

National Geodetic Survey Update

Duluth, MN

September 23, 2009

Juliana Blackwell

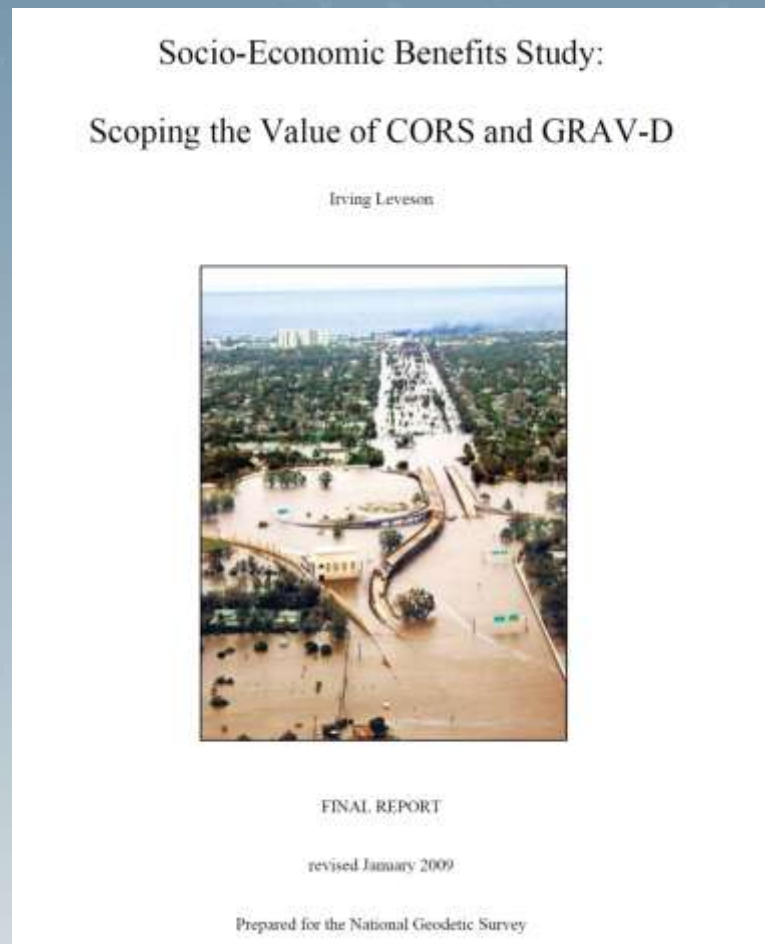
Director, National Geodetic Survey



NGS Adds Billion\$ to the Economy!

2009 Socio-economic Scoping Study

- Shows \$ billions in estimated benefits from NOAA Positioning Products and Services:
 - **National Spatial Reference System (NSRS): \$2.4 billion per year**
 - **CORS: \$758 million per year.**
 - **GRAV-D (Once completed): \$4.8 billion over 15 years, including \$2.2 billion in avoidance costs from improved floodplain management.**
 - Rolled out to Congress on June 15, 2009

