

Data Sources; SCNL

An aerial photograph of a vast, rugged mountain range covered in snow. The terrain is characterized by sharp peaks, deep valleys, and extensive snowfields. The lighting creates strong shadows, highlighting the three-dimensional structure of the mountains. The text 'Data Sources; SCNL' is superimposed in the upper center of the image in a white, bold, sans-serif font with a slight drop shadow.

Data Sources

- Data sources producing waveform data can come from a remote source, via an import or a connection to a Seed Link server (ie: slink2ew), or from a local source, for example: a Quanterra digitizer (q3302ew) or a Guralp digitizer/seismometer pair (scream2ew).
- We will be using the seedlink server from the IRIS DMC rtserve.iris.washington.edu to get data for this exercise.



Data Sources

- Last we checked IRIS (Incorporated Research Institutions for Seismology) exported about 35,000 streams, and GFZ (the national research center for Earth Sciences in Germany) exported 7,000 using the Seedlink protocol
- If there is sufficient density of stations you can use Seedlink streams to do real-time earthquake detection.

Seedlink

- You can find more information about Seedlink and download free seedlink tools here:

<http://www.iris.edu/data/dmc-seedlink.htm>

- Slinktool can be used to show a list of all thousands of stations available

```
slinktool -L rtserve.iris.washington.edu:18000
```

```
slinktool -L geofon.gfz-potsdam.de:18000
```

- Or streams

```
slinktool -Q rtserve.iris.washington.edu:18000
```

```
slinktool -Q geofon.gfz-potsdam.de:18000
```



IRIS Seedlink

If you want to see what available seedlink streams may be related to the area you're working, you can use this URL

[http://ds.iris.edu/gmap/ REALTIME/?
minlat=-38&maxlat=37&minlon=-20&maxlon=55](http://ds.iris.edu/gmap/ REALTIME/?minlat=-38&maxlat=37&minlon=-20&maxlon=55)

and plug in your latitude and longitude.

See the next slide



Network map for _REALTIME Stations collected and served in real time at the DMC

44 stations

9, 55, 19531



Data Available:
 Realtime **R**
 Archive **A**

- AF.GRHM **AR**
- AF.POGA **AR**
- AF.SOE **AR**
- G.ATD **AR**
- G.MBO **AR**
- G.TAM **AR**
- G.TRIS **AR**
- GE.EIL **AR**
- GT.BOSA **AR**
- GT.DBIC **AR**
- GT.LBTB **AR**
- HL.ARG **AR**
- II.ABPO **AR**
- II.ASCN **AR**
- II.MBAR **AR**
- II.RAYN **AR**
- II.SHEL **AR**
- II.SUR **AR**
- IM.H09N1 **AR**
- IM.H09W1 **AR**
- IM.H10C1 **AR**
- IM.H10C2 **AR**
- IM.H10N1 **AR**
- IM.H10N2 **AR**
- IM.H10N3 **AR**
- IM.H10S1 **AR**
- IM.H10S2 **AR**
- IM.H10S3 **AR**
- IM.I49H1 **AR**
- IM.I49H2 **AR**
- IM.I49H3 **AR**
- IM.I49H4 **AR**
- IM.I49H5 **AR**
- IU.FURI **AR**
- IU.KMBO **AR**
- IU.LSZ **AR**
- IU.MACI **AR**
- IU.TRIS **AR**
- IU.TSUM **AR**
- KO.ELL **AR**
- MN.IDI **AR**
- MN.WDD **AR**
- PM.PMOZ **AR**
- ZT.LESE **AR**

