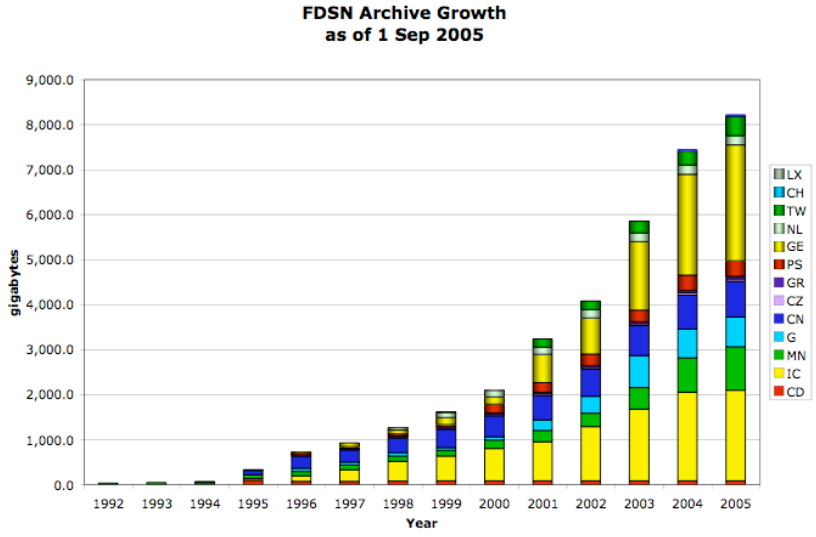

Figure 1. The FDSN archive now totals roughly 8 terabytes (dual sorted) with data from 13 FDSN networks other than US networks). This graph has not yet been updated to show current FDSN membership.

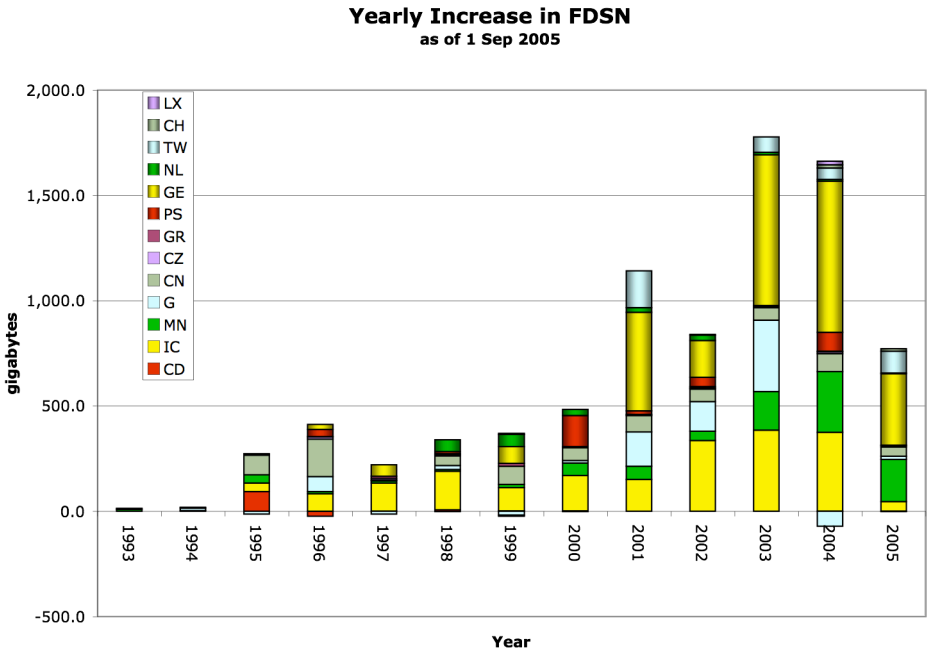

Figure 2. The above figure shows the net increase of FDSN data entering the FDSN archive by year. The figures for 2005 are valid through 1 Sep 2005. Geofone (GE) data is the most abundant source of data entering the DMC for the first portion of this year. Negative values reflected in the about chart are a result of removing data from the archive, usually in preparation for receiving retransmissions of the data. This graph has not yet been updated to show current FDSN membership.