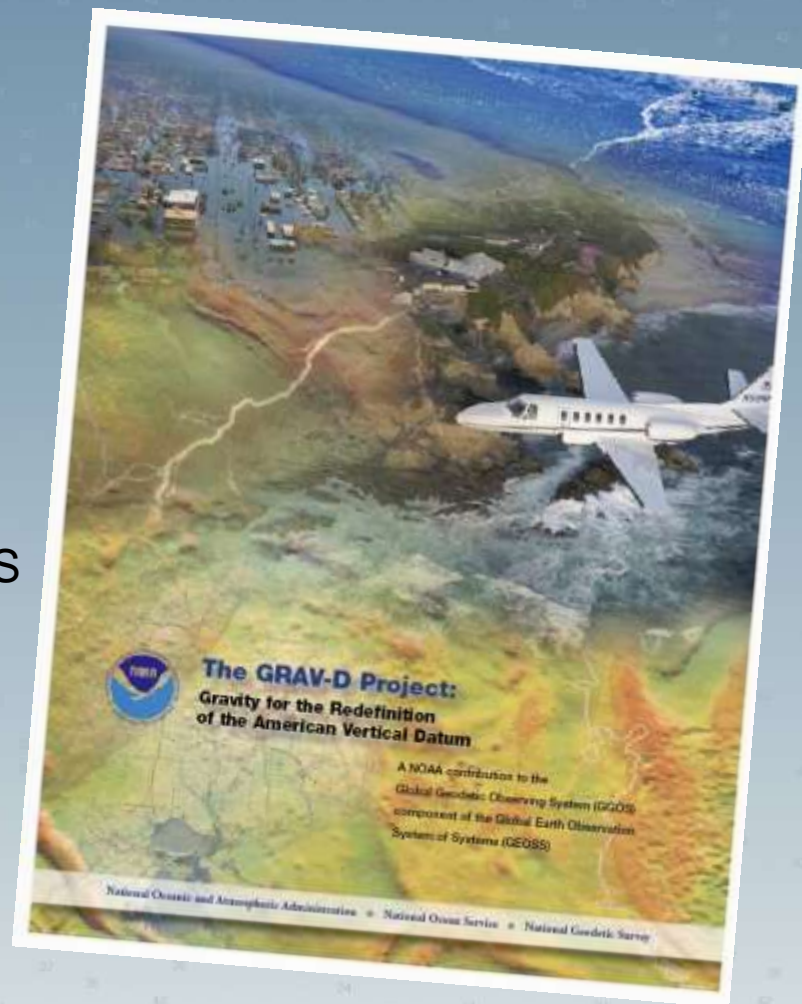


Available at: www.ngs.noaa.gov

The Future of Height Mod: GRAV-D

Gravity for the Redefinition of the American Vertical Datum

- GRAV-D
 - Airborne gravity survey (10 years)
 - Gravity monitoring into the future
 - Coastal areas surveyed first
 - All USA states and territories
 - www.ngs.noaa.gov/GRAV-D
- 2018-2022 Targets:
 - Orthometric heights (“elevations” on maps) good to 2 cm anywhere, anytime from GNSS technology
 - Height changes easily monitored using new vertical datum
- Gravity for the Nation’ benefits
 - **Imagery for the Nation**
 - **Lidar for the Nation**
 - **Elevation for the Nation**

