

Quarterly Report
Massachusetts Institute of Technology
GAGE Facility GPS Data Analysis Center Coordinator

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Period: 2025/07/01-2025/09/30

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Summary

Under the GAGE2 Facility Data Analysis sub-award, MIT has been processing SINEX files from Central Washington University (CWU) and aligning them to the GAGE NAM14 reference frame. In this report, we show analyses of the data processing for the period 2025/07/01 to 2025/09/30, as well as time series velocity field analyses for the GAGE processing (1996-2025). Several earthquakes were investigated this quarter up to 2025/09/15, and two of them generated detectable co-seismic offsets. These events were EQ77 ANSS(ComCat) us7000qd1y mww7.3 Sand Point, Alaska; date and time 2025/07/16 20:38, and A5 was added as Q78 ANSS(ComCat) us6000qw60 mww8.8 Kamchatka Peninsula; Date and time 2025/07/29 23:25.

Analysis files (pbo format velocity files and offset files) are generated monthly and sent via Python in the middle of each month.

We continue to process ANET data. These solutions are in the ANT14 frame as defined in the ITRF2014 plate motion model [Altamimi *et al.*, 2017].

GPS Analysis of Level 2a and 2b products

Level 2a products: Rapid products

Final and rapid level 2a products have been, in general, generated routinely during this quarter for the CWU solutions. The description of these products, the delivery schedule, and the delivery list remain unchanged from the previous quarter and will not be reported here.

Level 2a products: Final products

The final products are generated weekly and are based on the final JPL orbits and clocks. Finals and rapid solutions are now being generated in the IGS14 system. In this quarter, 2007 stations were processed, 5 more than last quarter. In addition, up to 34 sites were processed in the ANET solutions, one less than last quarter. The number of stations processed fluctuated as data systems were updated at EarthScope.

Level 2a products: 12-week, 26-week supplement products

Each week, we also process the Supplemental (12-week latency) and six-month supplemental (26-week latency) analyses from CWU for the main GAGE2 Networks of the Americas stations (NOTA). The delivery schedule for these products is also unchanged.

Analysis of Final products: June 15, 2025–September 27, 2025

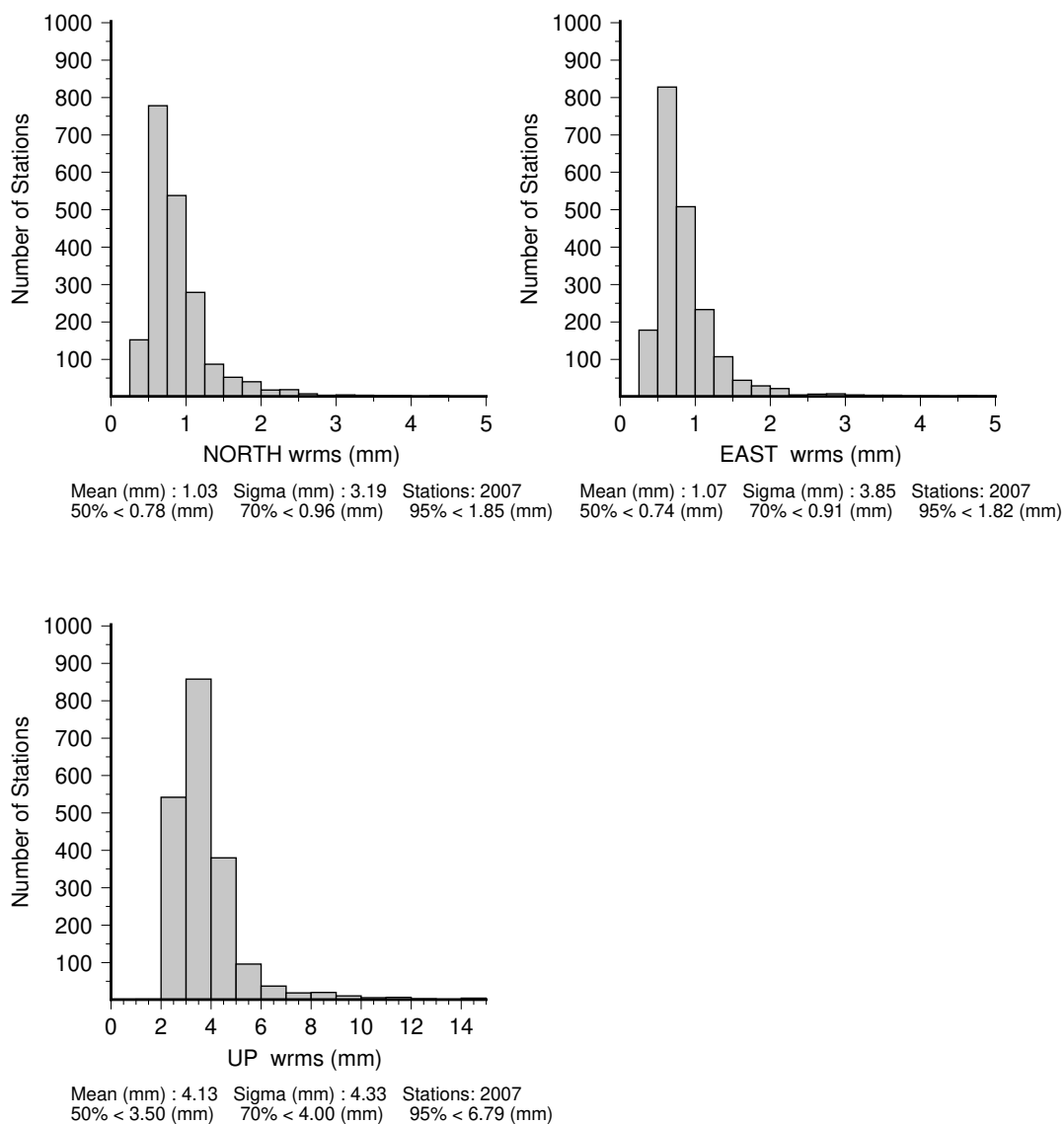
For this report, we generated the statistics using the ~3 months of CWU results between June 15, 2025, and September 27, 2025. These results are summarized in Table 1 and Figure 1.

For the three months of the final position time series generated, we fit linear trends and annual signals and compute the RMS scatters of the position residuals in north, east, and up for each station in the analysis. Table 1 shows the median (50%), 70%, and 95% limits for the RMS scatters CWU. The detailed histograms of the RMS scatters are shown in Figure 1 CWU.

Table 1: Statistics of the fits of 2007 stations for CWU analyzed in the finals analysis between June 15, 2025, and September 27, 2025.

Figure 1 shows histograms of the RMS scatters.

Center	North (mm)	East (mm)	Up (mm)
Median (50%)			
CWU	0.78	0.74	3.50
70%			
CWU	0.96	0.91	4.00
95%			
CWU	1.85	1.82	6.79



Scatter-Wrms Histogram : FILE: CWU_FIN_Y7Q4.sum

Figure 1: CWU solution histograms of the North, East, and Up RMS scatters of the position residuals for 2007 stations analyzed between June 15, 2025 and September 27, 2025. Linear trends and annual signals were estimated from the time series.

For the CWU analysis, we also evaluate the RMS scatters of the position estimates by network type. The figures below are based on our monthly submissions, but here, we use nominally three months of data to evaluate the RMS scatters. In Table 2, we give the median, 70, and 95 percentile limits on the RMS scatters. The geographical distributions of the RMS scatters by network type are shown in Figures 2-7. The values plotted are given in

[CWU_FIN_Y7Q4.tab](#). There are 2007 stations in the file for sites with at least two measurements during the month.

Table 2: Head and tail of WRMS scatter summary file CWU_FIN_Y7Q1.tab.
 Tabular Position RMS scatters created from CWU_FIN_Y7Q4.sum
 ChiN/E/U are square root of chisquared degree of freedom of the fits.
 Values of ChiN/E/U near unity indicate that the estimated error bars are consistent the scatter of the position estimates

.Site	#	N (mm)	ChiN	E (mm)	ChiE	U (mm)	ChiU	Years
1LSU	105	1.4	0.79	1.8	0.90	6.5	0.76	22.43
1NSU	105	1.0	0.67	1.1	0.71	3.8	0.60	21.69
1ULM	105	0.9	0.64	1.1	0.75	4.0	0.66	22.29
70DM	105	0.7	0.42	0.6	0.44	3.4	0.52	24.44
...								
ZDV1	75	0.7	0.42	0.8	0.59	3.6	0.62	22.32
ZKC1	75	0.8	0.53	0.7	0.50	4.1	0.69	22.32
ZLA1	75	0.7	0.46	0.8	0.63	4.1	0.66	22.32
ZLC1	75	0.7	0.40	0.9	0.62	3.8	0.63	22.55
ZME1	75	1.1	0.72	0.6	0.48	4.0	0.65	22.55
ZMP1	75	0.7	0.44	0.7	0.53	4.8	0.81	22.79
ZNY1	75	0.7	0.43	0.6	0.45	3.6	0.62	22.70
ZOA1	75	0.6	0.39	0.7	0.56	2.7	0.47	23.24
ZSE1	75	0.7	0.37	0.8	0.59	3.0	0.51	22.70
ZTL4	75	1.3	0.89	7.1	1.17	22.9	0.00	0.00

Table 2: RMS scatter of the position residuals for the CWU solution between June 15, 2025, and September 27, 2025, divided by network type. The division of networks is based on the JAVA script unavcoMetdata.jar with network codes PBO, Nucleus, Mid- SCIGN_USGS, America GAMA, COCONet and Expanded PBO

