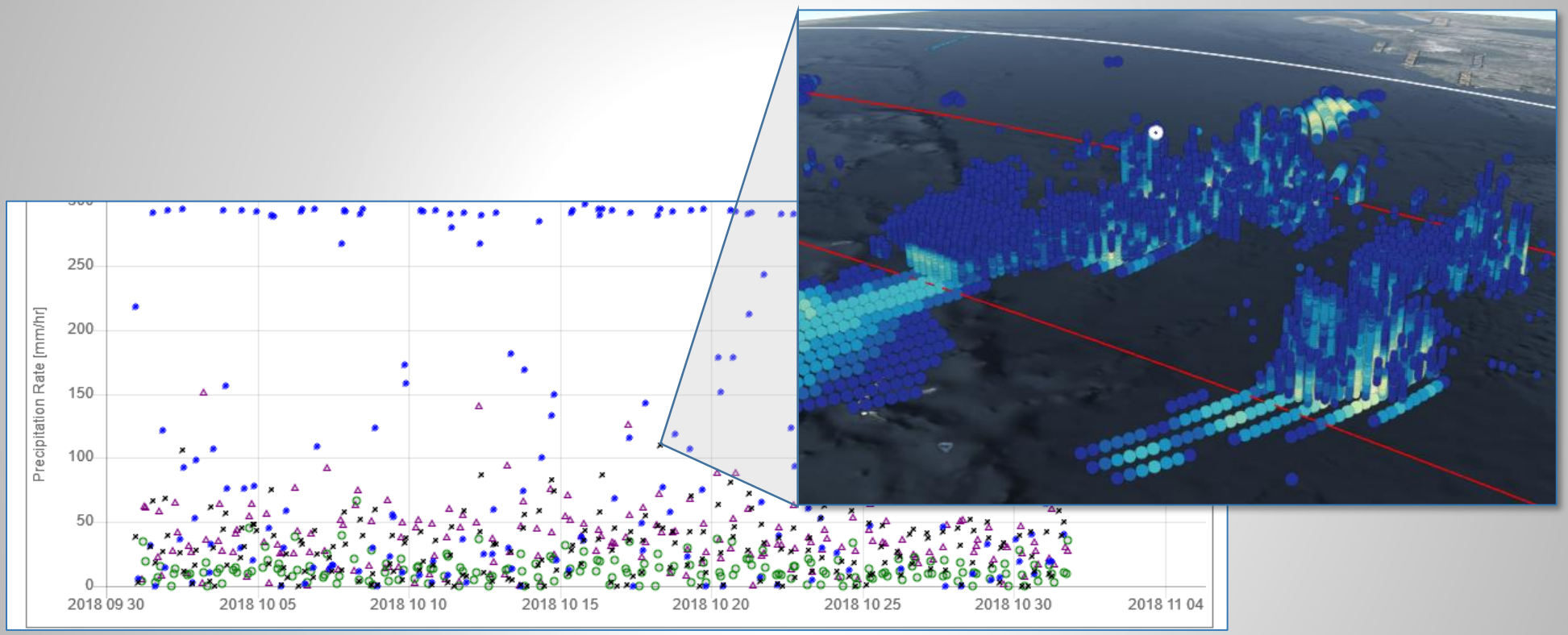
Integrating Complementary Visualizations Within a Data Order Interface



January 9, 2019

Matt Lammers (matthew.r.lammers@nasa.gov)
Senior Science Data Visualization Analyst & Software Engineer
NASA Goddard Space Flight Center / KBRwyle

STORM

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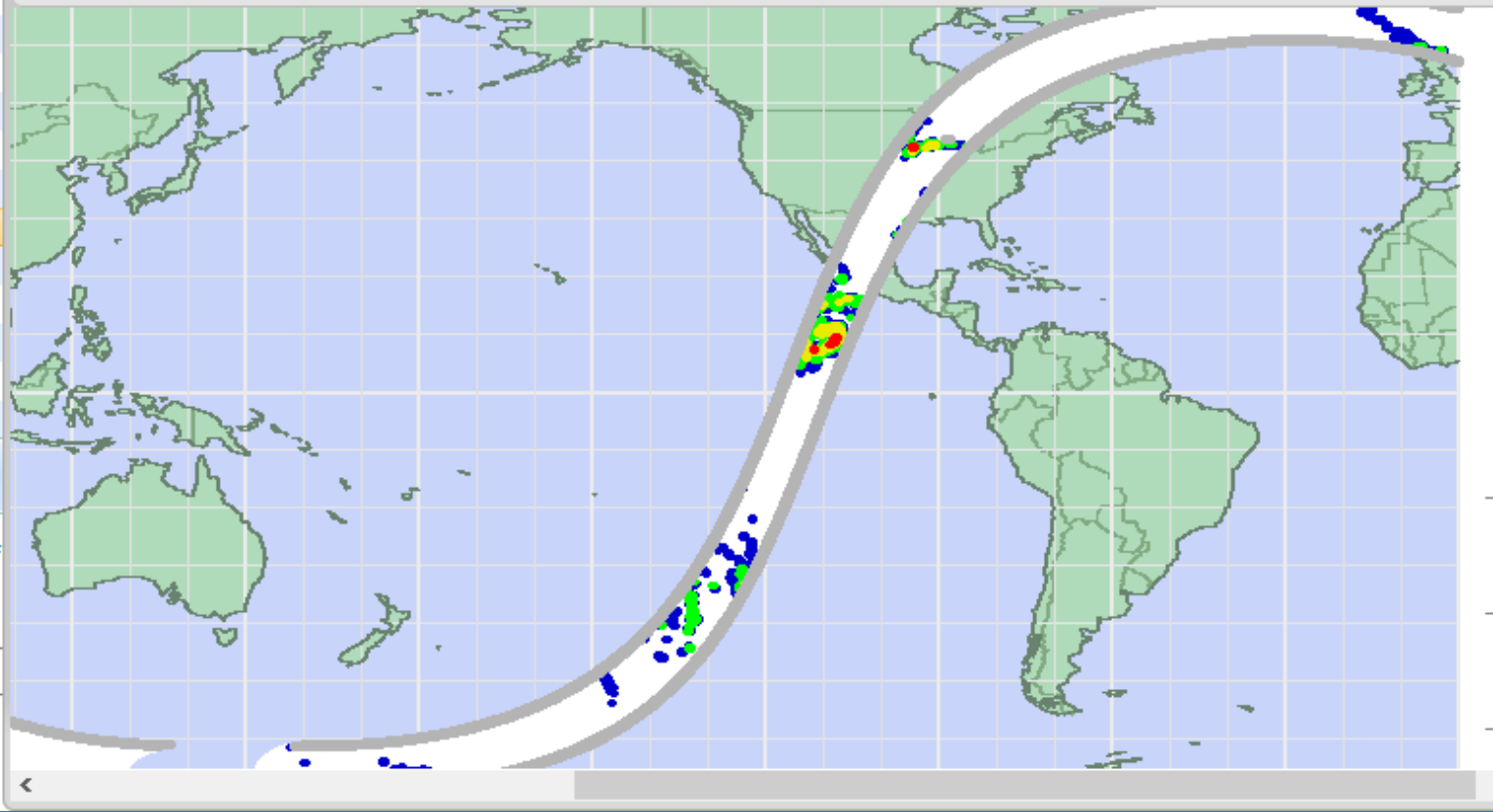
Left click on the header to sort columns. Right click to view additional info (file name, satellite, instrument, format and version).