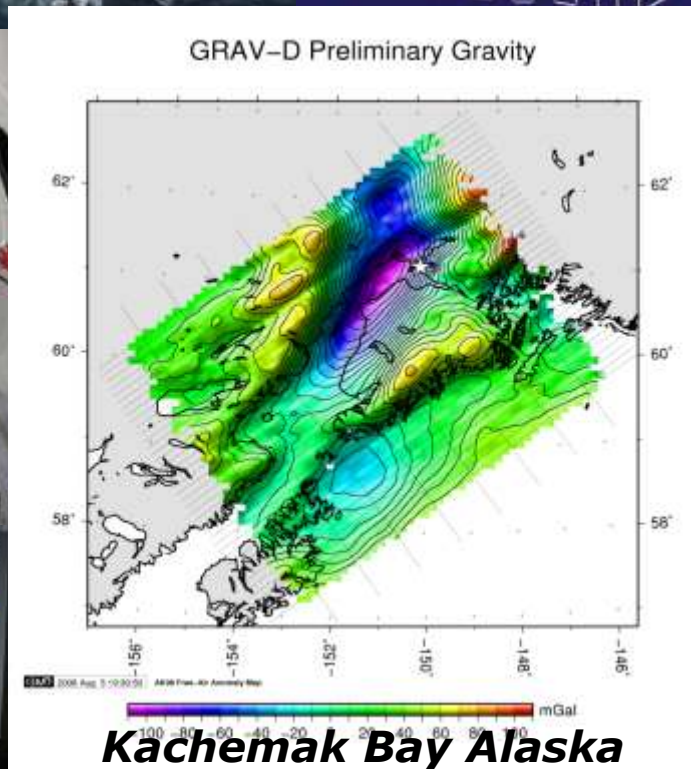
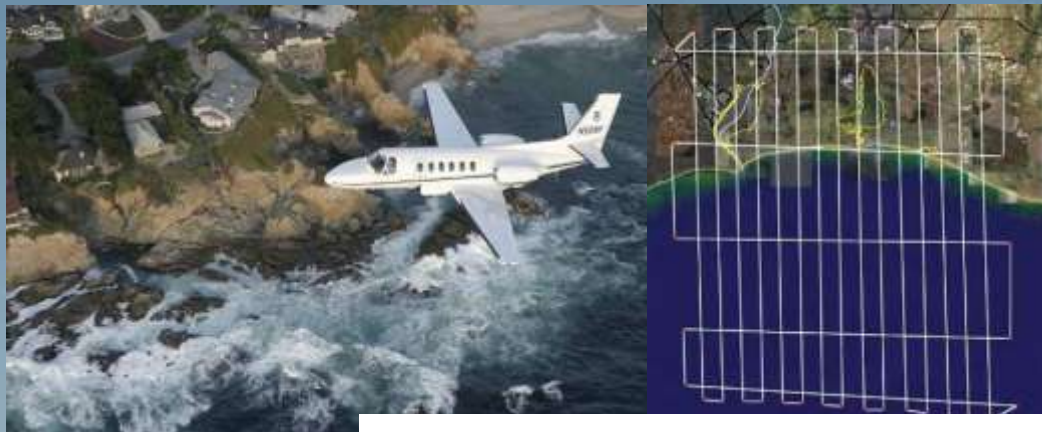


FY 2009 GRAV-D Update

\$4M in President's 2010 Budget to begin GRAV-D across the Nation.

Accomplishments:

- Sent letters to potential partners to share costs of GRAV-D.
- Oct. '08:
 - NGS begins operational gravity collection along Gulf Coast.
- Feb. '09:
 - NGS collects gravity data in Puerto Rico/Virgin Islands.
- May. '09:
 - NGS finishes gravity collection from AL/GA state line to the Mexican border.
- Aug. '09
 - NGS completes Gravity Collection of interior Western Alaska.



FY 2009 Q3 NGS Performance Measures

- Percentage of U.S. counties rated as fully enabled or substantially enabled with accurate positioning capacity.

FY09 Goal = 69%

FY09 Q3 Goal = 66%, FY09 Q3 Actual = 68.86%

- Update the US shoreline.

FY09 Goal = 3.3%

FY09 Q3 Goal = 1.3%, FY09 Q3 Actual = 1.6%

- Update the shoreline in priority ports.

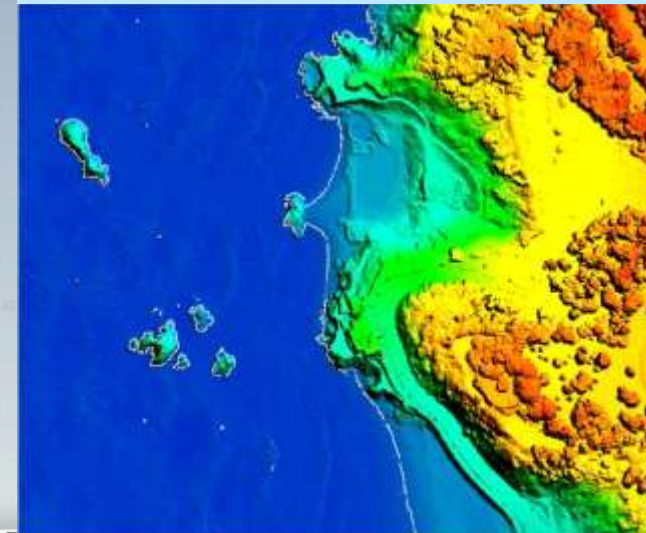
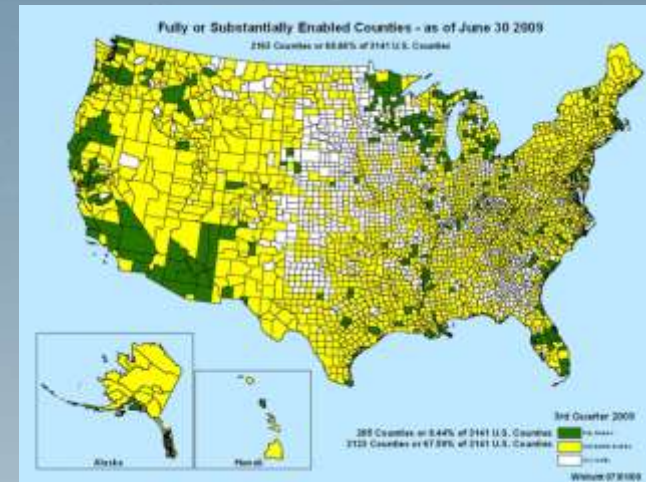
FY09 Goal = 16%

