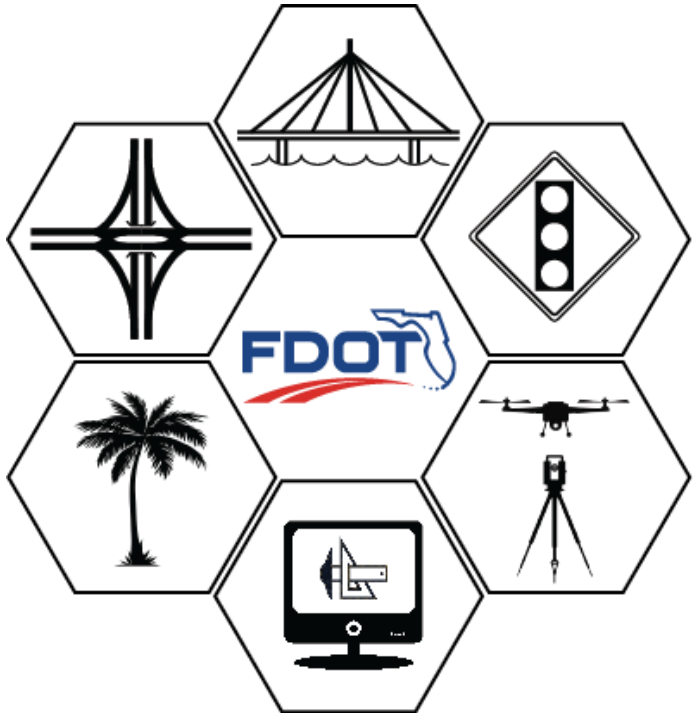


FDOT TRANSPORTATION SYMPOSIUM 2019

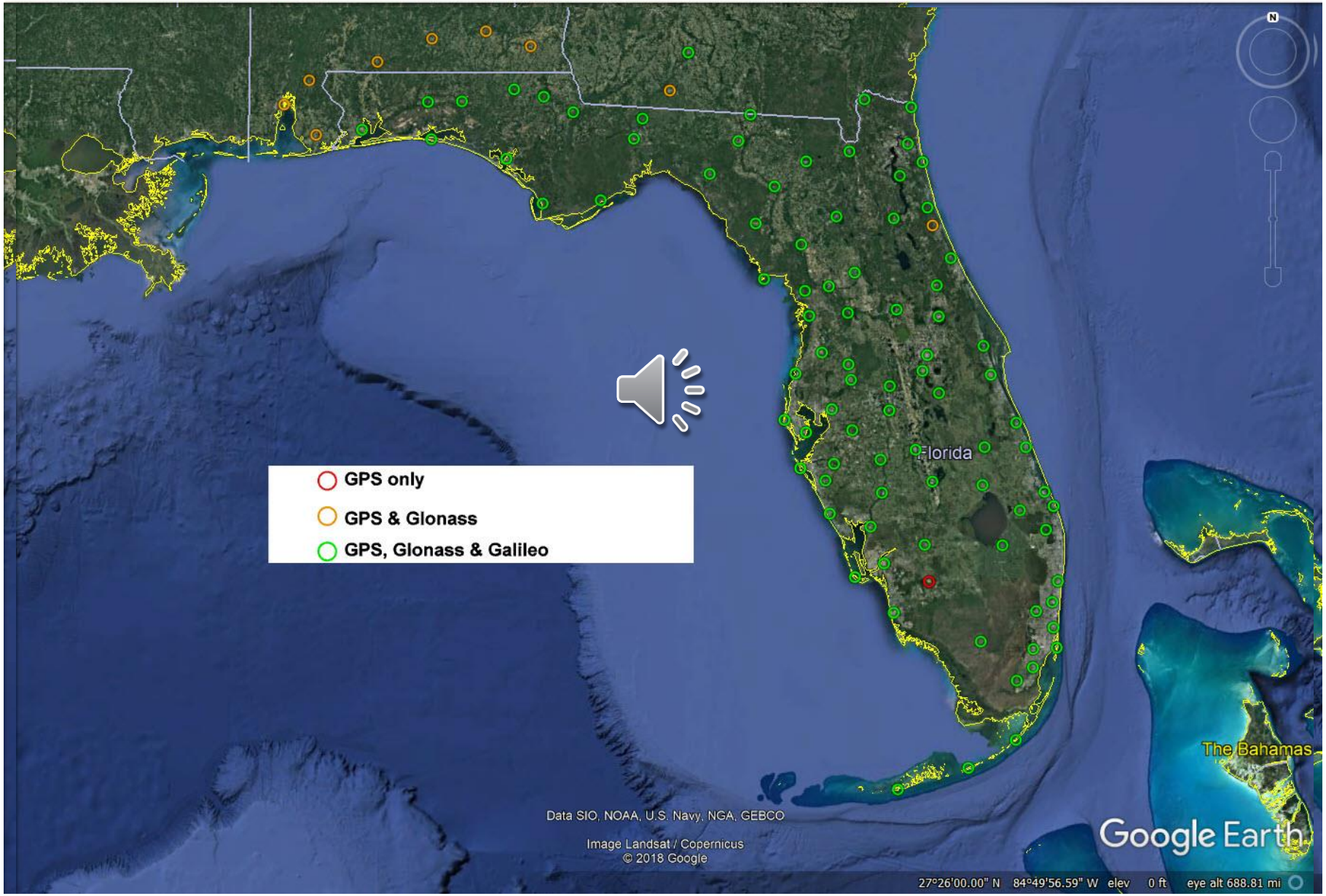
Comparing OPUS to FPRN for FDOT Project Control

George Massey and Ron Hanson

Upload Criteria

OPUS	FPRN
Rinex v2, many raw formats, & compressed	Rinex v2, 3.02 & 3.03
L1 / L2 full wavelength	L1 only or L1 / L2
15 mins to 48 hrs of data	1 min to 48 hrs of data
2 hrs for Primary Project Control	30 min for Primary Project Control
Multiple occupations	Multiple occupations
30 second epochs	1 second epochs
10° elevation mask	10° elevation mask
GPS only	GPS, Glonass, & Galileo

FPGS CORS Stations



FDOT TRANSPORTATION SYMPOSIUM

Processing

OPUS	FPRN
Automatically detects suitable reference stations	Automatically detects suitable reference stations
Uses GPS only signals	Automatically detects constellations used
Decimates data files to 30 second epochs	Automatically detects observation rates
2 hr file length for Primary Project Control	30 min file length for Primary Project Control
Uses 3 reference stations for calculations	Uses 6 reference stations for calculations
Published position is a weighted average of all 3	Published position is a weighted average of all 6
Ability to “share” your solution with others	

Processing with OPUS

Processing using OPUS

OPUS: Online Positioning User Service

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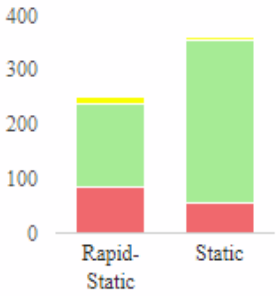

OPUS Today
as of 2019-05-01T10:25 EDT

ITRF2014 frame now available in BETA

Try BETA OPUS to preview the new ITRF2014 frame for CORS.

Upload your data file.

Solve your GPS position & tie it to the National Spatial Reference System.

What is OPUS? FAQs

Choose File | No file chosen

* data file of dual-frequency GPS observations. sample

sample solutions

NONE

antenna - choosing wrong may degrade your accuracy.

0.000 *meters above your mark.*

antenna height of your antenna's reference point.

* email address - your solution will be sent here. Privacy Act Statement

Options to customize your solution.

Upload to Rapid-Static
for data 15 min. - 2 hrs.

Upload to Static
for data 2 hrs. - 48 hrs.

* required fields

We may use your data for internal evaluations of OPUS use, accuracy, or related research.