Select	Data Type	Algorithm	Download / View	Start Time	Stop Time	Orbit #	Format
☐	2A	2AGPROFG	THOR	2018-09-30 22:49:26	2018-10-01 00:22:00	26078	hdf5
☐	2A	2AGPROFG	THOR	2018-10-01 00:22:01	2018-10-01 01:54:35	26079	hdf5
☐	2A	2AGPROFG	THOR	2018-10-01 01:54:36	2018-10-01 03:27:10	26080	hdf5
☐	2A	2AGPROFG					
☐	2A	2AGPROFG					
☑	2A	2AGPROFG					
☐	2A	2AGPROFG					
☑	2A	2AGPROFG					
☐	2A	2AGPROFG					
☐	2A	2AGPROFG					
☑	2A	2AGPROFG					
☐	2A	2AGPROFG					
☐	2A	2AGPROFG					
☐	2A	2AGPROFG					
☐	2A	2AGPROFG					
☐	2A	2AGPROFG					

Total Granules selected: 3

1 2 — Records from 1 to 16 of

View Browse File for granule 2A.GPM.GMI.GPROF2017v1.20181001-S141517-E154751.026...



Script Type

Select a script type to help access data

Why Swath-Based Analysis Tool?

- Users wanted to explore Level 2 swath products
  - Goddard Profiling Algorithm (GPROF)
    - TMI, GMI, AMSR2, ATMS, MHS, AMSRE, AMSUB, SSMI/S
  - Precipitation Radars
    - TRMM PR, GPM DPR
  - Combined Algorithm
    - TRMM Combined, GPM Combined

- Initially envisioned as a chart tool displaying statistics gathered from geographic regions of swaths

- Evolved to include connections to THOROnline and STORM Virtual Globe, as well as ordering capabilities

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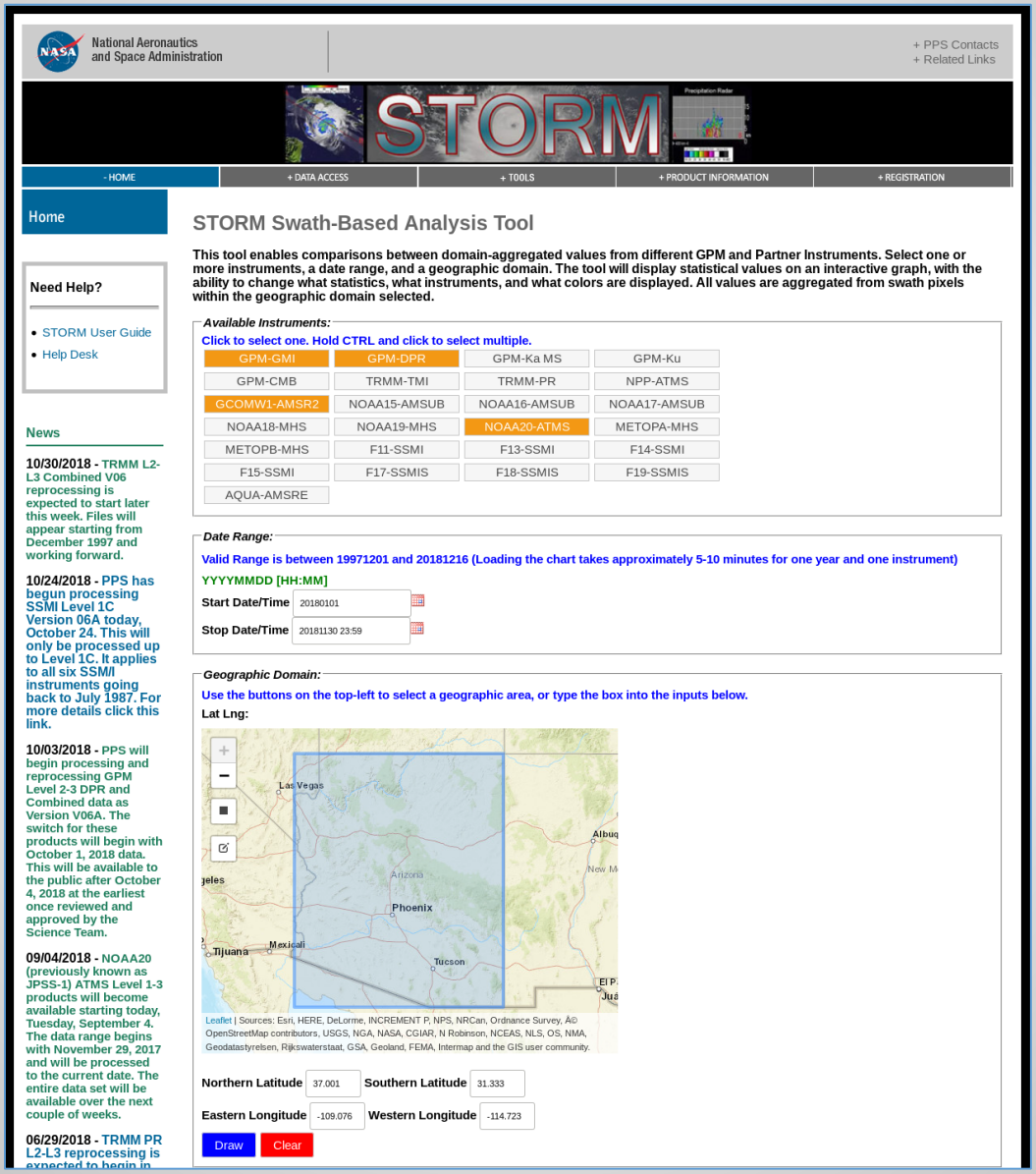
Instrument Select