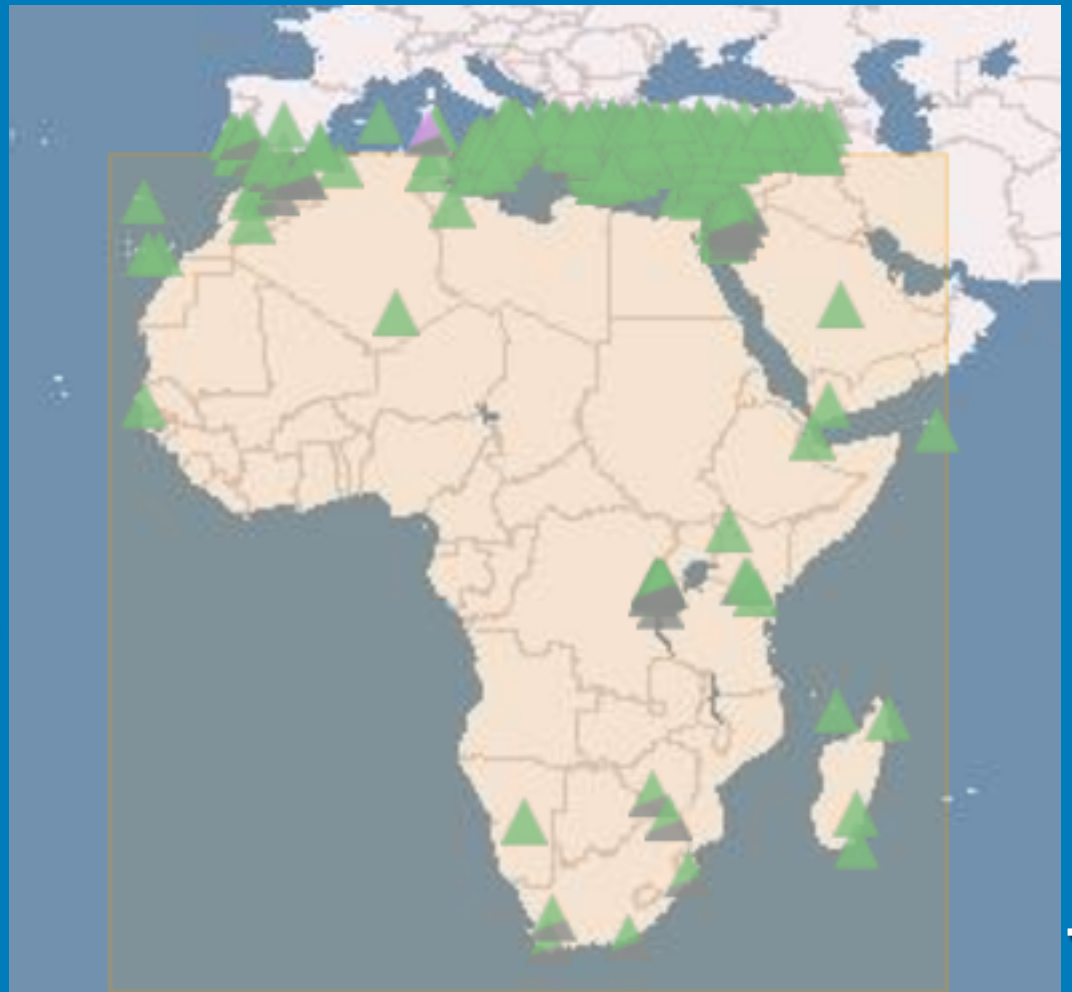
GFZ Seedlink

<http://eida.gfz-potsdam.de/webdc3/>

If you want to see what available seedlink streams may be available from GFZ, you can use this URL and plug in your latitude and longitude.

See the next slide.

(What you find here may not be realtime necessarily)





Access to GEOFON and EIDA Data Archives



HELMHOLTZ-ZENTRUM POTSDAM DEUTSCHES GEOFORSCHUNGSZENTRUM

Explore events Explore stations Submit request Download data View console

doc Help

Stations Controls

Station Information

Browse Inventory User Supplied

Networks

Year from 2017 to 2017:

Network Type:

All public nets

Network Code:

All Networks

* = temporary network; + = restricted access

Stations

by Code by Region by Events

Filter stations by region:

N

37

W

-20

55

E

-38

Clear

S

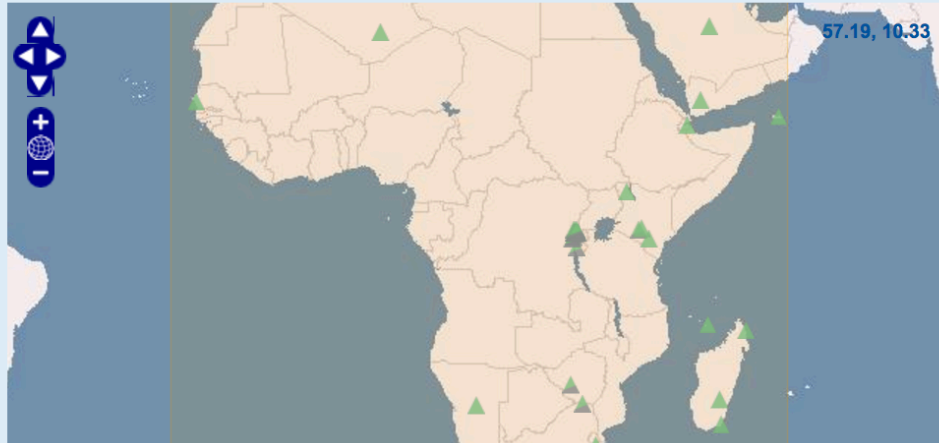
Streams

by Code by Sampling

Choose the desired set of channels: Use SHIFT and CTRL to extend the set.

BH HH LH HN

Event and Station Map



Use left SHIFT + drag mouse to select regions.

Legend Help

Event and Station List

Request:

Freeze Delete Stations Save Stations Delete Events

Events (-)

No Events loaded

Stations (503 stations)

	Network	Station	Lat.	Long.	O/R	Streams
<input type="checkbox"/>	AC	SRN	39.88	20.00	O	.HHE,.HHN,.HHZ
<input type="checkbox"/>	AF	BLWY	-20.14	28.61	R	.BHE,.BHN,.BHZ .HHE,.HHN,.HHZ .BHE,.BHN,.BHZ
<input type="checkbox"/>	AF	CER	-33.36	19.29	R	.HHE,.HHN,.HHZ .LHE,.LHN,.LHZ .VHE,.VHN,.VHZ .BHE,.BHN,.BHZ
<input type="checkbox"/>	AF	CVNA	-31.48	19.76	R	.HHE,.HHN,.HHZ .LHE,.LHN,.LHZ .VHE,.VHN,.VHZ .BHE,.BHN,.BHZ

GFZ Seedlink



Station Information

Networks

Year from 2017 to 2017:

Network Type:

All public nets

Network Code:

All Networks

* = temporary network; + = restricted access

Stations

Filter stations by region:

N

37

W

-20

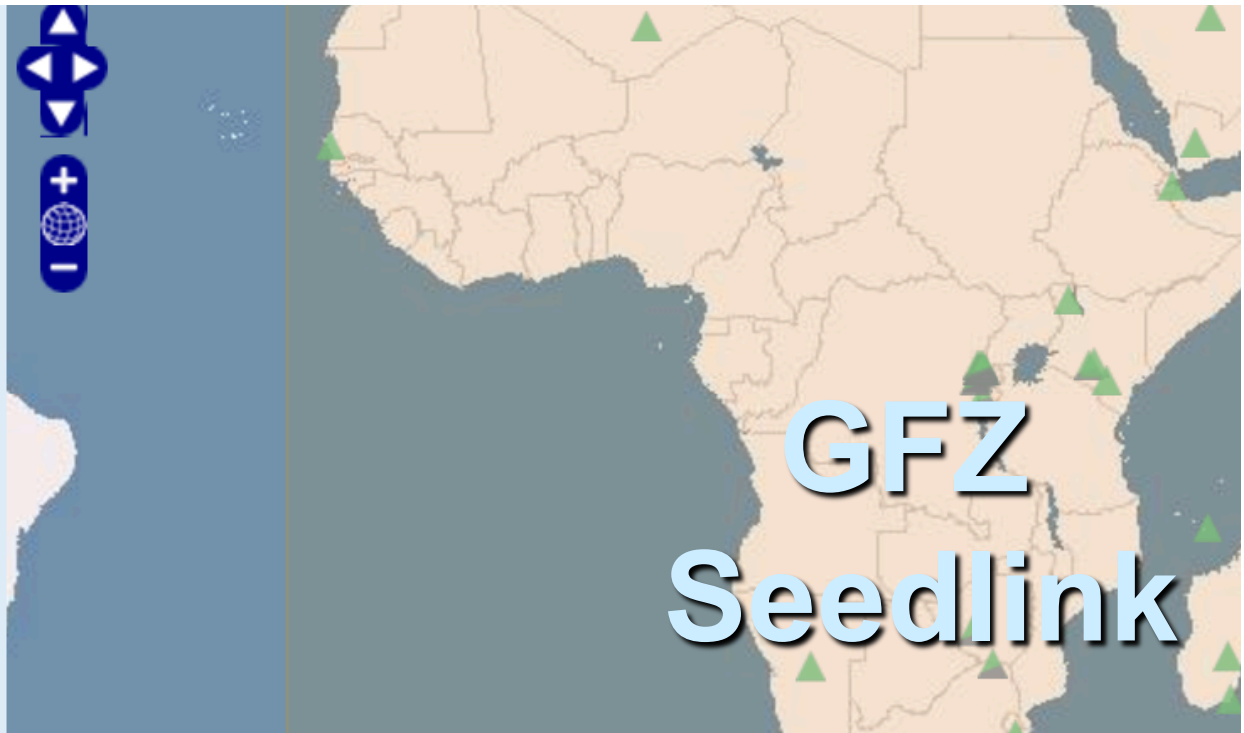
55

E

-38

S

Streams



Use left SHIFT + drag mouse to select regions.

Event and Station List

Request:

Events (-)

No Events loaded

Stations (503 stations)

Network ▲▼ Station ▲▼ Lat. ▲▼ Long. ▲▼ O/R

<input type="checkbox"/>	AC	SRN	39.88	20.00	O	.HH
<input type="checkbox"/>	AF	BLWY	-20.14	28.61	R	.BH .HH

SCNL



Naming Data Sources

- Data sources in SeisComP3 are typically named by (from global to local) Network name, Station name, Location id, and Channel or component name, as defined in the SEED manual from IRIS.
- SCNL = Station, Channel, Network, Location
- www.fdsn.org/seed_manual/SEEDManual_V2.4.pdf
- And this manual is likely on your USB key.