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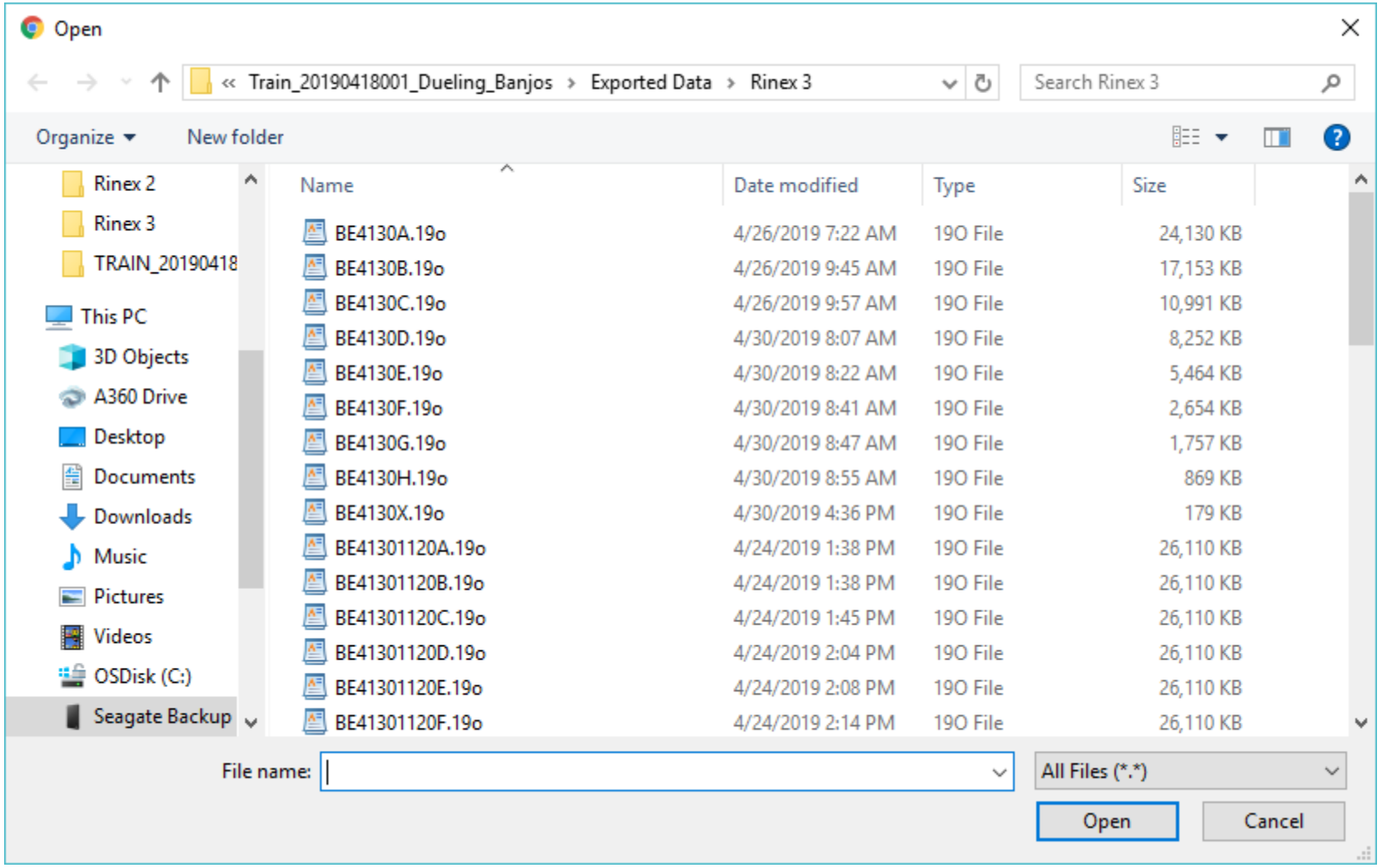
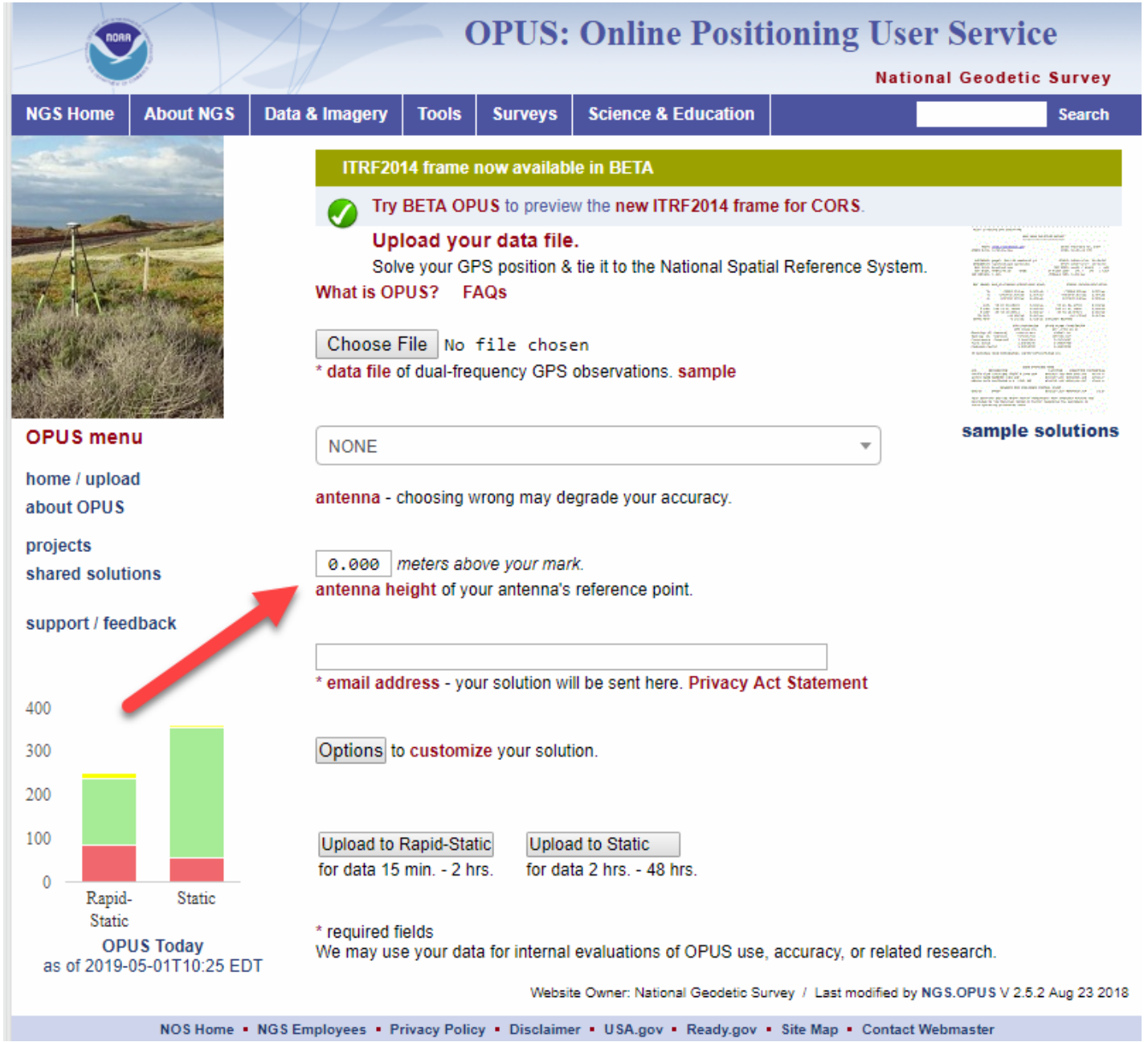
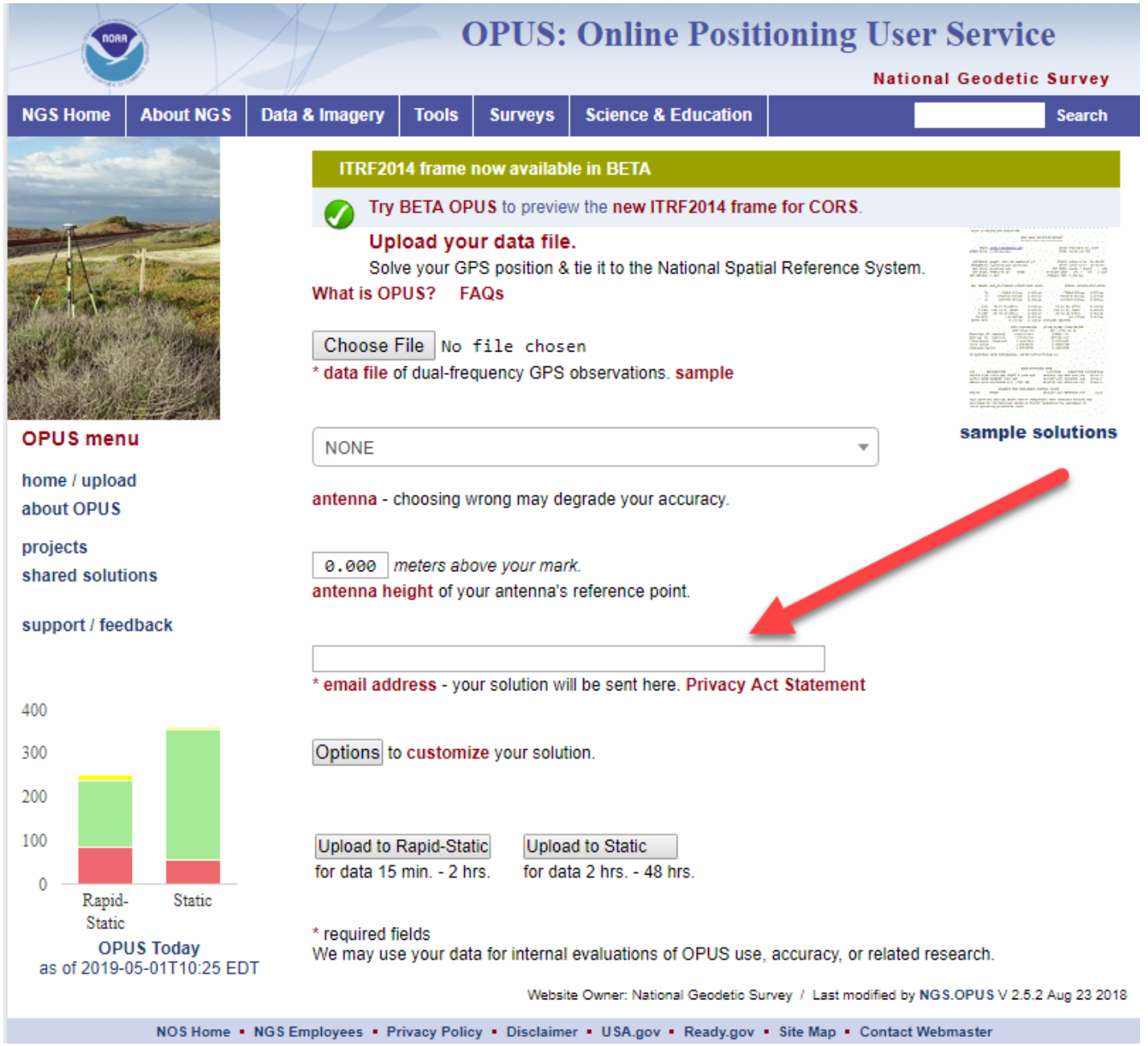


Processing using OPUS



Processing using OPUS



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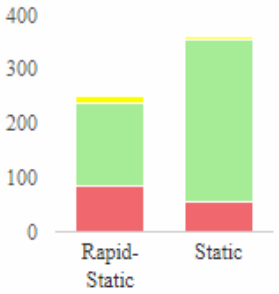

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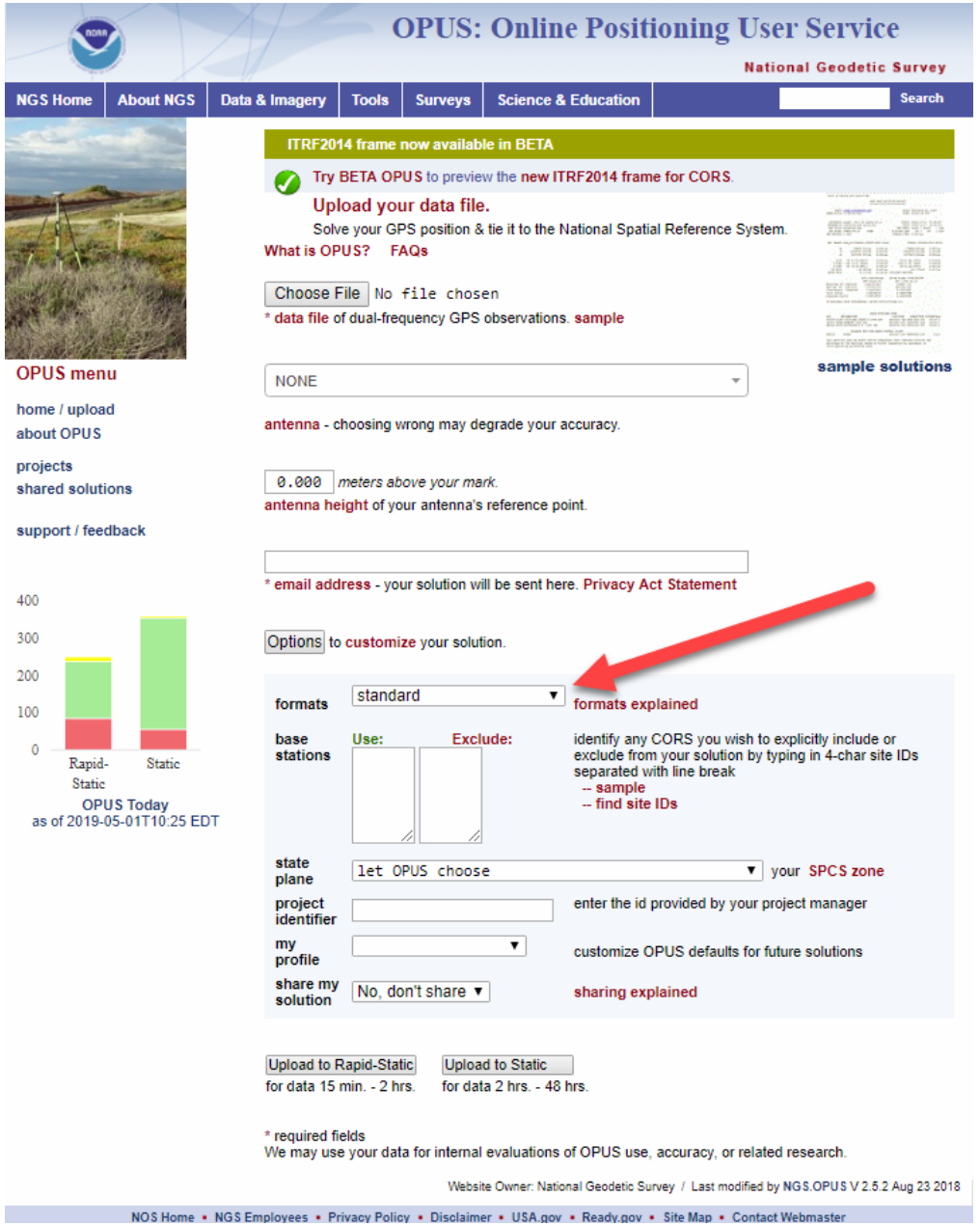
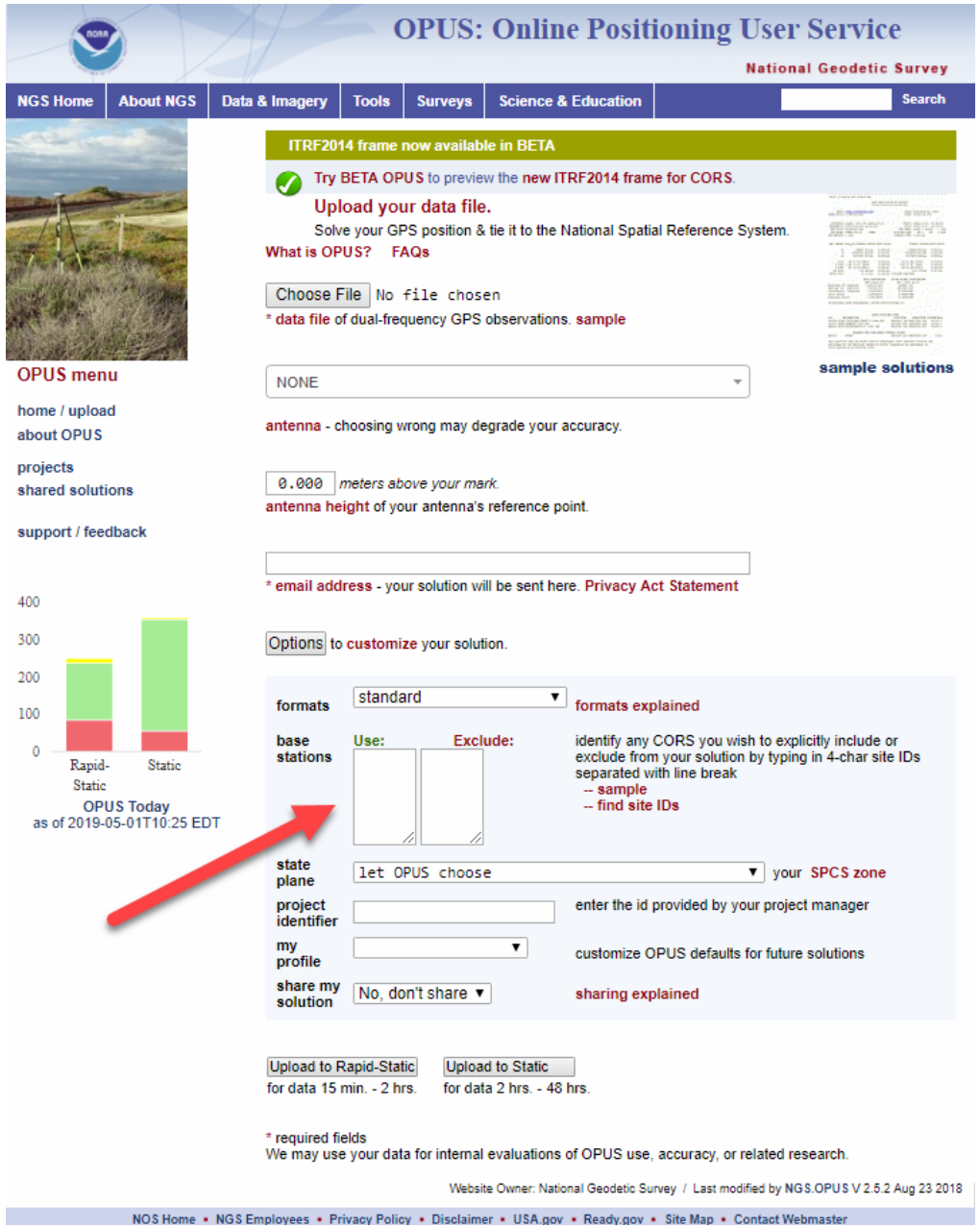


