

# Summary Forum Report

GEODETIC HEIGHT MODERNIZATION EDUCATION &  
RESEARCH, SOFTWARE RETOOLING & DEVELOPMENT

## Geodetic Height Modernization Forum

Greensboro, NC  
April 17, 2003

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# Summary Forum Report

## Geodetic Height Modernization Forum at Greensboro, NC

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## Introduction and Overview

As part of the overall NGS grant, NC A&T is responsible for designing and conducting Geodetic Height Modernization Forums at three locations in North Carolina for the National Geodetic Survey (NGS). These forums are targeted toward surveyors, engineers, environmentalists, flood plain mappers and other interested parties in the state of NC and perhaps some neighboring states. The presenters at these forums are provided by NGS but the University is in charge of advertising, local arrangements and meeting services for all the forums. The Height Modernization Forums will benefit NGS by providing a medium for NGS to educate the public (practitioners in geodesy and related fields) in regard to the technologies and practices which it champions.

This, the second Forum, was held in Greensboro, NC on April 17, 2003 at the North Carolina A&T State University Stallings Ballroom in the Student Union. The advertising for these Forums was through state meetings of surveyors and flyers advertising all Forums. See Appendix A for the flyer.

The Agenda for the Greensboro Forum was developed in conjunction with the staff of the NGS with special consideration for the comments from the Asheville Forum. The final agenda can be found in Appendix B. There were three changes made – (1) A new presentation giving more information on Height Modernization by Chris Pearson, (2) a panel discussion with all the presenters, and (3) less time for group activity with the issues given them.



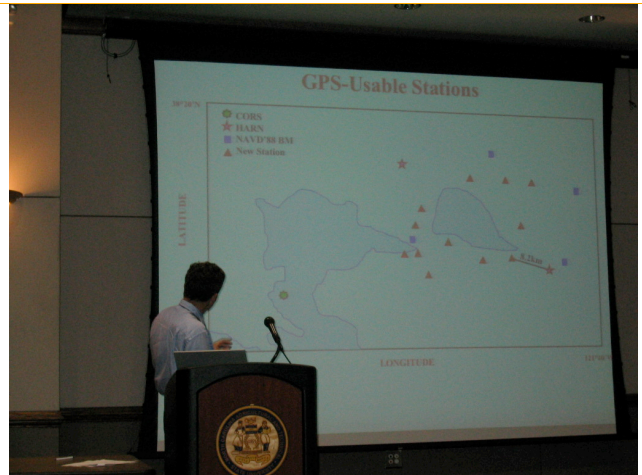
The program began with welcomes by Joseph Monroe, Dean of the College of Engineering, and Carolyn W. Meyers, Provost and Vice Chancellor for Academic Affairs at North Carolina A&T State University. Kenneth Murray, Associate Vice Chancellor made the introductions of Renee Shields of the NGS, Lucy Hall of the NGS, Gary Thompson of the North Carolina Geodetic

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Survey (NCGS), Chris Pearson of the NGS/Illinois, and Emmanuel Nzewi of North Carolina A&T State University. After the introductions, the program proceeded as published. During the afternoon, the participants were broken into ten groups to help establish possible solutions to the nine issues presented. Each group reported back to all the groups with their results.

The program was well attended with 54 registered participants, three NC A&T representatives, one NCGS representative, and three NGS representatives. Please see Appendix C for the list of participants.



## Results

The morning presentations were well received and the panel discussion had to be stopped because of time. The interaction with the participants was better than expected, even with a full room. The addition of the presentation *Geodetic Height Modernization: A Primer* by Chris Pearson added considerably to the forum and helped increase the effectiveness of the forum.

During the afternoon session, the participants were divided into ten groups to discuss the issues developed at the first forum. Each group was given three different issues from the following:

1. What educational process is needed to disseminate the information especially to procurement personnel?
  - How can we better explain Height Modernization to non-traditional users?
  - What is the role of the National Geodetic Survey, North Carolina Geodetic Survey, and North Carolina A&T State University?
2. How does photogrammetry fit in w/height mod?
3. What is the best way to upgrade the available GIS data (e.g. NGVD-29 data) and relate it to Height Mod?
4. How should the CORS be used in conjunction w/height mod and OPUS?
5. How do we decide on the density of CORS versus the density of passive monuments?
6. What's involved in maintaining height mod after implementation?
7. How do you envision the use of height mod in construction, agriculture and other industry?
8. How should the information be made available—dispersal and format? And how much will it cost?
9. What should be the contribution of professional surveyors and engineers? Should there be an advisory committee to help plan and oversee the implementation of Height Modernization?