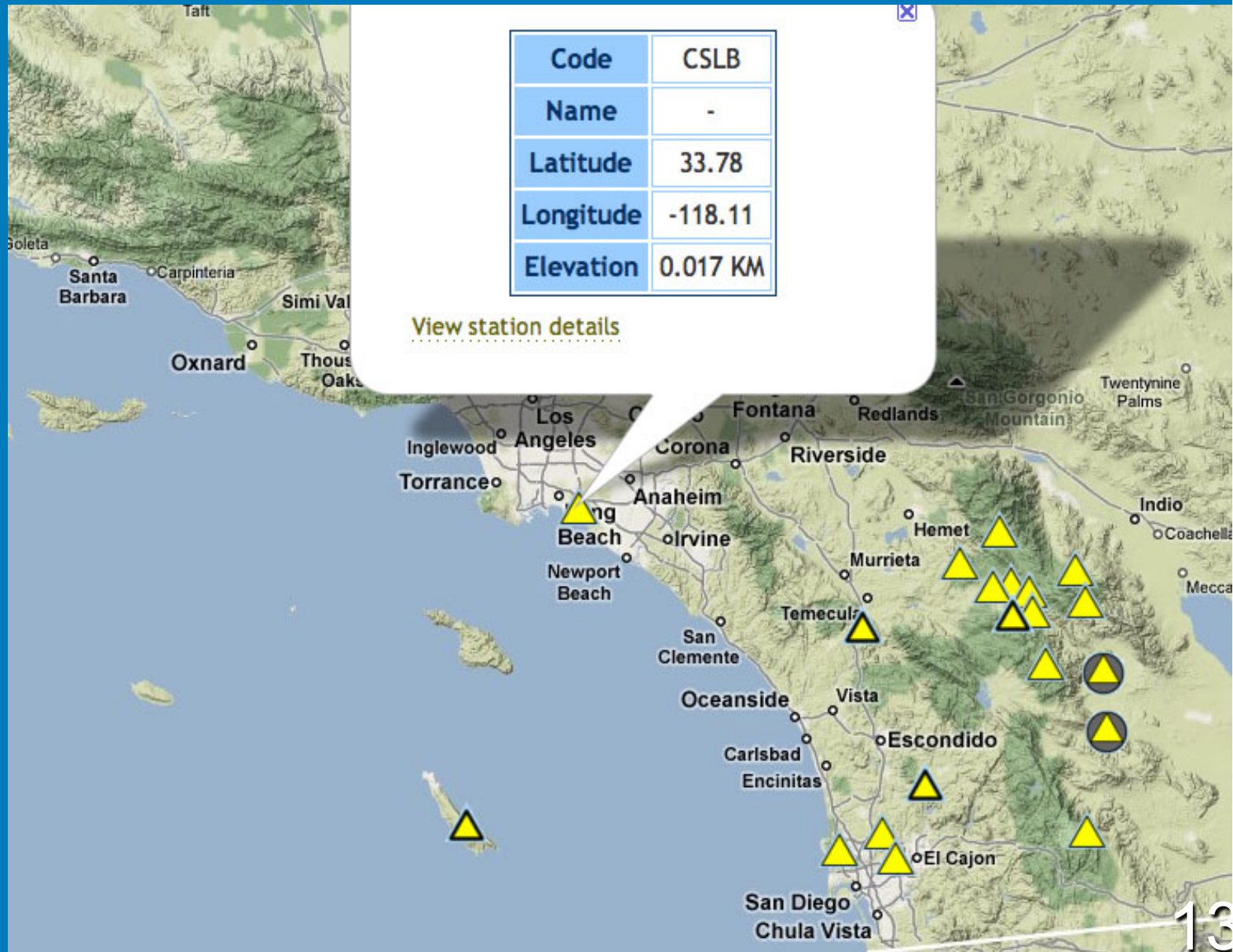
SCN vs. SCNL

- The current version of SeisComP3 uses SCNL in miniSEED waveform data packets.
- SCN = Station.Channel.Network
 - CSLB.HGE.AZ
- SCNL = Station.Channel.Network.Location
 - CSLB.HGE.AZ.01
- (The order of “S-C-N” or “S-C-N-L” doesn’t go from global to local or even from local to global, but it’s a frequently used acronym.)

Station for SCNL = CSLB.HGE.AZ.01

**Station:
CSLB**

LB stands
For
Long
Beach



Channel for CSLB.HGE.AZ.01

IRIS – Incorporated Research Institutions for Seismology
www.iris.edu publishes the SEED manual.

To see what the channel HGE likely stands for, look in the
SEEDManual_V2.4.pdf, Page 134

http://www.fdsn.org/seed_manual/SEEDManual_V2.4.pdf

1st letter: Band Code

Band code	Band type	Sample rate (Hz)	Corner
H	High Broad Band	≥ 80 to < 250	≥ 10 sec

2nd letter: Instrument Code

G Gravimeter

3rd letter: Orientation Code

E East-West



Network for CSLB.HGE.AZ.01

Network codes are available on request from IRIS. The SEED manual describes where to get them, and this link to find out what they are:

<http://www.fdsn.org/networks/>

We see:

...

AU Australian Seismological Centre
Australian Geological Survey

AV Alaska Volcano Observatory
USGS - Anchorage, University of Alaska, Geophysical Institute

AZ ANZA Regional Network
University of California, San Diego - USGS Menlo Park

BA UniBas
University della Basilicata, Italy

...



