

Expanded Antelope Python Qt Graphics Capabilities

Danny Harvey
Boulder Real Time Technologies, Inc.
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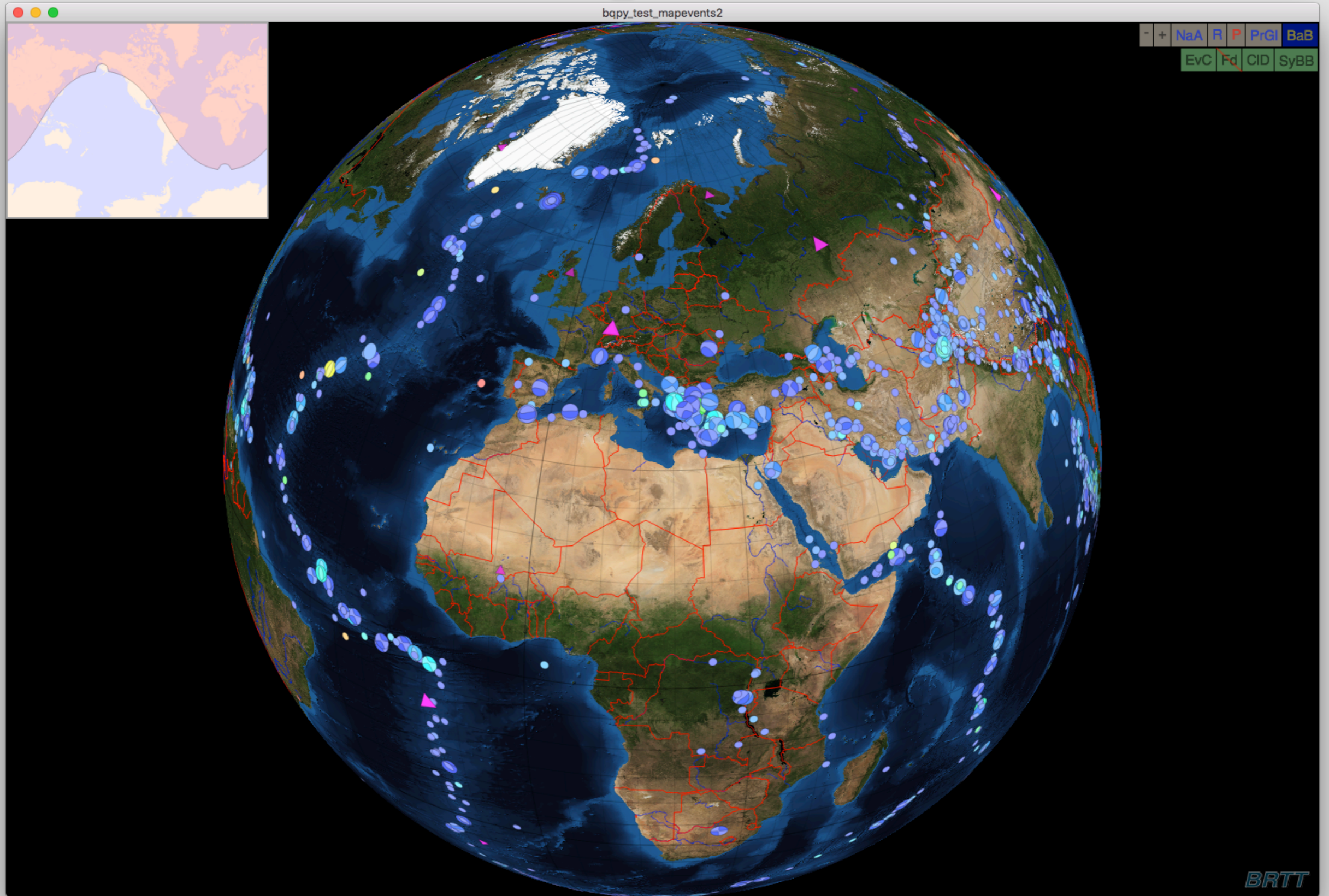
Outline

- Review of prior developments
- New integration with **EVServer**
- Development of comprehensive Python interface in version 5.7
- New **dbevents**, **dbmapevents**, **displayttgrid**