Processing using OPUS



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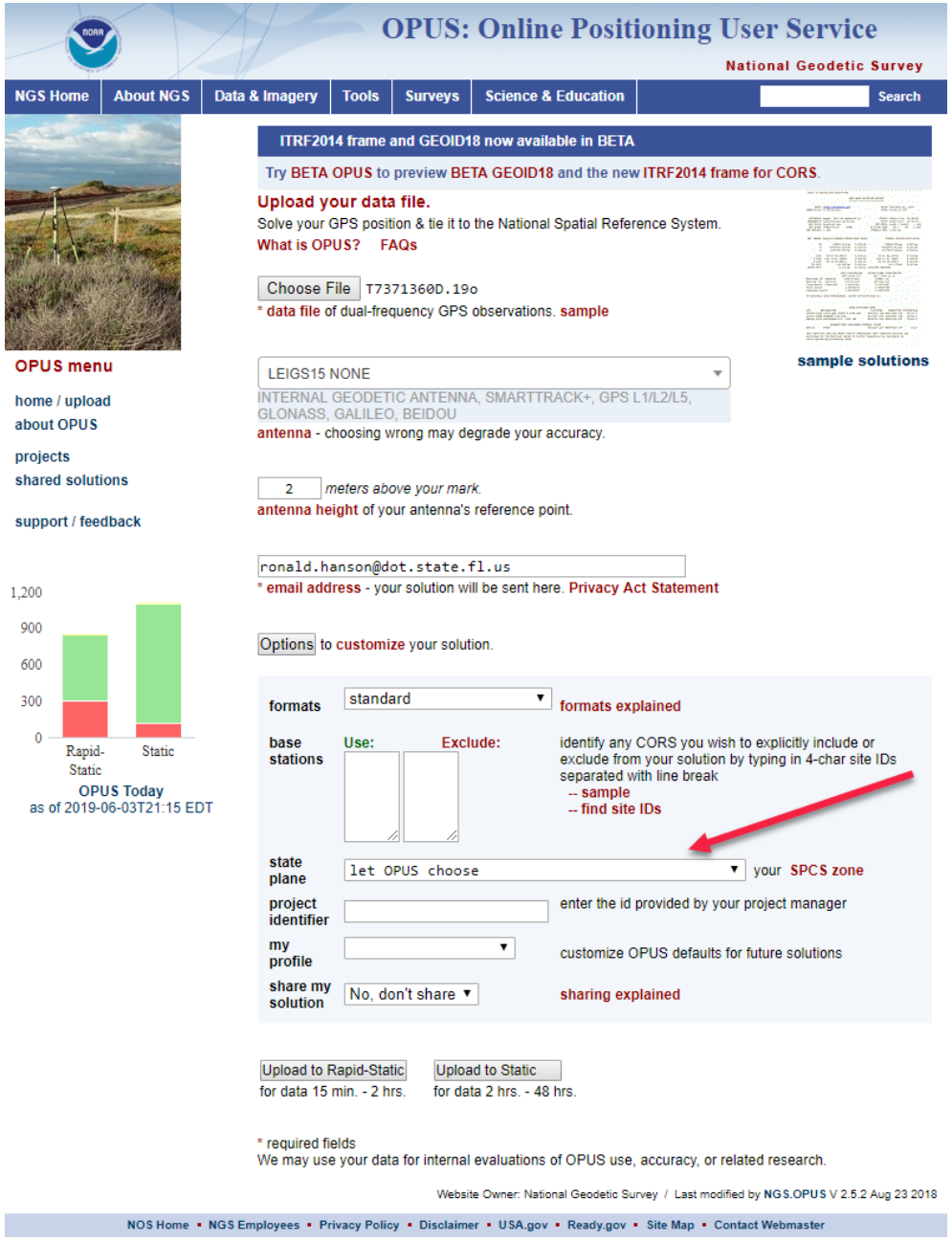

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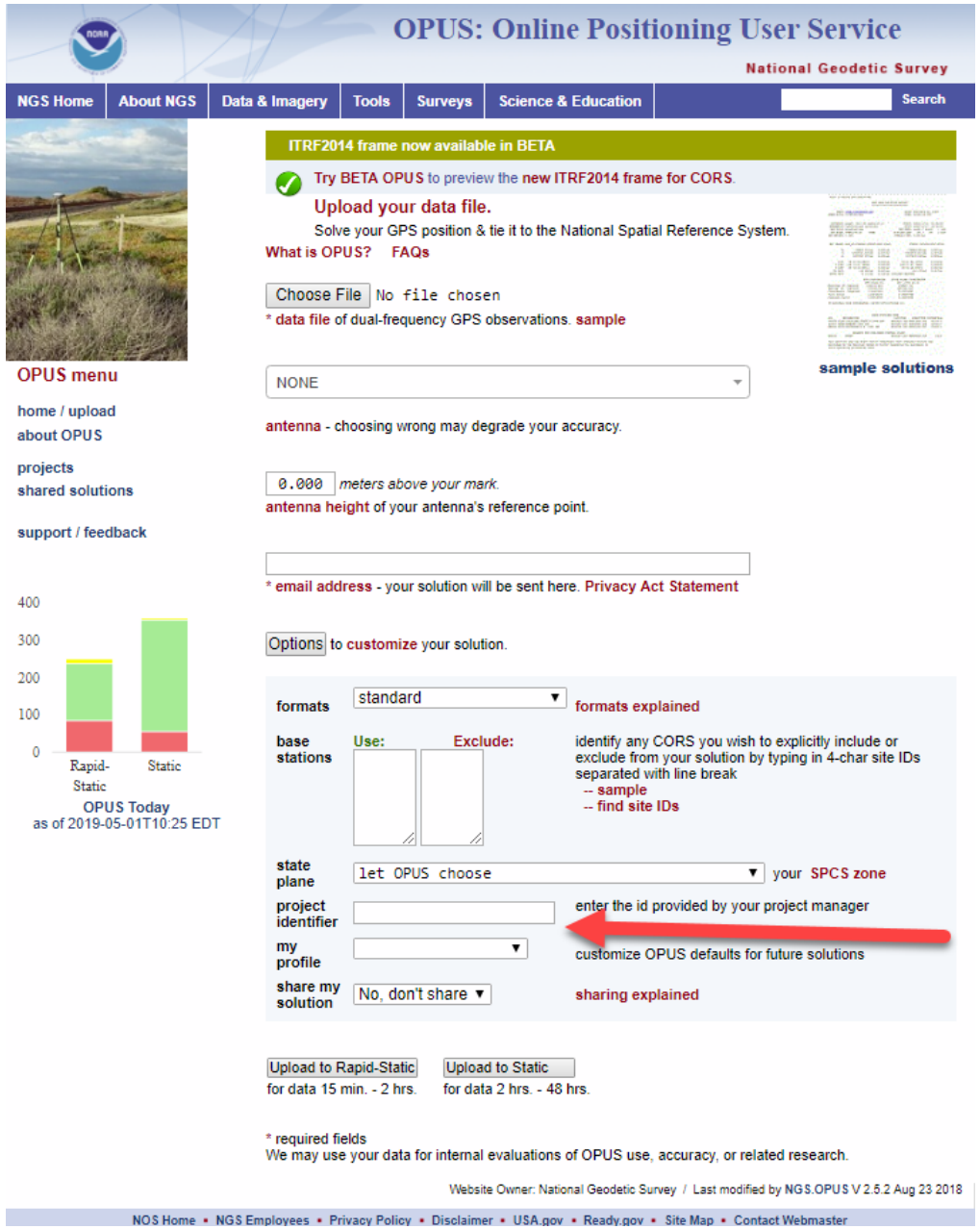