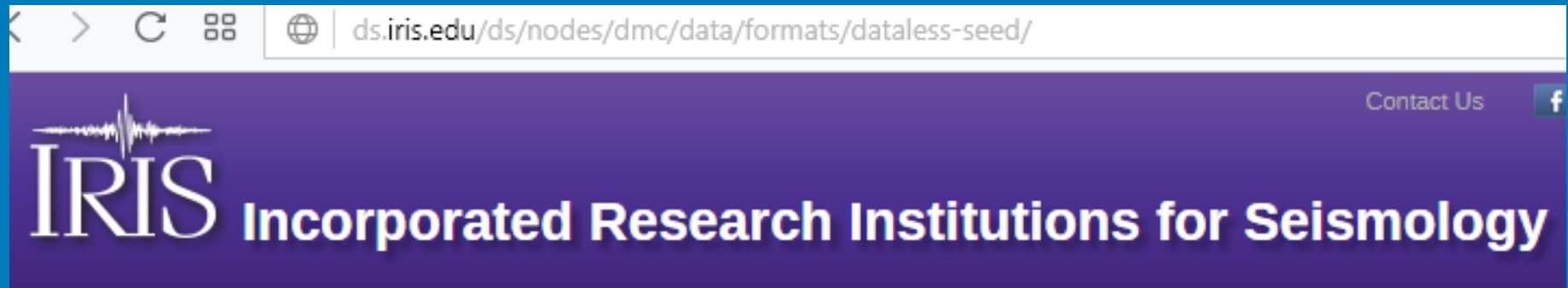
Location for CSLB.HGE.AZ.01

The location code for CSLB.HGE.AZ.01 is simply 01. This is used if there are more than one instrument at station CSLB. A second instrument might be 02 or whatever.

If this station only had one instrument, it might not use a location code. -- is synonymous with no location code CSLB.HGE.AZ.--



Where to get Dataless SEED



Dataless SEED

What is a dataless SEED volume?

A *dataless SEED* volume contains the metadata for a request only, including instrument responses, instrument coordinates, compression type, etc.. This dataless volume can be used in combination with a *miniSEED* volume (as extracted from the BUD filesystem) with `rdseed`. A dataless, by definition, contains no "data", in the sense that no waveform data are included, only headers.

Getting a Dataless SEED File:

1. Generate a request for a dataless using the [online form](#)
2. Submit a BREQ_FAST style request to dataless@iris.washington.edu from your mail client.
3. Get a dataless from the [BUD Query Interface](#).
4. Download network dataless SEED files from the [IRIS FTP site](#).

Full Network Dataless SEED



ds.iris.edu/pub/RESPONSES/DATALESS_SEEDS/

KN.dataless	25-Oct-2016 12:05 3.7M
KO.dataless	13-May-2015 11:41 2.1M
KP.dataless	09-Sep-2013 14:42 64K
KR.dataless	23-Mar-2017 11:43 4.4M
KS.dataless	15-Mar-2016 11:42 128K
KW.dataless	10-Jul-2013 14:41 32K
KY.dataless	11-Aug-2015 11:41 352K
KZ.dataless	07-Oct-2015 12:58 7.9M
LB.dataless	20-Jan-2017 11:42 512K
LD.dataless	21-Aug-2017 11:43 9.4M
LI.dataless	03-Mar-2006 10:42 640K
LO.dataless	19-May-2016 11:41 64K
LX.dataless	11-Feb-2013 14:33 670K

Pruning Network Dataless

There are tools to download specific station metadata but I've found a reliable way is downloading the full network dataless, importing it into SeisComP3 Inventory/Station XML format with the scconfig GUI, and then using the command line tool invextr it is possible to extract out just the station we want.



Pruning Network Dataless

For example
let's get II
SUR.

