

**NOAA, National Geodetic Survey  
HEIGHT MODERNIZATION COORDINATION MEETING  
DRAFT NOTES**

Date: Thursday, October 11, 2012  
Time: 2:00-3:30 pm East Coast time

**Attendees:**

*Call-ins from:* AK (Tom Heinrichs), CA (Scott Martin), IL (Sheena Beaverson), KY (Danielle Kelly, Wolfgang Ziegler), MI (Shawn Roy), MT (Bryce Larson), NGS (Vicki Veilleux, Dan Callahan, Kevin Jordan, Steve Holdorph, Dan Winester), SC (Dick Woods, Matt Wellslager), WA (Dave Steele), WI (David Moyer), USACE (Mark Huber), Woolpert (Dave Kuxhausen)

*Silver Spring:* NGS (Renee Shields, Gilbert Mitchell, Ross Mackay, Michael Dennis); CO-OPS (Mike Michalski, Tom Landon)

*Advisors/Coordinators:* Dave Newcomer (FL), Marti Ikehara (CA), Pam Fromhertz (CO), Jim Richardson (NE), Dave Conner (OH), Mark Armstrong (OR), Cliff Middleton and Dan Prouty (TX), Dan Martin (VT), John Ellingson (WI)

**Note:**

It is NGS' habit to only capture names of attendees who speak up at the initial roll call or during the meeting. We respect those who may wish to attend anonymously. If you want your name captured in the recorded notes, and you do not see it listed here, email Renee or Christine, or [ngs.htmod@noaa.gov](mailto:ngs.htmod@noaa.gov). We used a mute capability on this call, and comments indicated attendees appreciated not having the distraction of external noise.

**NGS and Height Mod related announcements (Renee):**

- An east-west line in Iowa has been chosen for the Geoid Slope Validation Survey 2013; budget and travel restrictions may dictate this project is done over the course of 2 fiscal years.
- USGS has released a technical manual for using GNSS to achieve accurate heights. It can be found online at: <http://pubs.usgs.gov/tm/11d1/>
- There are 2 meetings hosted by Height Mod partners this month. The California Spatial Reference Center is holding its semi-annual meeting at Scripps, in La Jolla, October 25. The Great Lakes Regional Height Mod Consortium is having its semi-annual meeting and workshop in Lansing, MI October 31-November 1. NGS will have a presence at both of these meetings.

**Other announcements / questions (Open to all callers):**

**Q (Dick Woods):** When will NGS resume accepting bluebooked GPS projects for inclusion in the NGS integrated database?

**A (Michael D):** Updates to the ADJUST software and processes are being tested by several people. NGS hopes to have the new version of ADJUST with documentation available to users by the end of October.

## 1. Monthly presentation – Results of the Adjustment of NAD 83(2011) Epoch 2010.00

Michael Dennis, National Geodetic Survey

The National Adjustment of 2011 updated coordinates to better align the Continuously Operating Reference Station (CORS) network with the network of passive geodetic control monuments positioned using Global Navigation Satellite System (GNSS) technology. Aligning the two systems best meets user needs by providing consistent and accurate access to the latest realization of the official national geometric coordinate system.

### *Presentation Summary*

- Results of adjustment of the network of 80,000 passive control stations, connected by 400,000 GPS vectors, were released June 30<sup>th</sup> concurrent with GEOID12.
- This adjustment was done to align passive control to be consistent with the CORS (2011) Multi-year CORS solution.
- The adjustment was done in 3 parts for CONUS, referencing that part of the network to the North American tectonic plate, plus 2 adjustments for U.S. Pacific territories, where stations were referenced to the Pacific and Marianas tectonic plates respectively.
- Horizontal position changes for 96% of the stations were less than 6 cm, with the median change being 1.9 cm, with an accuracy of 0.9 cm, 2 sigma.
- Changes in ellipsoid height for 97% of the stations was less than 5 cm, with the median being 2.1 cm, with an accuracy of 1.5 cm, 2 sigma.
- **NAVD 88 orthometric heights were not changed with this adjustment.** A national adjustment of GPS height modernization surveys is being considered, but will depend on resources and priorities at NGS.
- GIS tools were developed and used extensively for analysis of the adjustment results. These tools will eventually be packaged and provided for the public.

