IRIS PASSCAL

Current practice and future directions

Portable Meta-Data Management

Technical Interchange Meeting
Palm Springs, CA
April 12 & 13, 2016

Current Procedures: Meta-Data Capture on Passive Experiments

INSTALL SHEET

Broadband RT130 with FW 3.4.3
For iFSC – iPod Touch Handheld Controller

EXPERIMENT: ______________
Station:____________________
Local Date/Time:______________________________ GMT Date/Time:___________________________
Field Team: ____
GPS Location of Site: Lat:______________________ Lon:_________________ Elev(m):_______________
Equipment
Sensor S/N:______________ Sensor Type: _______________
DAS S/N:________________ DAS Type: _________________
Flash Disk 1 S/N:__________ Size:__________
Flash Disk 2 S/N:__________ Size:__________
Clock S/N:_______________ Power Box S/N: ___________

meta-data captured on install/service sheets

Current Procedures: Meta-Data Transcription on Passive Experiments

Antelope is used to create dataless SEED

For a much more detailed processing guide, please see the PASSCAL document: "Generating SEED From RT130 Data", available from our web page: http://www.passcal.nmt.edu/content/data-archiving

```
#comment: This is a batch file example.

net PI Pier database at PASSCAL

sta ME42 34.0745 -106.9247 1.430 Socorro, NM, USA
time 02/06/2011 00:00:00
datalogger rt130_mp 0984
sensor cmg3t 0 T4476
axis Z 0 0 - 1 1
axis N 0 90 - 2 1
axis E 90 90 - 3 1
samplerate 40sps
channel Z BHZ
channel N BHN
channel E BHE
samplerate 1sps
channel Z LHZ
channel N LHN
channel E LHE
add

close ME42 12/31/2013 23:59:59

sta ME101 -77.72591 162.26907 0.079 Elsewhere, Antarctica
time 02/29/2011 00:00:00
datalogger rt130_mp 0988
sensor l22 0 G071
axis Z 0 180 - 1 32
axis N 0 90 - 2 32
axis E 90 90 - 3 32
samplerate 100sps
channel Z EHZ
channel N EHN
channel E EHE
samplerate 1sps
channel Z LHZ
channel N LHN
channel E LHE
add

close ME101 12/31/2013 23:59:59
```

Last revised: June 11, 2015

RT130 Data Processing In a Nutshell

You've offloaded a service run and have stacks of zip files. Now what to do with them? Start by getting organized (Steps 1-3). Then convert the data & log files to miniseed (4-7). Build the database (8-12) and the dataless (13-14). Finally, send the day volumes and the dataless to PASSCAL (15). **Unix commands (bold print)** and any command line arguments are highlighted in yellow. Input files are denoted by <*filename*>.

1. Create and maintain an organized directory structure for your data. Start by creating a main directory for the project. Once the main project directory is made, create subdirectories within it for your raw data (RAW), log files (LOGS), and database (DB). For example: **mkdir** RAW (move your raw files here), **mkdir** LOGS (for your log files), **mkdir** DB (for the database files along with batch and par files).

