



## In this issue

- 3-Dimensional Modeling
- Technical Tips – NGS Geoid 03
- Training Schedule
- Current SW/FW Versions
- ESRI Survey Analyst
- FCC Update
- Satellite Differential GPS
- Trimble's R8 and R7 Receivers



## Contacts

Central and Eastern NC  
Daryl Huffman, 800-849-7708  
darylgps@vnet.net

Central and Southern SC  
Chuck Drouillard, 800-849-7710  
chuckd@duncan-parnell.com

Central and Western TN  
Wes Worrell, 615-384-8982  
wesgps@comcast.net

Northern SC and Western NC  
Mike Withers, 704-724-4333  
mikew@duncan-parnell.com

GPS Training & Support  
Clay Pate, PE, 800-353-7392  
ext. 203; cptrmbtrnr@aol.com

Randy Jones, PLS, 800-353-7392  
ext. 201; randyjgps@aol.com

GPS Repair  
Gary Kempf, 800-353-7392  
ext. 204; garyk@duncan-parnell.com

Optical Instrument Repair  
Ken Lane, 888-688-7961  
kenlane@duncan-parnell.com

Administration  
Bob O'Brien, 800-353-7392,  
ext. 202; bobo@duncan-parnell.com

Published by Duncan-Parnell, Inc., GPS Division  
If you have any questions, comments or sugges-  
tions, please contact Bob O'Brien at:  
1208 Copeland Oaks, Dr., Morrisville, NC 27560  
Ph: 800-353-7392, Fax: 919-460-8896  
E-mail: bobo@duncan-parnell.com © 2004, DPI  
All trademarks reserved to their respective owners.

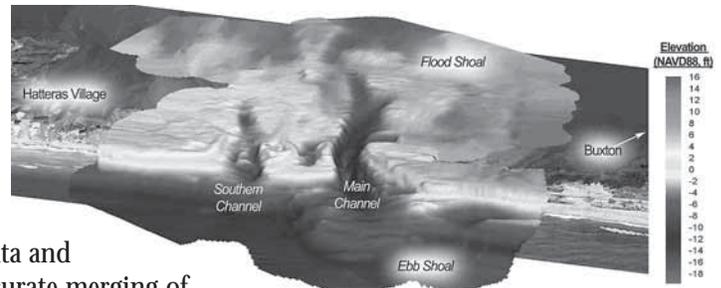
## Field notes



### Three-Dimensional Topo/Bathy Elevation Modeling: Examples from Isabel's Inlet, NC, by Chris Freeman

On September 18, 2003 Hurricane Isabel created a 500-m wide breach in the barrier island south of Cape Hatteras. Geodynamics was contracted by the US Army Corps to rapidly assess the breach morphology, document its short-term evolution, and to collect data in support of numerical modeling efforts used to predict future events. A series of high-density topographic and bathymetric (T&B) surveys were performed prior to the emergency infilling. These rapid response surveys collected high-resolution T&B data of the breach to generate raster-based 3D digital elevation models (DEM's) for multi-user GIS analyses.

Accomplishing this required a unique geospatial data acquisition technique that could rapidly collect a large amount of T&B data and would allow for accurate merging of the beach and seafloor information. An RTK-GPS total station was key in Geodynamics' Shoreline and Nearshore Digital Mapping and Analysis Program (SANDMAP), which efficiently facilitate 3D elevation modeling. In addition to collecting cm-scale topography at 10 Hz along the beach face, RTK is used for precise positioning and tidal elevation offsets for the hydrographic surveys. The commonality of the T&B positioning, along with various statistical QA/QC procedures, provided a T&B merge at the breach accurate to within 8-cm RMS.



Four different T&B data acquisition systems and collection methods were deployed. Topography data was collected along the beach face using Trimble RTK-GPS integrated with an ATV for high-density acquisition or were walked with backpack GPS. Seafloor data was collected with single-beam and multi-beam sonar depending on the depth and required data overlap. Ultra-shallow water single-beam data was acquired from a personal watercraft modified for hydrographic surveying in the surf and swash zones. Offshore gradients and

*(continued on page 2)*



*Shown on right:  
(Top) Topographic mapping of the subaerial beach with RTK-GPS mounted on all-terrain vehicles.  
(Bottom) Singlebeam bathymetric mapping of the Hatteras Breach with the "Surfzone Explorer."*



## Training

Mapping Classes

GPS Mapping for GIS with Asset Surveyor, or TerraSync for Pathfinder or GeoExplorer.

Learn how to effectively collect and process GPS/GIS data with the Pathfinder Pro XR/XRS, GeoExplorer 3, TerraSync and Pathfinder Office. Topics include planning a project, creating a data dictionary, hands-on field exercises, processing, and exporting data to GIS or CAD.

**15 PDH Credits**

Land Surveying ClassesPostprocessing Surveying.