Network	North (mm)	East (mm)	Up (mm)	#Sites
Median				
PBO	0.68	0.66	3.16	829
NUCLEUS	0.64	0.64	3.11	191
GAMA	0.91	0.90	4.04	14
COCONet	1.29	1.28	5.08	73
USGS_SCIGN	0.70	0.70	3.28	127
Expanded	0.88	0.84	3.90	774
70%				
PBO	0.83	0.80	3.56	
NUCLEUS	0.74	0.72	3.36	
GAMA	0.93	0.96	4.11	

COCONet	1.50	1.55	5.97
USGS_SCIGN	0.88	0.85	3.65
Expanded	1.03	1.04	4.33
95%			
PBO	1.66	1.45	5.40
NUCLEUS	1.37	1.10	4.50
GAMA	1.22	1.07	4.27
COCONet	3.90	6.75	14.06
USGS_SCIGN	1.58	1.38	5.58
Expanded	2.00	2.04	7.58

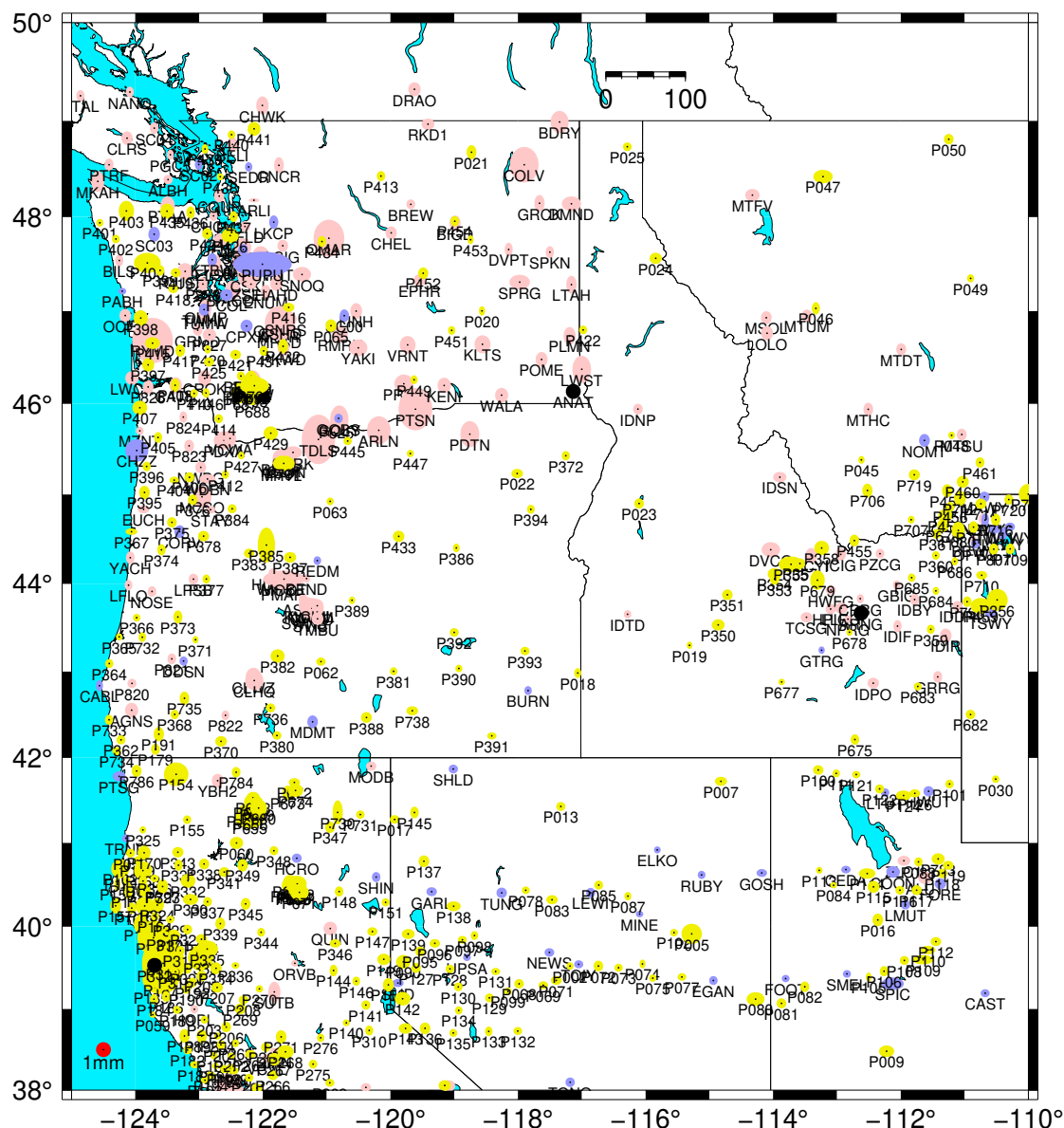


Figure 2: Distribution of the RMS scatters of horizontal position estimates from the CWU analysis for the Northern Western United States. The color of the ellipses that give the north and east RMS scatters denotes the network given by the legend in the figure. The small red circle shows the size of 1 mm scatters. Sites shown with black circles have combined RMS scatters in north and east greater than 5 mm or are sites that have no data during this 3-month interval.

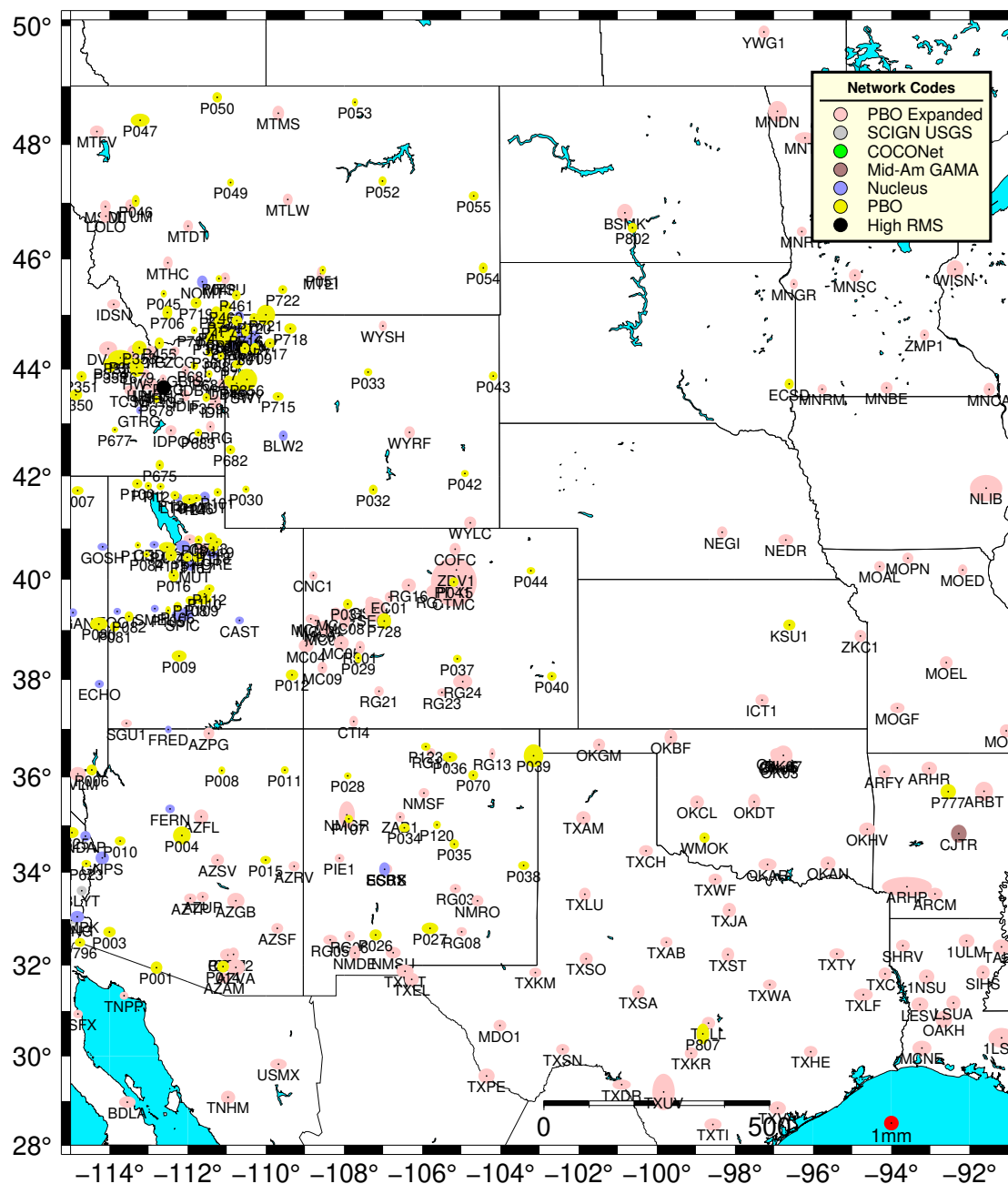


Figure 5: Same as Figure 4 except for the Central United States

Snapshot velocity field analysis from the reprocessed PBO analysis.

For this quarterly report, we generate velocity estimates for the reprocessed results and the current GAGE analyses that are in the NAM14 reference frame using the CWU analysis. There are 2756 stations in the CWU solution. The statistics of the fits to results are shown in Table 3. Because these are cumulative statistics, they are little changed from last quarter. In this analysis, offsets are estimated for antenna changes and earthquakes. Annual signals are estimated, and for some earthquakes, logarithmic post-seismic signals are also estimated. The full tables of RMS fit, along with the duration of the data used, are given in [cwu_nam14_250621.tab](#). The velocity estimates are shown by region and network type in Figures 8-14. The color scheme used is the same as Figures 2-7. The snapshot velocity field file for CWU is [cwu_nam14_250621.snpvel](#).

Table 3: Statistics of the fits of 2756 stations analyzed CWU in the reprocessed analysis for data collected between Jan 1, 1996 and September 27, 2025.