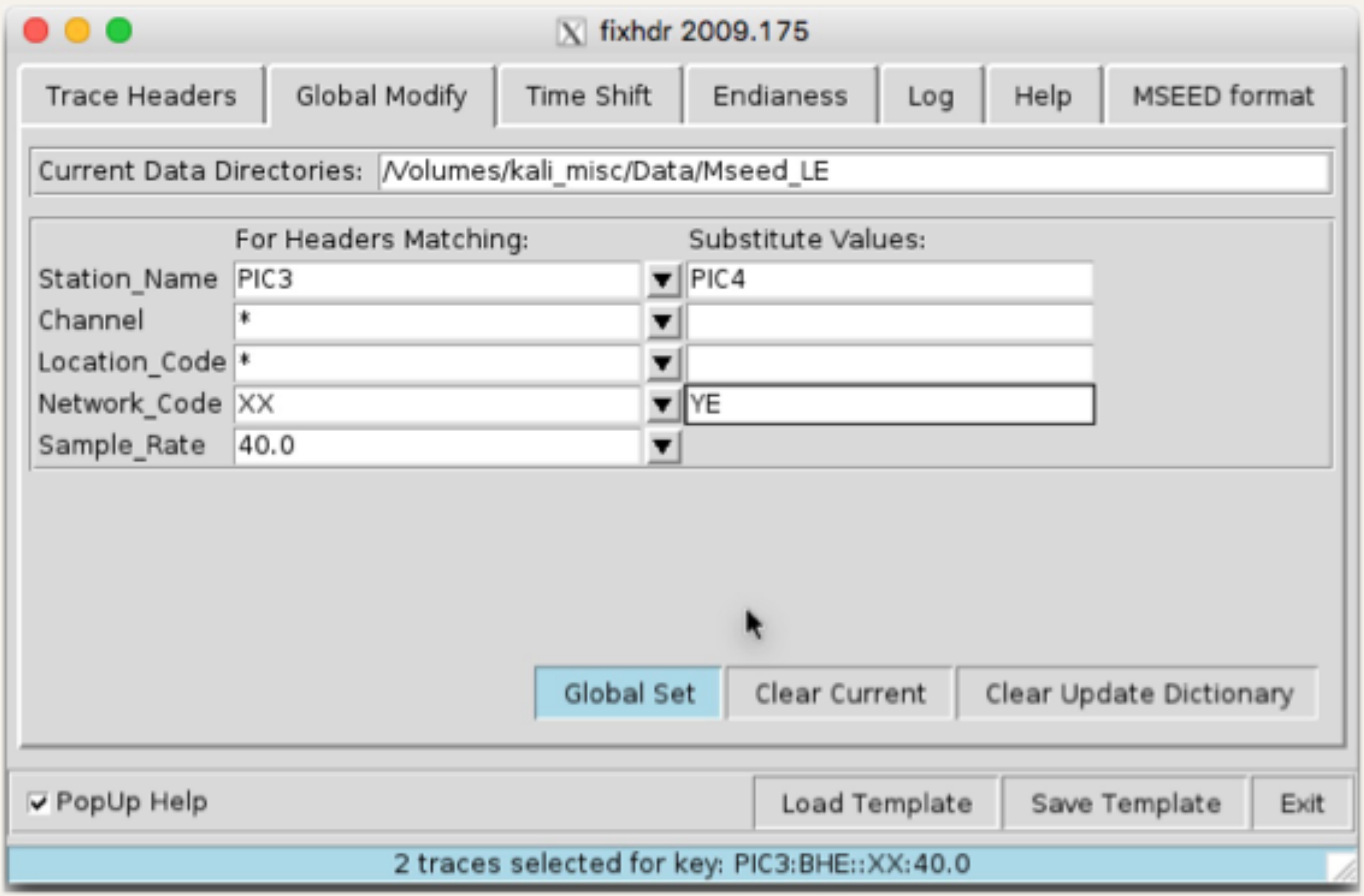
2. In the DB directory, use a text editor to create a batch file describing every station in your network. See the template on page 4 to get started. Be very accurate with your entries – small typos now can cause big headaches later.

3. Next you will need to create a parameter file in the DB directory that our tool, **rt2ms**, can parse. You can either use batch2par:
batch2par <*batchfile*> –m > <*parfile*>
(-m assures that the mass positions are correctly formatted). Or use a text editor and the format below to create one from information in the batch file.
This example describes three data streams for DAS 9306 at station ME42. The data are 40sps (refstrm 1), 1 sps (refstrm 2), and 0.1sps (refstrm 9, the mass positions). **Please note** that if you use **batch2par** the 'refstrm' column might need to be hand-edited because the initial output will not be understood by rt2ms. You will also need to edit the default 'gain' column by changing the placeholder value of X1 to your instrument gain (usually 1 or 32).