FY09 Q3 Goal = 6.3%, FY09 Q3 Actual = 9.7%

- Analyze priority ports for changes.

FY09 Goal = 14.9%

FY09 Q3 Goal = 9.5%, FY09 Q3 Actual = 12.9%



FY 2010 President's Budget

NGS - Geodesy:

- Base: \$27.417 million (includes \$4 million for GRAV-D)
 - Change from FY 2009 Omnibus: + \$4.557 million
- National Height Modernization: \$2.541 million
 - Change from FY 2009 Omnibus: None

NGS - MTS:

- Mapping and Charting Base: \$3.95 million
 - Change from FY 2009 Omnibus: + \$750,000
- Shoreline Mapping: \$2.424 million
 - Change from FY 2009 Omnibus: None



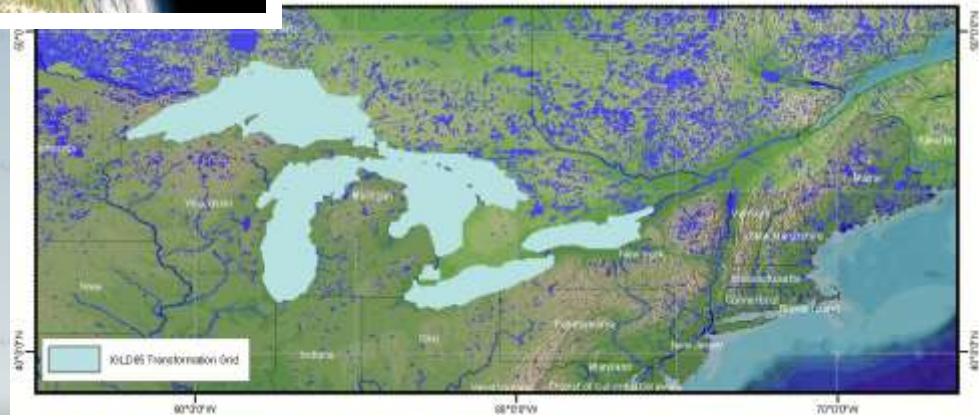
NGS FY 2010 Potential Milestones

- Complete 50% of GRAV-D Littoral Alaska Collection
- Define how users will access the new gravity based vertical datum resulting from GRAV-D and publish and develop an informational brochure for the user community
- Estimate the vertical velocity of each CORS that has collected at least three consecutive years of GPS data.
- Complete OPUS-Projects including meta data assimilation, scheduling, and data base loading elements
- Finalize and announce the definition of new geopotential datum in preparation for re-definition in the next 10 years.