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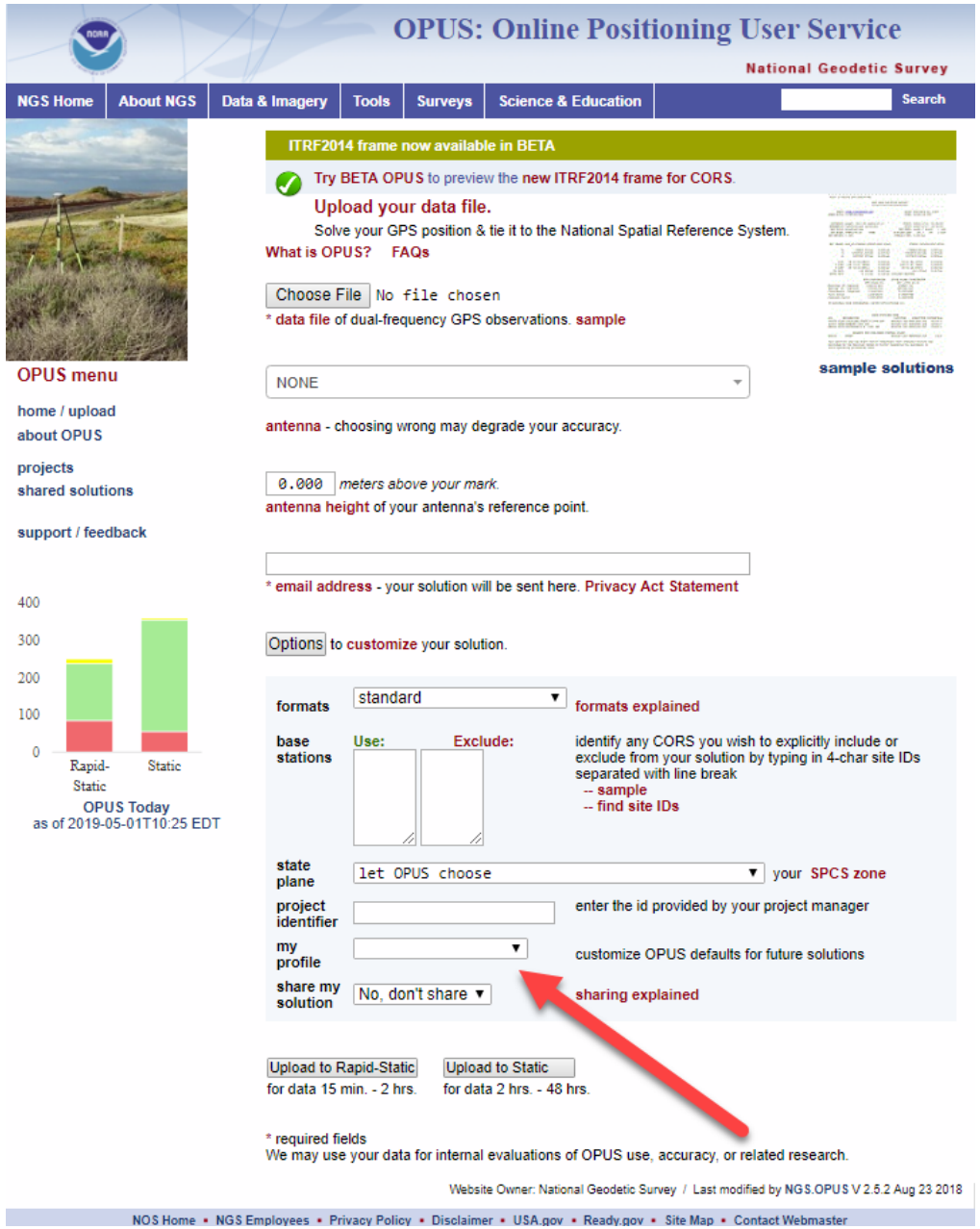
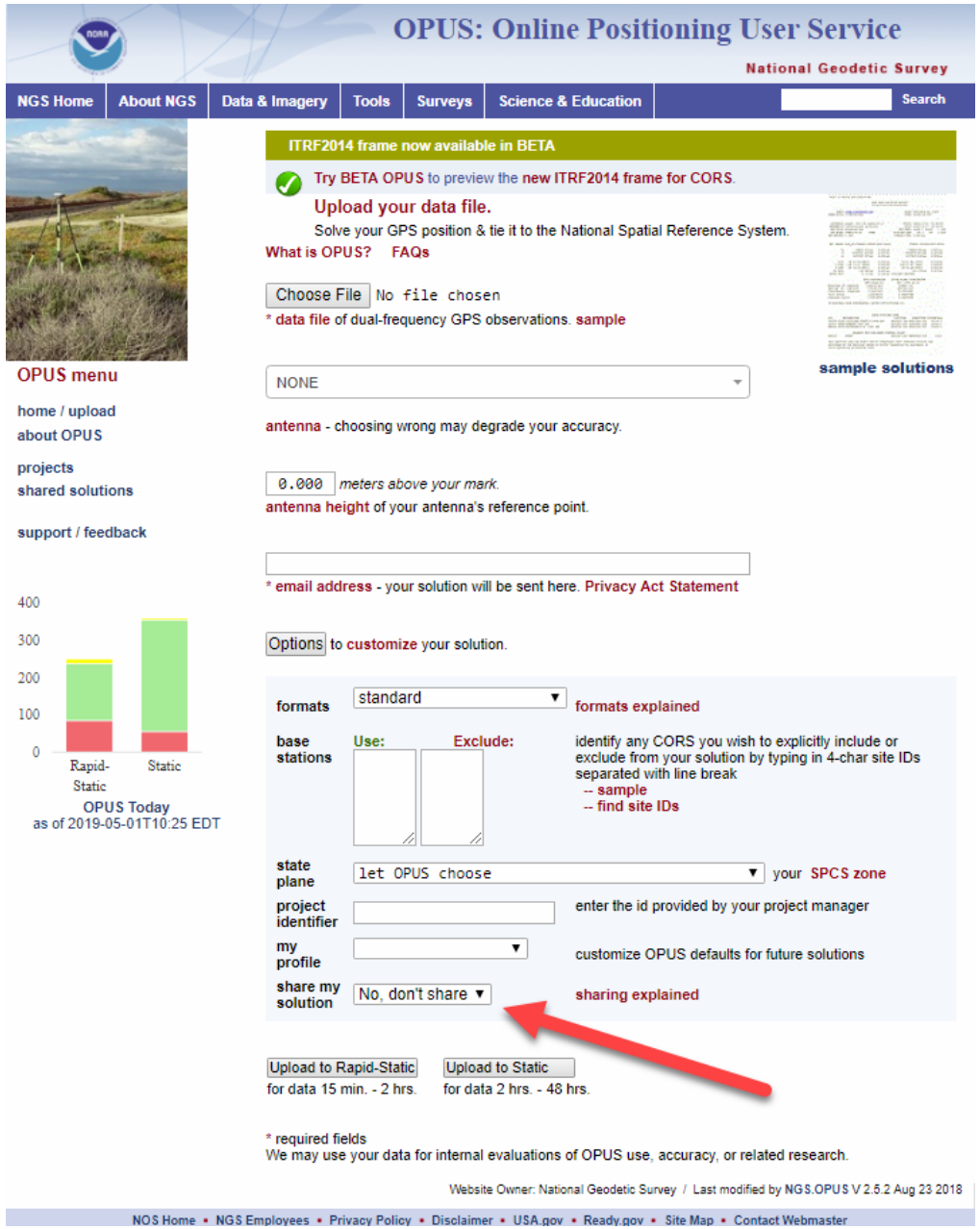
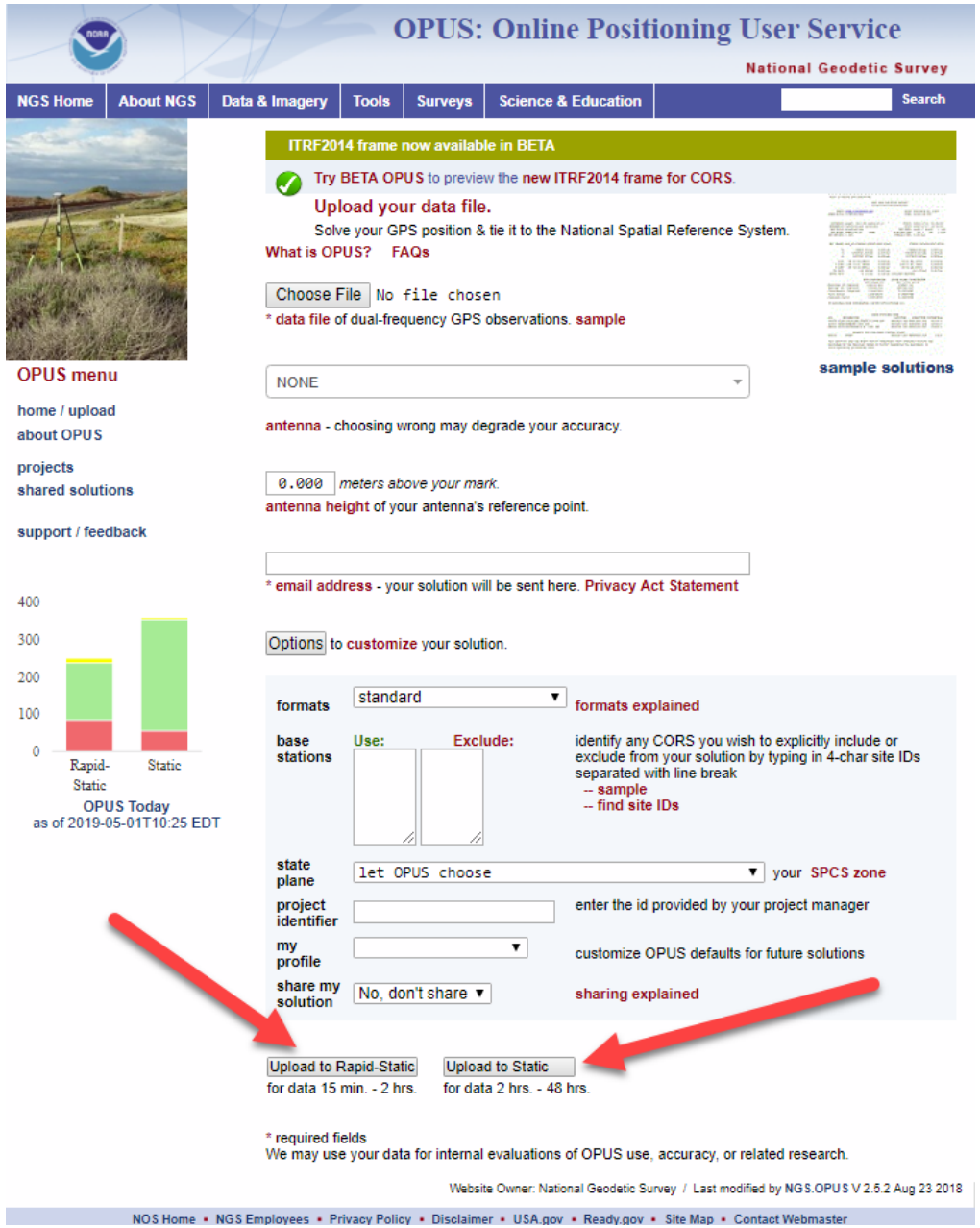


Processing using OPUS



Processing using OPUS



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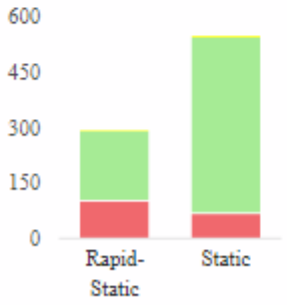

OPUS Today
as of 2019-05-01T11:35 EDT

Upload successful!
You will receive an email when processing is complete.

uploaded:		Solving with:	
data file	BE4130A.19o	solution format	Standard + XML (DRAFT)
converted to	be41112n.19o (RINEX format)	base sta. used	--
antenna	LEIGS15 NONE	base sta. excluded	--
antenna height	2.00 meters	state plane zone	--
email address	ronald.hanson@dot.state.fl.us		
processor	Rapid-Static	project ID	--