Qt-related Developments Introduced in 5.6

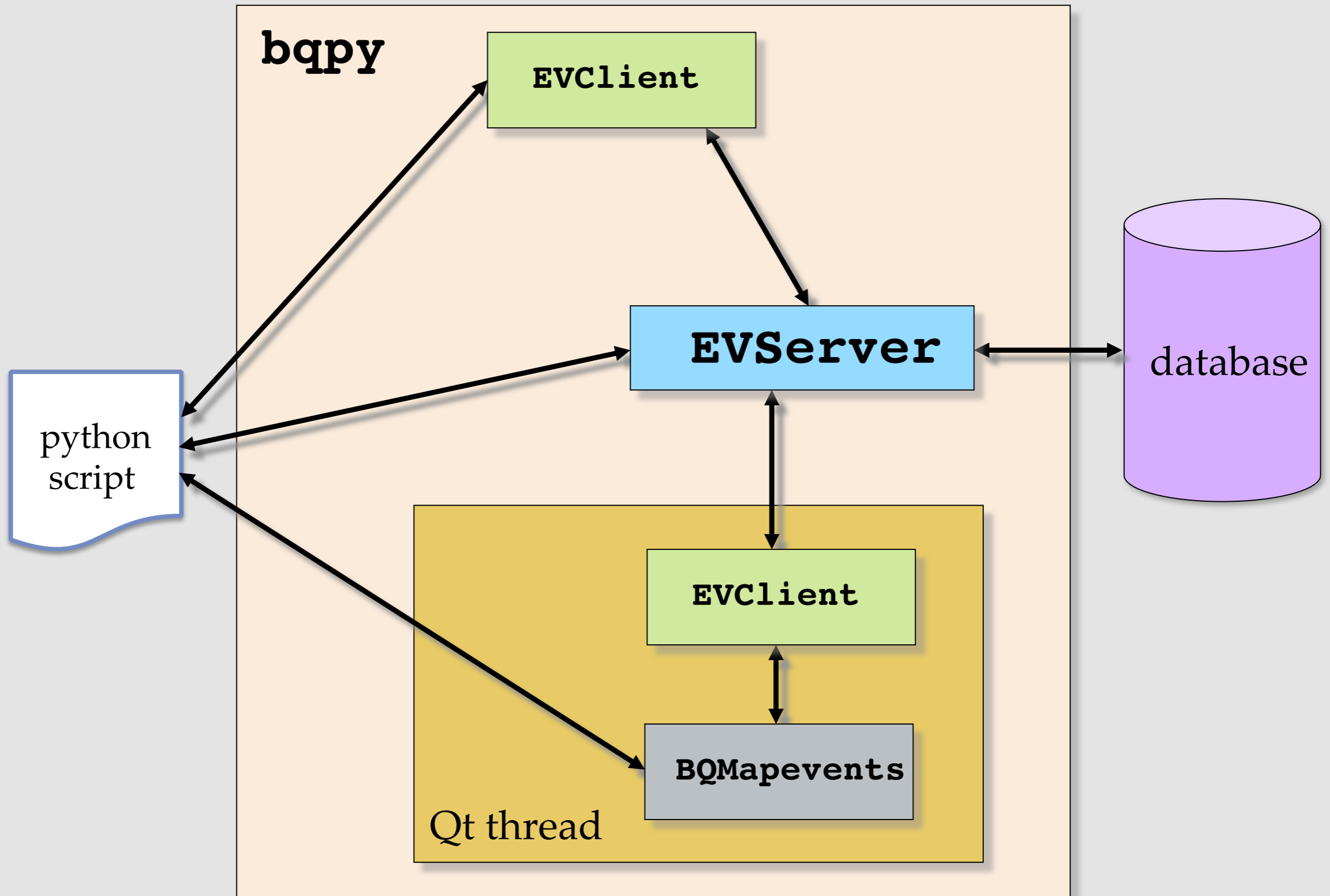
- Further development of the Qt-based library **bqplot** (still not available for development by our users)
- Development of specialized Python-Qt interpreter, **bqpy**.
- First pass at Python script level interfaces.
- **dbevents_pre, qtmapevents**

5.6 – BQMapevents class



New Developments for 5.7

- Complete rewrite of **BQMapevents** class using integration with **EVServer**.
- Greatly expanded **bqp1ot** access to basic Qt widget set (top level windows, layouts, menu bars, buttons, entry widgets, spreadsheets).
- Addition of expanded print capability.
- All **bqp1ot** c++ classes accessible from high-level Python classes.



Addition of Basic Qt Widgets

- Objective to completely eliminate need for `tk` widgets both for BRTT developed applications and for applications developed by our users.
- Initial focus on “basic” set of widgets.
- Top level widgets; mainwindow, frame
- Layout widgets; gridlayout, formlayout, splitter
- Menubar widgets; menubar, menu, item, action
- Other widgets; pushbutton, textentry

Addition of Basic Qt Widgets

- Expanded spreadsheet widget based upon Qt tableview class with efficient access to cell rendering plus spreadsheet sorting.
- Access to Qt printing classes.

Python `bqplot` module in 5.7

- Extensive high-level python classes to interface with new `bqplot` c++ library, basic widgets:
 - `GraphicsEngine` – Qt thread connection
 - `MainWindow` – make a Qt `QMainWindow` toplevel widget.
 - `Frame` – make a Qt `QFrame` widget, child or toplevel.
 - `GridLayout` – make a Qt `QGridLayout` layout.
 - `FormLayout` – make a Qt `QFormLayout` layout.
 - `Splitter` – make a Qt `QSplitter` layout.
 - `Menubar` – make a Qt `QMenubar` widget.
 - `Menu` – make a Qt `QMenu` widget.
 - `Action` – make a Qt `QAction` widget.
 - `Print` – print to printer or pdf file.
 - `PrintDialog` – bring up a print dialog window.
 - `PageDialog` – bring up a printer setting dialog window.
 - `FileDialog` – bring up a file open dialog window.
 - `Button` – make a Qt `QPushButton` widget.
 - `LineEdit` – make a Qt `QLineEdit` widget.

Python `bqplot` module in 5.7

- Extensive high-level python classes to interface with new `bqplot` c++ library, spreadsheet widgets:
 - `Spreadsheet` – make a Qt `QTableView` widget with generic python callbacks to render cells.
 - `DbSpreadsheet` – make a Qt `QTableView` widget specialized python callbacks to render cells from Datascope expressions and to sort using Datascope sorting calls.
 - `EVEventsSpreadsheet` – make a Qt `QTableView` widget to display the events in a list of `EVEvents` structures.
 - `EVEventSpreadsheet` – make a Qt `QTableView` widget to display the list of `EVOrigin` structures in a single event.