This two-day course is designed for users of the new Trimble Geomatics Office software suite and those using land surveying grade receivers with or without TSC1 with Survey Controller. Course includes network design, hands on field exercises, baseline processing, and network adjustment. **15 PDH Credits**

Real-Time Surveying.

This three-day course is designed for GPS Total Station users on the TSC1 with Survey Controller and Trimble Geomatics Office. Includes base station setup and rover initialization, GPS site calibration, feature coding, and stake out. **21 PDH Credits**

For the latest class schedule or to register for a course, go to [www.duncan-parnell.com](http://www.duncan-parnell.com).

On-site training is available.

Special pricing for groups of six or more and educators.

For more information or to register for a class contact Clay Pate, PE at 800-353-7392. Or you can e-mail Clay at: [cptrmbtrnr@aol.com](mailto:cptrmbtrnr@aol.com)

News  itemsThree Dimensional Topo (continued from Page 1).

submerged objects were detected using multi-beam sonar that allows for 100% bottom coverage in a swath approximately 4 times the water depth.

The collection and processing of 1.5 million data points into accurate 3D surfaces provided several unique challenges. The combination of data acquisition platforms with customized interpolation algorithms allowed us to seamlessly merge the high-resolution geospatial data. Rapid 3D processing and GIS integration provided the USACE with critical information necessary to assess and engineer the breach closure and provided researchers of complex coastal processes with information that could not have been adequately captured with traditional 2D techniques.

Technical Tip – Using the NGS Geoid 03 Model with Trimble Geomatics Office, by Randy Jones, PLS

Go to [www.trimble.com](http://www.trimble.com) and click on “Support and Training,” then scroll down to “T” and choose “Trimble Geomatics Office,” next “Downloads,” next “Geoid Files,” then “Geoid 03 Continental US.” The file “Geoid 03 Combined CONUS” (28 Meg) should be downloaded. If you have a high-speed internet connection, this 28 Meg file should take approximately 12 minutes to download at 40kb/sec. If you do not have a high-speed internet connection, you can choose the region files using the same instructions.

When you download and execute (double click) the Geoid 03 file, the self extracting utility will ask you for the location of where to save the file. Save the Geoid 03 file to the C:\Program Files\Common Files\Trimble\Geodata folder. While you are in the Geodata folder you will need to make a copy of the current.csd file, pasting the copied file also in the Geodata folder. Now, rename the copied current.csd file to current-ORG.csd to preserve the original contents.

The next step is to make the new current.csd file available for TGO using Trimble’s “Coordinate System Manager.” This can be found by going to your program folder on your START menu and selecting “all programs,” next “Trimble Office,” next “Utilities,” and lastly “Coordinate System Manager.” As “Coordinate System Manager” opens, select the Edit menu at the top of the box and choose “Add a Geoid Model .....” For the name enter “GEOID03 (Conus).” For the file name, click on the down arrow and pick “Geoid 03” from the list.

The last thing you need to do is to save the Coordinate System Database (.csd) file as “current.csd” in the C:\Program Files\Common Files\Trimble\Geodata folder. To do this, simply select “File,” next “Save As,” and select the current.csd , you will be prompted that the file exists do you want to replace it, select “YES.”

When you start a new project in TGO, in the properties box, select the Coordinate System tab, choose Change at the Coordinate System Settings box, the new settings radio button, and next. Make sure Coordinate System and Zone is selected and click next. You will now pick the Coordinate System Group and Zone, and select next. If you have followed these instructions, you will now see and be able to select “GEOID03 (Conus)” from the list of predefined geoid models, now click finish.

Geoid 03 (Conus) is now the geoid model for your current project.



Randy Jones

News  itemsESRI Survey Analyst Software – Merging Land Surveying and GIS.

ESRI Survey Analyst Software (SASw) is a comprehensive software solution that bridges the gap between mapping databases and modern surveying solutions, enabling surveyors and GIS technicians to work together in an integrated system. Surveyors can use SASw to store and manage their measurements in an ArcGIS geodatabase. GIS technicians can use the survey data stored to improve their GIS data and evaluate the accuracy of GIS features. With SASw, surveyors and GIS technicians will be able to integrate survey measurements into a geodatabase, improve the accuracy of mapped features, map new features based on surveyed points, organize survey data on projects, maintain data about, and report on, the spatial accuracy of surveyed points. Many surveyors are using mapping grade GPS as another tool to rapidly collect point, line and area data where survey grade accuracy is not needed or required. ESRI Survey Analyst is an ideal fit where such mapping and land survey functions are intertwined.

Update on FCC Mandate to Expedite Transition to Narrowband Technology.