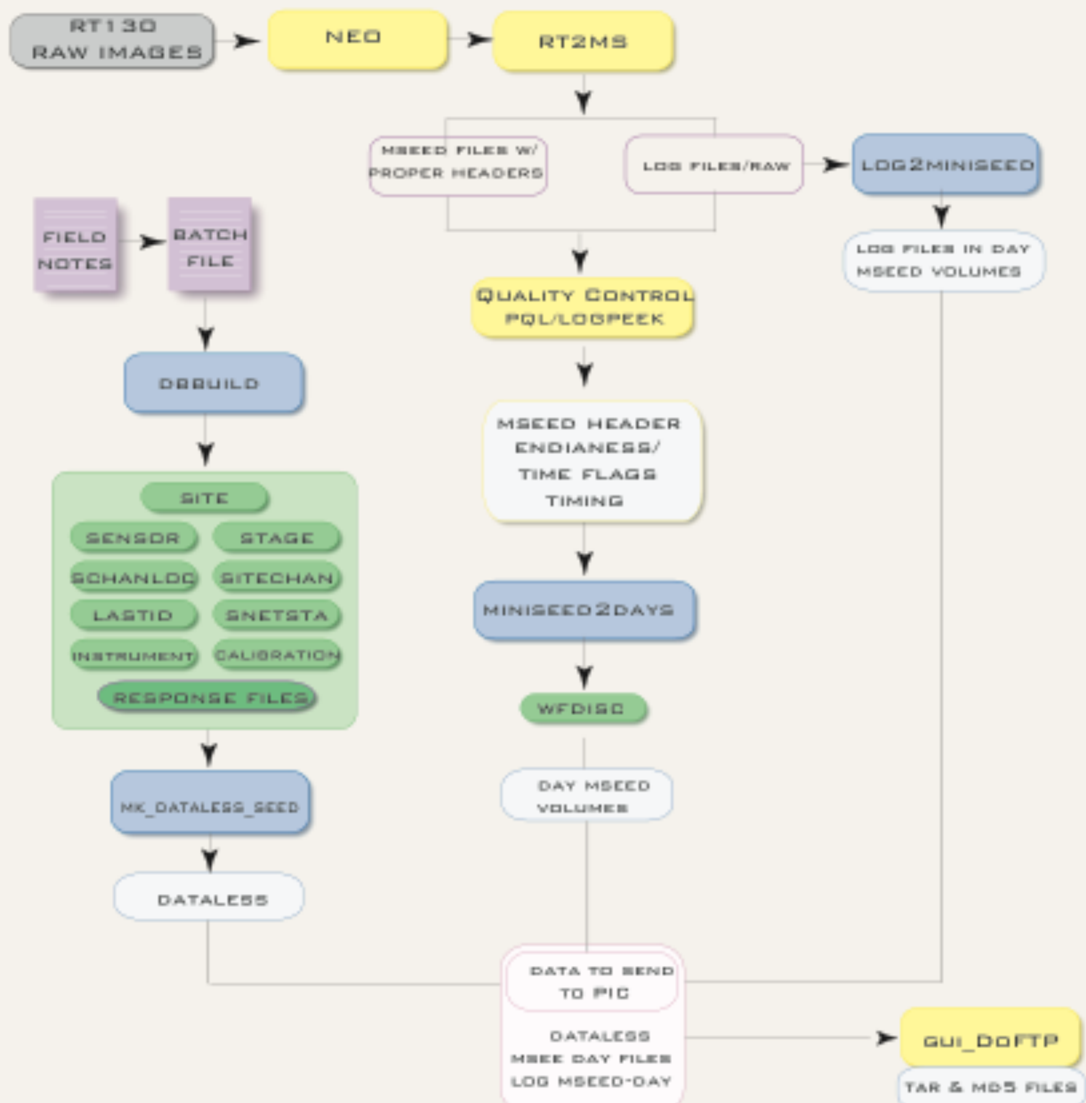
```
#das; refchan; refstrm; netcode; station; channel; samplerate; gain
9306;  1;  1;  PI;  ME42;  BHZ;  40;   1
9306;  3;  1;  PI;  ME42;  BHE;  40;   1
9306;  2;  1;  PI;  ME42;  BHN;  40;   1
9306;  1;  2;  PI;  ME42;  LHZ;  1;    1
9306;  3;  2;  PI;  ME42;  LHE;  1;    1
9306;  2;  2;  PI;  ME42;  LHN;  1;    1
9306;  1;  9;  PI;  ME42;  VM1;  0.1;  1
9306;  2;  9;  PI;  ME42;  VM2;  0.1;  1
9306;  3;  9;  PI;  ME42;  VM3;  0.1;  1
```