Center	North (mm)	East (mm)	Up (mm)
Median (50%)			
CWU	1.41	1.37	6.25
70%			
CWU	1.78	1.74	7.12
95%			
CWU	4.23	3.91	11.82

In Figures 8-14, different tolerances are used for maximum standard deviation in each figure so that regions with small velocity vectors can be displayed at large scales without the plots being dominated by large error bar points. The standard deviations of the velocity estimated are computed using the GLOBK First-order-Gauss-Markov Extrapolation (FOGMEX) model that aims to account for temporal correlations in the time series residuals. This algorithm is also called the “Realistic Sigma” model.

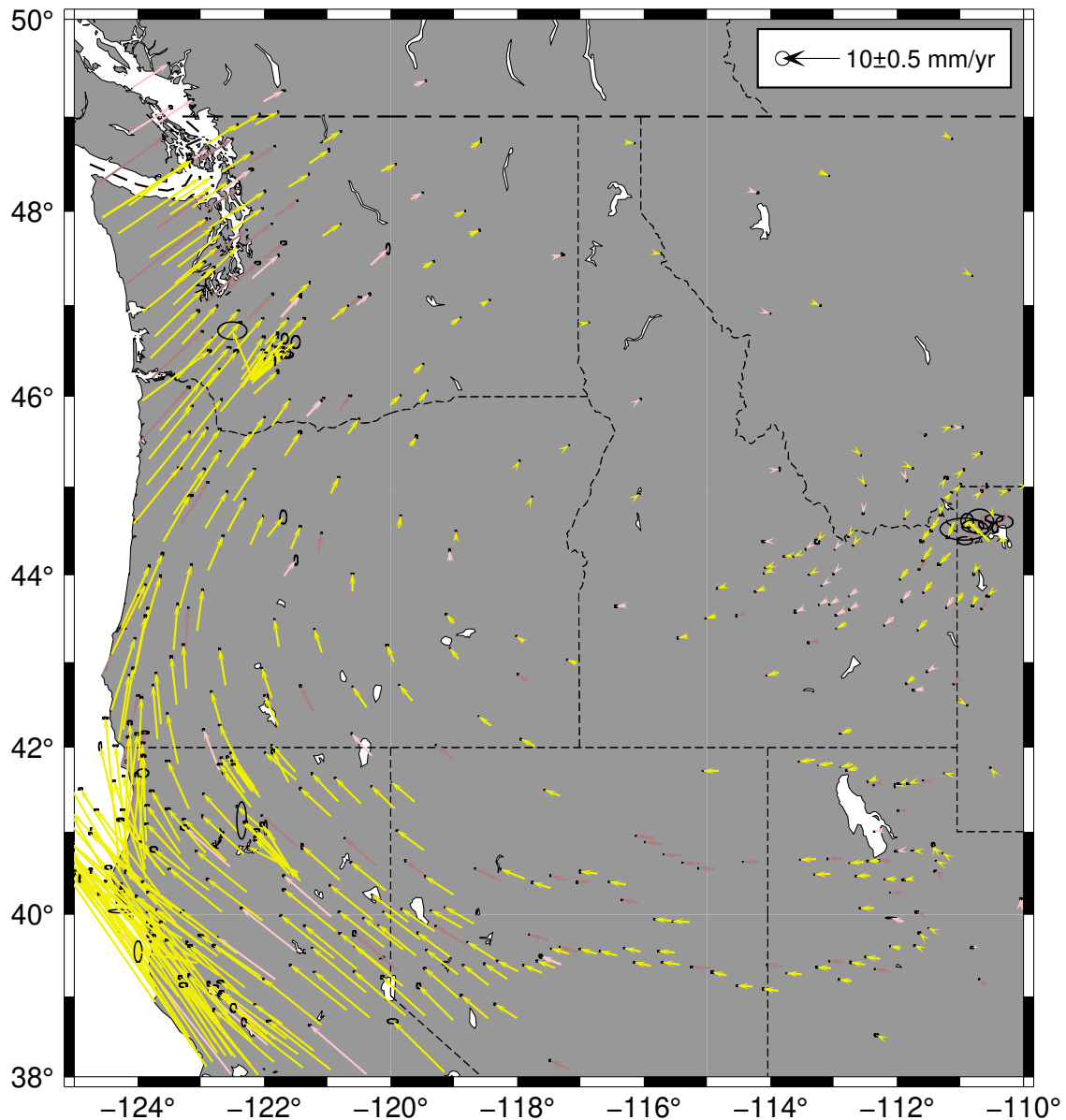


Figure 8: Velocity field estimates for the Pacific Northwest from the CWU solution generated using time series analysis and the FOGMEX error model. 95% confidence interval error ellipses are shown. The color scheme of the vectors matches the network type legend in Figure 4. Only velocities with horizontal standard deviations less than 2 mm/yr are shown (this value is reduced from previous reports due to the improved velocity sigmas).

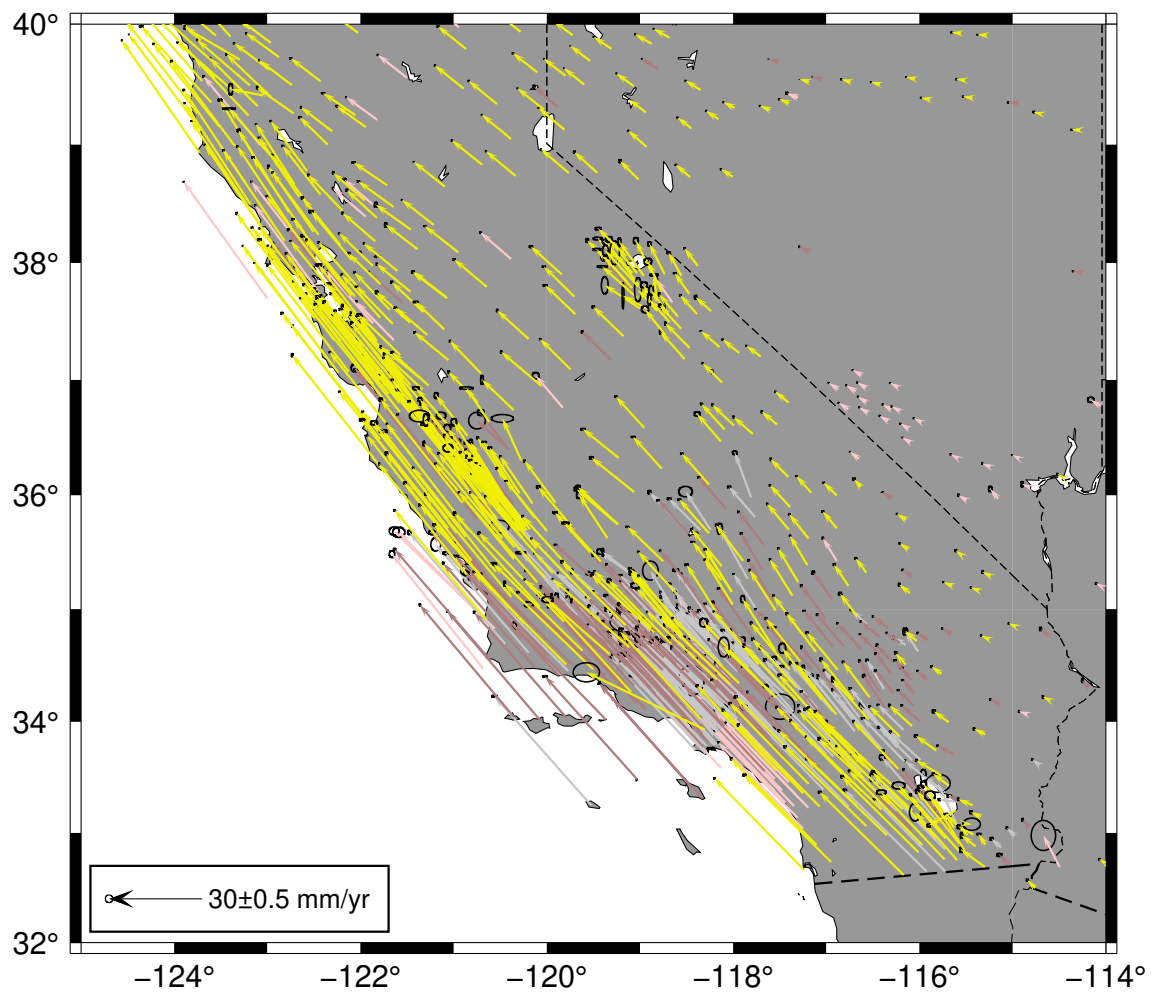


Figure 9: Same as Figure 8 except for the Southwestern United States. Only velocities with horizontal standard deviations less than 2 mm/yr are shown.