widgets_test.py

File

Button1 Enter entry1

Button2 Enter entry2

Button3 Enter entry3

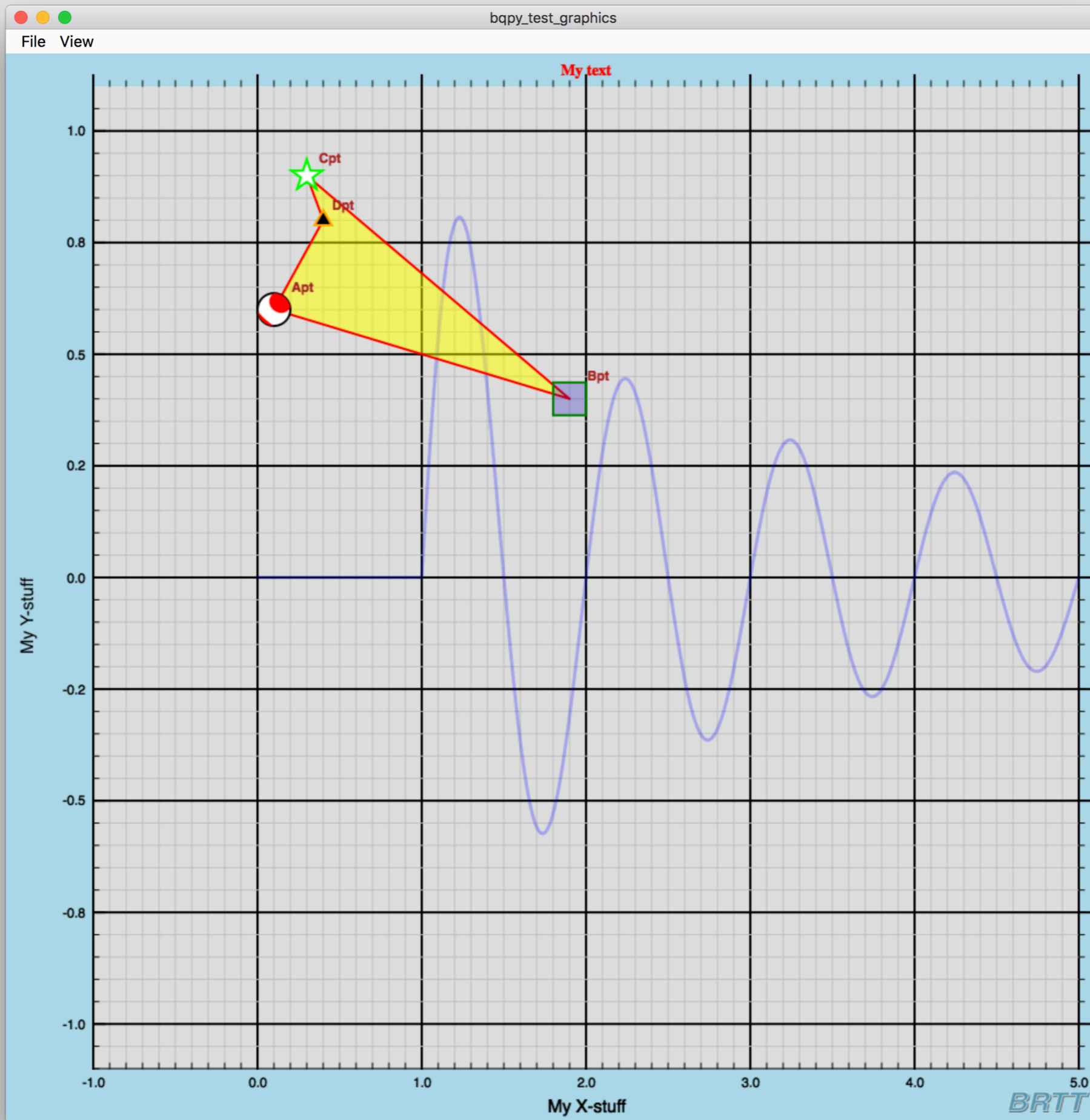
Button4 Enter entry4

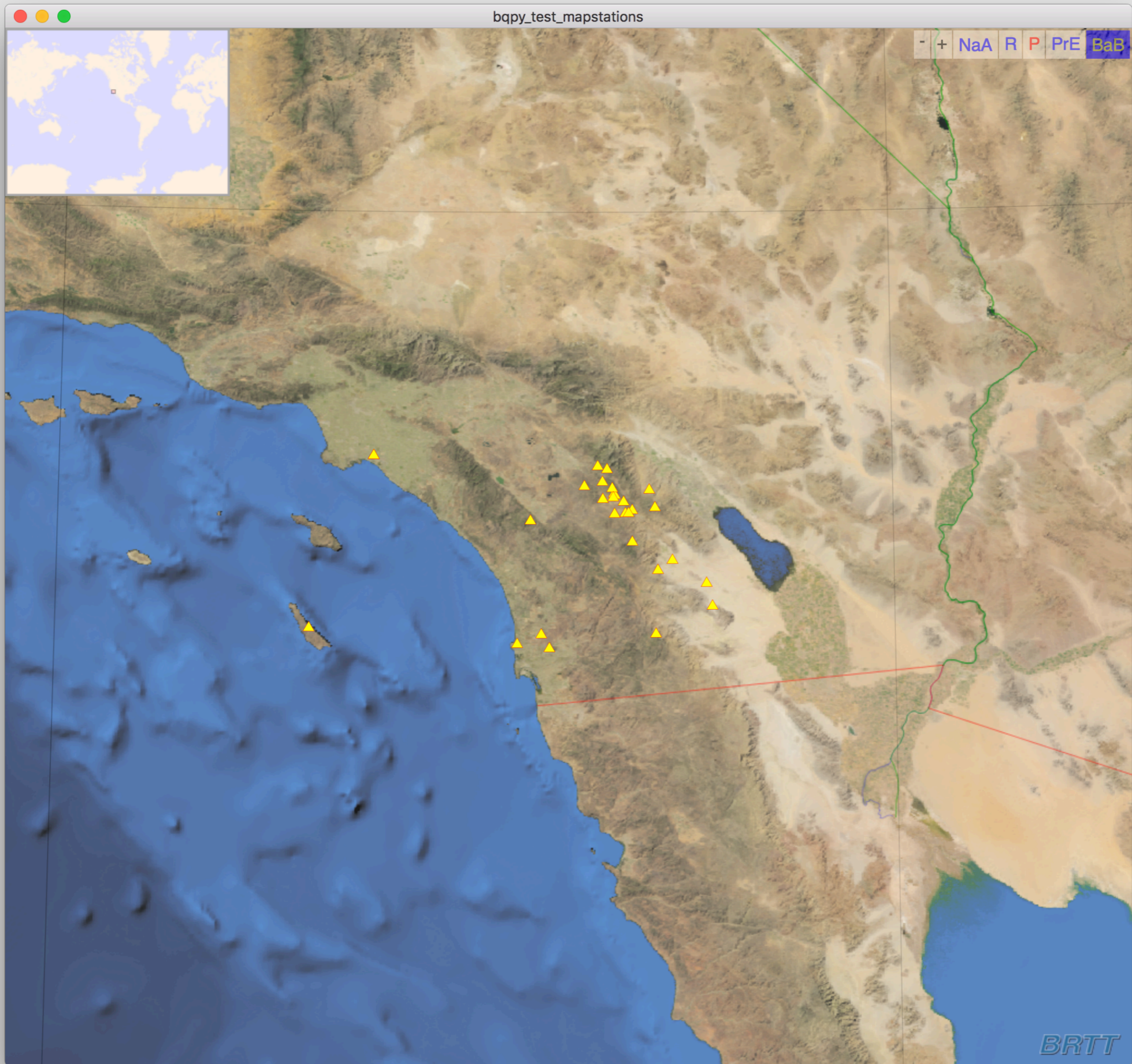
column 0 ▲	column 1	column 2	column 3	column 4	column 5	column 6	column 7	column 8
000X000	000X001	000X002	000X003	000X004	000X005	000X006	000X007	000X008
001X000	001X001	001X002	001X003	001X004	001X005	001X006	001X007	001X008
002X000	002X001	002X002	002X003	002X004	002X005	002X006	002X007	002X008
003X000	003X001	003X002	003X003	003X004	003X005	003X006	003X007	003X008
004X000	004X001	004X002	004X003	004X004	004X005	004X006	004X007	004X008
005X000	005X001	005X002	005X003	005X004	005X005	005X006	005X007	005X008
006X000	006X001	006X002	006X003	006X004	006X005	006X006	006X007	006X008
007X000	007X001	007X002	007X003	007X004	007X005	007X006	007X007	007X008
008X000	008X001	008X002	008X003	008X004	008X005	008X006	008X007	008X008
009X000	009X001	009X002	009X003	009X004	009X005	009X006	009X007	009X008
010X000	010X001	010X002	010X003	010X004	010X005	010X006	010X007	010X008