Current Procedures: Meta-Data Transcription on Passive Experiments

mseed fixed header values modified on offload or with fixhdr

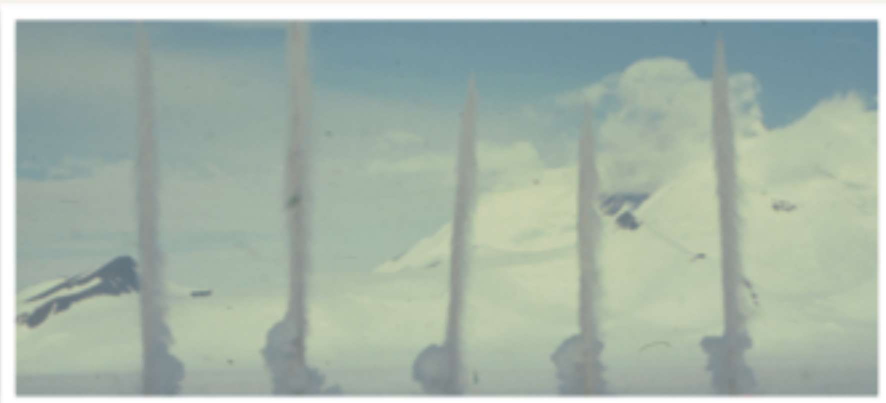


Current Procedures: Meta-Data Flow on Passive Experiments



Current Procedures: Meta-Data Capture on Active Experiments

meta-data captured on install / service sheets



Appendix A

Meta-Data Checklist - PH5 Data Sets

Seismic Source (Shot) Information:

- ID
- date and time
- location (latitude and longitude or UTM coordinates, elevation in meters, WGS84)
- type of source
- size, if applicable (in kilograms or seismic magnitude)
- depth below the surface in meters
- vibrator sweep information, if applicable
- comments, if applicable

Receiver (Station) Information:

- ID (station name)
- deployment and retrieval times for each array; an array being a logical collection of instruments each at a single location and all recording at the same sample rate.
- location (latitude and longitude or UTM coordinates, elevation in meters, WGS84)
- serial number of data logger
- data logger manufacturer and model number
- sensor manufacturer and model number (include response information if applicable)
- comments, if applicable

General Information about the experiment:

names of Principle Investigator(s) (PI) and their contact information
institutions involved in experiment (PI institutions)
experiment name (same as that given in IRIS DMC request form for an assembled ID)
experiment nickname (same as that given in IRIS DMC request form for an assembled ID)
report (doc or pdf formats) describing the purpose of the experiment, its physical layout and the sources (type, depth and size or vibroseis parameters) and receivers (sensor, data logger) used on the experiment. Tables and maps are encouraged, if helpful. The intent of the report is to provide enough documentation so an individual previously unfamiliar with the experiment could essentially recreate the experiment (from a technical perspective) and can ascertain what the data has to offer.