return to OPUS

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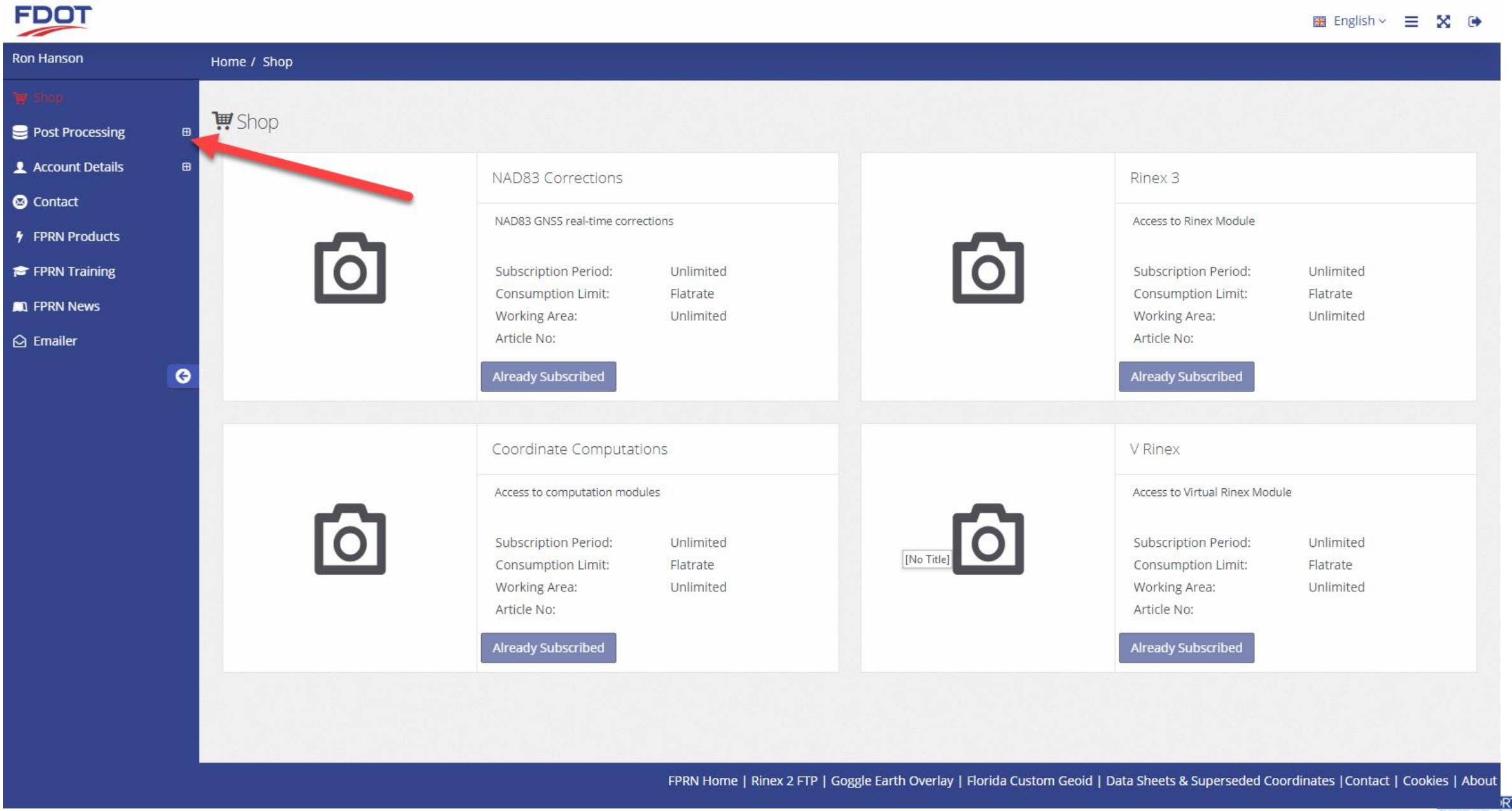
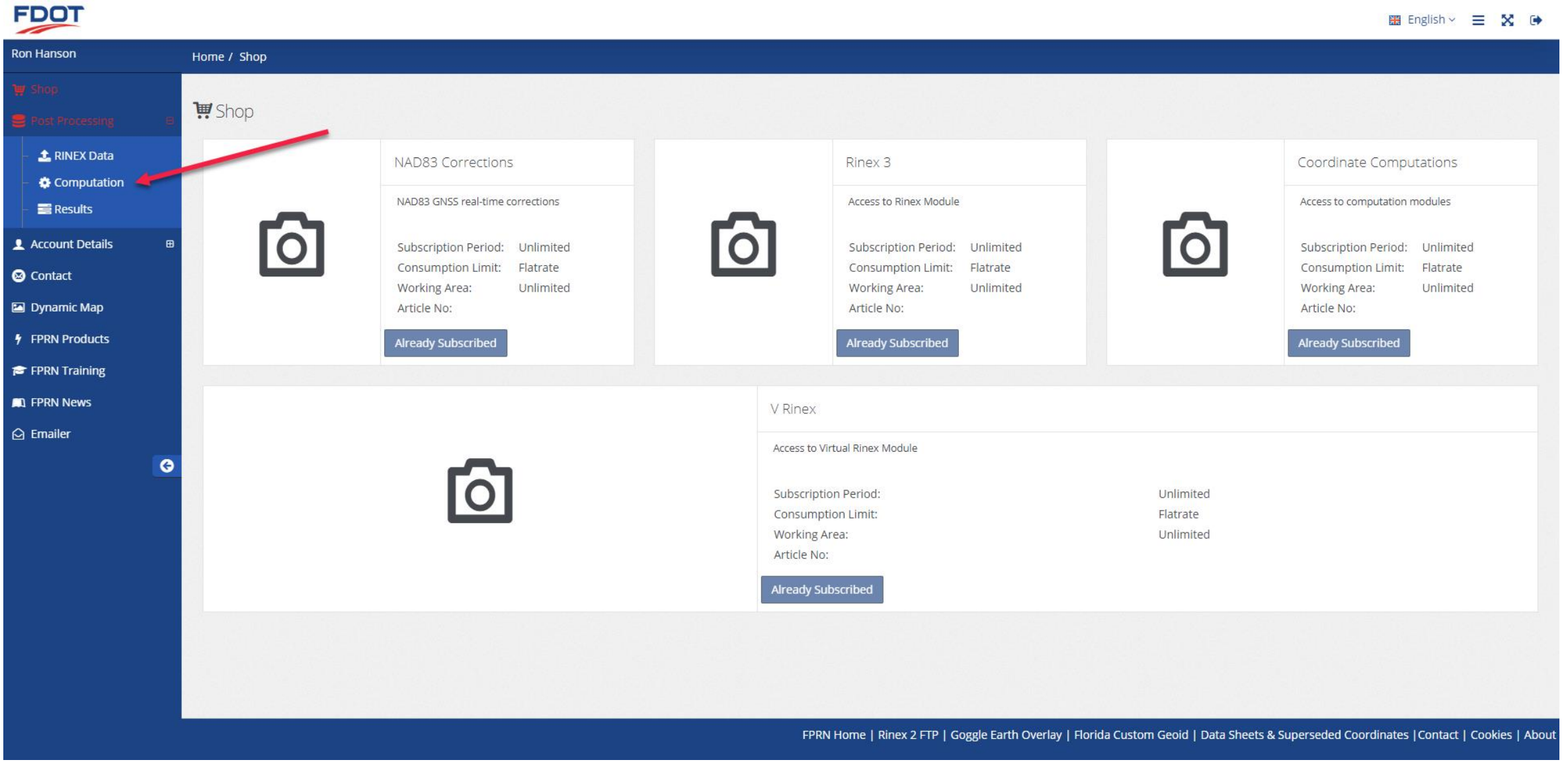
Processing with FPRN

