

Subject: OPUS solution : 17U_01_114039.17o OP1505826476813

From: opus <opus@ngs.noaa.gov>

Date: 9/19/2017 9:08 AM

To: kellybellis@gwi.net

FILE: 17U_01_114039.17o OP1505826476813

2005 NOTE: The IGS precise and IGS rapid orbits were not available
 2005 at processing time. The IGS ultra-rapid orbit was/will be used to
 2005 process the data.
 2005

NGS OPUS SOLUTION REPORT
 =====

All computed coordinate accuracies are listed as peak-to-peak values.
 For additional information: <https://www.ngs.noaa.gov/OPUS/about.jsp#accuracy>

USER: kellybellis@gwi.net DATE: September 19, 2017
 RINEX FILE: 17u_261p.17o TIME: 13:08:38 UTC

SOFTWARE: page5 1603.24 master90.pl 160321 START: 2017/09/18 15:41:00
 EPHEMERIS: igu19671.eph [ultra-rapid] STOP: 2017/09/18 18:26:00
 NAV FILE: brdc2610.17n OBS USED: 5908 / 6828 : 87%
 ANT NAME: JAVTRIOUMPH_2A NONE # FIXED AMB: 49 / 54 : 91%
 ARP HEIGHT: 2.025 OVERALL RMS: 0.018(m)

REF FRAME: NAD_83(2011)(EPOCH:2010.0000) IGS08 (EPOCH:2017.7143)

X:	1674897.649(m)	0.028(m)	1674896.737(m)	0.028(m)
Y:	-4234009.285(m)	0.031(m)	-4234007.872(m)	0.031(m)
Z:	4451430.300(m)	0.001(m)	4451430.332(m)	0.001(m)

LAT:	44 32 40.29590	0.028(m)	44 32 40.33410	0.028(m)
E LON:	291 34 58.28599	0.015(m)	291 34 58.27112	0.015(m)
W LON:	68 25 1.71401	0.015(m)	68 25 1.72888	0.015(m)
EL HGT:	20.472(m)	0.029(m)	19.319(m)	0.029(m)
ORTHO HGT:	45.004(m)	0.050(m)	[NAVD88 (Computed using GEOID12B)]	

	UTM COORDINATES	STATE PLANE COORDINATES
	UTM (Zone 19)	SPC (1801 ME E)
Northing (Y) [meters]	4932520.309	97536.386
Easting (X) [meters]	546300.572	306583.923
Convergence [degrees]	0.40886021	0.05812132
Point Scale	0.99962636	0.99990053
Combined Factor	0.99962315	0.99989732

US NATIONAL GRID DESIGNATOR: 19TEK4630032520(NAD 83)

BASE STATIONS USED				
PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)

DK4436	PNB6	PENOBSCOT 6	CORS ARP	N442707.247	W0684619.958	30052.3
DO2058	MEWA	WALDO	CORS ARP	N442715.192	W0690549.489	54998.9
DP1322	MECC	BANGOR	CORS ARP	N444933.210	W0684438.601	40611.6

NEAREST NGS PUBLISHED CONTROL POINT

PE0027	E 8		N443238.	W0682506.	118.2
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BASE STATION INFORMATION

STATION NAME: pnb6 a 2 (Penobscot 6; Penobscot, Maine USA)

MONUMENT: NO DOMES NUMBER

XYZ	1651238.5996	-4251031.1000	4444106.7053	MON @ 2005.0000 (M)
XYZ	-0.0160	-0.0014	0.0049	VEL (M/YR)
NEU	0.0000	0.0000	0.0000	MON TO ARP (M)
NEU	-0.0028	-0.0023	0.0631	ARP TO L1 PHASE CENTER (M)
NEU	-0.0038	-0.0021	0.0612	ARP TO L2 PHASE CENTER (M)
XYZ	-0.2029	-0.0175	0.0621	VEL TIMES 12.7141 YRS
XYZ	0.0000	0.0000	0.0000	MON TO ARP
XYZ	0.0149	-0.0447	0.0422	ARP TO L1 PHASE CENTER
XYZ	1651238.4117	-4251031.1622	4444106.8095	L1 PHS CEN @ 2017.7143
XYZ	-0.0000	-0.0000	-0.0000	+ XYZ ADJUSTMENTS
XYZ	1651238.4117	-4251031.1622	4444106.8095	NEW L1 PHS CEN @ 2017.7143
XYZ	1651238.3967	-4251031.1175	4444106.7673	NEW ARP @ 2017.7143
XYZ	1651238.3967	-4251031.1175	4444106.7673	NEW MON @ 2017.7143
LLH	44 27 7.28510	291 13 40.02622	32.3710	NEW L1 PHS CEN @ 2017.7143
LLH	44 27 7.28519	291 13 40.02632	32.3079	NEW ARP @ 2017.7143
LLH	44 27 7.28519	291 13 40.02632	32.3079	NEW MON @ 2017.7143