Date/Time Range Select

Geographic Select

storm.pps.eosdis.nasa.gov/storm/Analysis.jsp



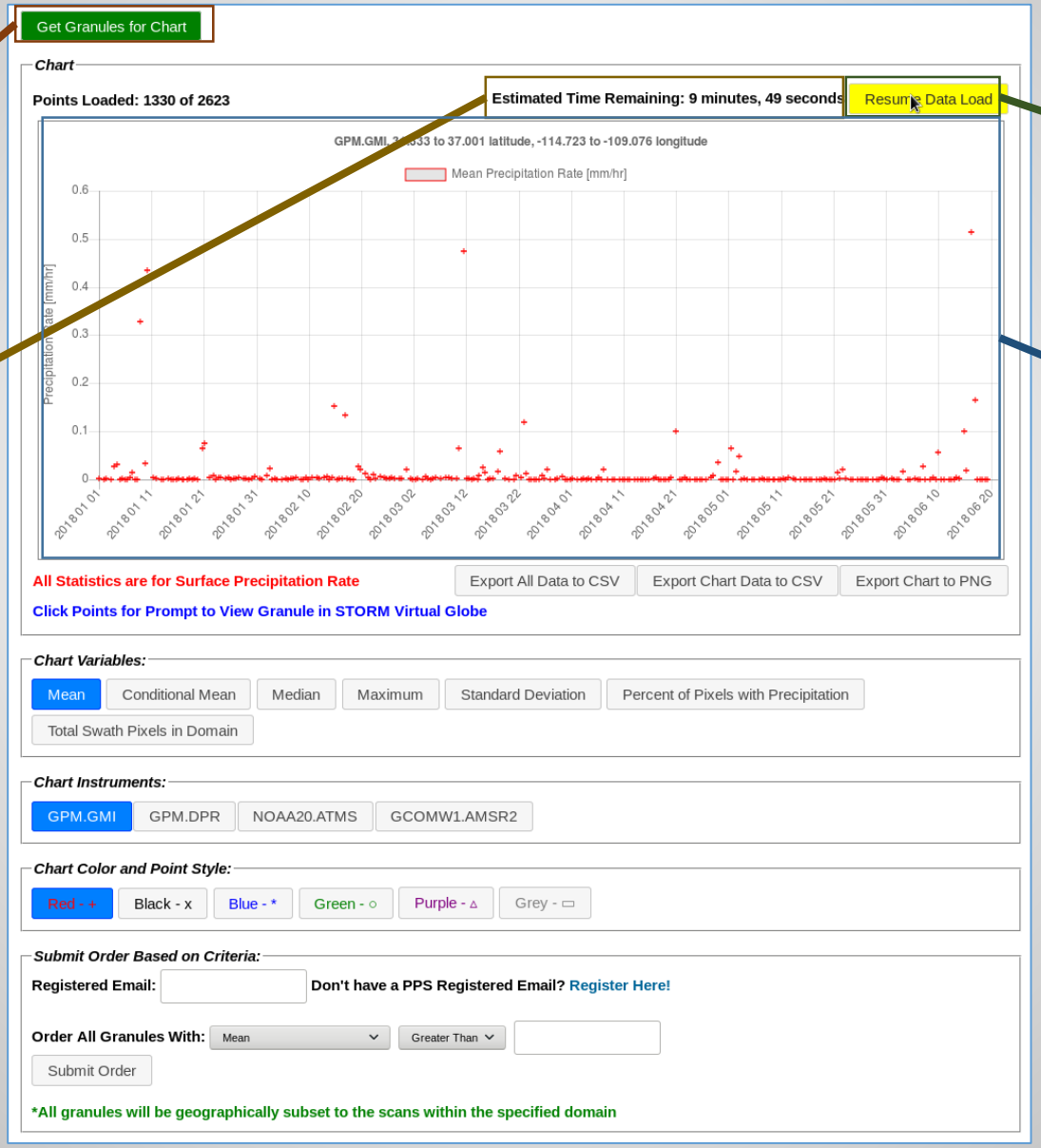
Visualization Tool 1: The Chart

Click the button to "Get Granules For Chart"

