

**NOAA, National Geodetic Survey**  
**HEIGHT MODERNIZATION COORDINATION MEETING**  
**DRAFT – MEETING NOTES - Thursday, January 14, 2010**

**Attendance:**

Call-ins from: AK (Scott Sexton), CA (John Canas), IL (Bev Herzog, Amy Eller), NJ (John Knapp), NGS (Erika Wilson, Vicki Veilleux), WI (Dr. Dave Moyer, Darin Henkel), MO (Rick Reese), VT (Tom Meyer), TX (Gary Jeffress), CO (Dan Winester),

Silver Spring: NGS (Neil Weston, Ajit Singh, Bill Henning, Sonita Tiwari, Christine Gallagher, Renee Shields, Gilbert Mitchell, Dave Zilkoski, Dan Roman, Joe Evjen, Ronnie Taylor), COOPS (Tom Landon)

Advisors/Coordinators: Jim Harrington (AL), Marti Ikehara (CA), Pam Fromhertz (CO), Dave Newcomer (FL), Chris Pearson (IL), Ross Mackay (KY), Dave Rigney (MI), James Richardson (NE), Bill Stone (NM), John Ellingson (WI), David Conner (OH), Curt Smith (ID/MT), Brian Ward (AR)

**Grants/Budget status (Gilbert, Renee, Sonita)**

Gilbert reported the budget passed, but we do not have a final allocation details. GRAVD funded at \$3 million, and we are back to issuing travel orders and making purchases.

Renee reported that those with earmarks should know about it at the point and have likely been in touch with Sonita. Hard earmarks went to TX, WI, IL, and LA. Soft earmarks went to University of So. MS. It will be a little while before the grant process is in place for those.

Question – is there any possibility that the grant part of Height Mod project will have money?

Renee answered hopes that some money will be available in the competitive grant process although there will not be a lot. Although they are still talking about it, Renee believes the last round of applications will go forward with any funding available because we did not publish FFO with Dec. omnibus so the previous applications should be eligible. We are looking to post more information on the grant process on the web page, and the new information should become available as we migrate to the new web template.

**Infrastructure, Models and Tools, Standards, Specs, and Guidelines**

**Software developments –TX HM level tool (Gary Jeffress)**

The tool is still on the web and available to use, but it needs some tweaking. Recently hired a grad student to finish the code for the Lieca and Topcon code with deadline of May. No progress with Trimble because there are no codes and no machine.

**LOCUS (Ajit Singh)**

LOCUS is fully functional, and the beta website interface has been updated. The link is available from Ajit or Christine, but use is restricted to state advisors and other limited partners.

The link will be part of toolkit on new web page. It will work in CONUS, AK, and HI.

Documentation is on the web page. The observation file from the field data must be clean for LOCUS to work. The user will get an error message if your data is not working in the tool. If you put the data through Translev, it should successfully go through LOCUS and produce heights within a mm. After stakeholder feedback, PSC has to approve the product before it is

available to the full public. Gilbert expressed concern that this had been with the PSC for a long time.

Dave Z. asked if all the corrections are applied, and Ajit said that as long as the information is available, it will show corrections. If gravity is not available, the user gets a message and LOCUS assumes default gravity of 980.00. The user can provide a gravity value or if the station is in database, it will pull a value from there. Dave Z. said that NAVD88 heights use NAVD88 gravity model, so if you use a different gravity value, than you are not getting a NAVD88 height. Tools are available on the web to get a gravity value through interpolation. Dave Z. says you require the use of that tool or you don't call it a NAVD88 height. Dave Z said it won't matter on east, but it will matter west of MS River and Dan added that it could change the geoid by decimeters. Ajit said he compared values and it matches on mm level. Renee asked if we could have LOCUS include computation of the gravity value, which is another tool in the toolkit, and Ajit said it could be added to the program. Curt Smith suggested that it get resolved before going to the PSC. He said that out west you cannot use LOCUS to adjust heights unless you have constraints at each end. It does not apply the gravity correction, and it is a big disconnect. Ajit said he will look into it.