## Focus Groups Activities

Each group discussed three issues and developed a report to be made to the all groups. Each issue was discussed by at least three groups. The following is the listing of the issues with the comments from each group that discussed that issue.



1. **What educational process is needed to disseminate the information especially to procurement personnel?**
  - **How can we better explain Height Modernization to non-traditional users? What is the role of the National Geodetic Survey (NGS), North Carolina Geodetic Survey (NCGS), and North Carolina A&T State University (NC A&T)?**
  - **Those who order surveys don't always know what they need, and it is our job to educate them.**

### **Report**

- Use forums
- Speak at professional meetings
- Speak at local schools
- Supply information to local professionals
- Develop handouts and brochures
- Attend local city/county planning and zoning meetings
- Provide seminars for continuing education for professional groups
  - Real estate commission
  - PE/LS Board

- Lenders/insurers
- Individual level-word of mouth
- Deliver simple presentation about the world is not a perfect sphere—old datum not accurate
- NCGS-provide continuing education presentation for real estate commission, Board of Registrations, others
- NGS-provide expertise and funding for local forums and advice at local level
- NC A&T-provide facilities, sponsor seminars, provide personnel to deliver message.

## **2. How does photogrammetry fit in with Height Modernization?**

### **Report**

- Every contractor and vendor should use the same datum plane
- Helps get/keep everything on one datum
- Photogrammetry uses height modernization for X, Y, Z control on the ground and in the airplane.
- Photogrammetry can determine where to and where not to put height modernization monuments.

## **3. What is the best way to upgrade the available GIS data (e.g. NGVD-29 data) and relate it to Height Modernization?**

### **Report**

- Federal Government should maintain minimum standards through
  - Education
  - Standardized Data Base Format
  - State Corporation
  - Budget
- GIS should be public utility
- County should initiate changes in a timely manner
- Build a new triangulated surface from existing contour lines. Shift the datum, then reprocess for contours on the new datum.
- Should be guided by NGS to make elevations consistent.
- Downloadable and interactive program to convert NGVD-29 to NGVD-88
- Best way for counties to upgrade to GIS-DFIRM
- Federally funded program to assist upgrading existing GIS data base to new data bases.

## **4. How should the CORS be used in conjunction with Height Modernization and OPUS?**

### **Report**

- Change question to “How should OPUS be used with Height Modernization?”
- With OPUS every surveyor has access to GPS
- Provide increased capabilities and productivity for surveyors and others
- With CORS and OPUS, every surveyor could have GPS capabilities
- Everyone should use the CORS data and process it using OPUS to create elevations that are consistent.

- To encourage local surveyors and other users to make use of OPUS in conjunction with GPS
- To improve and check the quality of work.
- The CORS positions should be adjusted first, since these positions determine R.T.K. and new occupied points.
- CORS provides common data control across the state

**5. How do we decide on the density of CORS versus the density of passive monuments?**

**Report**

- More CORS sites for better geometry
- CORS Network should be expanded to provide full development height modernization
- What is the cost difference between CORS & passive monuments?—CORS is \$20,000-\$30,000, very durable and accessible (wireless), although there will be places where CORS is not accessible.
- New software will cut down on delay
- Cost effectiveness – have more CORS in areas of growth or potential growth.
- Keep passive monuments for practicality, still have many surveyors not using GPS
- CORS helpful in resetting passive monuments that have been destroyed
- How do you tie to CORS?
- DOT needs are primary
- Need based
- Keep minimum constraints for precision
- Urban - many passives
- Rural – less passives
- Economics – how much to install and maintain
- One per county and maintain existing network of passive monuments.
- Any new monuments to be set away from possible construction sites.