Time remaining updates

Click to pause Data Load

First Data Points have loaded for single instrument

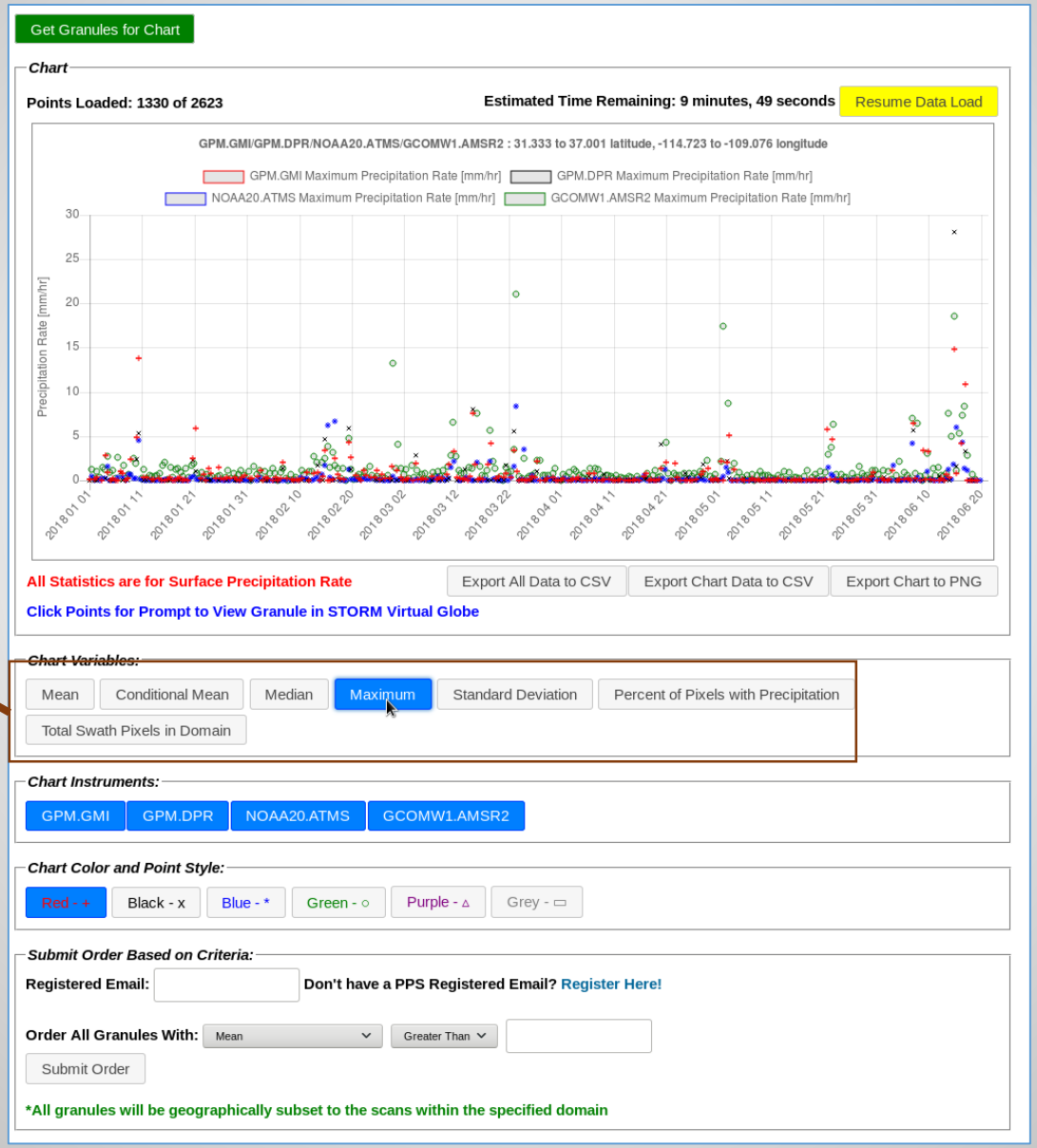


Visualization Tool 1: The Chart

Add more Instruments to the chart

Visualization Tool 1: The Chart

Choose between variables, which automatically updates the chart



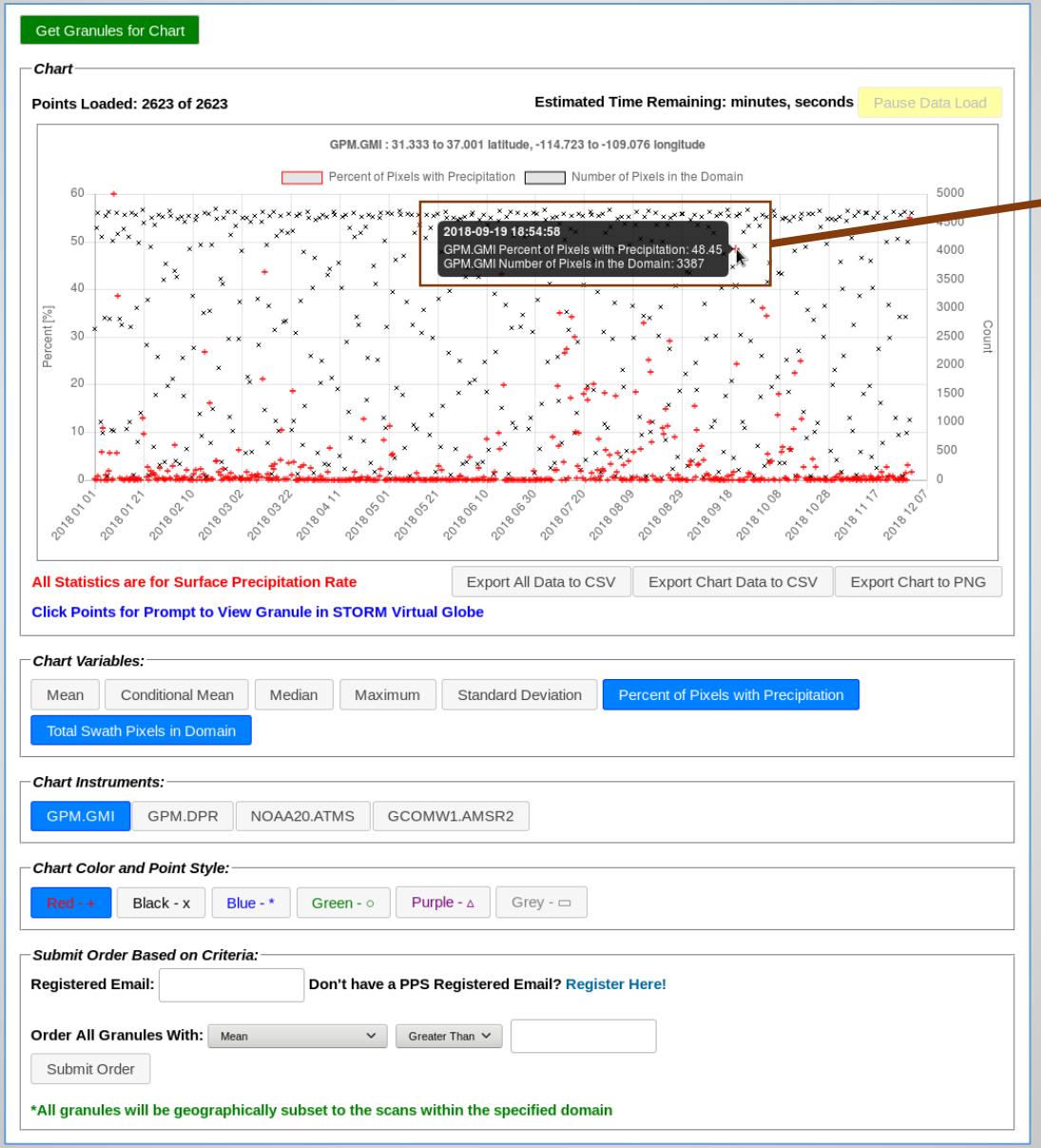
Visualization Tool 1: The Chart

Unpausing, we see the summer monsoon season in a spike in maximum rates

Visualization Tool 1: The Chart

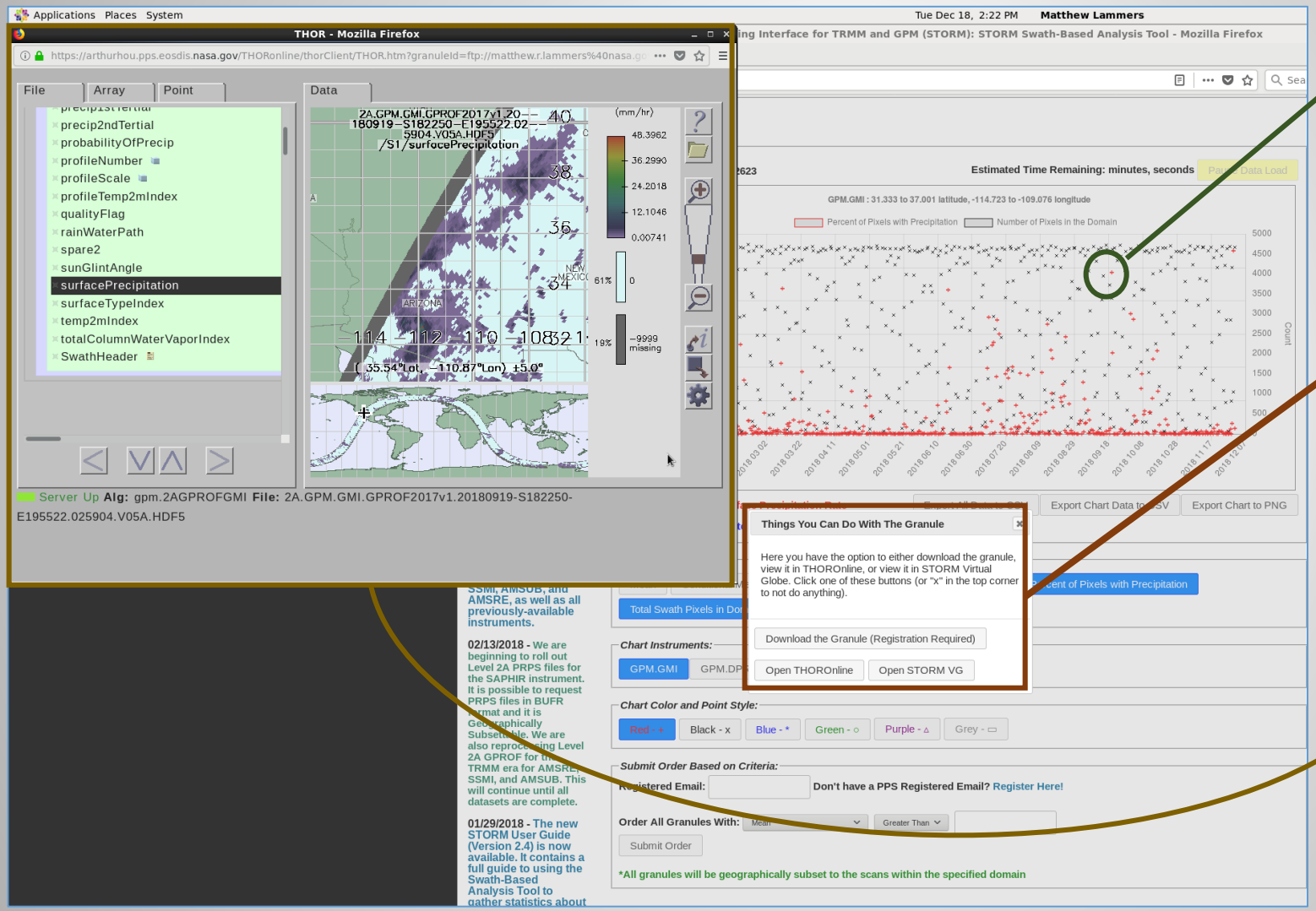
Focusing on a single instrument, GMI, we can now display multiple variables simultaneously

Visualization Tool 1: The Chart



You can mouse over the points in the chart to see the raw values.