STATION NAME: mewa a 1 (Waldo; Waldo, Maine USA)

MONUMENT: NO DOMES NUMBER

XYZ	1627051.7451	-4260176.3523	4444293.8494	MON @ 2005.0000 (M)
XYZ	-0.0159	-0.0014	0.0045	VEL (M/YR)
NEU	0.0000	0.0000	0.0000	MON TO ARP (M)
NEU	0.0013	-0.0002	0.0667	ARP TO L1 PHASE CENTER (M)
NEU	0.0004	0.0006	0.0577	ARP TO L2 PHASE CENTER (M)
XYZ	-0.2022	-0.0178	0.0572	VEL TIMES 12.7141 YRS
XYZ	0.0000	0.0000	0.0000	MON TO ARP
XYZ	0.0165	-0.0437	0.0477	ARP TO L1 PHASE CENTER
XYZ	1627051.5594	-4260176.4138	4444293.9543	L1 PHS CEN @ 2017.7143
XYZ	-0.0000	-0.0000	-0.0000	+ XYZ ADJUSTMENTS
XYZ	1627051.5594	-4260176.4138	4444293.9543	NEW L1 PHS CEN @ 2017.7143
XYZ	1627051.5429	-4260176.3701	4444293.9066	NEW ARP @ 2017.7143
XYZ	1627051.5429	-4260176.3701	4444293.9066	NEW MON @ 2017.7143
LLH	44 27 15.23078	290 54 10.49510	49.6084	NEW L1 PHS CEN @ 2017.7143
LLH	44 27 15.23074	290 54 10.49511	49.5417	NEW ARP @ 2017.7143
LLH	44 27 15.23074	290 54 10.49511	49.5417	NEW MON @ 2017.7143

STATION NAME: mecc a 1 (Bangor; Bangor, Maine USA)

MONUMENT: NO DOMES NUMBER

XYZ	1642740.6466	-4223003.9787	4473660.5524	MON @ 2005.0000 (M)
XYZ	-0.0160	-0.0014	0.0046	VEL (M/YR)
NEU	0.0000	0.0000	0.0000	MON TO ARP (M)

NEU	0.0013	-0.0002	0.0667	ARP TO L1 PHASE CENTER (M)
NEU	0.0004	0.0006	0.0577	ARP TO L2 PHASE CENTER (M)
XYZ	-0.2034	-0.0178	0.0585	VEL TIMES 12.7141 YRS
XYZ	0.0000	0.0000	0.0000	MON TO ARP
XYZ	0.0167	-0.0433	0.0480	ARP TO L1 PHASE CENTER
XYZ	1642740.4598	-4223004.0398	4473660.6588	L1 PHS CEN @ 2017.7143
XYZ	0.0000	-0.0000	-0.0000	+ XYZ ADJUSTMENTS
XYZ	1642740.4598	-4223004.0398	4473660.6588	NEW L1 PHS CEN @ 2017.7143
XYZ	1642740.4432	-4223003.9965	4473660.6109	NEW ARP @ 2017.7143
XYZ	1642740.4432	-4223003.9965	4473660.6109	NEW MON @ 2017.7143
LLH	44 49 33.24835	291 15 21.38255	19.5106	NEW L1 PHS CEN @ 2017.7143
LLH	44 49 33.24831	291 15 21.38256	19.4439	NEW ARP @ 2017.7143
LLH	44 49 33.24831	291 15 21.38256	19.4439	NEW MON @ 2017.7143