orid ▼	evid	ml	auth	time	latitude	longitude	depth	ndef	n
39	17	2.42	UCSD:rtMl	2016013 01/13 12:01:04.027	32.7769	-115.8205	22.35	31	
38	17		USGS:ci	2016013 01/13 12:01:04.330	32.7000	-115.8003	10.99	58	
37	16	2.31	UCSD:rtMl	2016013 01/13 06:53:54.111	34.6289	-116.2552	0.00	34	
36	16		USGS:ci	2016013 01/13 06:53:53.230	34.6907	-116.2408	1.42	50	
35	21	2.22	UCSD:rtMl	2016013 01/13 16:50:13.915	34.5962	-116.2674	5.20	28	
34	21		USGS:ci	2016013 01/13 16:50:11.870	34.6950	-116.2373	1.83	29	
33	20		USGS:ci	2016013 01/13 16:03:19.630	33.9283	-116.9580	13.52	60	
32	20	1.14	UCSD:rtMl	2016013 01/13 16:03:18.895	33.8651	-116.9679	27.46	29	
31	19		USGS:ci	2016013 01/13 13:37:05.880	33.4723	-116.4090	5.67	61	
30	19		UCSD:rt	2016013 01/13 13:37:05.520	33.4818	-116.3940	7.22	36	
29	18		USGS:ci	2016013 01/13 12:05:15.000	32.7142	-115.8113	6.66	46	
28	18	2.05	UCSD:rtMl	2016013 01/13 12:05:13.124	32.7010	-115.7925	17.89	31	
27	18	2.05	UCSD:rtMl	2016013 01/13 12:05:12.710	32.6990	-115.7656	15.06	31	
26	5	-0.05	UCSD:rtMl	2016013 01/13 06:06:40.366	33.5355	-116.4824	9.89	20	
25	5	-0.03	UCSD:rtMl	2016013 01/13 06:06:40.333	33.5321	-116.4673	7.07	20	

Python `bqplot` module in 5.7

- Extensive high-level python classes to interface with new `bqplot` c++ library, graphics extension widgets
 - `Viewport` – make a `bqplot BQViewport` item.
 - `Axes` – make a `bqplot BQAxes` item.
 - `Text` – make a `bqplot BQText` item.
 - `Textpopup` – make a `bqplot BQTextPopup` item.
 - `Polyline` – make a `bqplot BQPolyline` item.
 - `Polypoint` – make a `bqplot BQPolypoint` item.
 - `Taskbar` – make a `bqplot BQTaskbar` item.
 - `Map` – make a `bqplot BQMap` item.
 - `Mapevents` – make a `bqplot BQMapevents` item.





Python `bqplot` module in 5.7

- Access to print output and native print dialog windows.
- Print output from top level windows or any frame.
- Print output to a printer or to a pdf file.
- Either print rendering to an image or to pdf vector primitives.

Print

Printer: Canon MX880 series_8D1E849D4689

Presets: Default Settings

Copies:

Pages: All
 From: to:

Layout

Pages per Sheet:

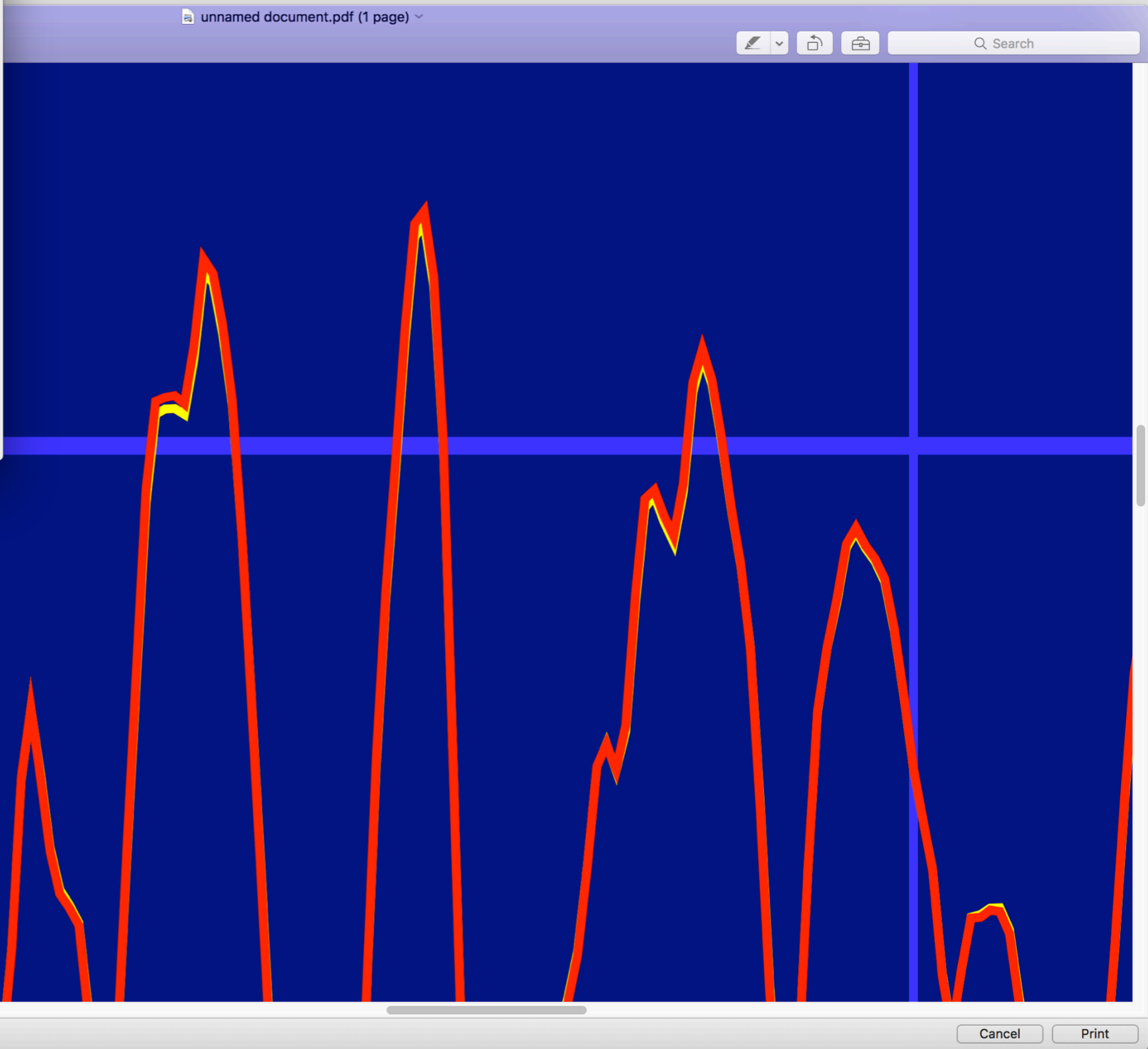
Layout Direction:

Border: None

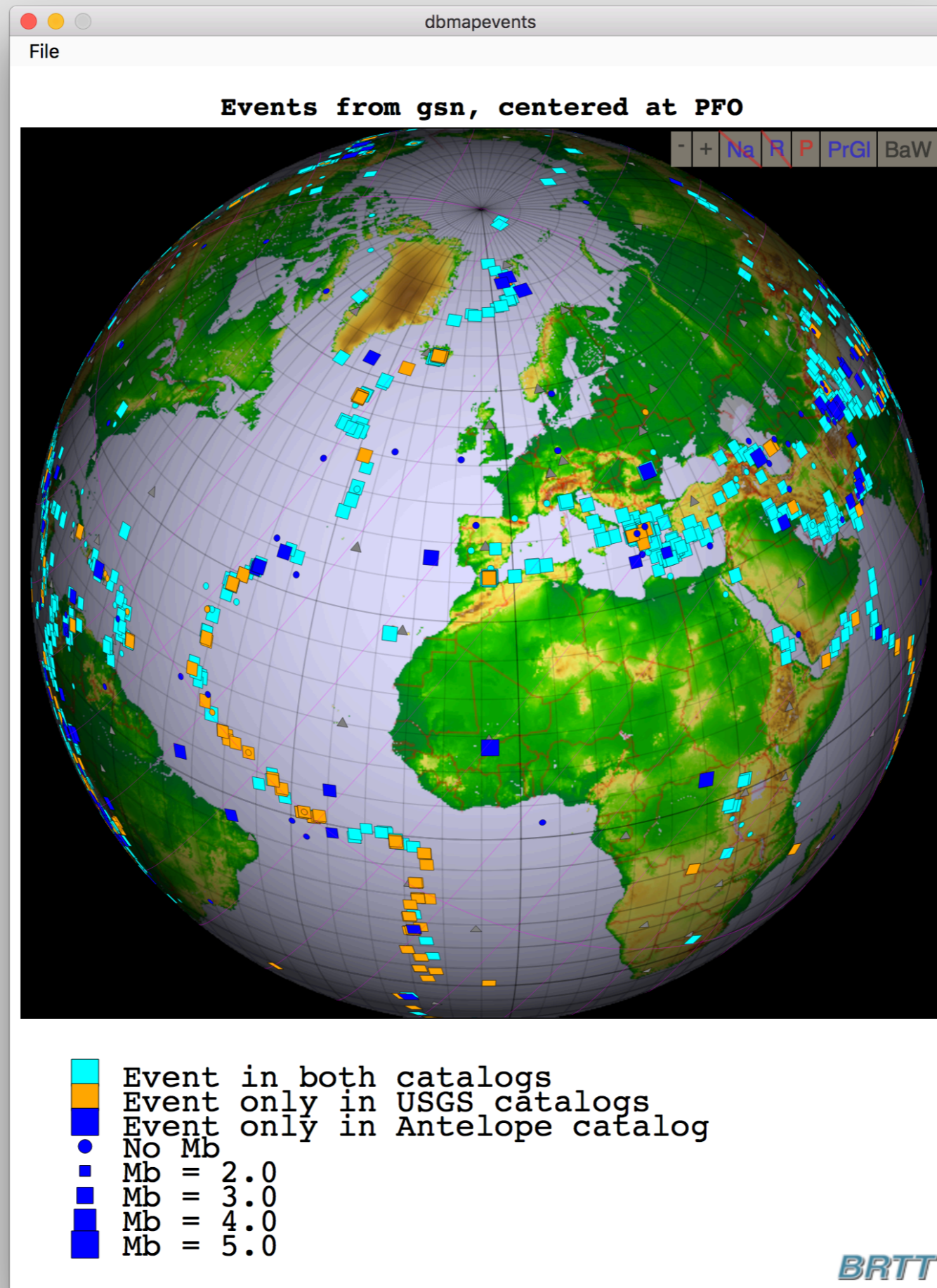
Two-Sided: Off

Reverse page orientation
 Flip horizontally

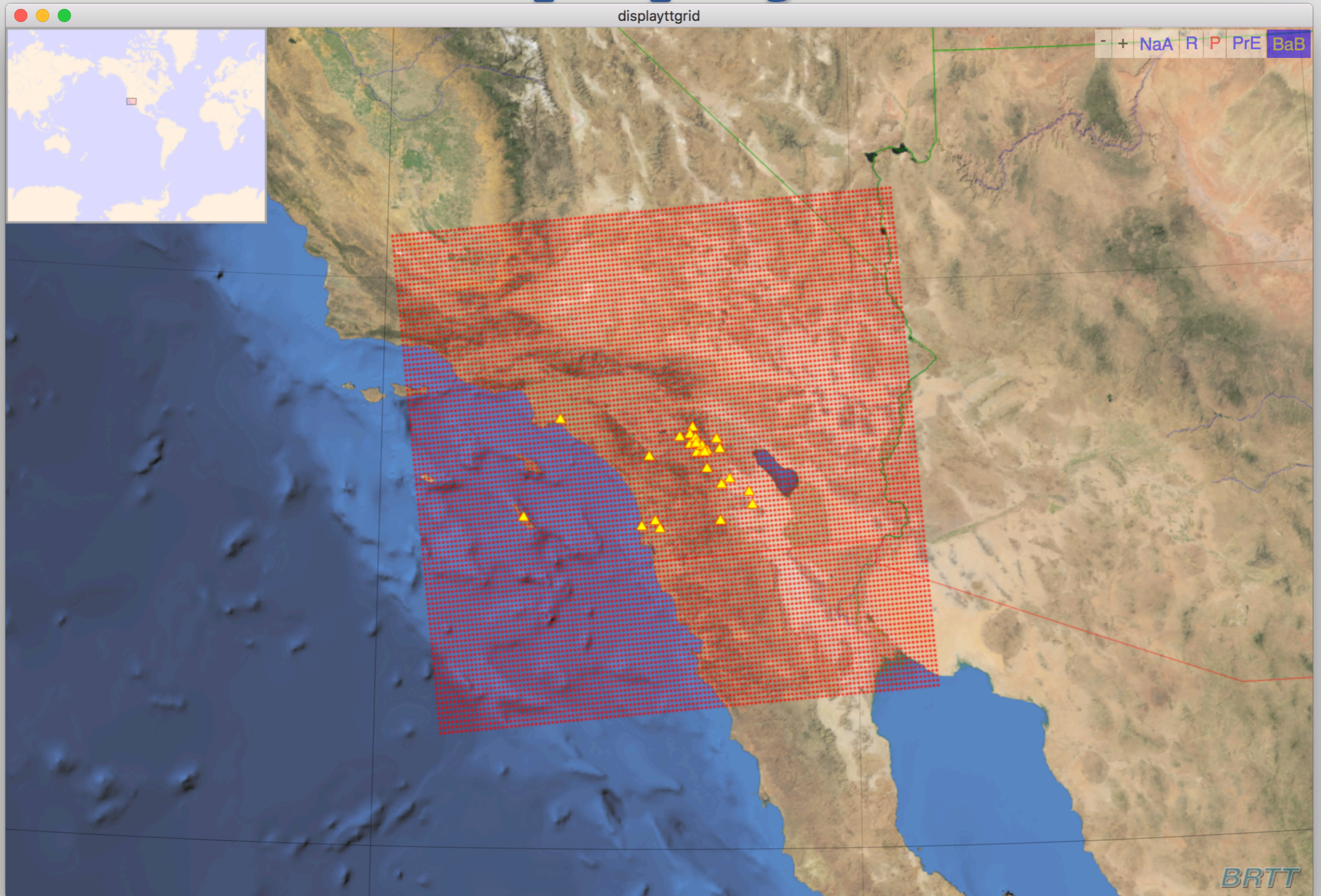
? PDF Hide Details Cancel Print



dbmapevents

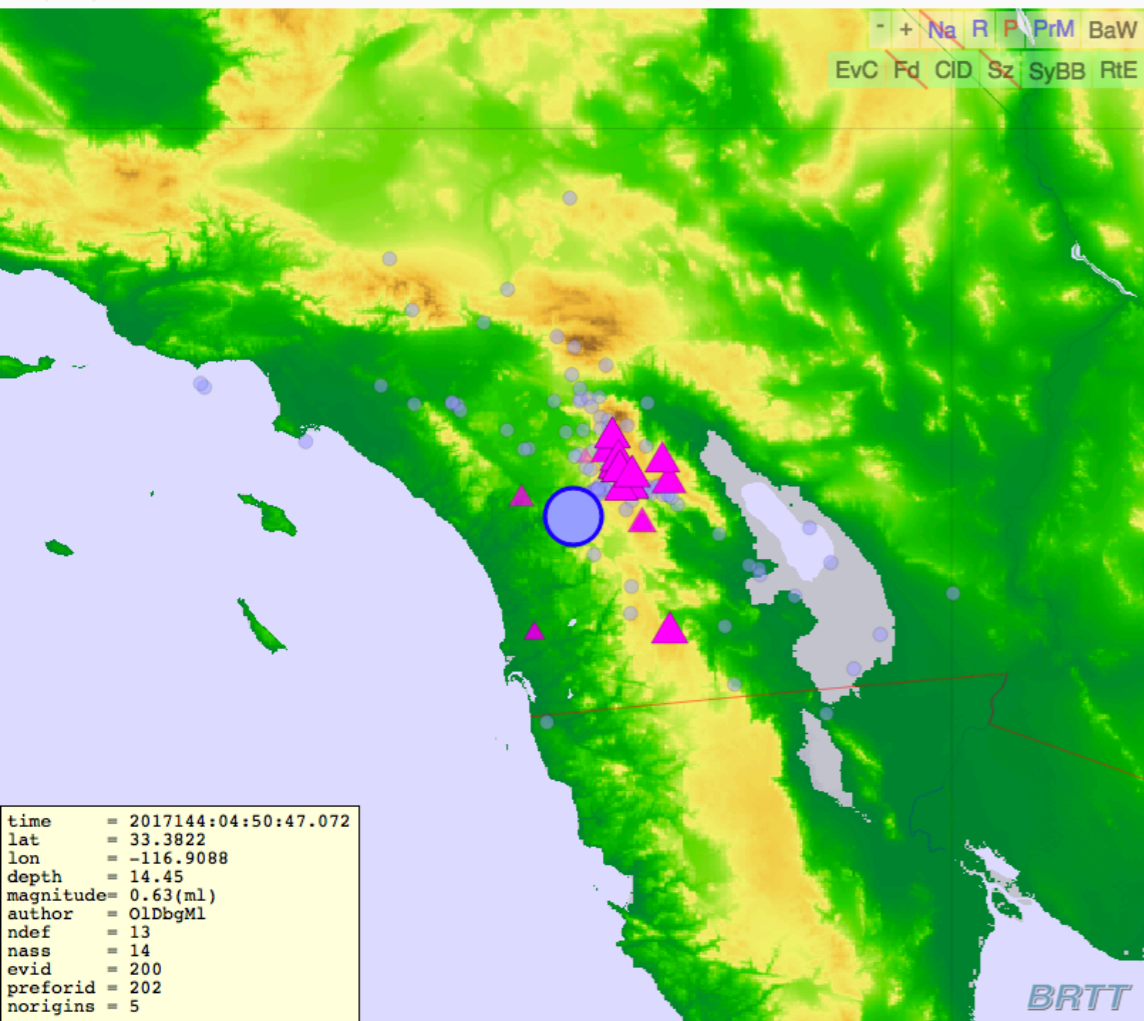