Visualization Tool 2: THOROnline

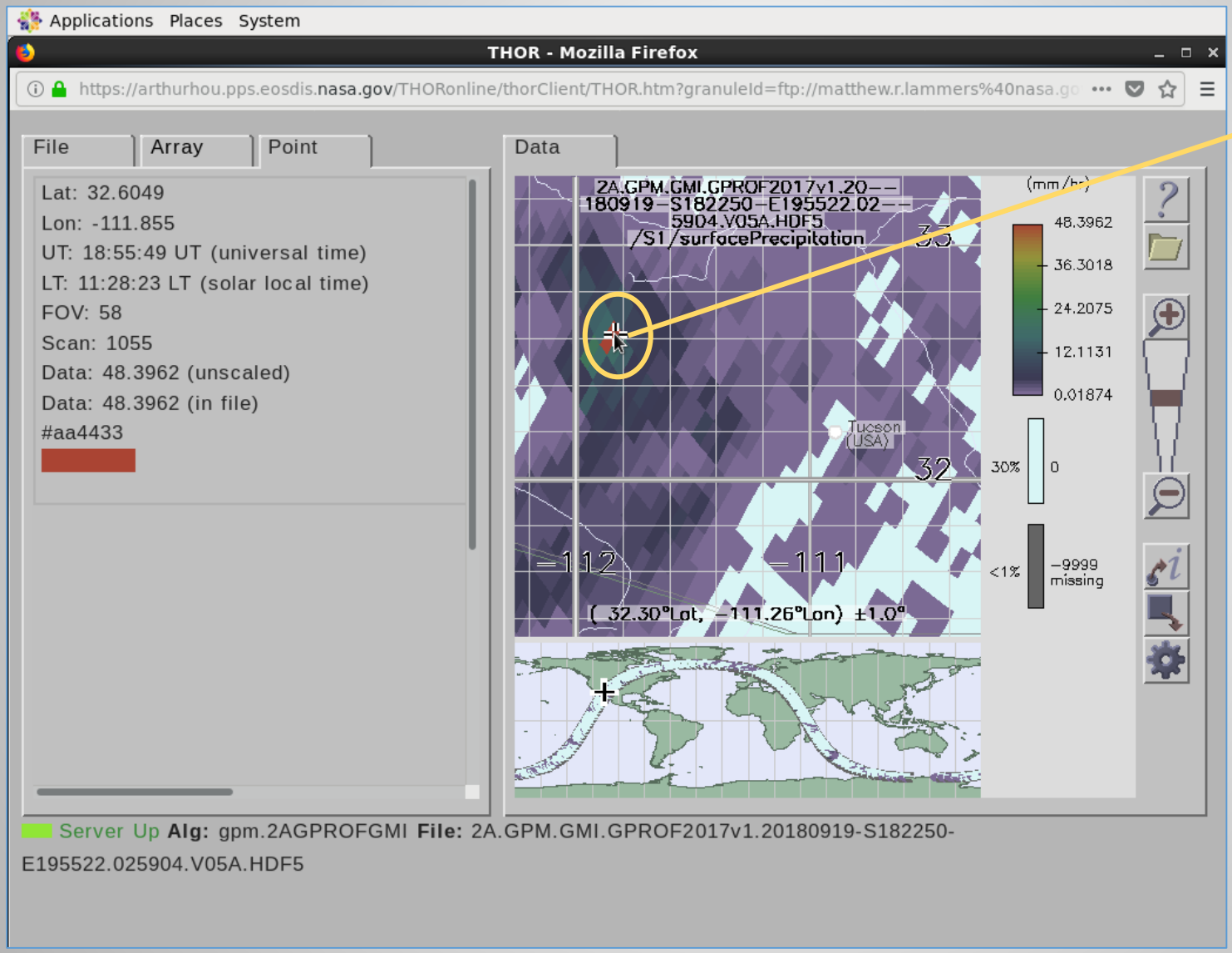


Clicking on this point pops up the "Things You Can Do With The Granule" box

These options include downloading the file, or visualizing it with two tools

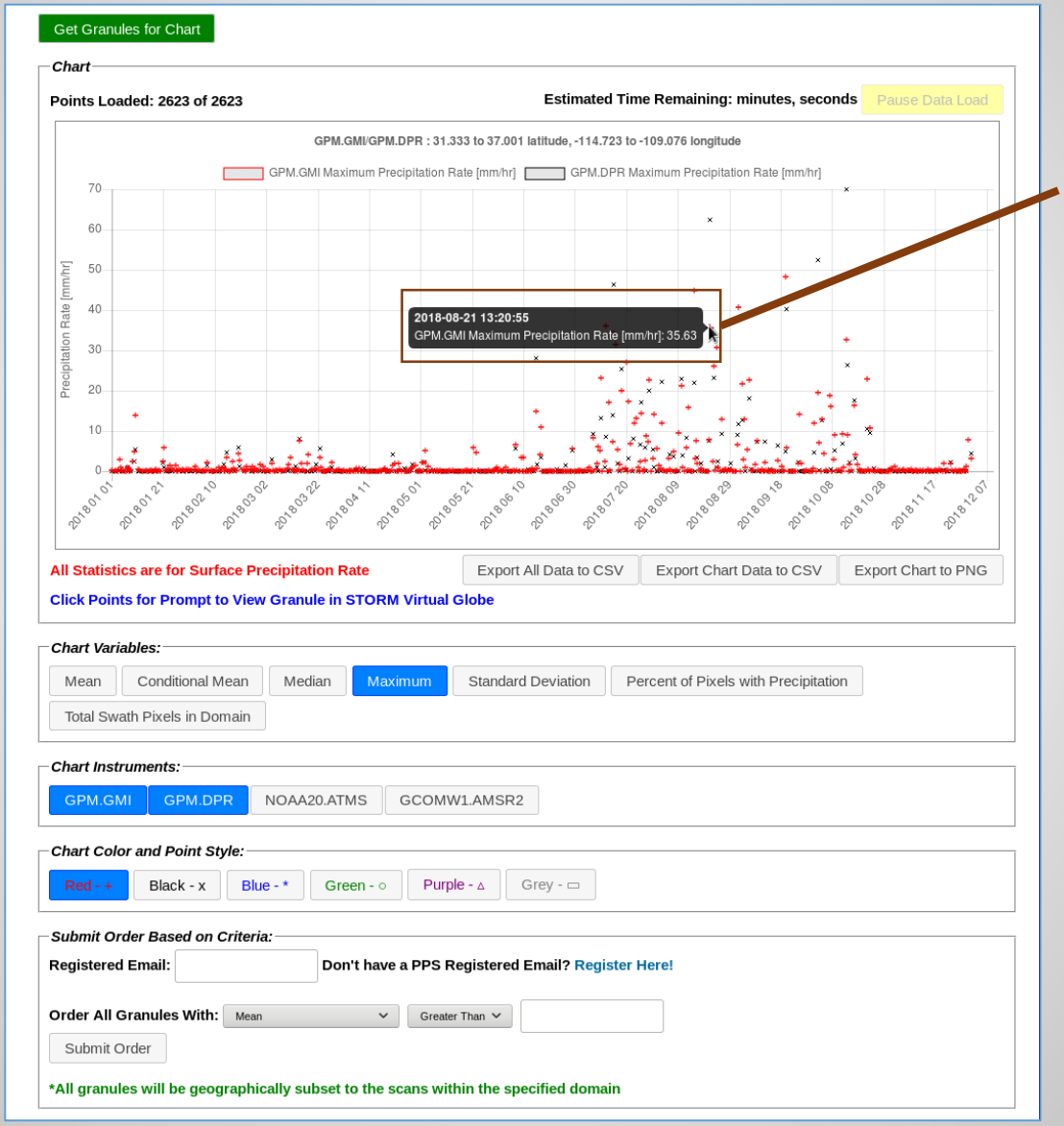
Here we have the THOROnline Window, where users explore all the variables in the file.

Visualization Tool 2: THOROnline



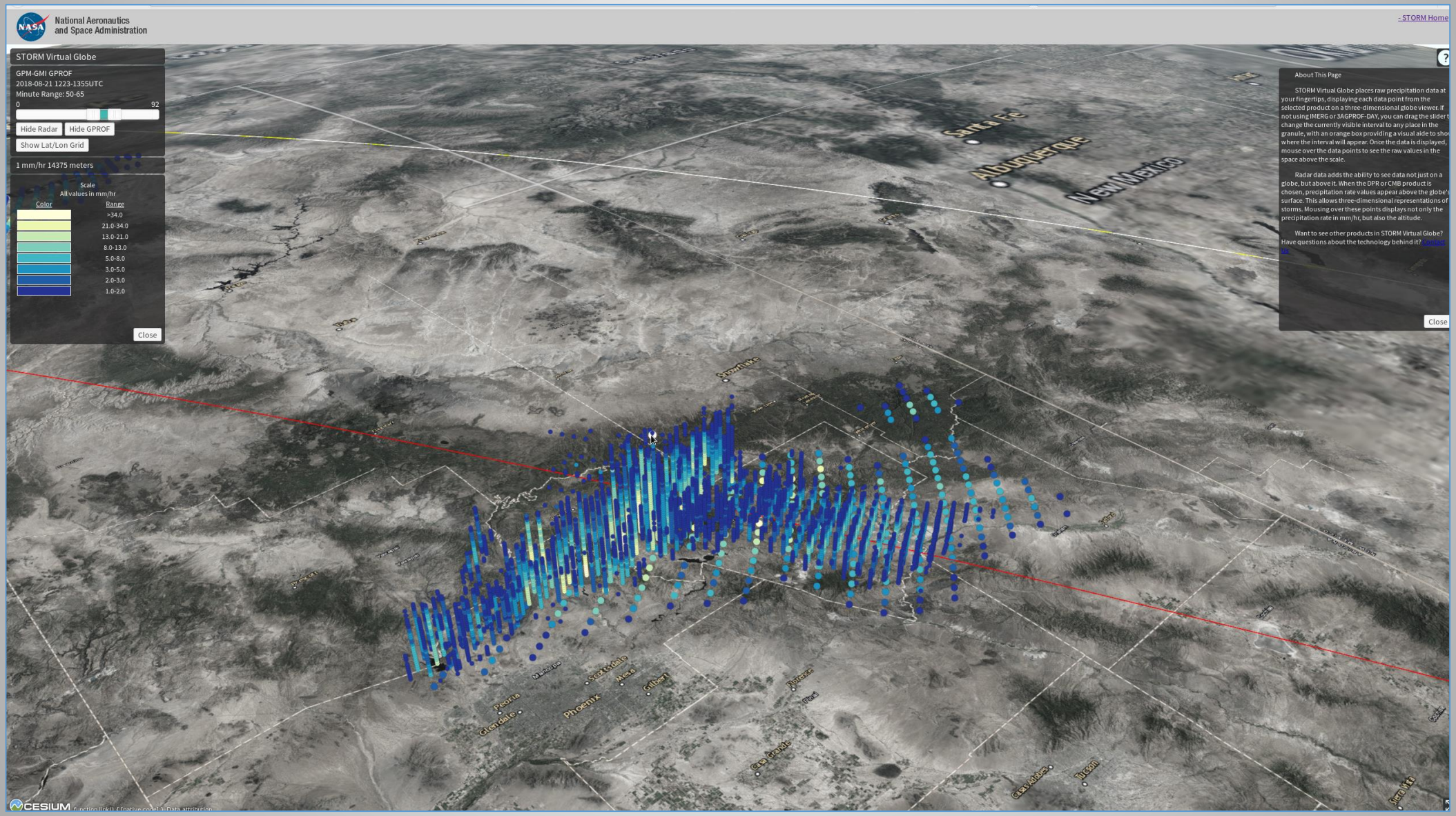
When we see a pixel of interest, we can use THOROnline to discover its actual value