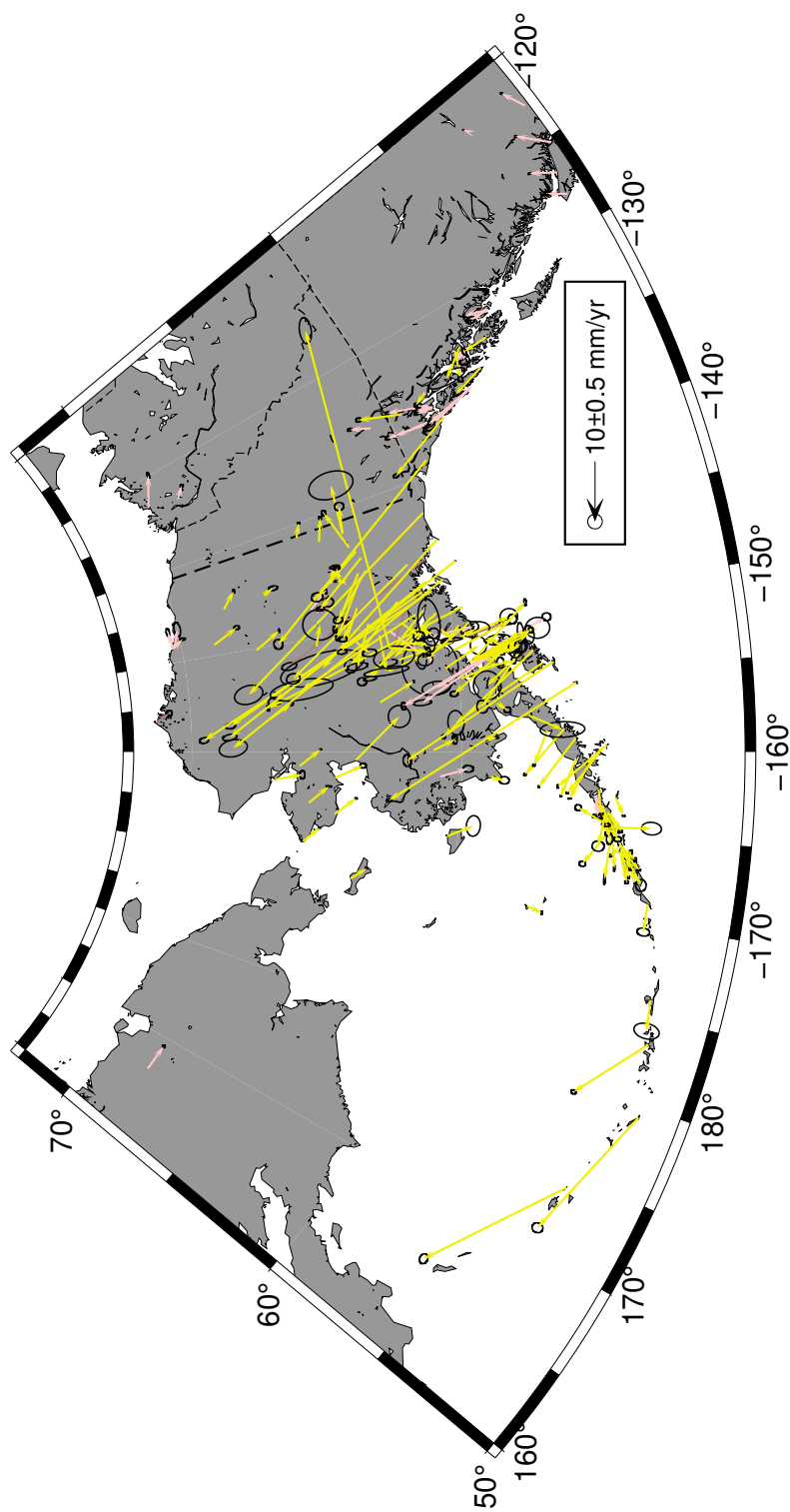


Figure 10: Same as Figure 8 except for Alaska. Only velocities with horizontal standard deviations less than 5 mm/yr are shown

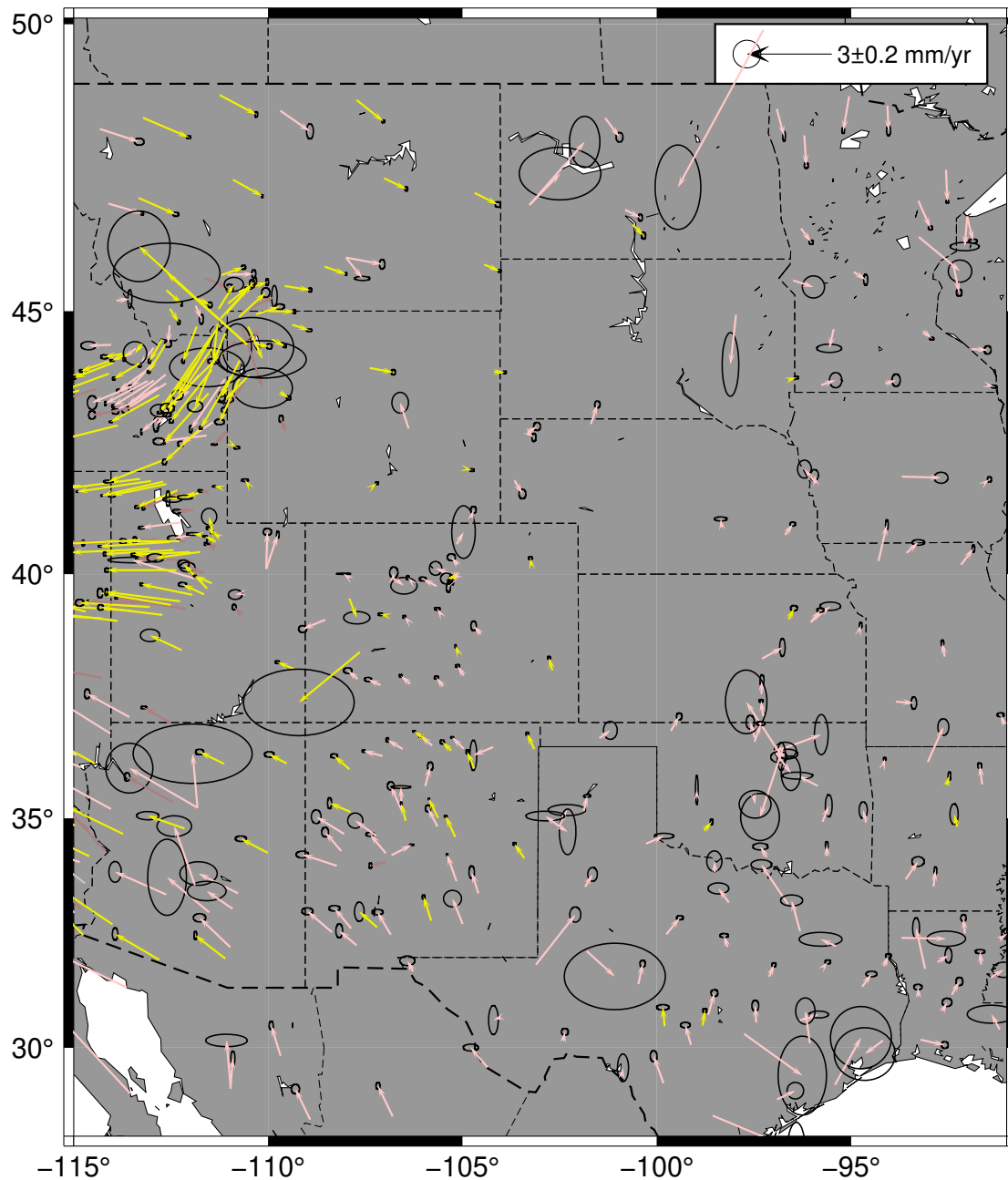


Figure 11: Same as Figure 8 except for Central United States. Only velocities with horizontal standard deviations less than 1 mm/yr are shown.

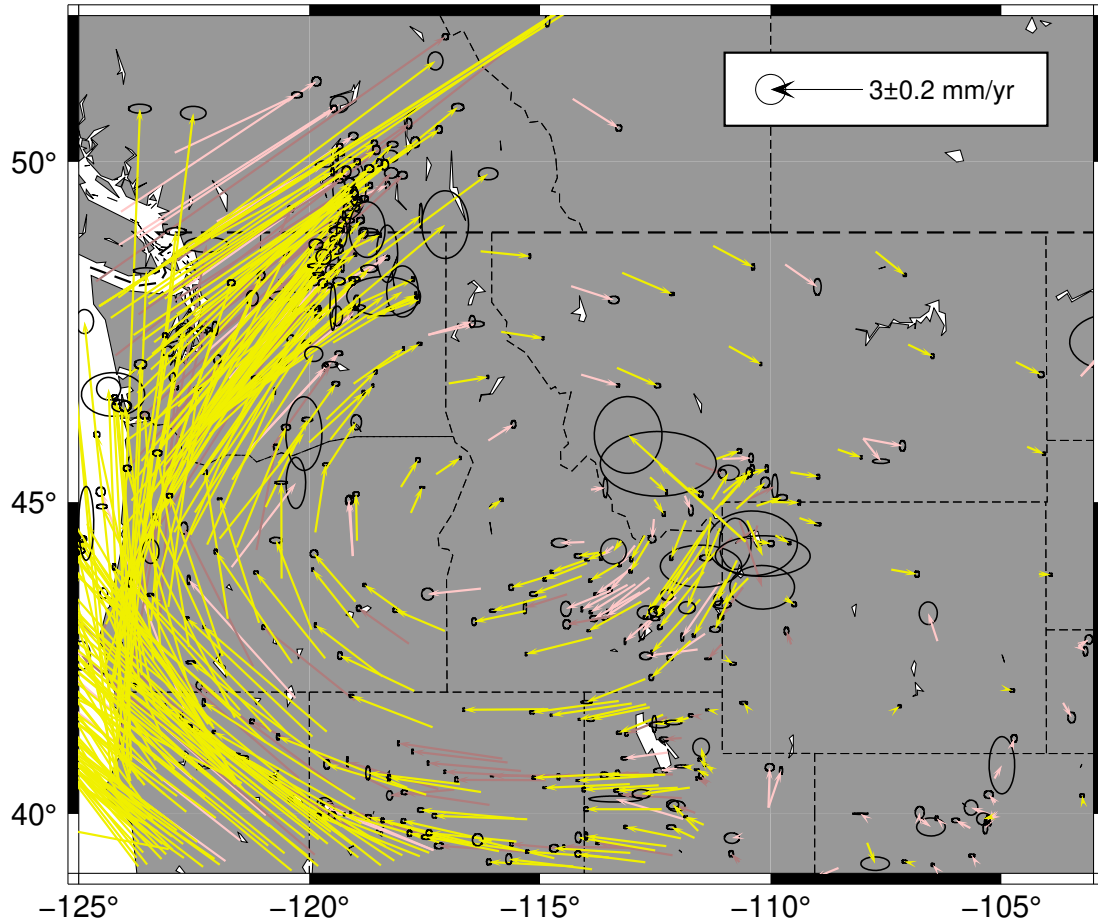


Figure 12: Same as Figure 8 except for Western Central United States. Only velocities with horizontal standard deviations less than 1 mm/yr are shown. Anomalous vectors at longitude 250° are in the Yellowstone National Park and most likely are showing volcanic processes.