**6. What's involved in maintaining Height Modernization after implementation?**

**Report**

- Incorporate private data
- Develop method to verify private data
- New monuments and recovery of old monuments
- Education
- Monitoring for movement
- Keep up with data on GEOID – update and recalculate, as needed.
- Maintain the mind set that more precision is better
- Phase out use of NAD-27
- What do you do when the power goes out?
- Funding new block satellites
- Educating construction industry, surveyors, engineers about datum planes
- Modernize legacy monuments.



**7. How do you envision the use of Height Modernization in construction, agriculture and other industries?**

**Report**

- Ski slopes—to determine the depth of the snow base.
- Uses are only limited by the imagination.
- Wisconsin—GPS driving bus.
- Hydrological conditions for weather systems.
- Flood plane identification
- Standardization – use of one datum
- Construction grading without stakeout
- Terra-forming for E/C
- Photogrammetry
- The more accurate the data and the more user friendly, the more useful.
- Vertical control more available
- Mapping and GIS information for flood – drainage, commercial farms, census, and land uses
- Interconnectivity of surveying – engineering and construction

**8. How should the information be made available—dispersal and format? And how much will it cost?**

**Report**

- Make user friendly regardless the format to invite use, thus lowering the user fee.
- Buy annual license to give unlimited access to data, or pay per use.
- Fees charged should be for cost of production (information published by State).
- Web
- Practical use seminars
- Local municipalities
- Data should be free
- Chapter seminars – user paid
- Format – Adobe ASC II and \*.dwg and \*.dxf
- Format varies according to end user requirements
- Budget to be determined by type of information
- Licensing Boards
- Continuing education
- Subscription services
- Designers
- Engineers
- Surveyors
- Industry standards



**9. Should there be an advisory committee to help plan and oversee the implementation of Height Modernization? What should be the contribution of professional surveyors and engineers?**

**Report**

- Yes, there should be a Advisory Council Committee to provide consistency of application
- LS-PEs should be on the committee
- Members - NCGS, PENC, Surveyors Society, Contractors, FEMA, League of Municipalities, Insurance Representatives, Lenders

## Themes from Focus Groups Discussions

The major themes that developed from the group discussions are summarized below.

- More education is needed on Height Modernization to help all users to know as much as possible
- All data should be available on the web, but also available in hard copy
- New elevations established using Height Modernization must be reconciled with existing data
- Passive monuments must be maintained until all CORS are operating within acceptable accuracy and coverage
- Access to all data must be easy and free
- An advisory committee of surveyors, engineers, planners, and others should be established to help with future activities with Height Modernization in North Carolina



## Assessment of the Forum

Participants were asked to evaluate the effectiveness of the forum in six categories as to how well participant needs were met. Please see Appendix D for a sample of the Assessment Form.

The six categories evaluated were:

- 1.) Whether the forum met participants' professional needs;
- 2.) The effectiveness of general session presentations by
  - a.) National Geodetic Survey;
  - b.) North Carolina Geodetic Survey;
  - c.) North Carolina A&T State University
- 3.) How well the small focus groups enhanced understanding of height modernization issues in North Carolina; and
- 4.) Whether the small focus groups resulted in recommendations for North Carolina that are practical and implementable.

The rating for the six categories was:

- none at all
- some
- met expectations
- exceeded expectations.

Out of 54 participants 24% rated each category as "exceeded expectations"; 9% split the category ratings between "exceeded expectations" and "met expectations;" 57% rated the majority of categories as "met expectations", and 4% rated the majority of categories as "some".

Participants were also asked which sessions were most effective for them—presentations, general sessions, or focus groups. As the first two categories were not clearly defined (i.e., the presentations took place during the general sessions), these two ratings were counted together. 11% of the participants said that the focus groups were most effective and 88% said the presentations/general sessions were most effective. Not included in this rating was the panel discussion/question and answer session following the presentations. This needs to be added to the rating system in the next evaluation for the New Bern Forum.

Finally, participants were asked to provide suggestions for forum improvement and those who responded (29%) suggested some clarification of GPS versus height modernization, hand-outs of acronyms and technical terms, and better and timelier advertisement.

# **Appendix A**

## **Flyer for Height Modernization Forums**