### **OPUS (Neil Weston)**

Geoid 09 is coded and now in all OPUS products so you can select 09 or a past model. Dru (at meeting yesterday) wanted another height added to extended output. It is an orthometric height based on the gravimetric geoid instead of **the hybrid model, and** will be based on another dataset from the Geoid team. Concern emerged that it could confuse people and needs to be well labeled. Dru and Juliana made it a 3<sup>rd</sup> quarter deadline in the NGS annual operating plan. Mark said the intent is to give people an idea what the new datum will look like in the future, and it will be a 4<sup>th</sup> quarter deadline. Bill Waickman is working on the code, Neil will add it to the output, and Joe is working with the OPUS committee to determine how to label it and where it will be placed etc. Dave Z. asked what ellipsoid height it would be based on, and Dan said on the ITRF because that is what the gravimetric geoids are based on.

Neil mentioned that international users have asked if they do not get a geoid height from NGS, can they use EGM. Dan said it will be a policy decision. Joe added that our chief geodesist is less than enthusiastic about using models that we do not control. Eventually the North American geoid could cover Canada and Mexico, but right now it does not. Dan added that the models in the future will less dependent on EGM08 instead depending on GOCE and GRACE. Even when it is possible to do using the same reference frame, there is a political decision whether it is appropriate to make predictions in another country's sovereign area. More on that may come...

Chris Pearson had a geoid question asking if there is a blue book code for geoid09. Dan answered the code is 1 and 2 for geoid09 and USGG2009 because we ran out of alpha letters and cannot go to two characters without changing database. Bill Waickman would be POC for further information. Marti said that Bill Waickman sent out an email about it in the past. If there are still problems, Renee suggested advisors submit a software request to make sure it gets updated.

### **GRAV-D project status – (Dan Roman)**

On track and planning to fly three months or so in summer in Alaska. Still honing software for filtering airborne data and internally debating what altitude to fly at because they are running into problems at 35,000 feet where most of the data has been collected to this point. It could be a processing problem, but it impacts what aircraft to fly, where, and costs.

Similar updates were emailed in by Vicki: We have a few new developments since November. An airborne GRAV-D survey is planned for Alaska this summer beginning in May and lasting through August. Also, we have made some recent breakthroughs in developing our processing capability. Although the final software strategy will require another 6 months to be completed, we have a vastly improved gravity product that has allowed us to perform analysis on the test data acquired in Alabama in 2008 regarding flying height and line spacing. We will soon finalize flying height for the entire GRAV-D survey and hence the aircraft that can perform this survey.

Gary J. asked if GRAVD has a budget. It is funded, but it was added to geodesy base. It is about half of what was asked for at \$3M. Not being fully funded may cause problems completing the project on the initial timeline. Ronnie added that the upcoming Presidential budgets may be changed to match Congress which could keep funding at \$3M.

### **Geoid09 status (Dan Roman)**

Entire suite of models of geoid09 should be released by the end of the month. Continue to treat gravimetric geoid. USGG2009 is published but does not include any aircraft data, and it will act as a baseline for comparison as airborne data begins to be used. A lot of experimental models incorporating airborne data will likely be posted on the GRAVD webpage, but they will not become published right away. Some concern was expressed about making test models available, but Dan thinks that as long as it is clearly labeled, there should not be a problem. Also it will be on the GRAVD page and not on the geoid page. One additional firewall would be to post it on a beta website. We want people to advertise it and promote it, but it should not be used for production.

Dan also reported they removed a first order trend that is elevation dependent in NAVD88 that has shown really great results. A 1.2 m overall “tilt” was removed from east coast to west coast that really accelerated at the Rockies. The team continues to work at identifying and removing errors and building a better model. Dave Z. encouraged NGS to leverage these identifiable systematic errors to show the need for the new vertical datum.