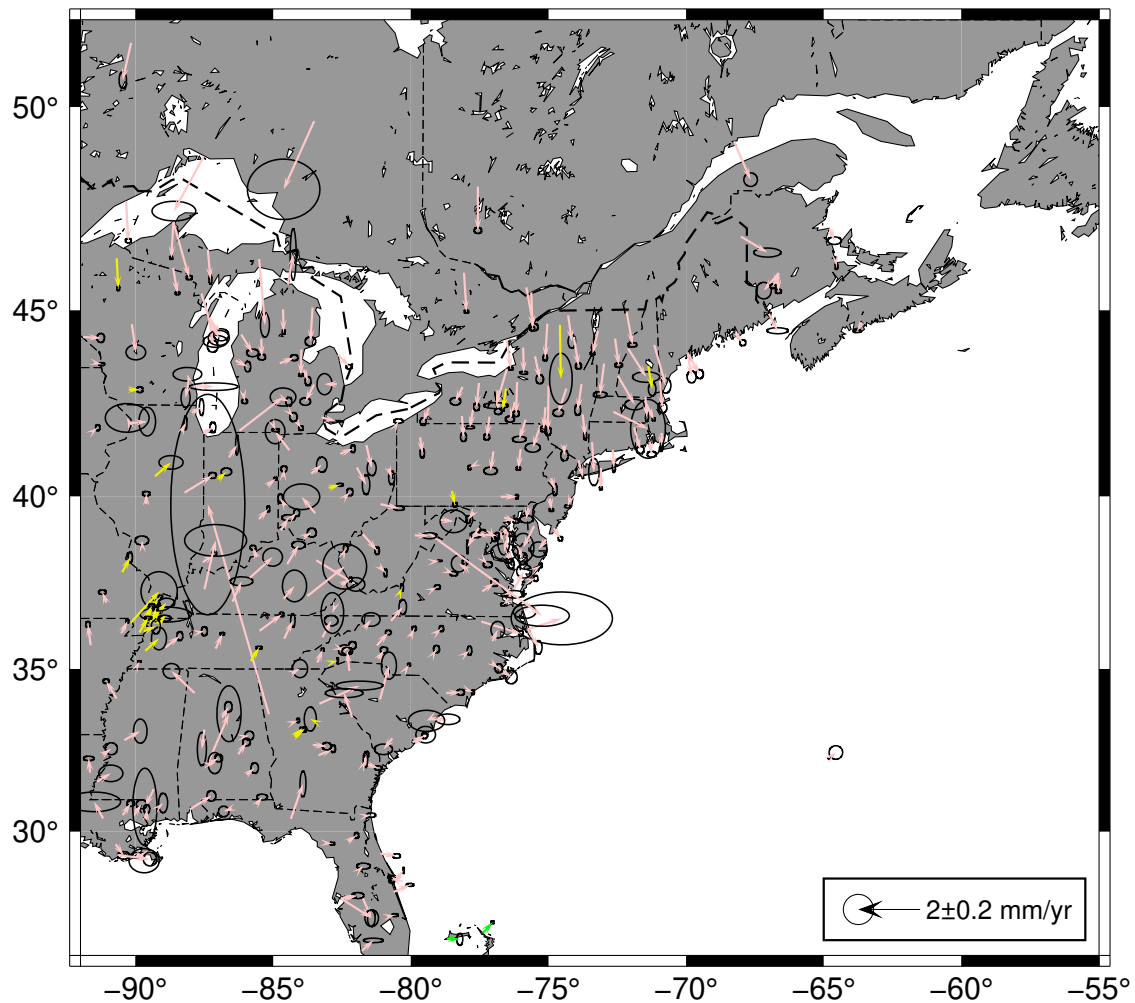


Figure 13: Same as Figure 8 except for the Eastern United States. Only velocities with horizontal standard deviations less than 2 mm/yr are shown. The systematic velocity of sites in the Northeast and central US show deviations for current GIA models in the horizontal velocities.

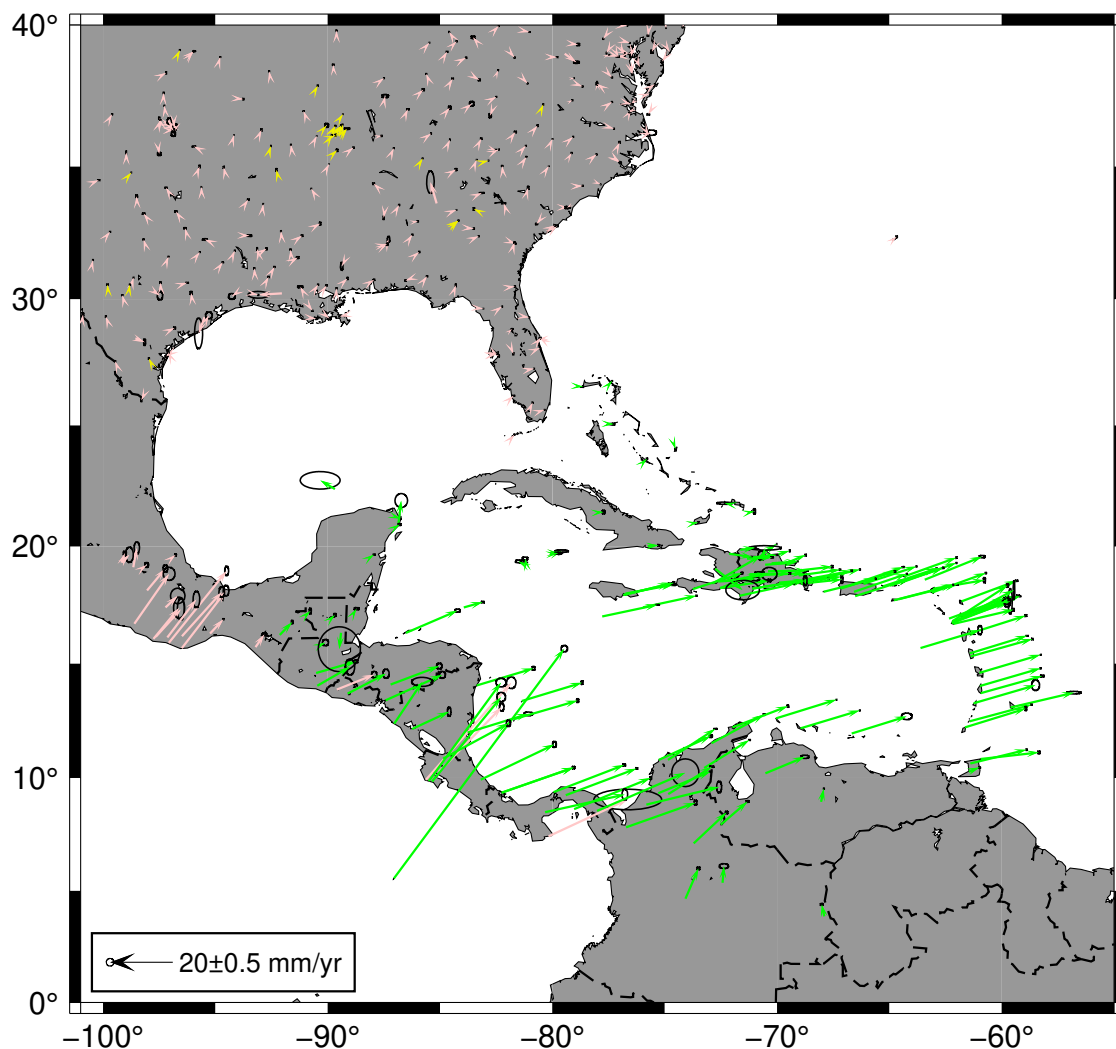


Figure 14: Same as Figure 8 except for the Caribbean region. Only velocities with horizontal standard deviations less than 5 mm/yr are shown.

Earthquake Analyses: 2025/03/15-2025/09/15

We use the NEIC catalog to search for earthquakes that could cause coseismic offsets at the sites analyzed by the GAGE analysis centers. Of the 20 earthquakes examined during this quarter, two generated coseismic offsets. The two earthquakes are EQ77 ANSS(ComCat) us7000qd1y mww7.3 Sand Point, Alaska; date and time 2025/07/16 20:38 (epicenter 54.5489°N, 160.4717°W) and EQ78 ANSS(ComCat) us6000qw60 mww8.8 Kamchatka Peninsula; Date and time 2025/07/29 23:25 (epicenter 52.5300°N, 160.1648°E). The largest offset from EQ77 was at AC12 -22.57 mm E, -44.43 mm N, with four sites showing displacements

greater than 10 mm. The largest offset from EQ78 was at AC60 -11.12 mm E, 0.16 mm N. It was the only site showing more than 10 mm displacement.

Antenna and other discontinuity events.

Antenna swaps at 37 sites have been added to the list of offsets estimated when fitting velocities and other parameters to the CWU time series. These offsets were spread throughout the quarter. An additional 4 breaks were added to the All_NOTA_unkn.eq file.

Anomalous sites

The following sites have been noted as having anomalous motions during this quarter. We updated the ACC_GAGE website to show times of earthquakes, antenna changes, and offsets for unknown reasons. Plots for CWU are now generated with and without offsets (computed from the Kalman filter time series analysis) removed. The landing page for http://geoweb.mit.edu/~tah/ACC_GAGE/ now has the following explanation.