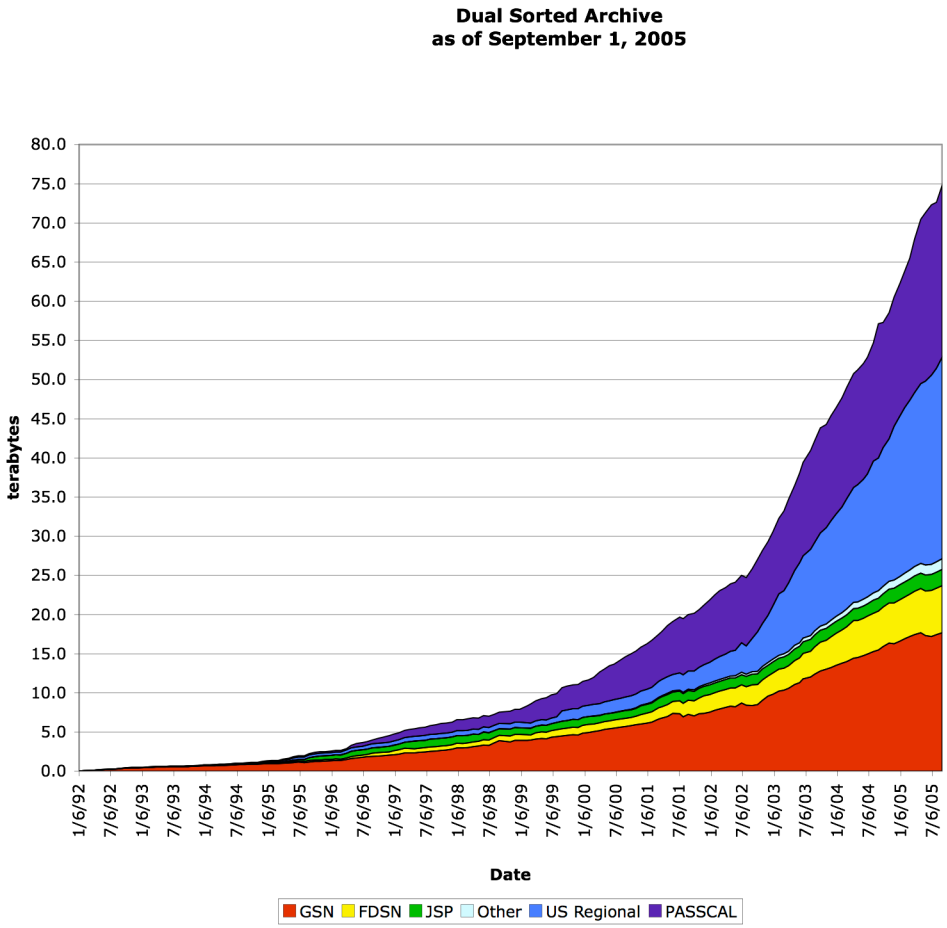

Figure 3. The above figure shows the total amount of data archived at the IRIS DMC. As of the beginning of September 2005 the IRIS DMC had a total of 75 terabytes (dual sorted) in the archive. The non-IRIS FDSN contributions are shown in yellow. The data from the IC network is included in the GSN value, not the FDSN value in the above chart explaining the discrepancy between Figure 2 and 3.

Data Shipments

The IRIS DMC has seen a significant increase in the number of shipments this year. At the present time we are estimating that roughly 190,000 individual user requests will be serviced, up from 100,000 in 2004. This increase continues the rough doubling of serviced requests that began last year.