Visualization Tool 3: STORM Virtual Globe

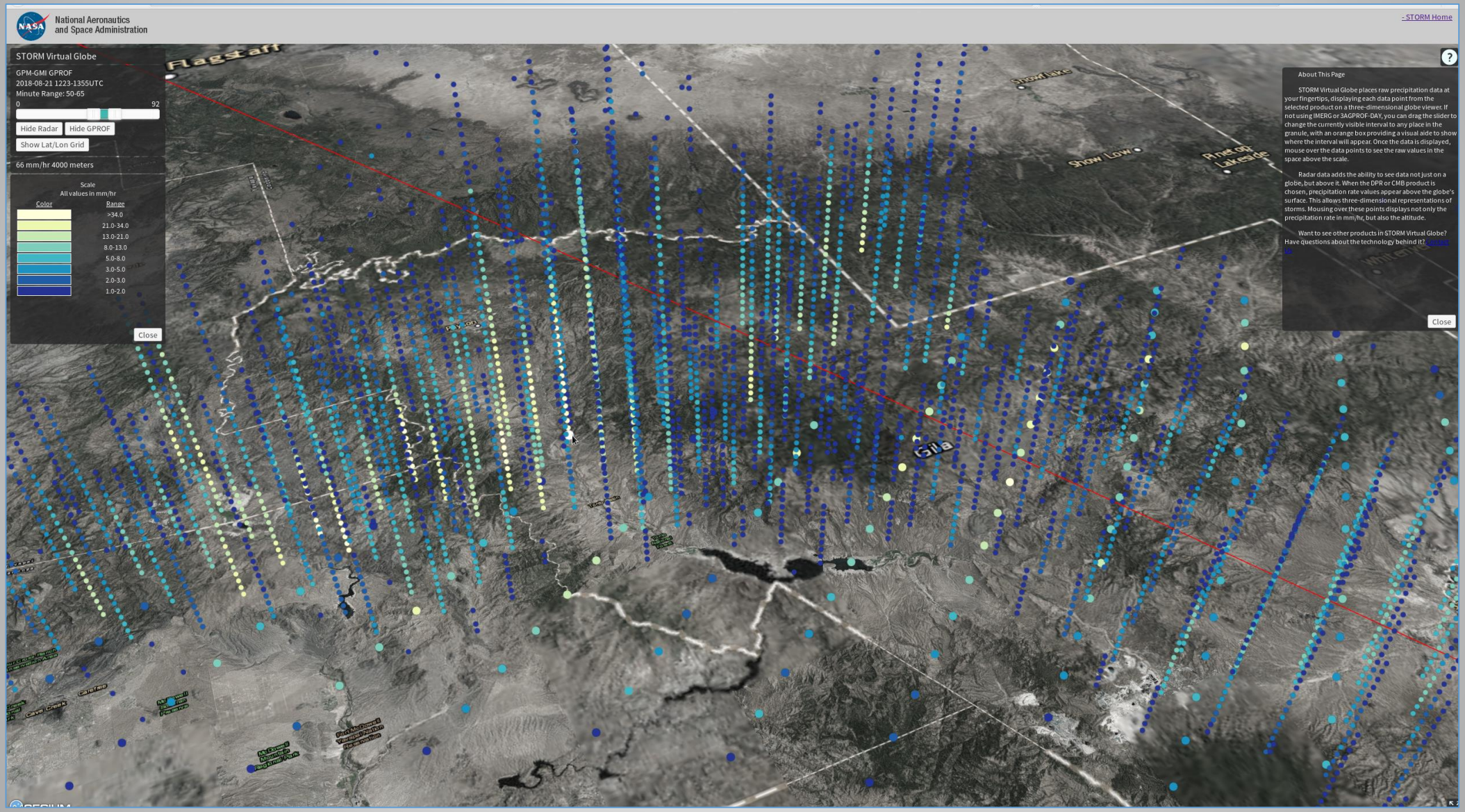


You can mouse over the points in the chart to see the raw values.

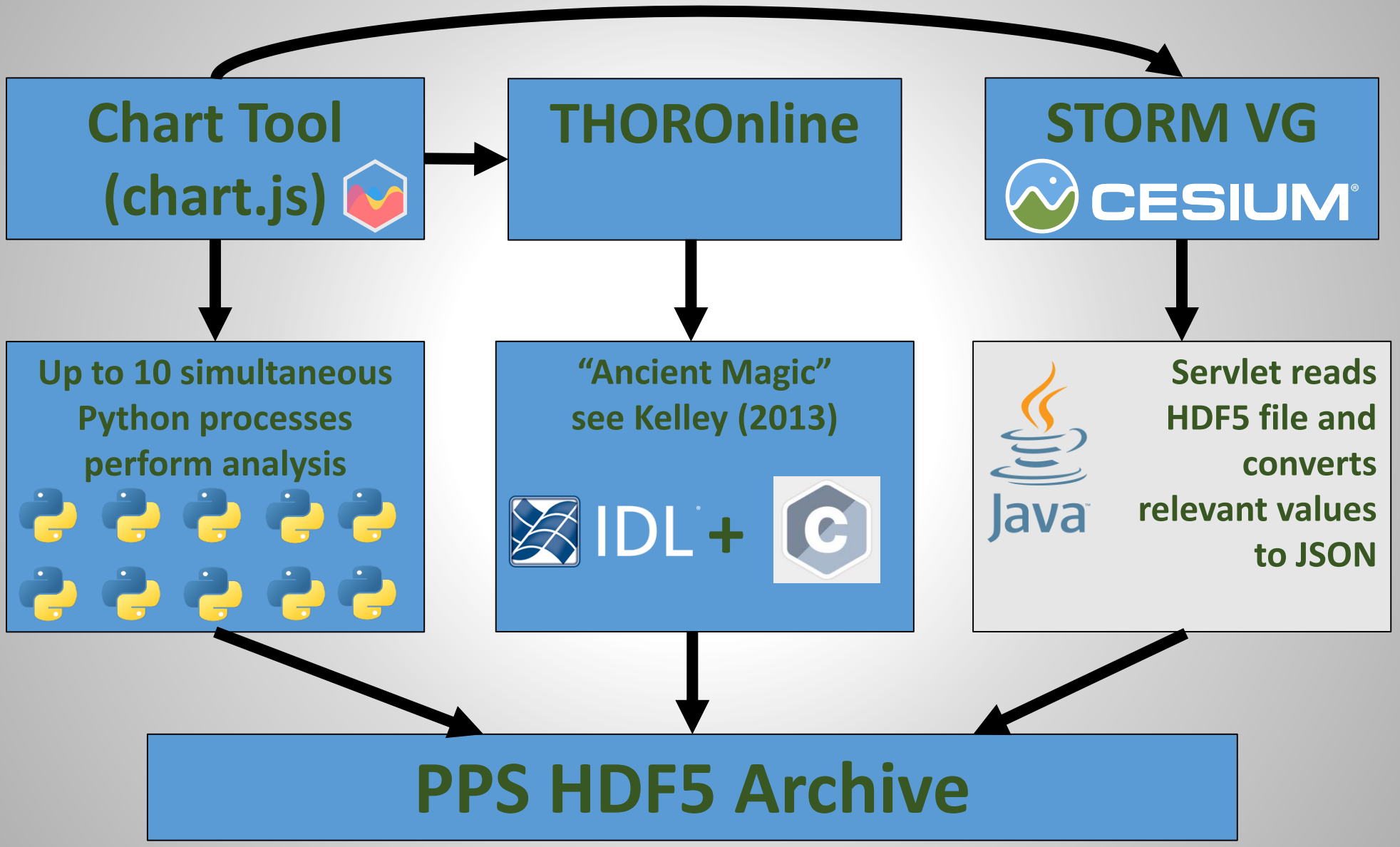
Visualization Tool 3: STORM Virtual Globe