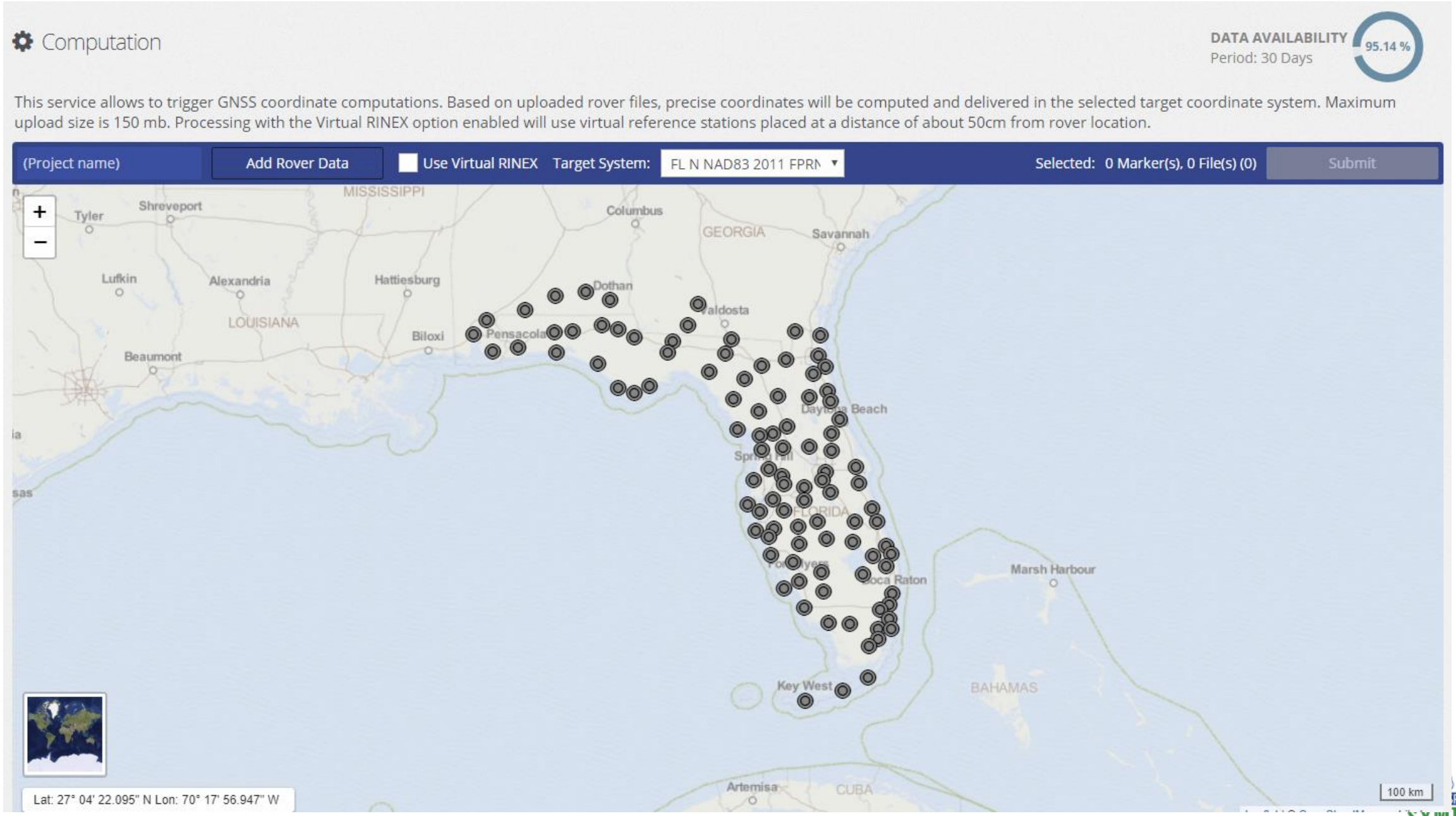
Processing using FPRN



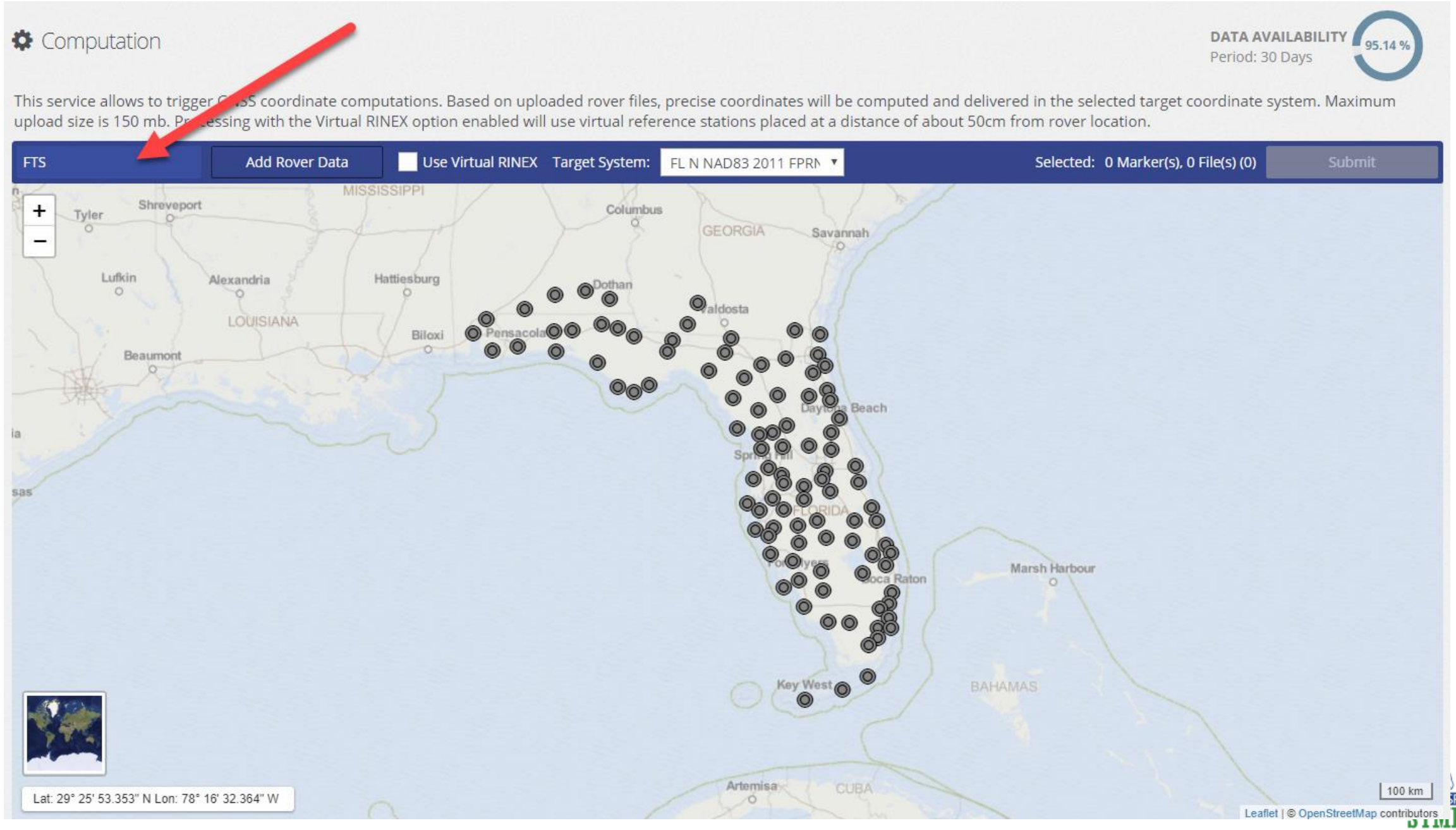
Processing using FPRN



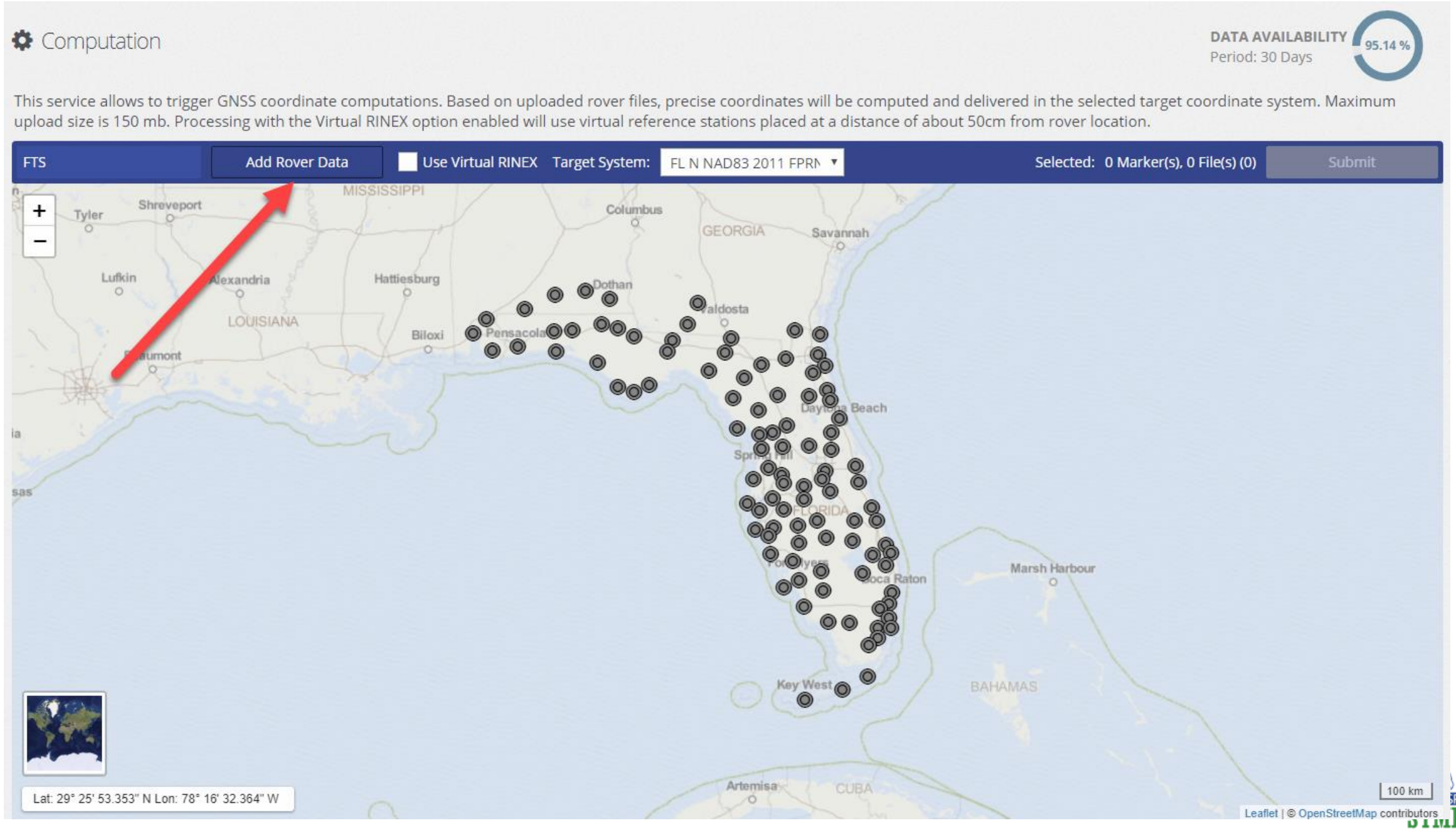
Processing using FPRN



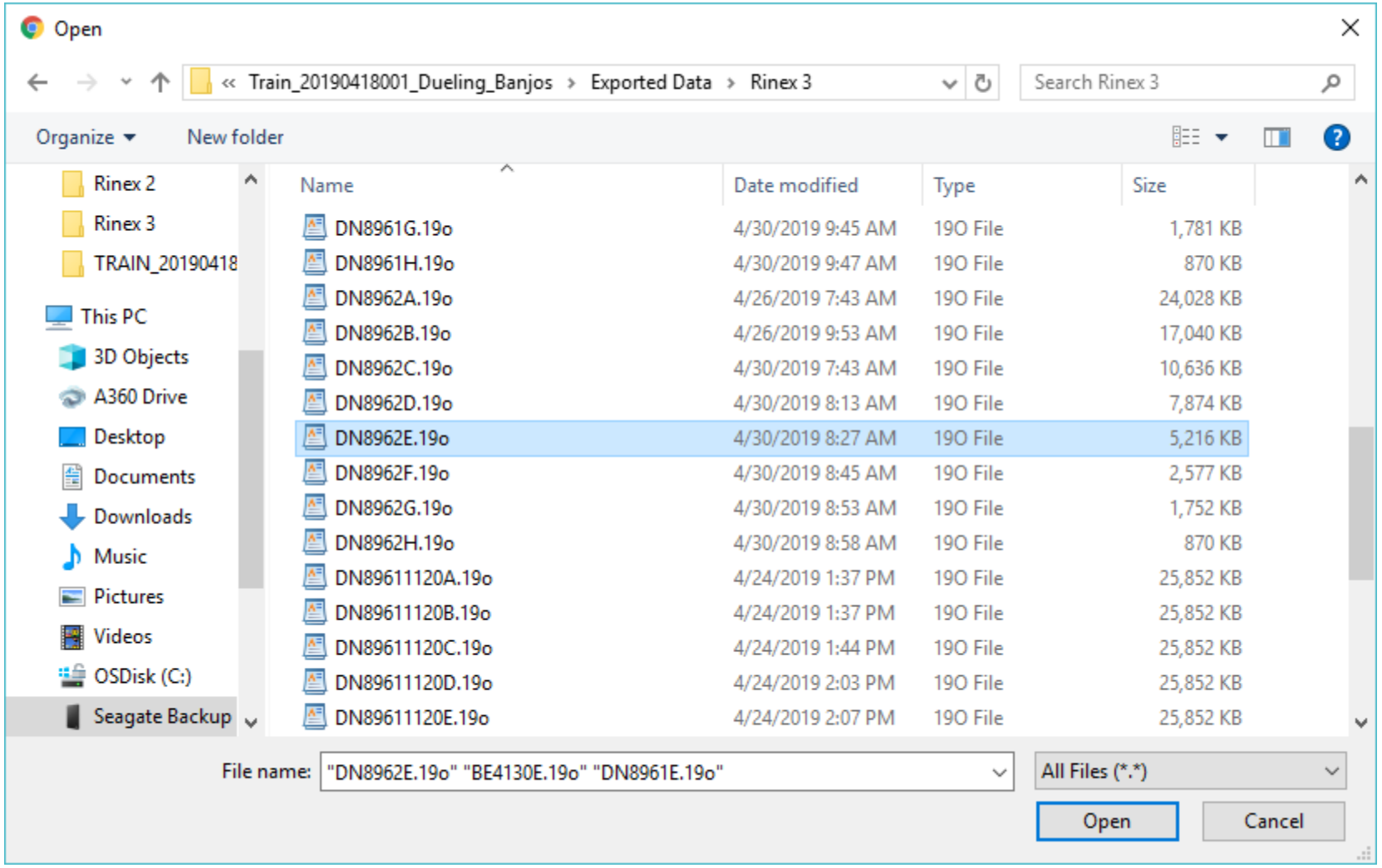
Processing using FPRN