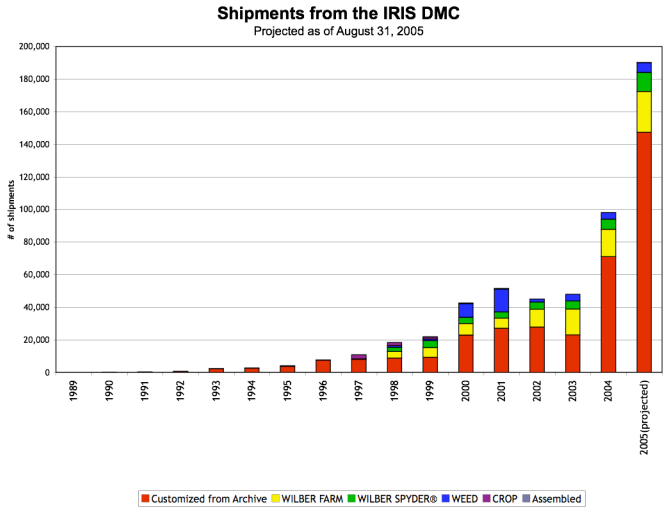

Figure 4. This figure shows the number of shipments from the Archive, and the SPYDER® and FARM products through WILBER that we project will be shipped this year. A significant fraction of this increase is FDSN members outside the United States. This graph is projected based on shipments through 31 August, 2005.

Of the 190,000, approximately 60,000 are being shipped outside the United States with France generating the most requests other than the US.

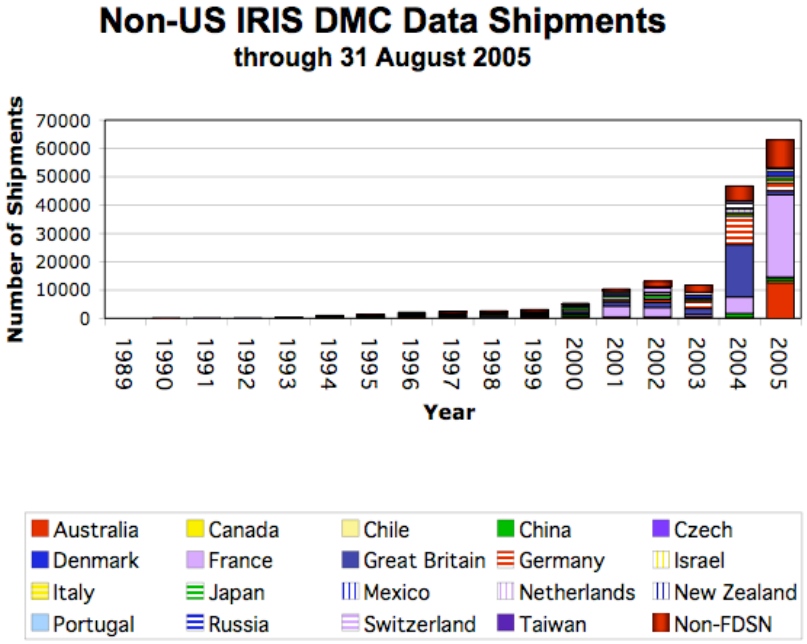

Figure 5. This figure shows the number of shipments flowing outside the United States. This is not projected, but rather reflects the actual shipments made through August 31, 2005.

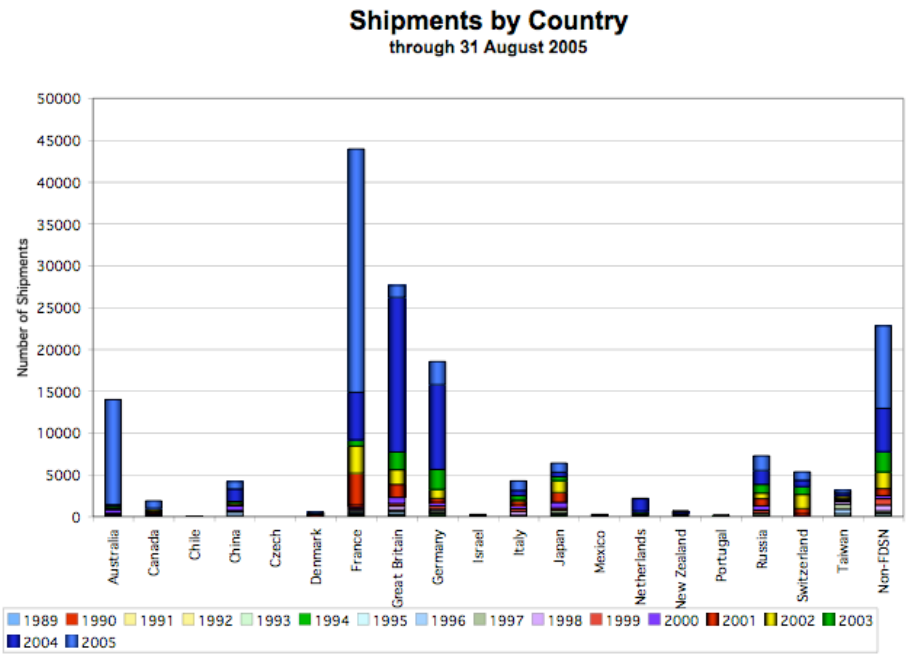

Figure 6. This figure shows that France is now the country (other than the US) that has requested data from the FDSN archive most frequently. Large numbers of requests also come from Germany, and Australia.