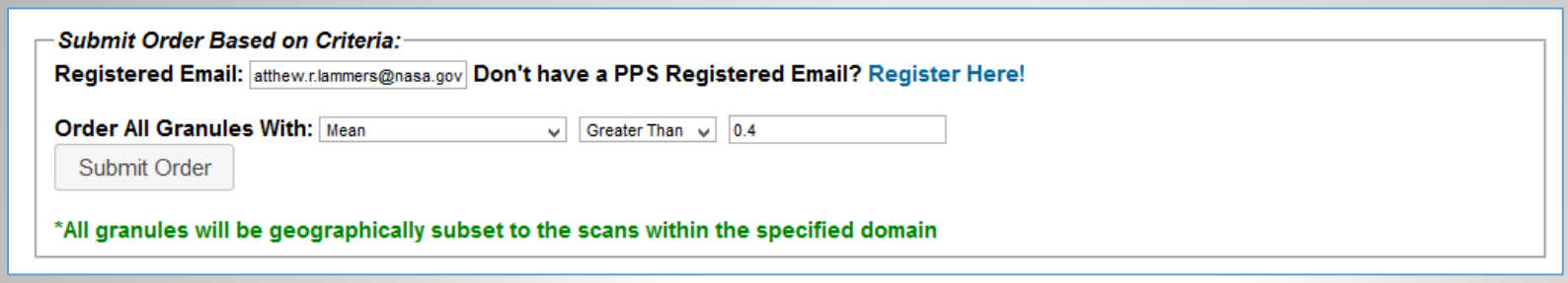
Visualization Tool 3: STORM Virtual Globe



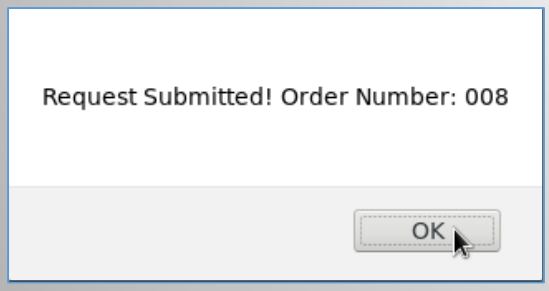
Technical Breakdown



Making an Order



At the bottom of the page, users can create a geographically-subset order for all files meeting a statistical threshold. Here we only want granules with mean precipitation rate greater than 0.4 (mm/hr).



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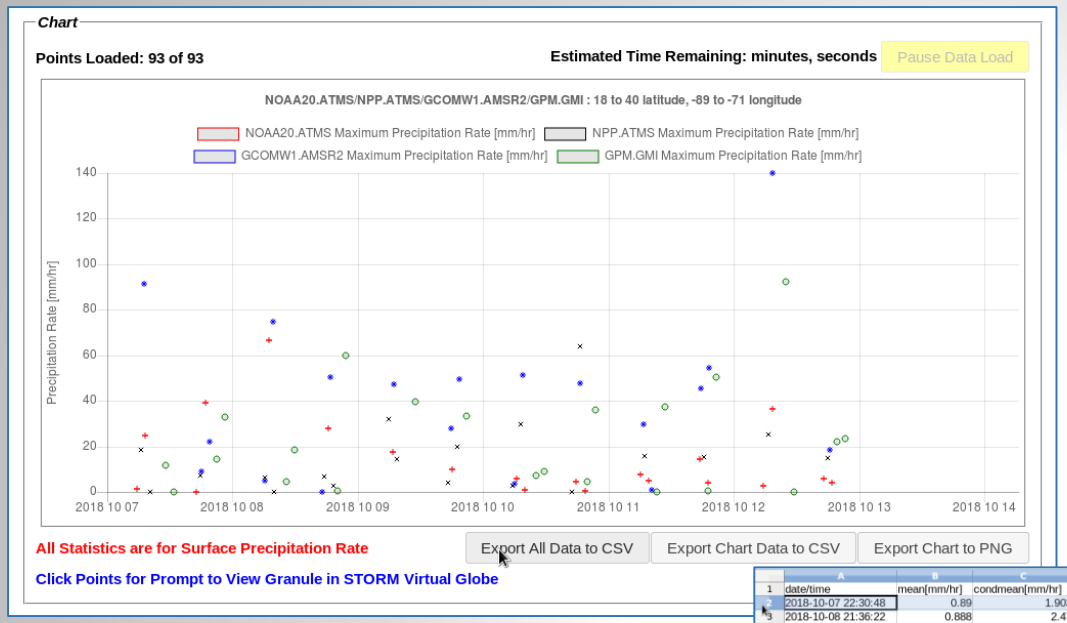

If you just want to work with the statistical data, you can do that too! Export all the data (or just the currently plotted data) to CSV and put it in your favorite spreadsheet…or your programming language