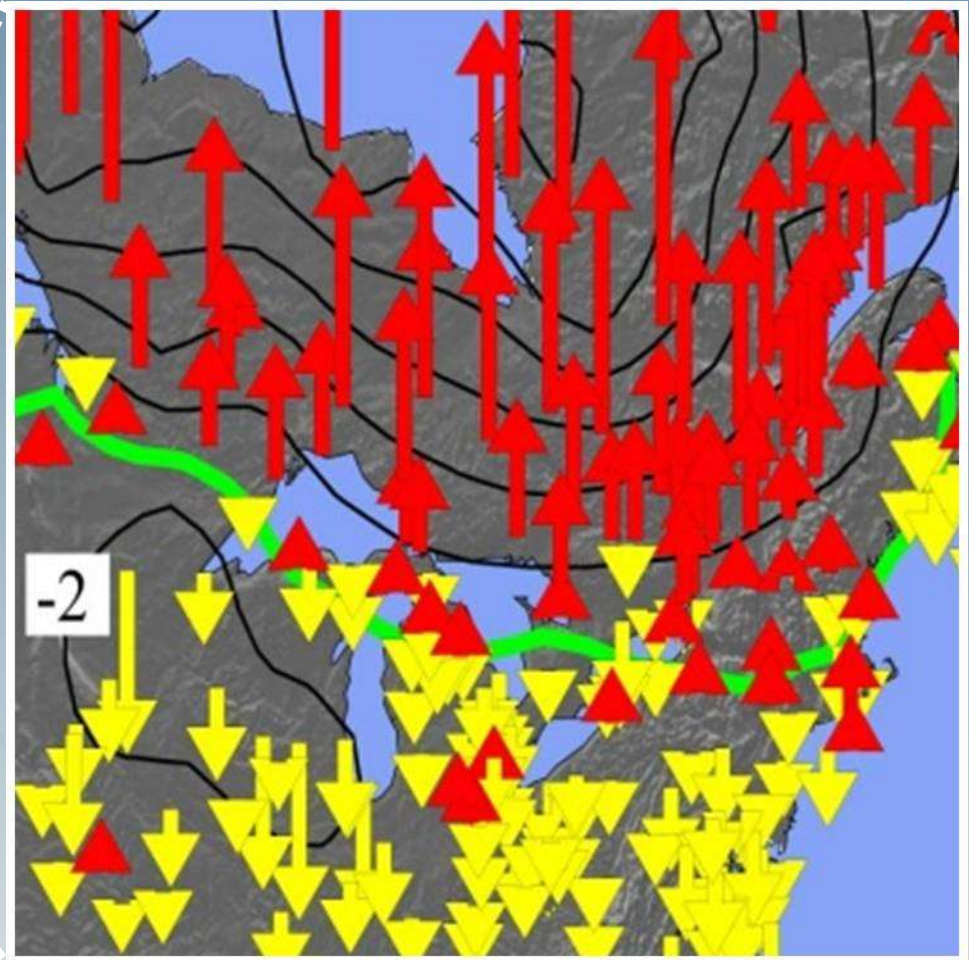
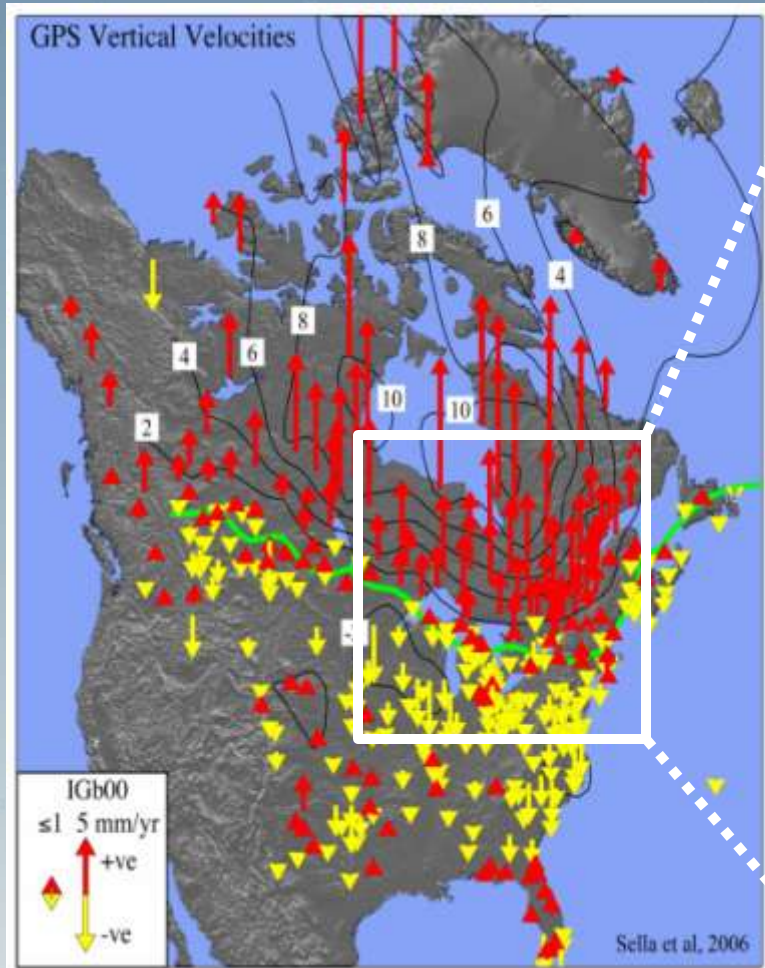
IGLD 2015