REMOTE STATION INFORMATION

STATION NAME: 17u_ 1

MONUMENT: NO DOMES NUMBER

XYZ	1674896.9754	-4234008.1578	4451430.8193	MON @ 2017.7141 (M)
NEU	-0.0028	0.0005	2.0250	MON TO ARP (M)
NEU	0.0028	-0.0005	0.0502	ARP TO L1 PHASE CENTER (M)
NEU	-0.0032	0.0019	0.0356	ARP TO L2 PHASE CENTER (M)
XYZ	0.5321	-1.3437	1.4185	MON TO ARP
XYZ	0.0120	-0.0317	0.0372	ARP TO L1 PHASE CENTER
XYZ	1674897.5195	-4234009.5332	4451432.2750	L1 PHS CEN @ 2017.7143

BASELINE NAME: pnb6 17u_

XYZ	-0.2410	0.2878	-0.4885	+ XYZ ADJUSTMENTS
XYZ	1674897.2785	-4234009.2453	4451431.7866	NEW L1 PHS CEN @ 2017.7143
XYZ	1674897.2665	-4234009.2136	4451431.7493	NEW ARP @ 2017.7143
XYZ	1674896.7344	-4234007.8700	4451430.3308	NEW MON @ 2017.7143
LLH	44 32 40.33415	291 34 58.27106	21.3911	NEW L1 PHS CEN @ 2017.7143
LLH	44 32 40.33406	291 34 58.27108	21.3409	NEW ARP @ 2017.7143
LLH	44 32 40.33415	291 34 58.27106	19.3158	NEW MON @ 2017.7143

BASELINE NAME: mewa 17u_

XYZ	-0.2509	0.3003	-0.4878	+ XYZ ADJUSTMENTS
XYZ	1674897.2685	-4234009.2329	4451431.7873	NEW L1 PHS CEN @ 2017.7143
XYZ	1674897.2566	-4234009.2012	4451431.7500	NEW ARP @ 2017.7143
XYZ	1674896.7245	-4234007.8575	4451430.3315	NEW MON @ 2017.7143
LLH	44 32 40.33452	291 34 58.27085	21.3808	NEW L1 PHS CEN @ 2017.7143
LLH	44 32 40.33443	291 34 58.27087	21.3305	NEW ARP @ 2017.7143
LLH	44 32 40.33452	291 34 58.27085	19.3055	NEW MON @ 2017.7143

BASELINE NAME: mecc 17u_

XYZ	-0.2227	0.2689	-0.4871	+ XYZ ADJUSTMENTS
XYZ	1674897.2968	-4234009.2643	4451431.7879	NEW L1 PHS CEN @ 2017.7143
XYZ	1674897.2848	-4234009.2326	4451431.7507	NEW ARP @ 2017.7143
XYZ	1674896.7527	-4234007.8889	4451430.3322	NEW MON @ 2017.7143
LLH	44 32 40.33363	291 34 58.27151	21.4094	NEW L1 PHS CEN @ 2017.7143
LLH	44 32 40.33354	291 34 58.27154	21.3592	NEW ARP @ 2017.7143
LLH	44 32 40.33363	291 34 58.27151	19.3341	NEW MON @ 2017.7143

G-FILES

Axx2017 918 17 918
 B2017 9181541 17 9181826 1 page5 v1603.24IGS 126 1 2 27NGS 2017 919IFDDPX
 IIGS08_1930 IGS 20170101
 C00090002 -236583377 16 -170232476 37 -73235635 34 X2617A17U_X2617APNB6
 D 1 2 -6644386 1 3 8241712 2 3 -8789428

Axx2017 918 17 918
 B2017 9181541 17 9181826 1 page5 v1603.24IGS 126 1 2 27NGS 2017 919IFDDPX
 IIGS08_1930 IGS 20170101
 C00090001 -478451815 18 -261685126 37 -71364249 36 X2617A17U_X2617AMEWA
 D 1 2 -6445994 1 3 7577396 2 3 -9059302

Axx2017 918 17 918
 B2017 9181541 17 9181826 1 page5 v1603.24IGS 126 1 2 27NGS 2017 919IFDDPX
 IIGS08_1930 IGS 20170101
 C00090003 -321563095 22 110038924 40 222302787 41 X2617A17U_X2617AMECC
 D 1 2 -8212608 1 3 6577317 2 3 -8752416