Analyses from Central Washington University (CWU). Series are:

NMT -- Old plots from New Mexico Tech Analyses (Ends 9/15/2018).

PBO -- Old plots from Combined NMT+CWU analyses (Ends 9/15/2108).

CWURAW -- Raw time series with linear trend removed

CWUOFF -- Time series with linear trend and offsets from [cwu.kalts_nam14.off](http://geoweb.mit.edu/~tah/kalts_nam14.off) removed

Vertical lines denote times of offsets in time series:

Purple, solid: Earthquakes (OffEq ! EQ)

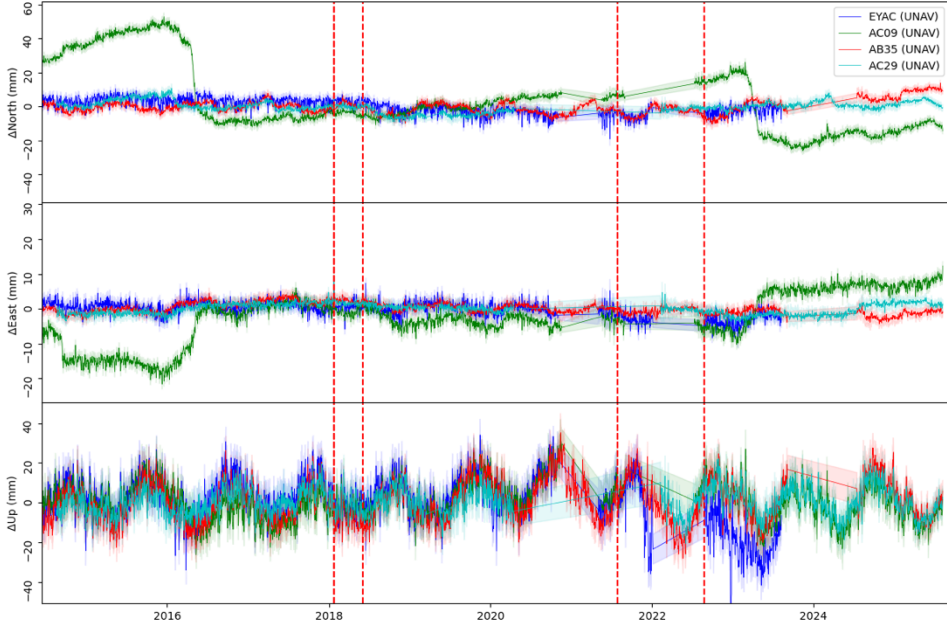
Blue, dotted: Antenna changes (Break ! AN)

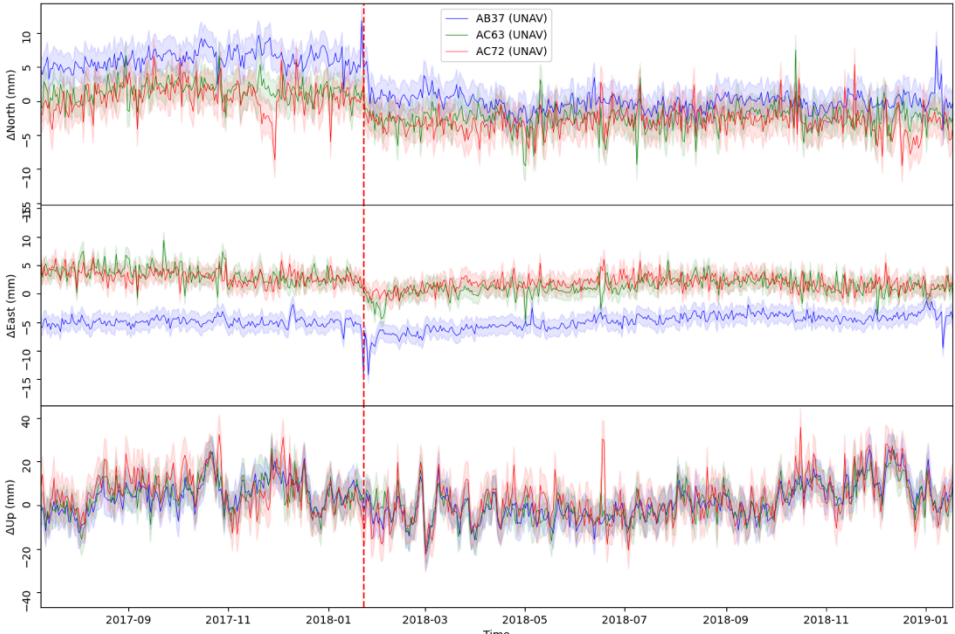
Cyan, dashed: Breaks for unkown reasons (Break ! UN)

N after site name means NOTA operated site, U means UNAVCO/Earthscope log file.

Site	N	Issues related to site
		2025-07-11
CHOW		Site in Central Valley, compare to P307 only 20km away. Effects of ground water changes. Only log at SOPAC. http://geoweb.mit.edu/~tah/ACC_GAGE/CHOW.CWUOFF.png http://geoweb.mit.edu/~tah/ACC_GAGE/P307.CWUOFF.png
LPHS		Near LA, systematic. Share some behaviors with VYAS (gone) and WCHS. No site photos but seems to be between two buildings. http://geoweb.mit.edu/~tah/ACC_GAGE/LPHS.CWUOFF.png

P604	E	Missed antenna change (2025-01-30) in offset settings. Re-scanned antenna information for consistency with monthly updates. http://geoweb.mit.edu/~tah/ACC_GAGE/P604.CWUOFF.png
		2025-07-18 Not in telecon
WHFG	E	New antenna, waiting for metadata to be updated. http://geoweb.mit.edu/~tah/ACC_GAGE/WHFG.CWUOFF.png
		2025-07-25
AC12	E	Earthquake 2025/07/16 20:38 near Sandpoint. Added as EQ 77. Other sites affected as well. http://geoweb.mit.edu/~tah/ACC_GAGE/AC12.CWUOFF.png
LBC2	E	New antenna. Metadata not updated yet. http://geoweb.mit.edu/~tah/ACC_GAGE/LBC2.CWUOFF.png
THU2		Offset after gap in data. IGS site with no metadata update. http://geoweb.mit.edu/~tah/ACC_GAGE/THU2.CWUOFF.png
		2025-08-01
AB07	E	Seems to be North Offset due to EQ77 ANSS(ComCat) us7000qd1y mww7.3 Sand Point, Alaska; date and time 2025/07/16 20:38. http://geoweb.mit.edu/~tah/ACC_GAGE/AB07.CWUOFF.png
AC60	E	Likely offset due to EQ78 ANSS(ComCat) us6000qw60 mww8.8 2025 Kamchatka Peninsula; date and time 2025/07/29 23:25. Also AC60 http://geoweb.mit.edu/~tah/ACC_GAGE/AC60.CWUOFF.png
AV40	E	Aleutian volcano. Most likely snow. (Other sites in region show outliers) http://geoweb.mit.edu/~tah/ACC_GAGE/AV40.CWUOFF.png
MC03		CORS group of sites new Grand Junction Colorado. Systematic and other in region similar.(MC06 and other MCnn sites similar but different. No clear annual in heights. http://geoweb.mit.edu/~tah/ACC_GAGE/MC03.CWUOFF.png

NIST		IGS site. Recently back online after antenna change. Seems to be earlier (2013 11 22) break in North. No meta data change at the time. http://geoweb.mit.edu/~tah/ACC_GAGE/NIST.CWUOFF.png
P827	N	Newer affiliate site in Centralia WA. Has a strong tidal-like signal in height. http://geoweb.mit.edu/~tah/ACC_GAGE/P827.CWUOFF.png
RNCH	E	Parkfield site with growing annual in East and now north. http://geoweb.mit.edu/~tah/ACC_GAGE/RNCH.CWUOFF.png
		2025-08-08
AB18	N	Interesting East behavior. Likely to be real. http://geoweb.mit.edu/~tah/ACC_GAGE/AB18.CWUOFF.png
AB22	N	“Continuous” North skewness. Looks like offset in North after gap but no metadata change. http://geoweb.mit.edu/~tah/ACC_GAGE/AB22.CWUOFF.png
AC09	N	Systematic but site ~100 km away don’t show this behavior (EYAC, AB35, AC29). All show same annual except AC29 (on island) is lower seasonal amplitude until 2024 then is same as others.  http://geoweb.mit.edu/~tah/ACC_GAGE/AC09.CWUOFF.png
AC63	N	Offset in 2018/01/24 appears due to EQ44 but not in current distance range. Offset looks “slow” with accumulation over a few days. In plot AB37 (South of AC63 and AC72) is in earthquake offset list (-4.89 ± 0.42 -1.93 ± 0.40 mm, dNE). AC71 may also be offset. Note also how correlated the height changes are.

		 http://geoweb.mit.edu/~tah/ACC_GAGE/AC63.CWUOFF.png
		2025-08-15
KYBO		CORS site on building Byrlington KY. Strange change and east offset. http://geoweb.mit.edu/~tah/ACC_GAGE/KYBO.CWUOFF.png
KYMH		CORS site. Failed antenna. http://geoweb.mit.edu/~tah/ACC_GAGE/KYMH.CWUOFF.png
TPOG	E	New antenna with old meta data. http://geoweb.mit.edu/~tah/ACC_GAGE/TPOG.CWUOFF.png
		2025-08-22 (not in monthly)
ARHP		Site in Texas, East offset (check to see if persists) http://geoweb.mit.edu/~tah/ACC_GAGE/ARHP.CWUOFF.png
GV07		Galápagos Island recently back online after long gap. http://geoweb.mit.edu/~tah/ACC_GAGE/GV07.CWUOFF.png http://geoweb.mit.edu/~tah/ACC_GAGE/GV10.CWUOFF.png
		2025-08-29 Not in telecon
MC08		Jump in East. See if it continues. Has had outliers before. Just a few days off. https://geoweb.mit.edu/~tah/ACC_GAGE/MC08.CWUOFF.png
MORP		IGS Site In England East offset. Seems to returned to original position. https://geoweb.mit.edu/~tah/ACC_GAGE/MORP.CWUOFF.png
SPRG		PANGA site in Washington State, west of Spokane. Could be vegetation or failing antenna. https://geoweb.mit.edu/~tah/ACC_GAGE/SPRG.CWUOFF.png
TXTI		CORS site in Texas – could be oil pumping? https://geoweb.mit.edu/~tah/ACC_GAGE/TXTI.CWUOFF.png
WVBU		CORS site in Virginia with antenna program but WVCV 60 km away has clean time series but large velocity. Not clear why.
* Long Lat Evel Nvel E +- N +- Hvel H +- Site		