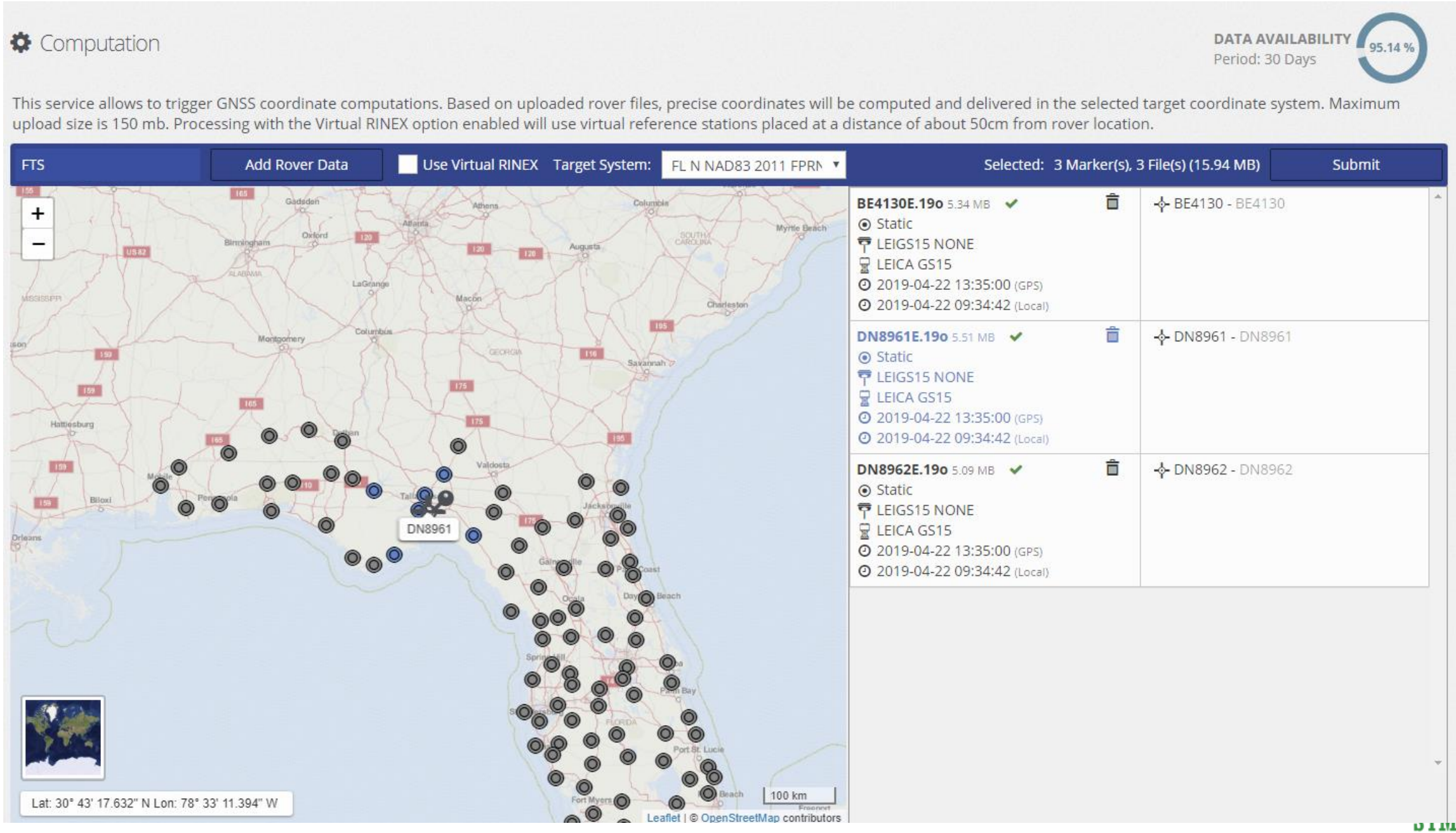
Processing using FPRN



Processing using FPRN



Processing using FPRN



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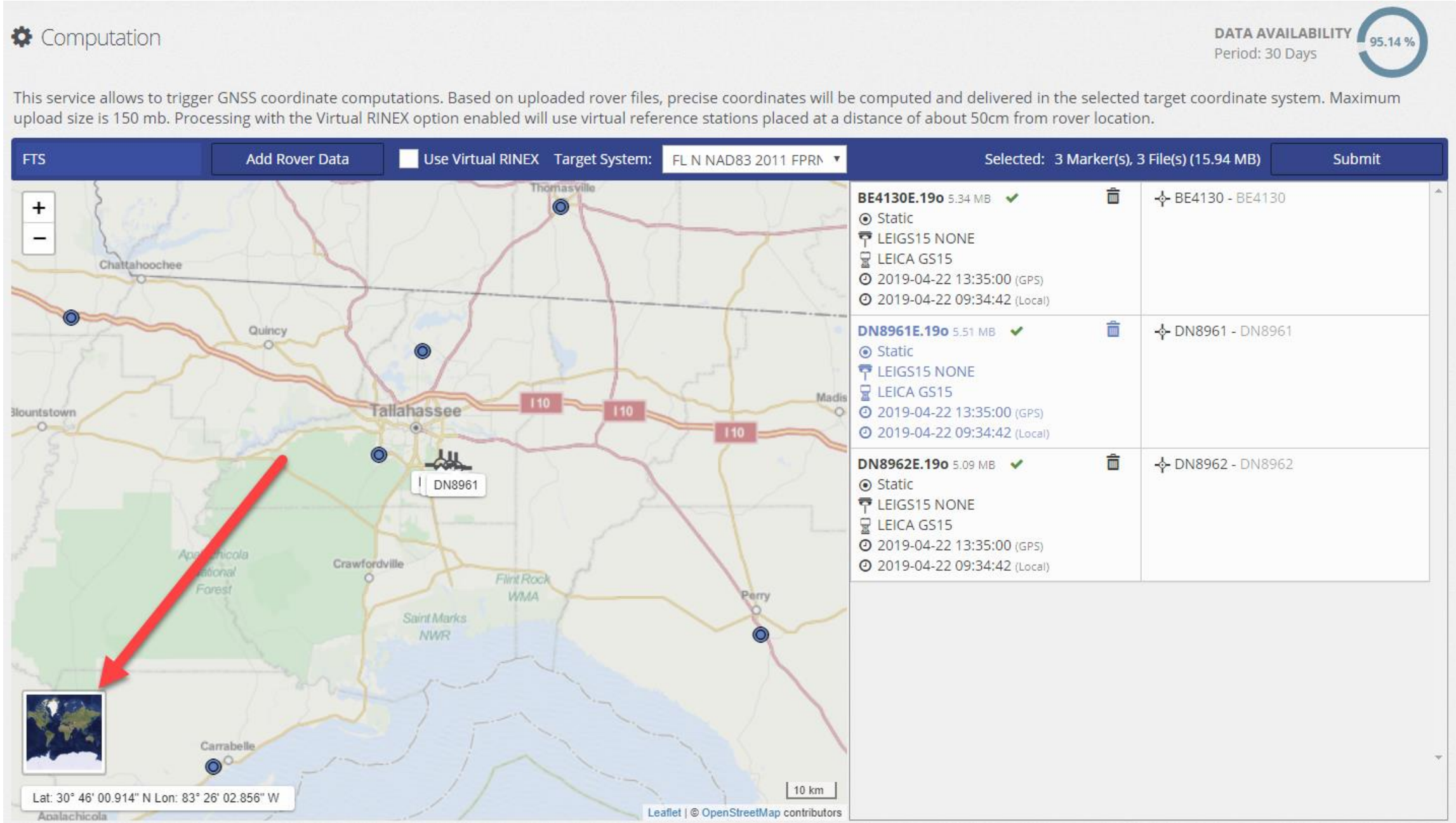
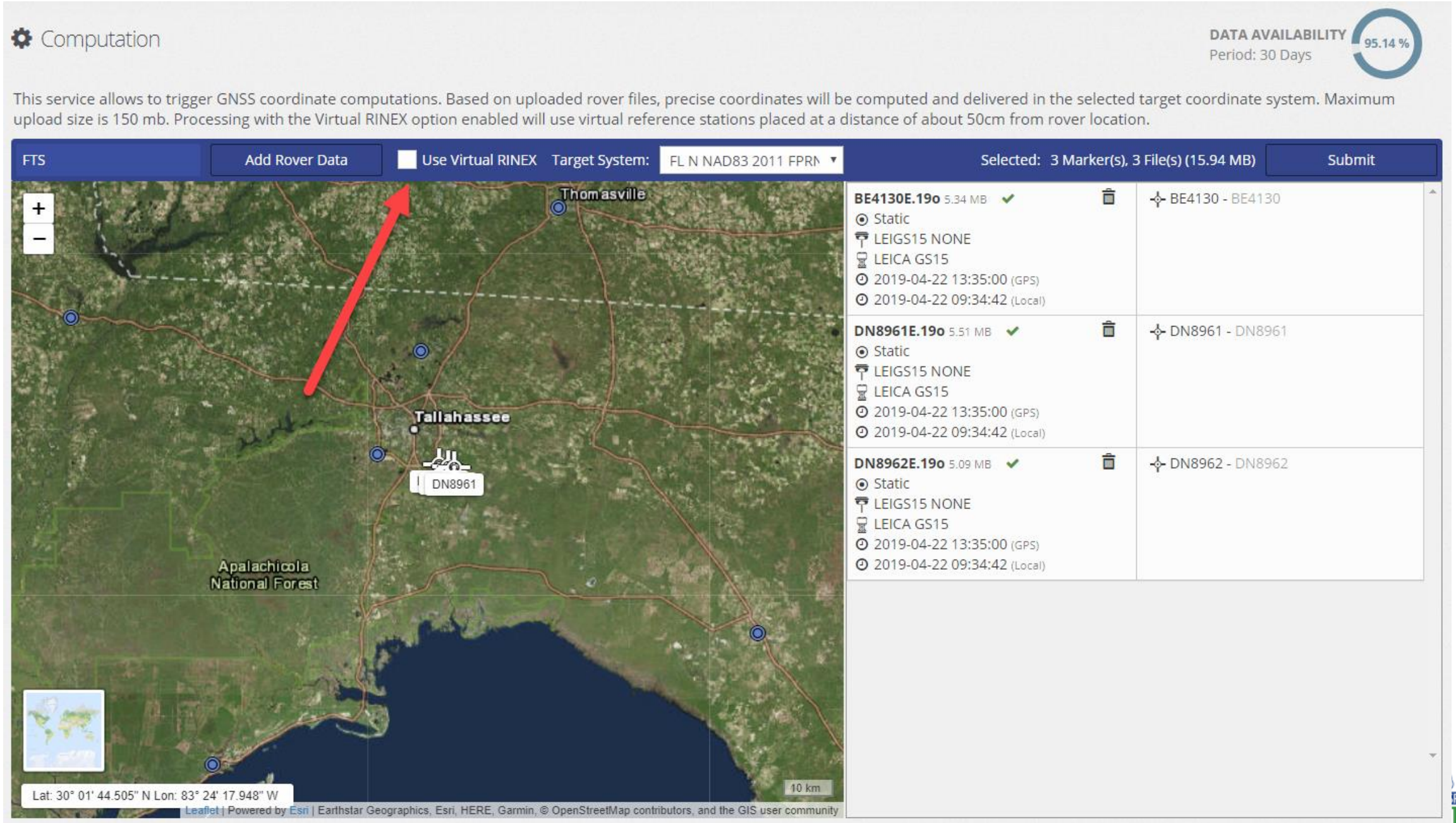
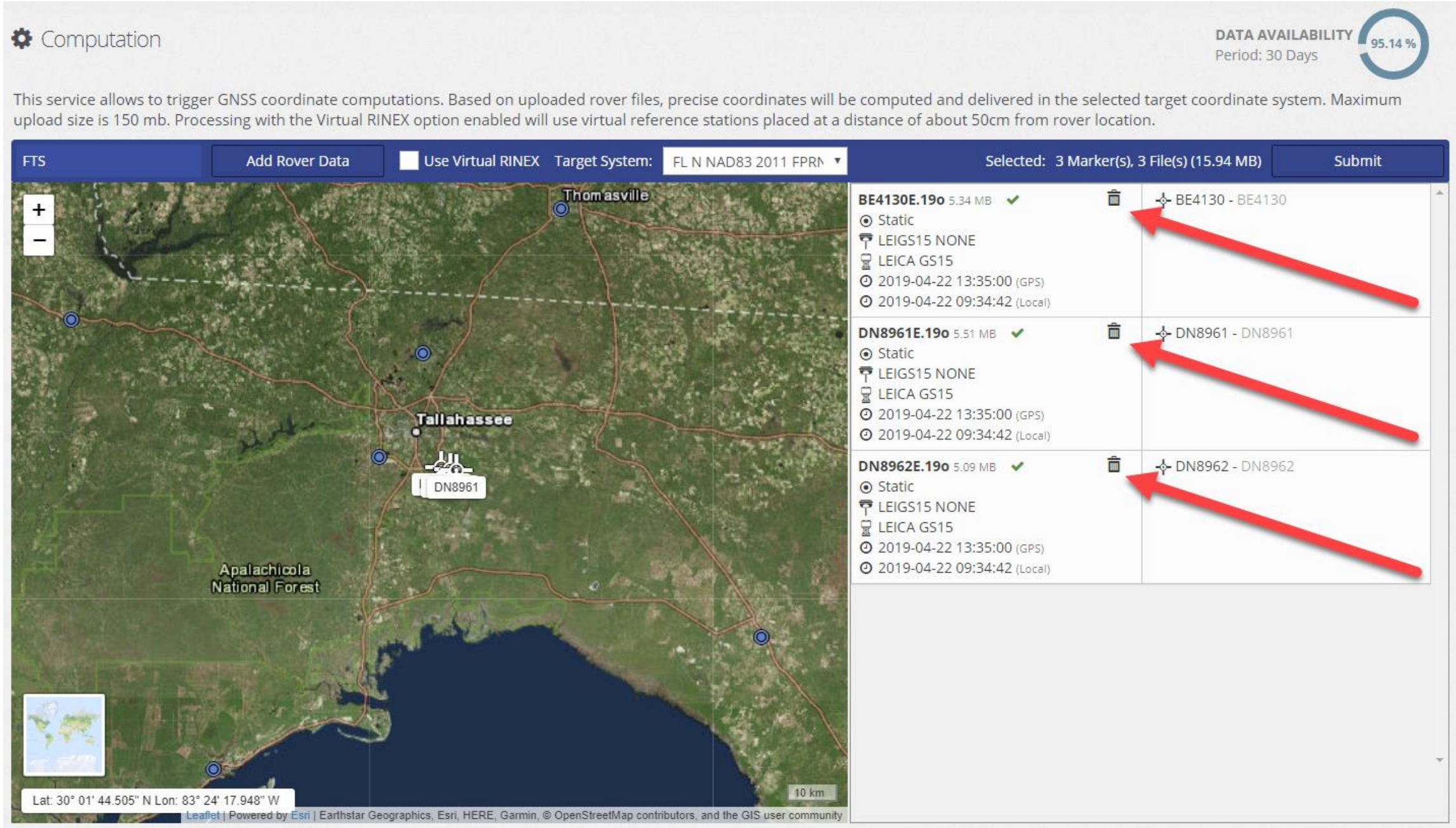