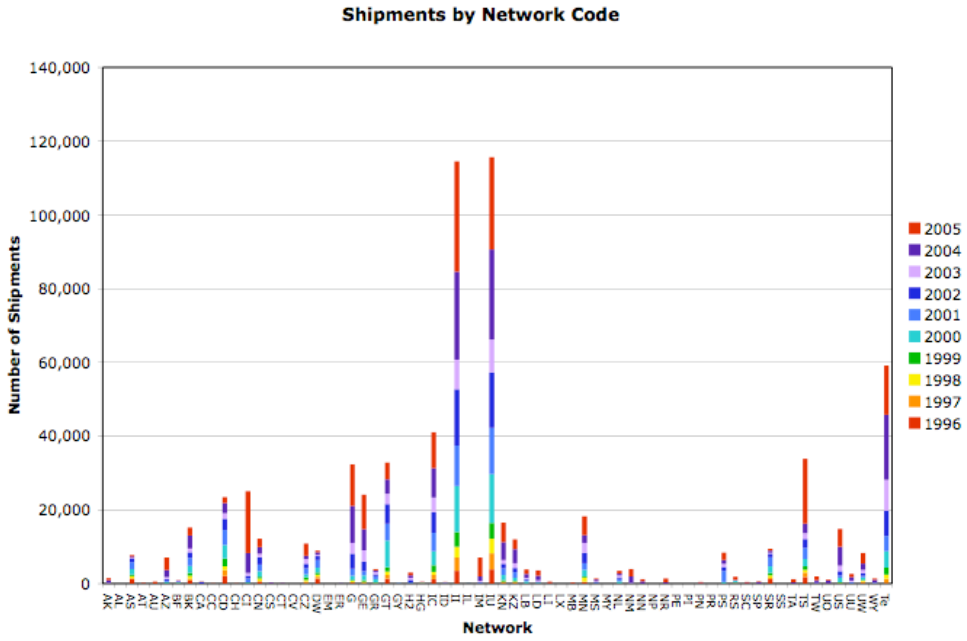

Figure 7. The above figure shows how requests vary by Network Code. The IRIS networks of IU, II, IC, GT and the temp networks dominated by PASSCAL are the most numerous of our requests but shipments from CI, G, GE, MN, and TS are also numerous.

Real Time Streaming Data Distribution

Just as the IRIS DMC is now receiving data in near real time through automated techniques, we are also beginning to support distribution of data via streaming mechanisms. We currently support streaming in one of three ways:

1. Live Internet Seismic Server (LISS) Developed by USGS/ASL
2. Data Handling Interface (DHI) Developed by the IRIS DMC and University of S. Carolina
3. SeedLink. Developed by the GEOFONE group at GFZ. This method of data distribution is just being introduced.

The DMC also released a new version of the autoDRM software that provides access to data in the BUD system. The IRIS DMC shows availability from more stations than any other system that are

monitored by Waves4U (http://www.seismo.ethz.ch/waves4u/) at ETH.