### *Questions and Answers*

**Q (Marti Ikehara):** Can you create a map showing the changes in the positions, on the 2 different epochs, but with the velocities removed?

**A (Michael D):** Yes. This could probably be generated using HTDP.

**Q (Jim Richardson):** Will the changes to ADJUST be incorporated in OPUS Projects and will there be a webinar on the new ADJUST.

**A (Michael D):** OPUS Projects does not use ADJUST to do what it does. The results of an adjustment using both programs is now being compared. OPUS Projects will at some point create the b- and g-files that ADJUST needs. We think the b-file is not yet generated in Projects. But there will be training and updated documentation for ADJUST. There is currently a training session planned the last week of October, so NGS will talk about those updates then. Also I plan to give some workshops in the use of the GIS tools.

**(Renee):** I will note that a demo of the new version of ADJUST might be a topic of interest in a future meeting.

**Q (Dave Kuxhausen):** I'm doing some work on airports (PACs and SACs) in Ogalalla, NE, and the SACs don't seem to have 2011 coordinates on their datasheets. Will those be computed and provided in 2011?

**A (Michael D):** Yes, in fact I intend to adjust those later today. There were about 10 SACs that were somehow missed in the retrieval of data for the adjustment. I have been talking with Mark Howard to make sure he knows of everything missed. I will email the results when the adjustment is done, tomorrow or Monday. If you don't hear from me by early next week, contact Michael.dennis@noaa.gov.

**Q (Dave Conner):** Will this presentation be made available?

**A (Michael D):** I've been bad about posting presentations, but have plans to add this to the NAD 83(2011) project web page, with plots and other information.

**(Renee):** It will be made available on the NGS web site, under the Height Mod Events section of the site. If you want it sooner, I can post it on my ftp site.

**Q (Danielle Kelly):** I had to leave my computer, but one of the slides showing plots of large changes or problems showed an area in Kentucky. Can you tell me what those stations are?

**A (Michael D):** I can pull those up in my ArcGIS. Looks like a project in Lexington County. I will email the shapefile for Kentucky stations to you.

## **2. Other Business**

**Important Links:** Previous months' meeting notes and a list of future meeting presentations can be found at: <http://www.ngs.noaa.gov/heightmod/MeetingNotes.shtml>

**Next meeting: November 8, 2012**

**Guest Speaker: Jeff Olsen will present a demonstration of NGS' Leveling Online Computation User Service (LOCUS)**

### **Recent Past Events**

**August 17, 2012, Mobile, AL** - Adjustments to the National Spatial Reference System

**August 20, 2012, Batesville, MS** - Adjustments to the National Spatial Reference System

**August 22, 2012 Hattiesburg, MS** - Adjustments to the National Spatial Reference System

**Sept 17-18, 2012, Nashville, TN** – Civil GPS Service Interface Committee (CGSIC)

**Sept 17-21, 2012, Nashville, TN** – Institute of Navigation (ION) GNSS 2012

**Sept 30 – Oct 4, 2012 Portland, OR** – GIS-Pro 2012; URISA 50<sup>th</sup> Annual Conference

## **Upcoming/Planned Events**

**October 9-12, 2012, Venice, Italy** – International Association of Geodesy (IAG), International Symposium on Gravity, Geoid and Height Systems (GGHS) 2012

**October 16-17, 2012, Naperville, IL** - Illinois GIS Association Fall Conference

**October 25, 2012, La Jolla, CA** – CSRC Semi-annual meeting

**October 31-November1, 2012, Lansing, MI** – Great Lakes Region Height Mod Consortium semi-annual meeting

**Dec 3-7, 2012, San Francisco, CA** – American Geophysical Union Fall Meeting

**April 30-May 1, 2013, location TBD** – National Height Modernization Meeting