		* deg deg mm/yr mm/yr mm/yr mm/yr mm/yr mm/yr 281.08650 39.33801 0.48 -0.01 0.10 0.10 -2.31 0.27 WVBU 280.54305 39.01531 3.78 -2.75 0.36 0.14 -2.68 0.14 WVCV 277.57529 38.42296 0.05 0.12 0.03 0.05 -2.34 0.15 WVHU 280.14159 38.89570 0.49 -0.01 0.05 0.03 -1.76 0.10 WVNR 278.86783 37.99826 0.20 -0.19 0.02 0.05 -2.54 0.35 WVOH 278.24865 38.94136 0.47 -0.55 0.03 0.05 -2.13 0.11 WVRA https://geoweb.mit.edu/~tah/ACC_GAGE/WVBU.CWUOFF.png
		2025-09-05
UPTC		Maybe be failing. Site in NorthEast. https://geoweb.mit.edu/~tah/ACC_GAGE/UPTC.CWUOFF.png
		2025-09-12
MTGG	E	California site, strange systematics, out of phase with LKHG 11 km away, P482 5 km away does not show pattern. No photos of MTGG but LKHG has one photo and looks like seismic station. Both listed as shallow foundation mast. https://geoweb.mit.edu/~tah/ACC_GAGE/MTGG.CWUOFF.png https://geoweb.mit.edu/~tah/ACC_GAGE/LKHG.CWUOFF.png
NYLV		CORS site in NY on building. Looks like it is disturbed. Check again later. Came back after about week? https://geoweb.mit.edu/~tah/ACC_GAGE/NYLV.CWUOFF.png
P029		Site near Colorado Springs. Systematic. https://geoweb.mit.edu/~tah/ACC_GAGE/P029.CWUOFF.png
ZLC1		CORS WAAS site in Salt Lake City, very systematic can correlated with SLCU a 1.5 km away but not with other sites 12 km (RBUT) away. https://geoweb.mit.edu/~tah/ACC_GAGE/ZLC1.CWUOFF.png
		2025-09-19 Not in Monthly
KYVW	E	Earthscope log, Looks like receiver has failed. Site in Southern CA. https://geoweb.mit.edu/~tah/ACC_GAGE/KYVW.CWUOFF.png
VIKH		CORS site in US Virgin Islands. 28 mm height 2024/09/17. No obvious reason. https://geoweb.mit.edu/~tah/ACC_GAGE/VIKH.CWUOFF.png
		2025-09-26 Not in telecon
P039	N	Offsets in North and East. Site near Clayton, CO. No new metadata since 2019? https://geoweb.mit.edu/~tah/ACC_GAGE/P039.CWUOFF.png
		2025-10-03
P435	N	10 mm outlier in East. Has done this once before; check again in a few days. Was single outlier; skewness in north so probably weather. https://geoweb.mit.edu/~tah/ACC_GAGE/P435.CWUOFF.png
YWG1		Canadian site near Lake Winnipeg: East oscillations. CORS WAAS station. https://geoweb.mit.edu/~tah/ACC_GAGE/YWG1.CWUOFF.png
		2025-10-10
PUPU	E	Site in Washington State South of Vancouver Island. ~20 mm NE offset when site comes back online. No new meta data. Also earlier offset in 2013. See what happens. Added UNKN breaks. https://geoweb.mit.edu/~tah/ACC_GAGE/PUPU.CWUOFF.png
		2025-10-17 not in Montly/telecon
AC81	E	New site and first point is offset. Point removed from time series.

		https://geoweb.mit.edu/~tah/ACC_GAGE/AC81.CWUOFF.png
RG24		RioGrand site, skewed (another example). https://geoweb.mit.edu/~tah/ACC_GAGE/RG24.CWUOFF.png

GNSS Rapid processing

Since 2021/10/20, CWU has generated a combined GPS and Galileo rapid solution because JPL has made available orbit and clock files from a global GPS and Galileo solution. These solutions are experimental, and for a number of sites, there are systematic mean differences in position between the GPS-only and the combined solutions. For this reason, these combined solutions are not distributed through the EarthScope GAGE products portal. Initially, there were inconsistencies in the GPS-only and combined analyses (e.g., elevation angle cutoff) that affected the comparison of the results, specifically when comparing mean positions and WRMS scatters of the fits to linear trends. Starting on 2024/03/26, these inconsistencies were resolved and since that time, a direct comparison of the GPS-only and combined GPS and Galileo solutions is possible. Results of the comparisons are reported daily to the GAGE_ACS email list. With nine months of consistently processed results available, we compare the results below. The current analysis used 973 stations with up to 569 days of comparison. The median NEU scatters for the GPS+GAL solutions are 0.88, 0.93, and 5.00 mm. The corresponding values from the common GPS-only solutions are 0.95, 0.98, and 5.32 mm, slightly larger than those from the GPS+GAL solution.

Table 4: Mean differences between GPS-only and GPS+Galileo rapid solutions. Differences are taken as GPS+GAL minus GPS-only position estimates. The largest 10 positive and negative differences in Up, North, and East are shown. The sig column is the standard deviation of the mean (assuming white noise statistics), wrms is the weighted root-mean-square scatter about the mean, and nrms is the normalized root mean square ($\sqrt{\chi^2/f}$).

CWU GNSSR Analysis Thu Oct 16 22:26:58 EDT 2025									
Stat	enu	#	MeanDiff (mm)	sig (mm)	wrms (mm)	nrms	Receiver	Antenna	Radome
FLIN	U	546	-13.18	0.10	2.27	0.2	SEPT POLARX5	NOV750.R4	NOVS
SASK	U	548	-12.17	0.09	2.11	0.2	JAVAD TRE_G3TH DELTA	NOV750.R4	NOVS
ARBT	U	356	-8.90	0.24	4.60	0.5	TRIMBLE NETR9	TRM115000.00	NONE
HDIL	U	102	-7.50	0.62	6.28	0.5	SEPT POLARX5	TRM59800.80	SCIT
PTRF	U	346	-7.09	0.24	4.48	0.4	SEPT POLARX5S	SEPCHOKE_B3E6	SPKE
SELD	U	468	-6.41	0.23	4.96	0.5	SEPT POLARX5	TRM159800.00	SCIT
1LSU	U	302	-6.30	0.36	6.29	0.5	TRIMBLE ALLOY	TRM115000.00	NONE
CN29	U	374	-6.21	0.48	9.36	0.6	TRIMBLE NETR9	TRM59800.99	SCIT
YORK	U	323	-5.91	1.55	27.77	1.0	TRIMBLE ALLOY	TRM115000.10	NONE
MHMS	U	545	-5.66	0.14	3.17	0.3	SEPT POLARX5	TWIVC6050	SCIT
.....									
ARML	U	397	5.88	0.18	3.68	0.4	SEPT POLARX5	SEPPOLANT_X_MF	NONE
LCHS	U	402	5.97	0.21	4.12	0.4	SEPT POLARX5	SEPPOLANT_X_MF	NONE
P669	U	548	6.10	0.18	4.11	0.3	SEPT POLARX5	TWIVC6050	SCIS
CHZZ	U	546	6.23	0.31	7.20	0.5	TRIMBLE NETR9	TRM59800.80	SCIT
LMCN	U	346	6.50	0.23	4.37	0.5	TRIMBLE ALLOY	TRM115000.00	NONE
NWCC	U	37	6.56	0.40	2.45	0.3	SEPT POLARX5	SEPPOLANT_X_MF	NONE
HCES	U	98	6.67	0.36	3.54	0.4	SEPT POLARX5	SEPPOLANT_X_MF	NONE
MCTY	U	399	7.89	0.24	4.81	0.5	SEPT POLARX5	SEPPOLANT_X_MF	NONE