Bill Stone asked Dan about LaPlace correction derived from USVD2009 software which uses ITRF as reference frame. Would it not be better to use DEFLEC09? Dan agreed saying USVD09 was derived from Geoid03 and is in ITRF and is more for scientific work. DEFLEC09 was derived from Geoid09 and is in NAD83. If you are in NAD83, you need to use DEFLEC09. Suggested it be addressed by PSC. Renee may follow-up with Bill for a software request to get the issue on record.

### **Guidelines/Publications (Bill Henning)**

1. Single base guidelines, draft version 3.1. Reviewed by AGS Government Programs Committee and we are hoping that PSC will take it out of draft. It remains a big document but it is intended to get ball rolling on low distortion which is included as an appendix. Background information and best practices.
2. RTN Guidelines, 60 people working on it across country. Still very much an internal draft in peer review. Dru Smith has already peer reviewed and Bill Stone will peer review. Next step, PSC needs to bless it as an official draft. There are different authors for different chapters; Gary Thompson – Administration, Dan Martin – site, Richard Snay – alignment to NSRS, Bill Henning – users, Gavin Schrock – project design but he has resigned from position. Hopefully will be a public draft by March. It includes background, best methods, and fills what is currently a void.

The guidelines will remain digital and dynamic document rather than formal report like GRAVD document.

### **CO-OPS (Tom Landon)**

Annual field operations meeting is coming up on Tues. Jan. 26. They have invited Ronnie and some other folks from NGS. In the past Joe E. presented on OPUS. GPS and OPUS are now pretty much under control. Also, they are implementing Translev and Windesc across all of COOPS this year. Rich Edwing is now acting and Ellen Clark is acting deputy.

### **Outreach and Education**

#### **Website (Vicki Veilleux, Renee Shields)**

We are currently moving the current height mod webpage to the new templates, holding regular meetings and making progress. Hopefully in a month and a half, the entire webpage can migrate over at once. A long term goal is to compile accomplishments of height mod partners and states to create a white paper to publish on website. Christine has been reading through grants and compiling accomplishments with the idea that eventually we will reach out to PIs and gather more information. So far, Christine has written up information on AL, AZ, MS, NC, TX, WA, and WI. If anyone wants to be moved up in the queue, let Christine know and feel free to send in additional information on your activities. This does not apply to only grant states because there is a lot going on in other states as well. If other states have information they want on the website, let us know. Marti added that it would be helpful to add grant information and perhaps earmark information on the current grant page. Renee thinks that is a viable option.

#### **Corbin (Erika Wilson)**

You can also get to the website from a new more memorable URL which is [NGS.noaa.gov/training](http://NGS.noaa.gov/training). Also, on the left hand side of the webpage, you can join our mailing list to receive automatic notification when new course or online module is listed.

### **Workshops, past and upcoming events,**

- (Renee) In February 11-12 there will be a workshop hosted by the Professional Land Surveyors of Ohio in Cincinnati, OH with Dave Conner, Bill Henning and Renee presenting workshops.

