



Reaching New Heights in PA 2014



Observer Handbook

The Pennsylvania Society of Land Surveyors (PSLS), an affiliate of the National Society of Land Surveyors (NSPS), Surveys PA during National Surveyor's Week 2014 to increase the accuracy of the next National Vertical Datum and increase the public awareness of Land Surveyors and the vital role they play in society. Surveyor's Week is March 16th through 22nd 2014.

Planning:

- 1) Make sure you have or know where to obtain the necessary equipment:
 - a. Digital Camera or quality camera phone
 - b. Handheld GPS receiver, tape, magnetic locator, shovel, etc for recovering benchmarks. Suggested smartphone apps for point recovery: FindAControl, BenchMap,
 - c. Observer Field Log, Observer Handbook with contact information for all Managers, clipboard, writing implement, PSLS Reaching New Heights Flyers
 - d. Dual-Frequency GPS receiver & antenna. GLONASS, Etc. capability not required.
 - e. Fixed-height tripod or fixed-height rover rod with a Bipod. Adjustable tripod not recommended but contact Tech Manager if necessary to use.
 - f. Sandbags for tri-, bi-pod is optional but recommended.
 - g. Traffic cones and/or signage may be needed as well as safety vest. Use your best judgement.
 - h. Be sure to: adjust circular level of fixed-height tripod or bipod to be used to ensure accuracy of setup. Videos available on YouTube.
- 2) Go to www.PSLS.org and navigate to Reaching New Heights webpage and access the online map.
- 3) Zoom to your locale and find a point group to recover and occupy. Blue points are already assigned. Red, Yellow, and Green indicate priority level with red being the highest.
- 4) Chose a point grouping and review datasheets, geocaching recovery, and any available aerial imagery for all the points in the point group prior to volunteering so you have a sense of the effort that will be required to recover and observe the a point in the group.
- 5) Note the GroupID and click on the volunteer link and fill out the Volunteer Form.



- 6) The map is not updated in real-time. If the point group has already been assigned you will be contacted with a suggested alternate point group.
- 7) As part of the Volunteer Form, you will be asked to list the number of field crews your company has. There will be special recognition to the most active company, or observer, in PA during National Surveyor's Week in several categories based upon survey department size.
- 8) If desiring to occupy a PR point and discuss Reaching New Heights with the public and media, contact the PR Manager and review the PR Handbook.

Recovery:

- 1) At least one week prior to National Surveyor's Week recover the points you volunteered for and determine which point is the best for GPS occupation.
- 2) When evaluating which point is best for GPS occupation consider the following:
 - a. How well does the mark match the description in the NGS datasheet? Is the type of mark correct? Is the stamping correct?
 - b. Does the point appear stable or damaged? Does it appear the position or elevation may have changed?
 - c. Can the point be occupied in a safe, stable, and secure manner for 4.5 hours using a fixed-height tri-, bi-pod?
 - d. Are there aerial obstructions? Are they more than 10° to 15° above the antenna horizon? Are they located north of the mark (might be ok)? Are they located east, south, or west of the mark (typically not good)? What will be the impact of trees/vegetation during leaf-on in the future for observations?
- 3) Take the following digital photos / phone photos and name the files as shown:
 - a. Close-up of mark. Any stamping must be legible. This is required by NGS. Filename: PID.jpg (Example: KV6062.JPG)
 - b. Photos documenting obstructions or lack of obstructions. These will be used for QA/QC by PSLs.
 - i. Stand on mark and face North. Filename: PID_000.JPG (example: KV6062_000.JPG)
 - ii. Stand on mark and face East. Filename: PID_090.JPG
 - iii. Stand on mark and face South. Filename: PID_180.JPG
 - iv. Stand on mark and face West. Filename: PID_270.JPG
 - v. Alternatively, the obstruction photos can be replaced with a video taken when standing on the point and scanning the entire horizon. Filename: PID_360
- 4) Visit the map at www.psls.org/ReachingNewHeights and click on the point you plan to occupy. Click on the Submit Recovery link and fill out the form to submit your recovery. Make sure the particular point you recovered is shown in the



- point field of the form. It is optional but appreciated if you input recovery data for all points in the point group you recovered.
- 5) Optional but suggested: submit recovery information to NGS:
www.ngs.noaa.gov/ngs-cgi-bin/recvy_entry_www.prl

Observation:

- 1) During National Surveyor's Week occupy the mark using a dual-frequency GNSS receiver and antenna for 4.5 hours. Be sure your epoch sampling rate is set to 1, 5, 10, 15, or 30 seconds. 30 seconds is the preferred setting. Set an appropriate mask angle between 10° and 20°.
- 2) The day or night before observation charge your batteries, pack some food, and assemble the other required supplies outlined above.
- 3) Prior to occupying the point, take digital photograph of the antenna model number tag. This will be used for QA/QC purposes. Filename: PID_Ant.JPG
- 4) While the point is occupied, take a digital photograph of the GPS receiver setup over the point with some identifying features in the background or foreground if possible. This is an NGS requirement. Filename: PID_hor.JPG.
- 5) Fill out the NGS Observer Field Log:
<http://geodesy.noaa.gov/PROJECTS/NGSforms/obslog-OPUS.pdf>

Submission:

- 1) Visit the point map at www.psls.org/ReachingNewHeights and click on the point occupied. Click the Submit Occupation link and fill out the form appropriately.
- 2) If you are familiar with OPUS:
 - a. Two days after occupying the point, submit the data to OPUS using the extended output option.
 - b. After receiving the results, Submit your photographs and OPUS report using the Submit Occupation link.
 - c. Your occupation will go through some QA/QC procedures. Once completed you will be contacted and asked to submit your result to OPUS-DB by sharing/publishing your result. We ask that you include **PSLS Reaching New Heights 2014** in the description, along with your name and company name, if desired.
- 3) If you are not familiar with OPUS or prefer PSLS to process your data:
 - a. Submit your photographs and raw data file (preferably RINEX format) using the Submit Occupation link.
 - b. We will process the information using OPUS and perform some QA/QC.



- c. We share/publish the result in OPUS-DB citing you and/or your company as the contributor.

Enjoy the knowledge that you assisted NGS in calculating a more precise Geoid Model that will lead to your ability to obtain more accurate GPS-derived orthometric heights and participated, along with dozens of other Surveyors across the State, in National Surveyor's Week 2014, Reaching New Heights in PA.

Frequently Asked Questions:

- 1) What if I don't find any suitable points in my point group?
 - a. Contact your RC or the Tech Manager. They will try to assist you by finding alternate points or another point grouping.
- 2) What if I know a better mark close by?
 - a. Verify it is a First or Second Order mark by consulting the NGS Datasheet. If it is, contact your RC or the Tech Manager. If it is within 1-2 miles it will most likely work out fine. If it is more than 2 miles away it may not be suitable for our purposes. Either way, check with your RC or Tech Manager.
- 3) What if my organization wants to occupy multiple points?
 - a. Great! Either submit the volunteer form for each point group or contact your RC or Tech Manager to coordinate with them.
- 4) What if I want to volunteer but can't make it happen during Surveyor's Week?
 - a. Not a problem. Anytime in March is acceptable. If you can't perform the work until April, let us know when you plan to occupy the point in the notes section of the Volunteer Form and we will do our best to accommodate.
- 5) What if I am not familiar with GPS but I want to help?
 - a. There is a large need to recover benchmarks. You can find someone in your area to team up with on your own through the help of your RC. You can recover the mark(s) and the other volunteer can perform the occupation(s). If you don't have someone to team up with contact your RC or the Tech Manager to find out which benchmark recoveries would be the most beneficial.

Notes:

- 1) PSLs has not performed any research into ownership of the property on which the marks are located. Please seek land owner permission for recovering or occupying any marks located on private property.
- 2) Many marks are along railroad tracks. PSLs has not made any attempts to determine which lines are active, inactive, or abandoned. Always exercise



- caution when working around railroad tracks and remain in compliance with any railroad policies regarding access and safety.
- 3) Many marks are located adjacent to roads or on bridges. Always exercise caution when working in, on, or near roads or bridges being sure to deploy any necessary traffic signage or cones.

Contact Information:

Technical Manager:

Brian Naberezny,
Brian@NabsMaps.com
Phone:

Public Relations Manager:

Mike Kreiger
Mkreiger@HRG-Inc.com
Phone:

Coordinator Manager:

Adam Crews
A.Crews@CrewsSurveying.com
Phone: 610-573-4311

Regional Coordinators: See map at www.PSLs.org

PSLS Office:

Kate Sherman, Director
Ksherman@PSLS.org
Phone: 717-540-6811