GMVs with Sweetwater

Danielle F. Sumy
IRIS Consortium
6 August 2015
On Monday, we used FetchData

- FetchData -s 2014,04,18,14,27,26 -e 2014,04,18,14,57,26 -N XB -C "BH?" -o sweetwaterBH.mseed -m sweetwaterBH.metadata

- FetchData -s 2014,04,18,14,27,26 -e 2014,04,18,14,57,26 -N XB -C DPZ -o sweetwaterDPZ.mseed -m sweetwaterDPZ.metadata
A program to convert miniSEED data to SAC format.

An optional metadata file may be supplied that contains values for the SAC headers that are not available in Mini-SEED. An event location may be supplied on the command line for placement into the SAC headers.

To download the source code either download the tar/zip from the Files tab or check it out using Subversion (svn) using the path indicated on the Repository tab.

This converter should work in Unix/Linux/Mac OSX and Windows.

Compiling the program

GNU make (or compatible) may be required to build the software. On some Solaris versions, the default make is known to fail, instead GNU make is often available as gmake. If GNU make is not available a work around is to remove the line "nozip: LOCALFLAGS = -DNOFDZIP" from src/Makefile.

- Category: Conversion Program
- Language: C / C++
- Keywords: miniSEED SAC

Issue tracking

- Bug: 0 open / 1
- Feature: 6 open / 6
- Support: 1 open / 1

View all issues
Then used ‘mseed2sac’

- mseed2sac sweetwaterBH.mseed –m sweetwaterBH.metadata

- mseed2sac sweetwaterDPZ.mseed –m sweetwaterDPZ.metadata
SAC commands

The broadband stations operate at 20 sps.
The nodes operate at 500 sps.
We want to make the two types of stations the same sample rate.

r *SAC
rmean
rtr
taper
decimate 5 filter on
We have BH? channels!

You can try these steps

OR

You can download from the ‘Agenda’ tab (Sweetwater.zip)
Let’s Build a GMV!

Data Services Products: USAArrayGMV The USAArray Ground Motion Visualization

Summary

Visualizations of real data showing how seismic waves sweep across the USAArray network of seismic stations. Watch how seismic waves from earthquakes in the US and around the world cause the ground to move at each seismometer.

Quicklinks

- View GMVs
- Super (combined) GMVs

Download MATLAB script to create customized GMVs
All information in README, but **important**

```{INSTALL_DIR}/IRIS_DMC_GMV/matTaup/lib/matTaup.jar
to
{MATLAB_DIR}/toolbox/local/classpath.txt```

Place the IRIS_DMC_GMV.zip in your `{INSTALL_DIR}`
- Contains Sweetwater data in SAC files
- Contains a file called `event.asc`
- Both are in the ‘data’ directory

- In the ‘bin’ directory, we want to run `GMV_Sweetwater.m`, which will call ‘event.asc’
What’s in event.asc?

<table>
<thead>
<tr>
<th>ID</th>
<th>123</th>
</tr>
</thead>
<tbody>
<tr>
<td>TITLE</td>
<td>GUERRERO, MEXICO, M=7.2, 2014-04-18, 0.001-0.01 Hz</td>
</tr>
<tr>
<td>WIN_START</td>
<td>2014-04-18 14:32:26</td>
</tr>
<tr>
<td>WIN_END</td>
<td>2014-04-18 14:57:26</td>
</tr>
<tr>
<td>WIN_STEP</td>
<td>4</td>
</tr>
<tr>
<td>EVENT_LAT</td>
<td>17.552</td>
</tr>
<tr>
<td>EVENT_LON</td>
<td>-100.816</td>
</tr>
<tr>
<td>EVENT_TIME</td>
<td>2014-04-18 14:27:26</td>
</tr>
<tr>
<td>SHOW_GC</td>
<td>1</td>
</tr>
<tr>
<td>MAGNIFICATION</td>
<td>5</td>
</tr>
<tr>
<td>LL_LAT</td>
<td>32.50</td>
</tr>
<tr>
<td>LL_LON</td>
<td>-100.90</td>
</tr>
<tr>
<td>UR_LAT</td>
<td>33.0</td>
</tr>
<tr>
<td>UR_LON</td>
<td>-100.20</td>
</tr>
<tr>
<td>WIDTH</td>
<td>800</td>
</tr>
<tr>
<td>CHANNEL</td>
<td>SEIS_BHZ</td>
</tr>
<tr>
<td>LP</td>
<td>0.001</td>
</tr>
<tr>
<td>HP</td>
<td>0.01</td>
</tr>
</tbody>
</table>
As this stands... it doesn’t work!

- Spend 10-15 minutes getting a sense of what the GMV is doing
- Do NOT change the GMV_Sweetwater.m file, as this part does work!
- Change the event.asc, and play around with different ways to look at the data
- HINT: You may want to look at the broadband and nodal data separately to compare