displayttgrid



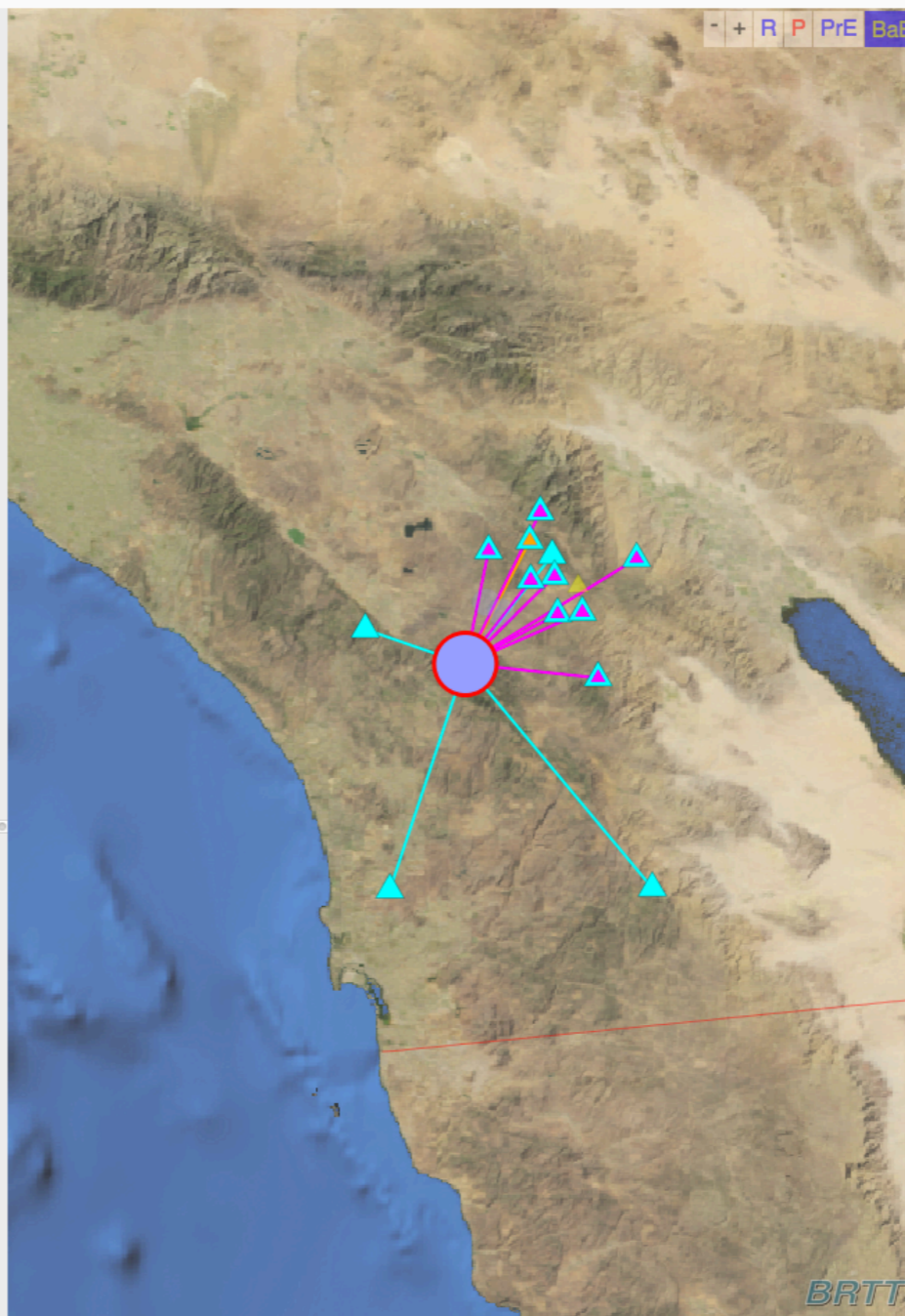
dbevents

File View



```
time = 2017144:04:50:47.072
lat = 33.3822
lon = -116.9088
depth = 14.45
magnitude = 0.63(ml)
author = OldbgMl
ndef = 13
nass = 14
evid = 200
preforid = 202
norigins = 5
```