Download
II.dataless,
convert

with SeisComP3, and edit the file in
seiscomp3/etc/inventory like so:

```
invextr --chans "*II.SUR.*"  
II.dataless.xml II.SUR.xml
```



The screenshot shows a window titled "II SUR" with a close button (X) in the top right corner. The text inside the window reads: "Sutherland, South Africa", "Global Seismograph Network (GSN - IRIS/IDA)", "Operating range: 1960/01/01 - 2599/01/01", "Realtime data: 2017/08/11 - 2017/08/22", "Archive data: 1990/11/02 - 2017/04/03", and a blue underlined link "More information". Below the text is a map showing the location of Sutherland in South Africa, with several colored dots (red, purple, blue) indicating other stations. The map also shows the Atlantic Ocean to the west.



Downloading Metadata from GFZ

- After you've made a selection on the main screen at <http://eida.gfz-potsdam.de/webdc3/>
- Click the Submit Request tab, choose Metadata (StationXML)
- For Authentication choose FDSNWS
- Click Submit



Downloading Metadata from GFZ

- Once you've hit "Submit" keep an eye on the "Download data" tab.
- Red when in progress

The screenshot shows the GFZ EIDA web interface. The top navigation bar includes the GFZ logo (Helmholtz-Zentrum Potsdam), the GEOFON logo, and the EIDA logo (Helmholtz-Zentrum Potsdam DEUTSCHES GEOFORSCHUNGSZENTRUM). The main content area is divided into two panels: 'Make Request' and 'Event and Station Map'.

Make Request Panel:

- Time Window selection:** Includes 'Relative Mode' and 'Absolute Mode' buttons. Below, it states 'Use an absolute time window.' with 'Start' and 'End' fields. The start is set to '2017-08-22 00:00:00' and the end is '2017-08-22 23:59:59'.
- Request Information:** Includes 'FDSNWS request type:' with radio buttons for 'Waveform (Mini-SEED)', 'Metadata (StationXML)' (selected), and 'Metadata (Text)'. It also includes 'ArcLink request type:' with radio buttons for 'Waveform (Mini-SEED)', 'Waveform (Full SEED)', 'Metadata (Dataless SEED)', and 'Metadata (Inventory XML)'. Below that is 'Metadata level?' with radio buttons for 'Station' (selected), 'Channel', and 'Response'.
- Authentication:** Includes 'ArcLink' and 'FDSNWS' buttons. Below, it shows 'Current ID: Anonymous' and 'Valid until: N/A'. There are 'Load Token', 'Remove Token', and 'Reset' buttons.
- At the bottom are 'Review' and 'Submit' buttons.

Event and Station Map Panel:

- Shows a world map with green triangles indicating station locations, primarily in Africa and the Middle East. The coordinates -82.85, -26.54 are shown in the top right.
- Below the map is the text 'Use left SHIFT + drag mouse to select regions.' and a 'Legend Help' link.

Event and Station List Panel:

- Includes 'Request:' buttons: 'Freeze', 'Delete Stations', 'Save Stations', and 'Delete Events'.
- Shows 'Events (-)' with the text 'No Events loaded'.
- Shows 'Stations (503 stations)' with a table below.

<input checked="" type="checkbox"/>	Network	Station	Lat.	Long.	O/R	Streams
<input checked="" type="checkbox"/>	AC	SRN	39.88	20.00	O	.HHE, .HHN, .HHZ .BHE, .BHN, .BHZ
<input checked="" type="checkbox"/>	AF	BLWY	-20.14	28.61	R	.HHE, .HHN, .HHZ .BHE, .BHN, .BHZ
<input checked="" type="checkbox"/>	AF	CER	-33.36	19.29	R	.HHE, .HHN, .HHZ .LHE, .LHN, .LHZ .VHE, .VHN, .VHZ
<input checked="" type="checkbox"/>	AF	CVNA	-31.48	19.76	R	.HHE, .HHN, .HHZ .LHE, .LHN, .LHZ .VHE, .VHN, .VHZ .BHE, .BHN, .BHZ