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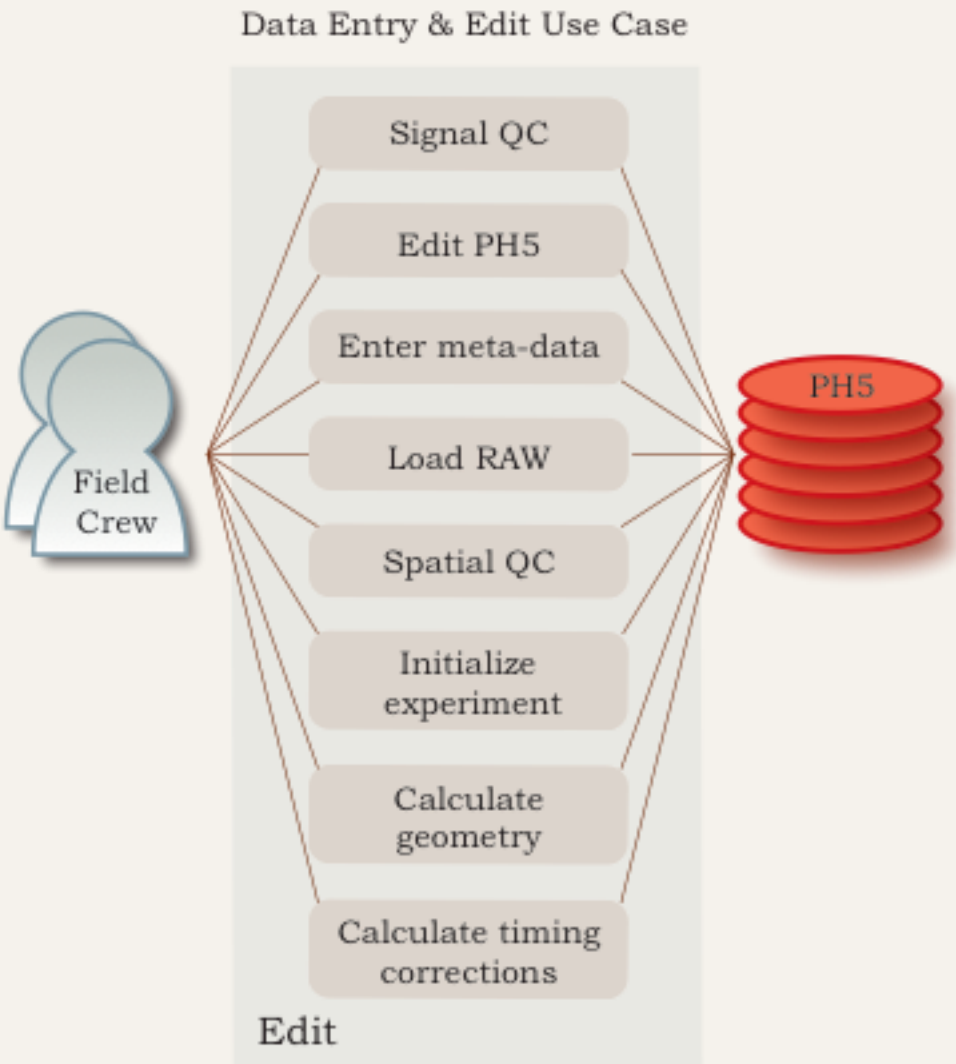