evid	magnitude	auth	time	region	latitude	longitude	depth
217		Ot	2017144 05/24 11:06:58.837	GILBERT ISLANDS, K...	1.9508	176.1677	30.00
215	1.52(ml)	OldbgMl	2017144 05/24 10:27:09.621	SOUTHERN CALIFORNIA	34.1944	-117.3619	14.92
214	1.02(ml)	USGS:ci	2017144 05/24 09:20:59.150	SOUTHERN CALIFORNIA	33.9775	-116.9172	4.43
208	0.28(ml)	OldbgMl	2017144 05/24 07:42:42.798	SOUTHERN CALIFORNIA	33.3455	-116.8501	11.88
206	1.75(ml)	USGS:ci	2017144 05/24 05:20:16.970	SOUTHERN CALIFORNIA	33.9245	-118.7703	9.11
207	1.74(ml)	USGS:ci	2017144 05/24 05:20:16.940	SOUTHERN CALIFORNIA	33.9407	-118.7900	11.27
200	0.63(ml)	OldbgMl	2017144 05/24 04:50:47.072	SOUTHERN CALIFORNIA	33.3822	-116.9088	14.45
196	0.99(ml)	OldbgMl	2017144 05/24 02:55:30.825	SOUTHERN CALIFORNIA	34.0174	-116.7445	15.00
194	1.46(ml)	USGS:ci	2017144 05/24 00:06:36.300	SOUTHERN CALIFORNIA	33.6447	-116.8800	29.63
195	1.83(ml)	USGS:ci	2017144 05/24 00:06:35.730	SOUTHERN CALIFORNIA	33.6348	-116.9030	34.27
192	-0.02(ml)	OldbgMl	2017143 05/23 23:06:17.617	SOUTHERN CALIFORNIA	33.5006	-116.7840	6.93
190		OldbgMl	2017143 05/23 21:27:31.676	SOUTHERN CALIFORNIA	33.6325	-116.7192	14.59
189		OldbgMl	2017143 05/23 20:26:01.798	SOUTHERN CALIFORNIA	33.5792	-116.8214	8.08
45	0.95(ml)	USGS:ci	2017143 05/23 19:01:45.660	SOUTHERN CALIFORNIA	33.8628	-117.5215	-0.54
42	1.36(ml)	OldbgMl	2017143 05/23 17:56:54.623	SOUTHERN CALIFORNIA	33.7547	-116.7281	15.00
41	1.33(ml)	USGS:ci	2017143 05/23 17:30:23.710	SOUTHERN CALIFORNIA	33.1875	-115.6097	2.06
43	1.37(ml)	USGS:ci	2017143 05/23 17:18:13.180	SOUTHERN CALIFORNIA	33.8265	-117.4773	-0.52
186		OldbgMl	2017143 05/23 15:48:12.264	SOUTHERN CALIFORNIA	33.7510	-116.7714	15.00
40	1.18(ml)	OldbgMl	2017143 05/23 15:03:42.078	CALIF.-BAJA CALIF. ...	32.9185	-116.1444	1.04
39	1.42(ml)	USGS:ci	2017143 05/23 15:03:03.190	SOUTHERN CALIFORNIA	33.3345	-115.7173	5.48
184	1.31(ml)	OldbgMl	2017143 05/23 14:31:34.374	SOUTHERN CALIFORNIA	33.0457	-115.7920	15.00
183	0.09(ml)	OldbgMl	2017143 05/23 12:55:55.296	SOUTHERN CALIFORNIA	33.4800	-116.7797	2.52
33	1.33(ml)	OldbgMl	2017143 05/23 12:46:17.714	SOUTHERN CALIFORNIA	33.8650	-116.8768	15.00
180		OldbgMl	2017143 05/23 12:02:17.596	SOUTHERN CALIFORNIA	33.8435	-116.8182	14.42
178	0.24(ml)	OldbgMl	2017143 05/23 11:45:05.184	SOUTHERN CALIFORNIA	33.4102	-116.6432	1.03
177		OldbgMl	2017143 05/23 11:08:12.905	SOUTHERN CALIFORNIA	33.7648	-116.6385	4.13
34	1.09(ml)	OldbgMl	2017143 05/23 11:05:33.105	SOUTHERN CALIFORNIA	33.8762	-116.8751	15.00
173		OldbgMl	2017143 05/23 11:00:23.780	SOUTHERN CALIFORNIA	33.6564	-116.6889	14.99



orid	latency	auth	magnitude	time	latitude	longitude	depth	ndef	nass	origin_row
200	12.446 seconds	OldbgMl		2017144 05/24 04:50:47.122	33.3610	-116.9364	0.00	7	7	198
201	19.335 seconds	OldbgMl	0.67(ml)	2017144 05/24 04:50:46.962	33.3753	-116.9230	12.77	12	13	199
202	26.255 seconds	OldbgMl	0.63(ml)	2017144 05/24 04:50:47.072	33.3822	-116.9088	14.45	13	14	200
204	2:04 minutes	USGS:ci	1.10(ml)	2017144 05/24 04:50:44.220	33.5170	-116.8542	25.20	30	13	201
205	3:47 minutes	USGS:ci	0.96(ml)	2017144 05/24 04:50:44.100	33.4952	-116.8153	26.80	15	13	202

Python `bqplot` module in 5.7

- Extensive documentation in `pythonbqplot` man page (91 pages long) with many examples

Future Development

- Add more Qt widgets
- Extended waveform graphics