	A	B	C	D	E	F	G	H	I	J
1	date/time	mean[mm/hr]	condmean[mm/hr]	median[mm/hr]	max[mm/hr]	std[mm/hr]	var[mm/hr]	perc[%]	count[number]	granule
2	2018-10-07 22:30:48	0.89	1.903	0.07	33.08	2.875	8.265	46.38	5464	2A.GPM.GMI.GPROF2017v1.20181007-S212837-E230111.026186.V05A.HDF5
3	2018-10-08 21:36:22	0.888	2.47	0	59.82	2.902	8.42	35.78	27594	2A.GPM.GMI.GPROF2017v1.20181008-S203722-E220956.026201.V05A.HDF5
4	2018-10-07 19:41:54	0.685	1.425	0.068	22.21	1.422	2.022	47.77	3096	2A.GCOMW1.AMSR2.GPROF2017v1.20181007-S191339-E205231.033993.V05A.HDF5
5	2018-10-09 19:29:01	0.67	2.111	0	49.62	2.977	8.86	31.47	25495	2A.GCOMW1.AMSR2.GPROF2017v1.20181009-S190117-E204009.034022.V05A.HDF5
6	2018-10-08 07:46:47	0.647	3.088	0	74.65	3.853	14.842	20.81	54572	2A.GCOMW1.AMSR2.GPROF2017v1.20181008-S064550-E082442.034000.V05A.HDF5
7	2018-10-10 18:38:26	0.578	1.999	0	63.91	2.116	4.477	28.62	7631	2A.NPP.ATMS.GPROF2017v2.20181010-S181546-E195715.036027.V05D.HDF5
8	2018-10-07 18:43:57	0.548	2.095	0	39.2	1.847	3.412	25.98	6416	2A.NOAA20.ATMS.GPROF2017v2.20181007-S182117-E200246.004589.V05A.HDF5
9	2018-10-09 06:51:12	0.538	2.146	0	47.45	2.556	6.535	24.7	90204	2A.GCOMW1.AMSR2.GPROF2017v1.20181009-S055013-E072905.034014.V05A.HDF5
10	2018-10-09 10:59:00	0.534	1.937	0	39.48	2.098	4.4	27.18	33496	2A.GPM.GMI.GPROF2017v1.20181009-S103037-E120312.026210.V05A.HDF5
11	2018-10-10 07:34:27	0.5	1.889	0	51.25	1.917	3.674	26.08	70782	2A.GCOMW1.AMSR2.GPROF2017v1.20181010-S063328-E081220.034029.V05A.HDF5
12	2018-10-11 10:49:55	0.482	1.853	0	37.56	1.608	2.587	25.7	29492	2A.GPM.GMI.GPROF2017v1.20181011-S102042-E115316.026241.V05A.HDF5
13	2018-10-08 06:59:56	0.476	2.452	0	66.41	2.362	5.581	19.32	9193	2A.NOAA20.ATMS.GPROF2017v2.20181008-S061146-E075315.004596.V05A.HDF5
14	2018-10-09 18:57:30	0.475	1.467	0	19.79	1.366	1.866	32.02	3995	2A.NPP.ATMS.GPROF2017v2.20181009-S183448-E201617.036013.V05D.HDF5
15	2018-10-08 18:45:40	0.453	2.203	0	50.25	1.976	3.906	20.37	87410	2A.GCOMW1.AMSR2.GPROF2017v1.20181008-S181801-E195653.034007.V05A.HDF5
16	2018-10-08 18:24:55	0.443	2.053	0	27.72	1.591	2.531	21.39	9456	2A.NOAA20.ATMS.GPROF2017v2.20181008-S180215-E194344.004603.V05A.HDF5
17	2018-10-10 07:13:25	0.443	1.745	0	29.63	1.455	2.118	25.03	7055	2A.NPP.ATMS.GPROF2017v2.20181010-S062517-E080646.036020.V05D.HDF5
18	2018-10-10 18:33:18	0.384	1.78	0	47.92	1.481	2.193	21.21	106127	2A.GCOMW1.AMSR2.GPROF2017v1.20181010-S180539-E194431.034036.V05A.HDF5
19	2018-10-12 21:22:10	0.369	2.734	0	23.28	1.772	3.14	13.5	326	2A.GPM.GMI.GPROF2017v1.20181012-S201731-E215005.026263.V05A.HDF5
20	2018-10-11 17:38:51	0.348	1.599	0	45.28	1.383	1.913	21.4	37843	2A.GCOMW1.AMSR2.GPROF2017v1.20181011-S171001-E184853.034050.V05A.HDF5
21	2018-10-11 17:28:14	0.343	1.66	0	14.5	1.303	1.699	20.24	3587	2A.NOAA20.ATMS.GPROF2017v2.20181011-S170510-E184638.004645.V05A.HDF5
22	2018-10-09 05:51:31	0.334	1.631	0	31.86	1.513	2.29	19.95	1870	2A.NPP.ATMS.GPROF2017v2.20181009-S050249-E064418.036005.V05D.HDF5
23	2018-10-12 09:57:48	0.324	1.435	0	92.29	1.865	3.478	22.26	30468	2A.GPM.GMI.GPROF2017v1.20181012-S092927-E110201.026256.V05A.HDF5
24	2018-10-09 20:44:06	0.317	1.533	0	33.39	1.304	1.701	20.37	32452	2A.GPM.GMI.GPROF2017v1.20181009-S194608-E211842.026216.V05A.HDF5
25	2018-10-11 07:44:18	0.301	1.984	0	4.78	0.832	0.692	15.07	1413	2A.NOAA20.ATMS.GPROF2017v2.20181011-S065610-E083739.004639.V05A.HDF5
26	2018-10-07 07:18:56	0.299	2.545	0	24.61	1.472	2.167	11.65	5761	2A.NOAA20.ATMS.GPROF2017v2.20181007-S063048-E081217.004582.V05A.HDF5
27	2018-10-07 07:03:34	0.284	2.091	0	91.5	2.068	4.277	13.4	106962	2A.GCOMW1.AMSR2.GPROF2017v1.20181007-S060235-E074127.033985.V05A.HDF5
28	2018-10-12 07:22:05	0.281	1.836	0	139.78	1.822	3.318	15.08	88181	2A.GCOMW1.AMSR2.GPROF2017v1.20181012-S062106-E075958.034058.V05A.HDF5
29	2018-10-11 06:54:29	0.279	1.446	0	15.75	1.013	1.026	18.66	9984	2A.NPP.ATMS.GPROF2017v2.20181011-S060615-E074744.036034.V05D.HDF5
30	2018-10-11 18:19:24	0.263	1.935	0	15.44	1.114	1.242	13.39	10077	2A.NPP.ATMS.GPROF2017v2.20181011-S175644-E193813.036041.V05D.HDF5
31	2018-10-09 06:41:06	0.261	1.249	0	17.54	1.071	1.148	20.35	10145	2A.NOAA20.ATMS.GPROF2017v2.20181009-S055244-E073413.004610.V05A.HDF5
32	2018-10-09 07:32:27	0.244	1.155	0	14.52	0.994	0.989	20.8	3385	2A.NPP.ATMS.GPROF2017v2.20181009-S064419-E082548.036006.V05D.HDF5
33	2018-10-12 06:35:39	0.231	1.421	0	25.33	1.157	1.34	15.86	9583	2A.NPP.ATMS.GPROF2017v2.20181012-S054713-E072842.036048.V05D.HDF5
34	2018-10-09 18:05:59	0.221	1.028	0	10.11	0.735	0.54	20.88	10070	2A.NOAA20.ATMS.GPROF2017v2.20181009-S174313-E192442.004617.V05A.HDF5
35	2018-10-07 06:29:23	0.212	1.505	0	18.51	1.169	1.366	13.92	8765	2A.NPP.ATMS.GPROF2017v2.20181007-S054053-E072222.035977.V05D.HDF5
36	2018-10-12 17:10:50	0.21	1.815	0	5.69	0.847	0.718	11.25	889	2A.NOAA20.ATMS.GPROF2017v2.20181012-S164608-E182737.004659.V05A.HDF5
37	2018-10-09 17:50:27	0.206	1.111	0	27.92	0.831	0.691	18.14	54717	2A.GCOMW1.AMSR2.GPROF2017v1.20181009-S172224-E190116.034021.V05A.HDF5
38	2018-10-10 11:44:19	0.195	0.861	0	8.88	0.593	0.351	22.45	7384	2A.GPM.GMI.GPROF2017v1.20181010-S111158-E124432.026226.V05A.HDF5
39	2018-10-10 05:36:27	0.174	0.453	0	2.65	0.461	0.213	37.84	37	2A.NPP.ATMS.GPROF2017v2.20181010-S044347-E062516.036019.V05D.HDF5
40	2018-10-10 17:47:05	0.17	0.768	0	4.28	0.486	0.236	21.29	7261	2A.NOAA20.ATMS.GPROF2017v2.20181010-S172411-E190540.004631.V05A.HDF5
41	2018-10-10 08:03:20	0.166	0.387	0	0.96	0.238	0.057	42.54	134	2A.NOAA20.ATMS.GPROF2017v2.20181010-S071512-E085641.004625.V05A.HDF5
42	2018-10-11 06:38:53	0.137	0.616	0	29.85	0.569	0.324	21.01	70120	2A.GCOMW1.AMSR2.GPROF2017v1.20181011-S053750-E071642.034043.V05A.HDF5
43	2018-10-10 10:07:44	0.134	0.649	0	7.37	0.463	0.214	19.01	15243	2A.GPM.GMI.GPROF2017v1.20181010-S093923-E111157.026225.V05A.HDF5

Wrap Up

- Just one example of how to integrate visualization techniques

- No "one size fits all" libraries for server-side or client-side code

- Tie visualizations to files/products, minimizing redundant tasks performed by users.

matthew.r.lammers@nasa.gov

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