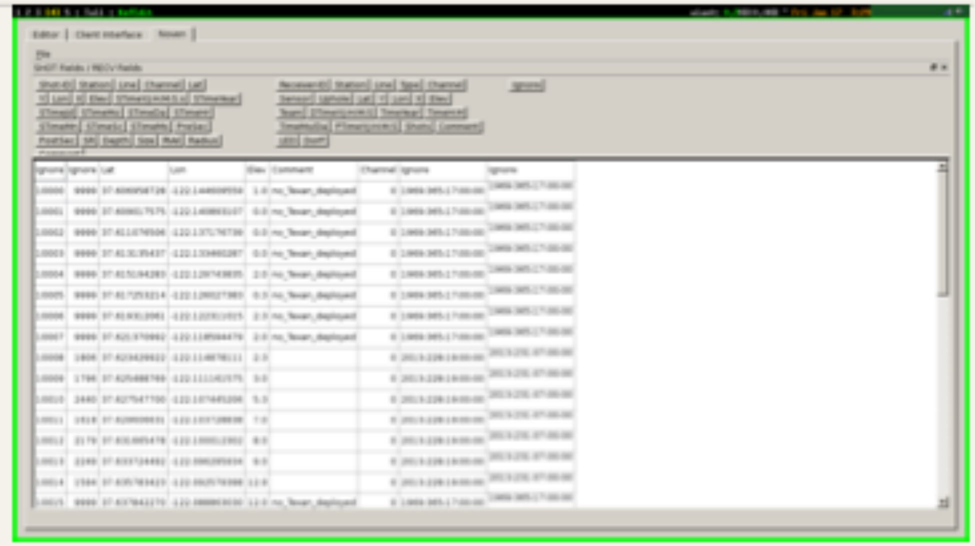
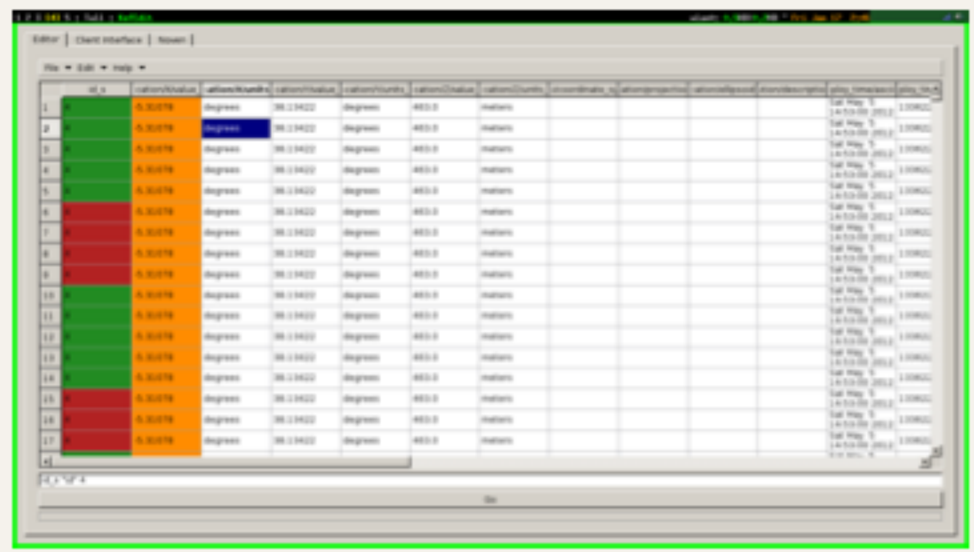