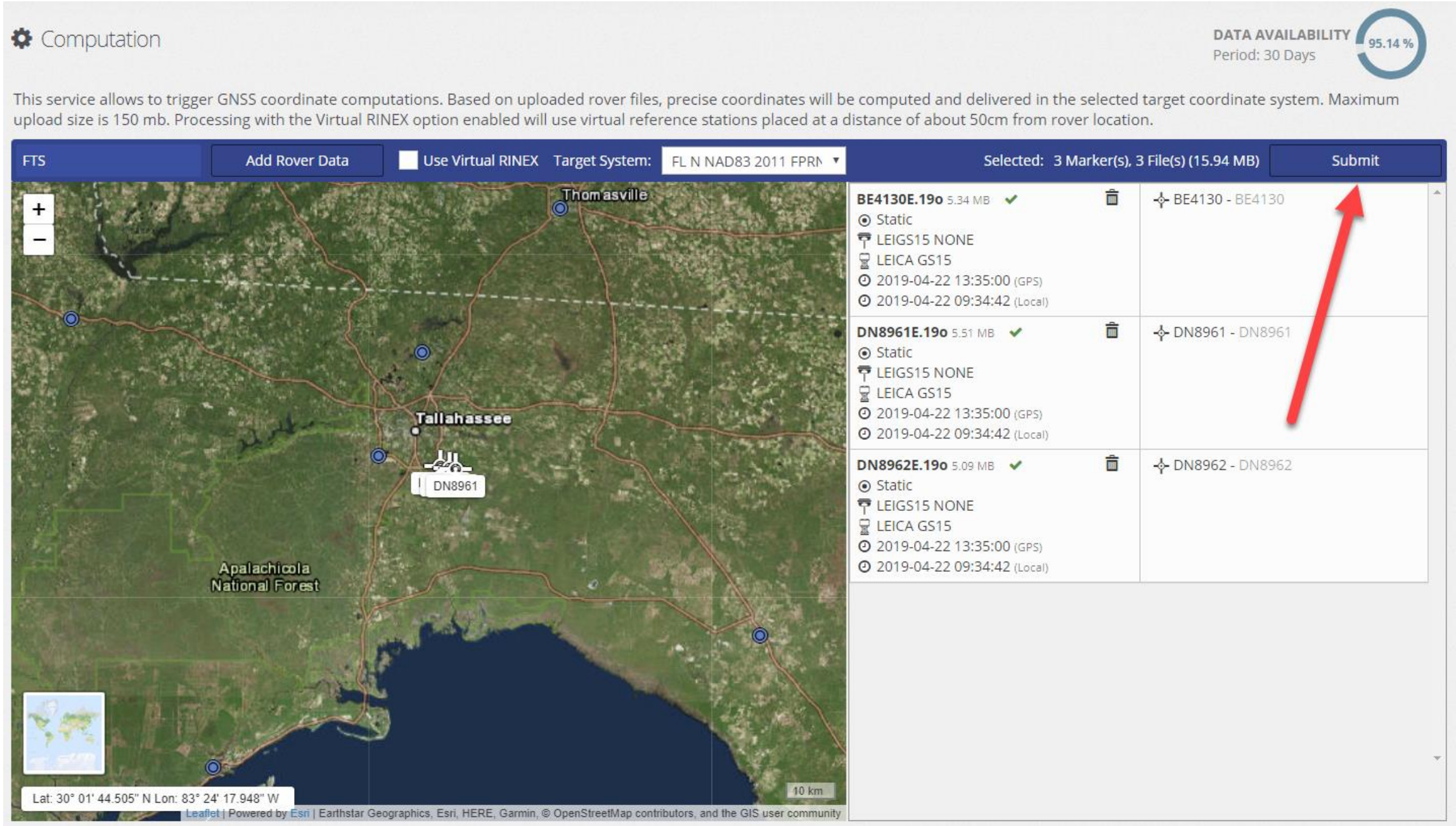
Processing using FPRN



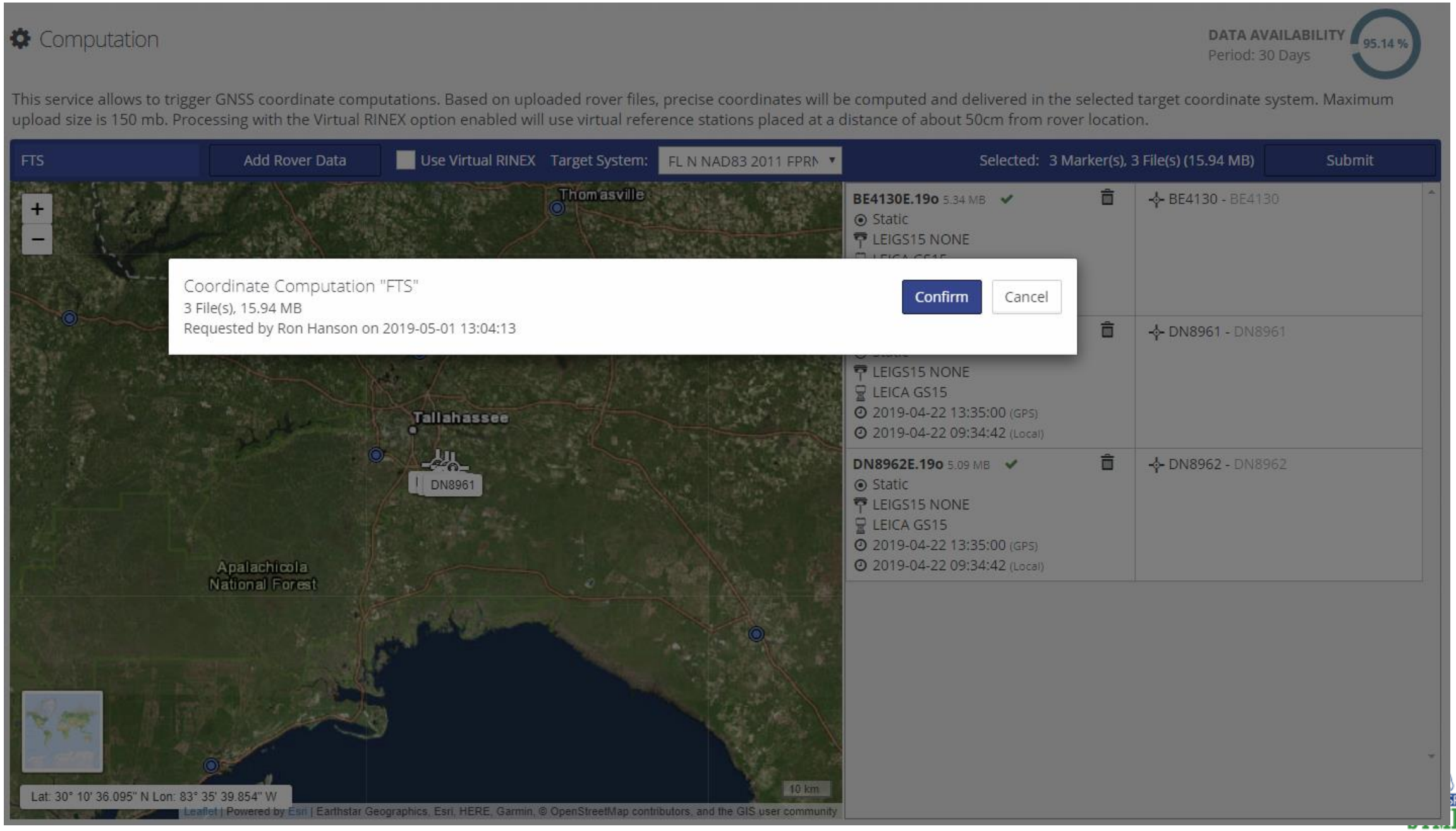
Processing using FPRN



Processing using FPRN



Processing using FPRN



Processing using FPRN

Results

On this page, all results related to any SBC post-processing service are displayed, divided by category.

RINEX Data | Virtual RINEX Data | **Coordinate Computations**

32. Processed at **2019-05-01 13:06:04** Project: FTS	3 File(s), 0 Point(s) Use Virtual RINEX: No	**Target System: FL N NAD83 2011 FPRN16**		
31. Processed at **2019-04-30 16:37:06** Project: Minimum	1 File(s), 1 Point(s) Use Virtual RINEX: No	**Target System: FL N NAD83 2011 FPRN16**	✔	
30. Processed at **2019-04-30 09:55:33** Project: 8962-5	1 File(s), 1 Point(s) Use Virtual RINEX: No	**Target System: FL N NAD83 2011 FPRN16**	✔	
29. Processed at **2019-04-30 09:55:19** Project: 8962-10	1 File(s), 1 Point(s) Use Virtual RINEX: No	**Target System: FL N NAD83 2011 FPRN16**	✔	
28. Processed at **2019-04-30 09:54:58** Project: 8962-15	1 File(s), 1 Point(s) Use Virtual RINEX: No	**Target System: FL N NAD83 2011 FPRN16**	✔	
27. Processed at **2019-04-30 09:54:34** Project: 8962-30	1 File(s), 1 Point(s) Use Virtual RINEX: No	**Target System: FL N NAD83 2011 FPRN16**	✔	
26. Processed at **2019-04-30 09:54:02** Project: 8962-45	1 File(s), 1 Point(s) Use Virtual RINEX: No	**Target System: FL N NAD83 2011 FPRN16**	✔	
25. Processed at **2019-04-30 09:53:35** Project: 8962-60	1 File(s), 1 Point(s) Use Virtual RINEX: No	**Target System: FL N NAD83 2011 FPRN16**	✔	
24. Processed at **2019-04-30 09:53:12** Project: 8962-90	1 File(s), 1 Point(s) Use Virtual RINEX: No	**Target System: FL N NAD83 2011 FPRN16**	✔	

Processing using FPRN

Results

On this page, all results related to any SBC post-processing service are displayed, divided by category.

RINEX Data | Virtual RINEX Data | **Coordinate Computations**

32. Processed at **2019-05-01 13:06:04**
Project: FTS

3 File(s), 3 Point(s)
Use Virtual RINEX: No

Target System: FL N NAD83 2011 FPRN16

Show File Details

Full Report

Point	Observation Time	Local Grid (E,N,h,H) FL N NAD83 2011 FPRN16	WGS84 Geodetic	Quality	
BE4130	2019-04-22 09:34:41, 30 min	627721.7478 m +/- 0.0059 m 152473.5778 m +/- 0.0049 m - 20.2920 m	30° 22' 30.7313" N +/- 0.0059 m 84° 12' 41.6980" W +/- 0.0049 m -7.4440 m +/- 0.0113 m	0.0136 m Phase Fixed	
DN8961	2019-04-22 09:34:41, 30 min	628949.4405 m +/- 0.0044 m 152170.5406 m +/- 0.0028 m - 12.0682 m	30° 22' 20.7870" N +/- 0.0044 m 84° 11' 55.7457" W +/- 0.0028 m -15.6388 m +/- 0.0098 m	0.0111 m Phase Fixed	
DN8962	2019-04-22 09:34:41, 30 min	626061.3760 m +/- 0.0036 m 152859.6253 m +/- 0.0021 m - 17.3109 m	30° 22' 43.4005" N +/- 0.0036 m 84° 13' 43.8516" W +/- 0.0021 m -10.4427 m +/- 0.0078 m	0.0088 m Phase Fixed	

FDOT TRANSPORTATION SYMPOSIUM

Processing using FPRN

Results

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RINEX Data | Virtual RINEX Data | **Coordinate Computations**

32. Processed at **2019-05-01 13:06:04**
Project: FTS

3 File(s), 3 Point(s)
Use Virtual RINEX: No

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DN8961	2019-04-22 09:34:41, 30 min	628949.4405 m +/- 0.0044 m 152170.5406 m +/- 0.0028 m - 12.0682 m	30° 22' 20.7870" N +/- 0.0044 m 84° 11' 55.7457" W +/- 0.0028 m -15.6388 m +/- 0.0098 m	0.0111 m Phase Fixed	
DN8962	2019-04-22 09:34:41, 30 min	626061.3760 m +/- 0.0036 m 152859.6253 m +/- 0.0021 m - 17.3109 m	30° 22' 43.4005" N +/- 0.0036 m 84° 13' 43.8516" W +/- 0.0021 m -10.4427 m +/- 0.0078 m	0.0088 m Phase Fixed	

FDOT TRANSPORTATION SYMPOSIUM

Conclusion

OPUS vs FPRN

OPUS

- 120 minute file length (minimum)
- 2 Occupations
- 30 second epoch
- GPS

FPRN

- 30 minute file length (minimum)
- 2 Occupations
- 1 second epoch
- GPS, Glonass, Galileo

Now a brief discussion on Networks

Questions?