POST-FIT RMS BY SATELLITE VS. BASELINE

	OVERALL	02	03	05	06	09	12	13	17
pnb6-17u_	0.017	0.014	0.019	0.017	...	0.018	0.017	...	0.013
	19	20	23	25	28	29			
pnb6-17u_	0.012	0.021	0.026	0.022	...	0.014			

	OVERALL	02	03	05	06	09	12	13	17
mewa-17u_	0.017	0.014	0.015	0.017	...	0.018	0.020	...	0.015
	19	20	23	25	28	29			
mewa-17u_	0.012	0.023	0.029	0.021	...	0.013			

	OVERALL	02	03	05	06	09	12	13	17
mecc-17u_	0.020	0.015	0.023	0.022	...	0.020	0.026	...	0.016
	19	20	23	25	29				
mecc-17u_	0.015	0.034	0.029	0.019	0.019				

OBS BY SATELLITE VS. BASELINE

	OVERALL	02	03	05	06	09	12	13	17
pnb6-17u_	1998	288	50	196	...	246	282	...	204
	19	20	23	25	28	29			
pnb6-17u_	306	40	97	192	...	97			
mewa-17u_	1990	287	51	195	...	229	287	...	201
	19	20	23	25	28	29			
mewa-17u_	309	30	79	224	...	98			
mecc-17u_	1920	289	50	195	...	248	264	...	194
	19	20	23	25	29				
mecc-17u_	277	21	107	179	96				

Covariance Matrix for the xyz OPUS Position (meters²).

0.0000023644	-0.0000003434	0.0000003406
-0.0000003434	0.0000096400	-0.0000008328
0.0000003406	-0.0000008328	0.0000091844

Covariance Matrix for the enu OPUS Position (meters²).

0.0000031140	0.0000015720	-0.0000015932
0.0000015720	0.0000081413	0.0000001673
-0.0000015932	0.0000001673	0.0000099336

Horizontal network accuracy = 0.00605 meters.
 Vertical network accuracy = 0.00618 meters.

Derivation of NAD 83 vector components

Position of reference station ARP in NAD_83(2011)(EPOCH:2010.0000).

	Xa(m)	Ya(m)	Za(m)	
PNB6	1651239.30774	-4251032.53018	4444106.73621	2010.00
MEWA	1627052.45315	-4260177.78121	4444293.87961	2010.00
MECC	1642741.35618	-4223005.40471	4473660.57810	2010.00

Position of reference station monument in NAD_83(2011)(EPOCH:2010.0000).

	Xr(m)	Yr(m)	Zr(m)	
PNB6	1651239.30774	-4251032.53018	4444106.73621	2010.00
MEWA	1627052.45315	-4260177.78121	4444293.87961	2010.00
MECC	1642741.35618	-4223005.40471	4473660.57810	2010.00

Velocity of reference station monument in NAD_83(2011)(EPOCH:2010.0000).

	Vx (m/yr)	Vy (m/yr)	Vz (m/yr)
PNB6	-0.01600	-0.00140	0.00490
MEWA	0.00210	0.00030	-0.00190
MECC	0.00210	0.00030	-0.00190

Vectors from unknown station monument to reference station monument in NAD_83(2011)(EPOCH:2010.0000).

	Xr-X= DX(m)	Yr-Y= DY(m)	Zr-Z= DZ(m)	
PNB6	-23658.34126	-17023.24518	-7323.56379	2010.00
MEWA	-47845.19585	-26168.49621	-7136.42039	2010.00
MECC	-32156.29282	11003.88029	22230.27810	2010.00

STATE PLANE COORDINATES - U.S. Survey Foot

SPC (1801	ME E)
Northing (Y) [feet]	320000.626
Easting (X) [feet]	1005850.754
Convergence [degrees]	0.05812132
Point Scale	0.99990053
Combined Factor	0.99989732

***** New Reference Frame Preview *****

We are replacing the nation's NAD 83 and NAVD 88 datums, to improve access and accuracy of the National Spatial Reference System. More at <https://geodesy.noaa.gov/datums/newdatums/>

Below are approximate coordinates for this solution in the new frames:

APPROX ORTHO HGT: 44.656 (m) [PROTOTYPE (Computed using xGeoid16B,GRS80,IGS08)]

This position and the above vector components were computed without any knowledge by the National Geodetic Survey regarding the equipment or field operating procedures used.