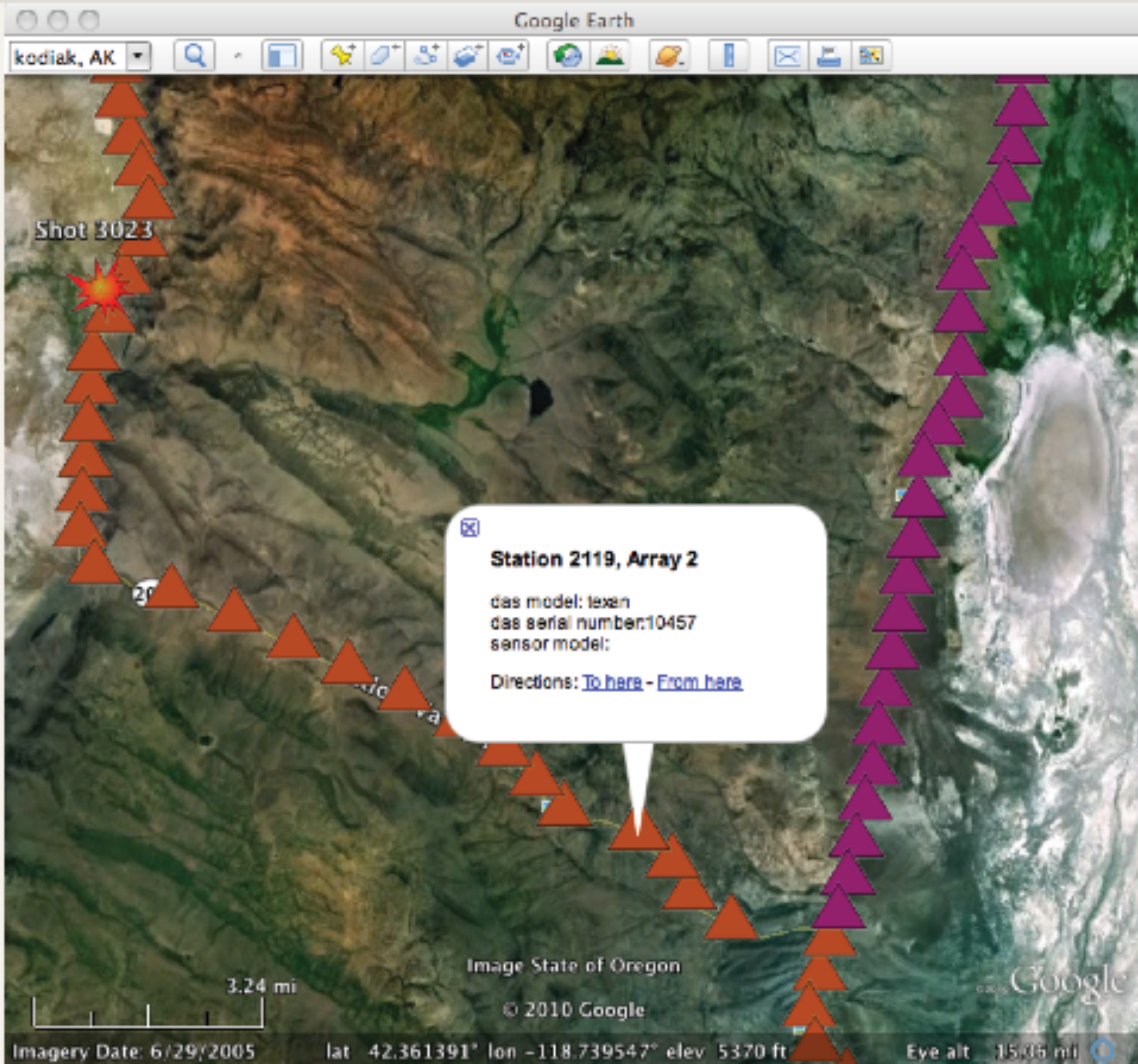
Current Procedures: Meta-Data Transcription on Passive Experiments