P312	U	544	10.14	1.64	38.24	1.1	TRIMBLE NETR9	TRM59800.80	SCIT
COLA	U	544	14.33	0.49	11.49	1.3	TRIMBLE ALLOY	TRM55971.00	NONE
Stat	enu	#	MeanDiff (mm)	sig (mm)	wrms (mm)	nrms	Receiver	Antenna	Radome
LONG	N	541	-2.40	0.13	3.13	1.1	SEPT POLARX5	TWIVC6050	SCPL
COLA	N	544	-1.89	0.07	1.73	0.8	TRIMBLE ALLOY	TRM55971.00	NONE
P669	N	548	-1.58	0.03	0.82	0.3	SEPT POLARX5	TWIVC6050	SCIS
SELD	N	468	-1.51	0.05	1.01	0.3	SEPT POLARX5	TRM159800.00	SCIT
P224	N	547	-1.47	0.04	0.87	0.3	TRIMBLE NETR9	TRM59800.00	SCIT
MHMS	N	545	-1.40	0.03	0.76	0.3	SEPT POLARX5	TWIVC6050	SCIT
P388	N	548	-1.35	0.02	0.42	0.1	SEPT POLARX5	TRM59800.00	SCIT
AB48	N	6	-1.32	1.25	1.14	0.3	SEPT POLARX5	TRM29659.00	SCIT
AC34	N	325	-1.24	0.04	0.80	0.3	SEPT POLARX5	TRM29659.00	SCIT
P312	N	544	-1.21	0.26	6.17	1.0	TRIMBLE NETR9	TRM59800.80	SCIT
....									
P794	N	464	1.17	0.02	0.51	0.2	SEPT POLARX5	TRM59800.00	SCIT
P399	N	444	1.18	0.02	0.46	0.2	SEPT POLARX5	TRM59800.99	SCIT
KYMH	N	333	1.23	0.06	1.10	0.5	TRIMBLE ALLOY	TRM115000.00	NONE
GOLD	N	541	1.24	0.02	0.41	0.2	JAVAD TRE_G3TH DELTA	A0AD/M_T	NONE
P156	N	425	1.36	0.11	2.35	0.7	SEPT POLARX5	TRM59800.80	SCIT
OSPA	N	355	1.46	0.07	1.25	0.5	SEPT POLARX5	TWIVC6150	SCIS
P215	N	471	1.61	0.04	0.98	0.4	SEPT POLARX5	TRM59800.80	SCIT
P385	N	533	1.92	0.10	2.41	0.9	SEPT POLARX5	TRM59800.80	SCIT
P252	N	53	2.28	0.20	1.49	0.6	TRIMBLE NETR9	TRM29659.00	SCIT
NNVN	N	410	2.85	0.25	5.03	1.8	ALERTGEO RESOLUTE	LEIAR20	LEIM
Stat	enu	#	MeanDiff (mm)	sig (mm)	wrms (mm)	nrms	Receiver	Antenna	Radome
CAT3	E	548	-2.57	0.29	6.79	0.8	TRIMBLE ALLOY	TRM59800.80	SCIT
P669	E	548	-1.81	0.04	0.88	0.3	SEPT POLARX5	TWIVC6050	SCIS
KVTX	E	549	-1.44	0.03	0.65	0.3	SEPT POLARX5	TRM59800.99	SCIT
RDF2	E	74	-1.42	0.18	1.51	0.5	TRIMBLE NETR9	TRM57971.00	NONE
AB48	E	6	-1.35	0.79	0.63	0.3	SEPT POLARX5	TRM29659.00	SCIT
TFNO	E	357	-1.34	0.09	1.70	0.7	SEPT POLARX5	SEPCH0KE_B3E6	SPKE
P011	E	547	-1.32	0.03	0.70	0.4	SEPT POLARX5	TRM59800.80	SCIT
P187	E	547	-1.22	0.12	2.78	0.9	SEPT POLARX5	TRM59800.99	SCIT
P051	E	544	-1.21	0.02	0.41	0.2	SEPT POLARX5	TRM59800.00	SCIT
TNAL	E	227	-1.15	0.07	1.03	0.4	TRIMBLE NETR9	TRM57971.00	NONE
....									
P505	E	457	1.03	0.13	2.70	1.4	TRIMBLE NETR9	TRM59800.80	SCIT
KIR0	E	539	1.04	0.03	0.68	0.4	SEPT POLARX5	JAVRINGANT_DM	OSOD
PAMS	E	344	1.06	0.04	0.70	0.3	TRIMBLE ALLOY	TRM115000.00	NONE
P740	E	536	1.08	0.06	1.33	0.5	SEPT POLARX5	TRM59800.99	SCIT
KOKB	E	407	1.14	0.05	0.99	0.5	SEPT POLARX5TR	ASH701945G_M	NONE
ONSA	E	542	1.24	0.03	0.72	0.4	SEPT POLARX5TR	A0AD/M_B	OSOD
P071	E	545	1.28	0.01	0.34	0.2	SEPT POLARX5	TRM59800.99	SCIT
NDAP	E	548	1.87	0.12	2.75	1.5	TRIMBLE NETR9	TRM59800.80	SCIT
EGAN	E	548	1.97	0.13	3.07	1.7	TRIMBLE NETR9	TRM59800.80	SCIS
P191	E	549	3.73	0.18	4.22	2.4	TRIMBLE NETR9	TRM59800.80	SCIT

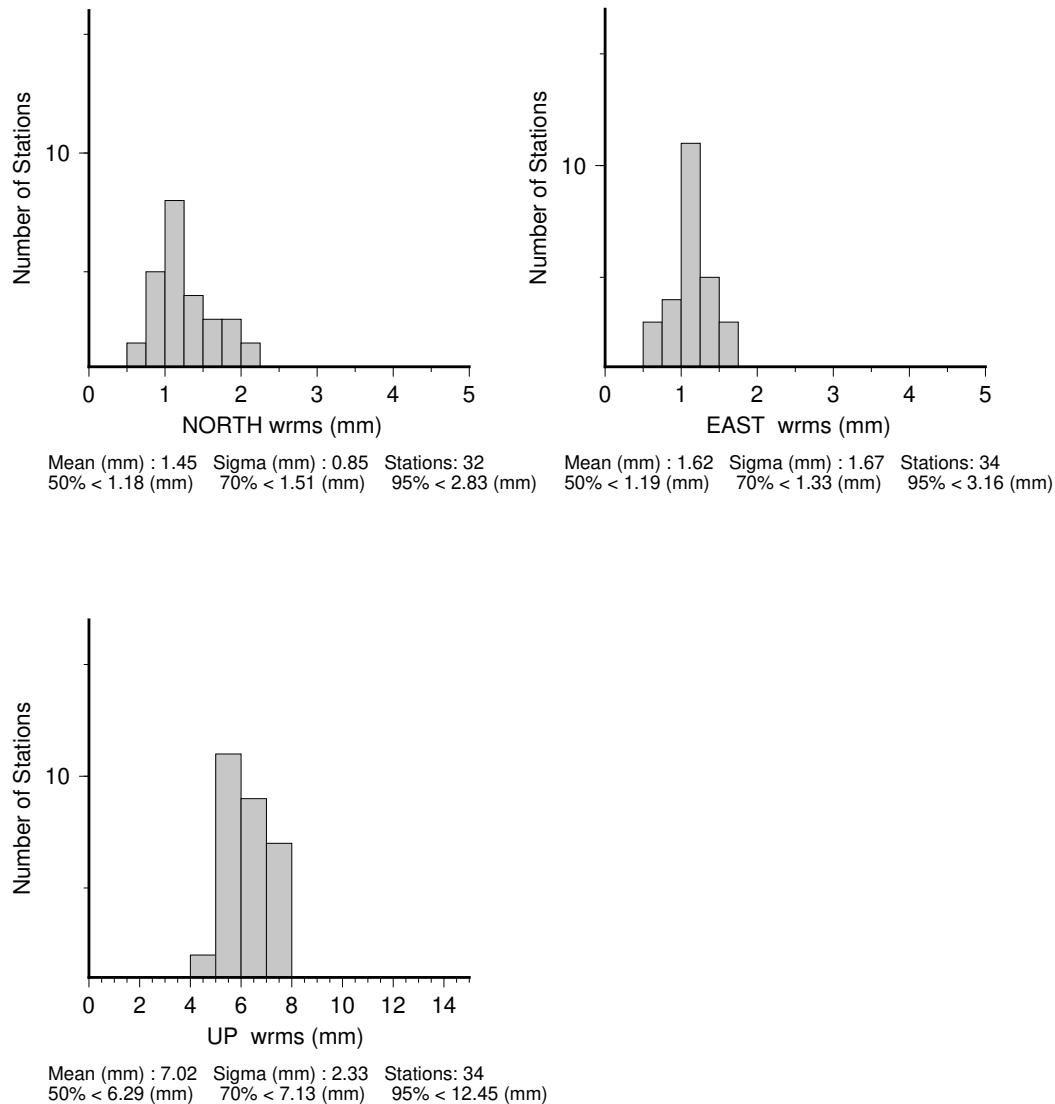
ANET Processing

The ANET additional sites are being processed as a separate network, and the frame-resolved SINEX files will be given in the Antarctica 2007 reference frame (Altamimi *et al.*, 2016, 2017). We label this frame ant14. Time series and SINEX files are generated only for final orbit solutions and are labeled as fanet (instead of final to avoid name conflicts with loose solutions). The IGS14 loose submission files are labeled with “lse14” to differentiate them for the IGS08 loose submissions, which were labeled as loose. The statistics of the time series fits from the CWU solution for this quarter are given in Table 5.

Table 5: Statistics of the fits of 34 stations in the ANET region for CWU analyzed in the final orbit analysis between June 15, 2025 and September 27, 2025.

CWU	North (mm)	East (mm)	Up (mm)
Median			
ANET	1.18	1.19	6.29
70%			
ANET	1.51	1.33	7.13
95%			
ANET	2.83	3.16	12.45

The histograms of the RMS scatter in NEU of the results for this quarter are shown in Figure A.1



Scatter-Wrms Histogram : FILE: CWU_ANT_Y7Q4.sum

Figure A.1: CWU solution histograms of the North, East and Up RMS scatters of the position residuals for 34 stations in Antarctica analyzed between June 15, 2025 and September 27, 2025. Linear trends and annual signals were estimated from the time series.

References

- Altamimi, Z., P. Rebischung, L. Metivier, and X. Collilieux (2016), ITRF2014: A new release of the International Terrestrial Reference Frame modeling nonlinear station motions, *J. Geophys. Res. Solid Earth*, 121, 6109-6131, doi: 10.1002/2016JB013098.
- Altamimi, Z., L. Metivier, P. Rebischung, H. Rouby, X. Collilieux; ITRF2014 plate motion model, *Geophysical Journal International*, Volume 209, Issue 3, 1 June 2017, Pages 1906-1912, <https://doi.org/10.1093/gji/ggx147>