- (Renee) In February, week of Feb. 22, there will be a conference in Anchorage, AK coming Surveying, Mapping, GIS, and Remote Sensing organizations together with many NGS presentations.
- (Roy Dokka) On March 16-17 in Baton Rouge, Louisiana there will be a Hurricane Conference for show-casing various parts of NOAA: improvements to NWS hurricane models, explaining GIS depends on proper position. Many different parts of NOAA will be involved, Steve Lyons, chief forecaster will be there, can post info on the webpage as information becomes more available.
- (Renee) Mar 22-23 there will be a Great Lakes Regional Conference in Indianapolis; the hotel is set, two day event, workshop and meeting, and agenda will be posted when available.
- (Renee) April there is the FIG conference in Sydney, Australia, and NGS is sending a contingent there.
- (Renee) In week of April 25 there is the ACSM conference in Phoenix, AZ
- (Renee) On May 11, 12 there is a Federal Geospatial Summit in Silver Spring, discussing the movement to a new geometric and geopotential datums for federal partners. More information to follow
- (Chris Pearson) Jan 17-20, IL Professional Land Survey with a IL Height Mod booth and Chris will give a few presentations also on
- (Chris Pearson) Illinois Height Mod presentation April 14-15 April
- (Bev Herzog) Illinois Height Mod presenting to the IL Floodplain managers on March 11
- (Curt Smith) Three day leveling workshop Jan 26-28 in Nevada sponsored by AZ Professional Surveyors and Nevada Association of Land Surveyors
- (Ross Mackay) In March, Kentucky Surveyors Conference in Cincinnati with presentations of Geodetic controls in KY
- (Dave Moyer) Wisconsin Surveyors conference in Feb where Paul Hartzheim and others with 4 sessions focusing CORS and HeightMod and hope to gather/produce information on benefits to side variety of users to put in. (Dave Z) Talked to Al Vonderal at Transportation Research Board and was very complimentary of WI Height Mod
- (Marti Ikehara) has several talks and conferences coming up in next few months, and Juliana will be calling on advisors to give a national perspective of NGS. Silver Spring will put together a generic version of a presentation that will include Height Mod and new datums
- (Gilbert) There will be a convocation week of May 17 in Silver Spring. Some people will come to Federal Geospatial Summit in the preceding week, and Dru has a meeting with Canadians preceding week. Gilbert and Neil are look at those advisors who are interested in attending the federal summit which is under consideration. Those who will be at both events (summit and convocation), there will be training during the intervening days, so if you have specific training needs, make sure you send them in.
- (Bill Henning) Erika is coordinating canned webinars with working groups that are tackling a number of different topics
- (Erika) There is a possible webinar in February, but it is not finalized yet due to scheduling conflicts with COOPS. The idea right now is to have 1 day each for east, west and gulf coasts, respectively. Hopefully can pull it together.

- (Tom Meyer) In December has successful Height Mod event in Nashua, NH with good attendance from all other the northeast including NY. May have opportunity to move forward with more Height Mod in the northeast; there were more than 50 people at the event.
- (Dave Moyer) In December Height Mod forums were held in Rhinelander and Hayward. Updated on physical progress and also to encourage them to keep the funding coming from Congress. 50 attendees at one and 30 at the other. Renee, Paul, and Elliot Smith all presented. Discussed national program, Wis Height Mod and Wis CORS; there was positive good feedback from attendees to and they expect to be able to continue the projects.
- (Bev Herzog) IL had a 3 day precise leveling workshop with a lot of people who attended have added it to their resumes with their proposals as training that makes them more qualified to do the work.
- (Renee) Gary Thompson organizing a southeast regional meeting at end of month by telephone. Some funding from another source to collect imagery. Developed aerial camera validation range to support statewide imagery. Seminar coming up for NC society surveyors annual conference in Greenville. Height Mod western NC and along the coast.

#### **Updates from States, Other Business.**

- (Roy Dokka) There is an interesting tool/ approach to get people's attention that Roy used you tube presentation in a 1 hour meeting with a state senator. Use real geospatial data and data from RTN to create an animation of a 3-d flyover parts of LA focusing on levee districts; easy to understand w/o background in geodesy. Three are available online just type in lsuc4g to youtube.
- (Darrell Pratte) Missouri is going to work with NGS, USGS, NWS and other state agencies to get stream gages all on NAVD88 throughout the whole state. Current plans: MO-DOT is just completing VRF network, so the plan is to occupy as many first order BM to get good heights on MO-DOT CORS stations and then get RTK heights on stream gages. Paul Rydland has really brought it together. Gary Jeffress added that he is working with the USACE and has spoken with engineers interested in hydrology and stream gages, and they are concerned with volume of water and elevation of stage rather than absolute elevation. Darrel agreed but explained MO is going above and beyond what USACE and NWS say they want/require. Dave Z. added that their relative heights might be incorrect at this point because the starting heights are mixed on how they were arrived at (e.g. off a topo map). You really gain being able to bring them all together, and they will appreciate the additional information. Pam added that she would like to leverage these efforts with the NOAA central regions. Chris Pearson added that it became a major issue in IL with stream gages and levee heights.

**Next meeting: Thursday, February 11, 2010, 2:00-3:30 East Coast Time**