Current Procedures: Meta-Data Transcription on Passive Experiments



Current Procedures: Pitfalls

- Human error in-field and during transcription (e.g. in Antarctica, completeness of notes is a good proxy for weather during service)
- Paper
- Maintaining long-term, original records

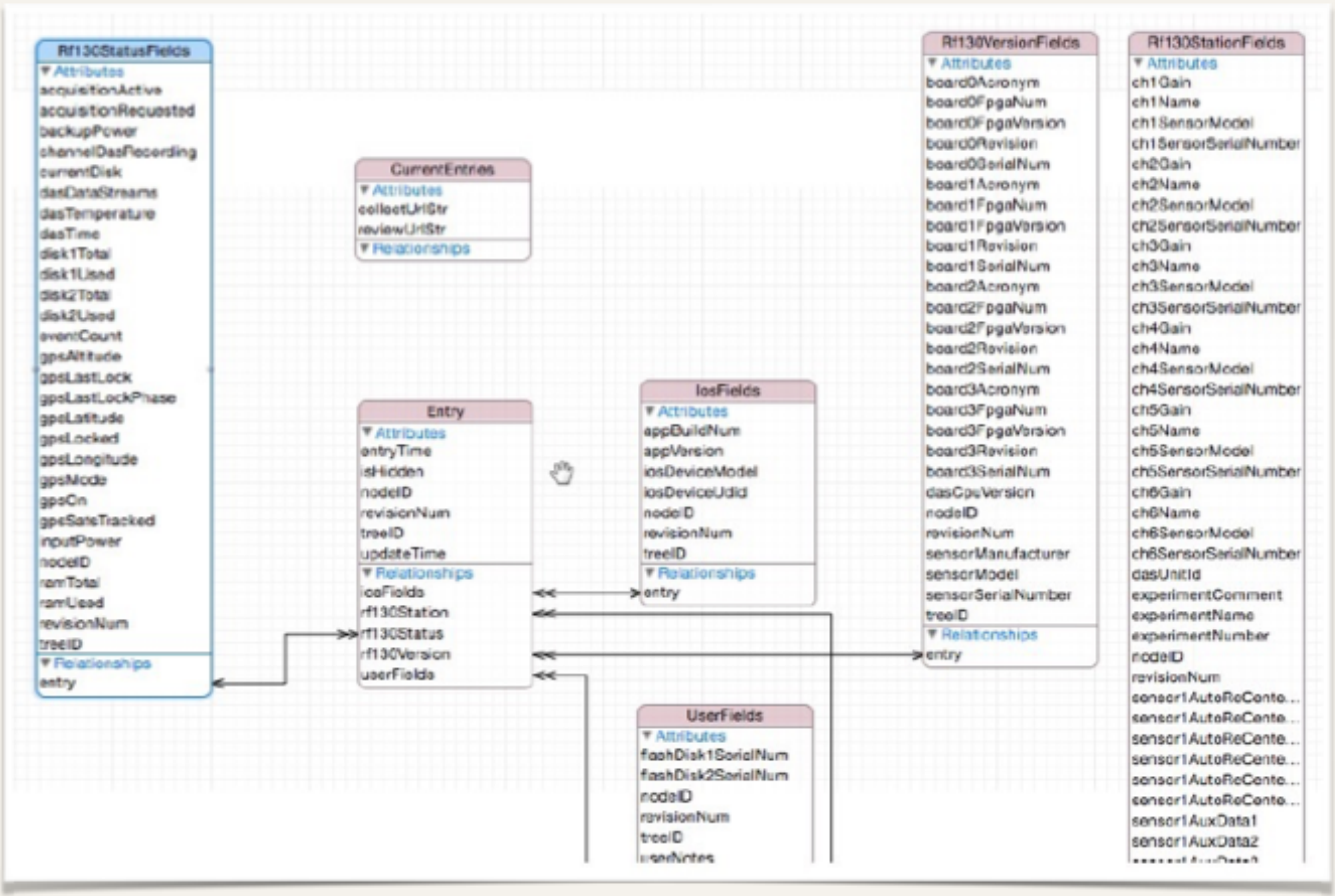
Future Directions: Electronic capture of available station meta-data

- Developed for Apple device
- Current status: RT130 interface, meta-data capture, meta-data store

Future Development

- Q330 interface
- 'Stop light' GUI interface to allow for quick evaluation of station state of health.

Future Directions: Electronic capture of available station meta-data



Future Directions: StationXML Generator

- Leveraging ObsPy
- Current Capability:
  - Read & Parse NRL response files.
  - Read and build "inventory" from mseed headers.
  - Calculates stage0.
  - Write StationXML from above inputs.
- Under Development:
  - Selector for responses from NRL.
  - PH5 integration
  - Nexus'er for stations, responses and user inputs.

Future Directions: Active Source