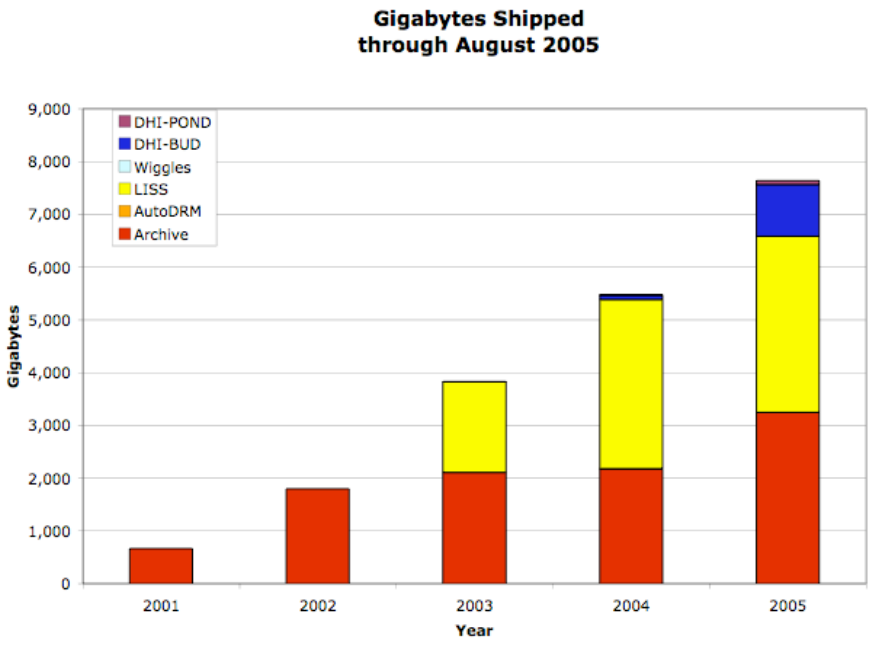

Figure 8. This figure shows the number of gigabytes of data shipped conventionally from the archive in red and the amount of data shipped through LISS and DHI based techniques. Data shipped from the archive and real time data shipments made by LISS are roughly equal. It also shows the increase in the amount of data shipped through the DHI interfaces. Although these statistics only include shipments through August, the FDSN archive has already shipped more data this year than all of last year.

The IRIS DMC will ship a total of more than 11 terabytes of waveform data this year if shipments continue at the current rate.

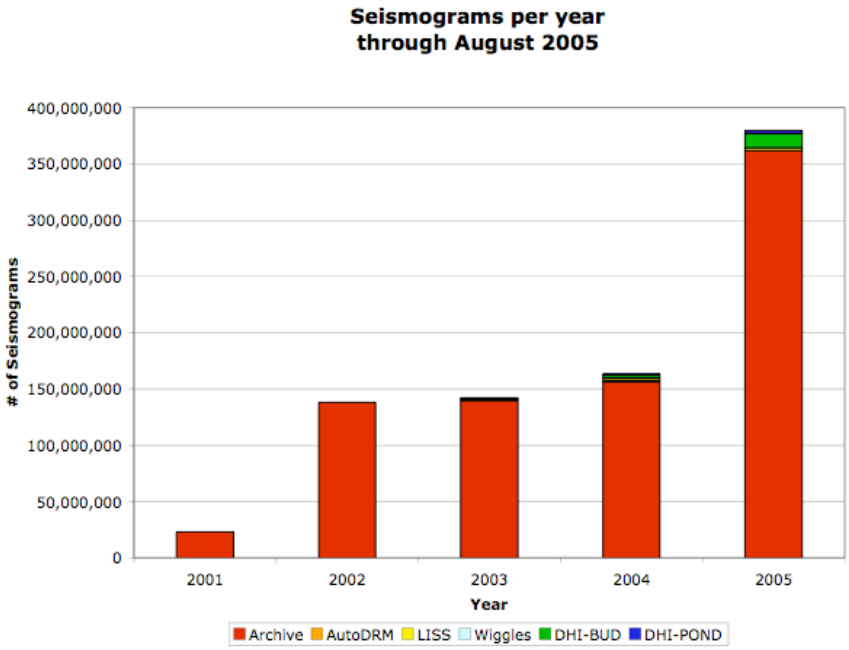

Figure 8. Seismograms Shipped by Year. A seismogram is defined to be a continuous time series from a single network, station, location, channel time series. This figure shows the number of seismograms shipped through August of this year. We project more than 570 million seismograms will be shipped during 2005 at the current rate.

LISS methods actually produce a fairly small number of seismograms (just over 1 million) shipped since a single channel normally only produces a single seismogram in an extended period of time. We project that the IRIS DMC will ship about 570 million seismograms in 2005, an increase of more than 3.5 times over 2004.