The FCC ruling to no longer accept any new licensing for 450mHZ radio users with 25hz separation was put on “Stay” in December 2003. They have since ruled that the “Stay” would continue, meaning new applications for the 25hz separation are still being accepted. Eventually, the FCC will require that all users of 25 KHZ channels move to the more spectrum efficient 12.5 KHZ channels. The objective is to reduce congestion and make more frequencies available. If you are a GPS RTK or robotic total station user, the FCC requires that you license your radios. Duncan-Parnell is available to assist you in this process. Call Darlene Day in our office 800-353-7392 x205 and she will forward the application to you.

Changes in Satellite Differential Correction Subscription Service.

OmniSTAR, Inc. has purchased the correction service formerly provided by Landstar. Landstar subscribers are being contacted to change their contract over to OmniSTAR - a simple procedure involving the codes in your unit. Also, later in 2004, OmniSTAR intends to change their satellite broadcast format. This will enable the use of additional base stations and will be required for all OmniSTAR, HP and VBS receivers. It will require a change in the receiver’s firmware and OmniSTAR will be providing this upgrade free of charge. As information becomes available, it will be posted at [www.omnistar.com](http://www.omnistar.com).

Trimble Navigation Introduces the R8/R7 Technology – The Next Generation of GPS Receivers.

All new Trimble survey grade GPS receivers now include the new R-track technology, R8 or R7. This includes the capability of tracking the new Civil Signal (L2C), scheduled to be available on certain satellites in 2004. The addition of the new L2C signal is expected to increase the signal strength of the L2 frequency. R-track technology will allow users to benefit from this, through improved tracking performance. The R8 receiver features an integrated antenna that allows it to serve as a highly portable rover - the R7 offers a separate receiver and antenna. The modernization of the GPS system beginning this year with the L2C signal followed by the introduction of a 3rd civil signal (L5) and the initial deployment of the European “Galileo” system will be a significant series of developments for GPS users. The R8 and R7 receivers will allow Trimble users to take early advantage of these improvements providing greater efficiency in the field.

FYI Trimble’s Latest Version Numbers.Survey Software and Firmware

- 5700: V2.01
- 5800: V2.03
- Survey Controller - TSC1: V7.72
- Survey Controller - TSCe: V10.72
- Trimble Geomatics Office: V1.61
- Trimmark 3: V1.11
- Pac Crest RFM 96: V5.06
- PacCrest PDL: FW V2.32 Config 2.40

Mapping Software and Firmware

- Asset Surveyor - TSC1: V5.27
- GPSCorrect for ArcPad: V1.01
- Terrasync™ V2.40
- Pathfinder Office: V3.00
- Beacon-on-Belt: V1.00
- GeoExplorer XM/XT CE.NET: V2.00.02
- GeoExplorer XM/XT CE: V3.0: V1.10.02
- GeoExplorer XM/XT GPS: V1.04
- Pro XR/XRS: V1.70
- TSCe CE.NET: v4.0.9
- TSCe CE V3.0: v2.3.7

Attention Federal Government Users Eligible for GSA Pricing.

Trimble Navigation has announced a new GSA contract for their entire product line of engineering, surveying and mapping products. The new contract number is: GS-07F 5588P.

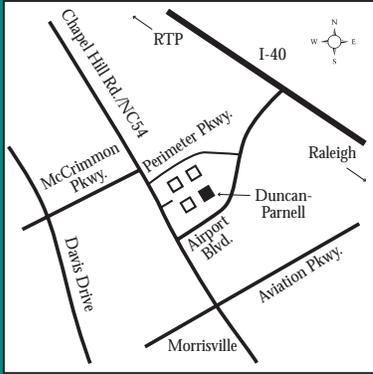
The Purchase order must be made out to Trimble Navigation c/o Duncan-Parnell, 5475 Kellenburger Rd, Dayton OH 4424. List the above contract number. Contact your Duncan-Parnell representative for additional information.

Special savings in effect during our annual Spring Sale, now through May 31, 2004.

Call 800-353-7392 for details!

# Duncan Parnell

900 S. McDowell St.  
Charlotte, NC 28204



**We've moved to  
a larger location!**

**New Address**  
1208 Copeland Oaks Dr.  
Morrisville, NC 27560  
Toll Free: 800-353-7392  
Local: 919-460-8886  
Fax: 919-460-8896

**All the latest GPS/GIS surveying and  
mapping news, technical tips and new  
product announcements.**

Charlotte, Charleston, Concord, High Point, Morrisville (RTP)  
Myrtle Beach, Nashville, Raleigh, Rocky Mount, Wilson

[www.duncan-parnell.com](http://www.duncan-parnell.com)

## WaveLengths

A newsletter for professional  
surveyors and mappers.



*Products for Survey, Mapping, GPS.*

Your link to quality GPS, surveying and  
mapping products, rentals and services.

PRESORTED  
STANDARD  
U.S. POSTAGE PAID  
PERMIT #1157  
CHARLOTTE NC



Spring 2004