NGS Airborne Gravity Surveys will be used to develop a more accurate geoid based vertical datum, over the course of several years, allowing for centimeter level measurements with GPS.

Current elevations have meter-level errors due to a poor gravity dataset (i.e. IGLD 1985).



Great Lakes Uplift and Subsidence Require Updates to the Vertical Datum



Recent Accomplishments/Updates

GPS Data Sharing Available from NOAA's Online Positioning User Service (OPUS)

OPUS users are now provided with an option to share their positioning results in a new online NGS database!

This new data sharing service includes the following features:

- 1) archive OPUS solutions, mark metadata, and digital photographs in a database
- 2) discover solutions by various search criteria
- 3) retrieve datasheets for display or download the content in XML or ESRI shapefile format
- 4) customize datasheets



The screenshot shows the OPUS web interface with the following elements:

- Header: "OPUS: Online Positioning User Service" with NOAA and NGS logos.
- Navigation: "upload", "view", and "about" buttons.
- Sub-header: "compute an accurate position for your GPS data file".
- Form fields:
 - 1. "enter your email address" with an input field.
 - 2. "attach your DATA file" with a "Browse..." button.
 - 3. "select your antenna type" with a dropdown menu showing "NONE" and "no antenna selected - see FAQ #6".
 - 4. "add your antenna height" with an input field showing "0.0" and "meters".
 - 5a. "customize your solution, report, and publishing options" with an "OPTIONS" button.
 - 5b. "choose a processor" with two buttons: "Upload to RAPID-STATIC" (for L1/L2 GPS data > 15 min. < 2 hrs.) and "Upload to STATIC" (for L1/L2 GPS data > 2 hrs. < 48 hrs.).

<http://www.ngs.noaa.gov/OPUS/>

Recent Accomplishments/Updates

LOCUS – Leveling Online Calculations User Service

Provides tools for users to submit vertical control data to perform the necessary reductions, apply the needed constraints, and compute elevations through a standard least squares adjustment process.

Release date is scheduled for FY 2010.

The screenshot shows the LOCUS web application interface. At the top, there is a header for the National Geodetic Survey and the Leveling Online Calculations User Service. The main navigation bar includes links for About NGS, Tools, Science and Education, Survey Project Information, and Data Imagery, along with a search box. The left sidebar contains a menu with links for Information, Data Submittal, Project Proposal, Equipment Information, NGS Resources, and FAQ. The main content area is titled 'Information' and contains text explaining the service: 'LOCUS allows users to submit vertical control data, either from an optical instrument or a digital instrument, perform the necessary reductions, apply the necessary constraints, and compute elevations through a standard least squares adjustment process. Users interact with the adjustment process to arrive at the desired result and receive NAVD88 elevations for the control points in the project. The observation data and elevations ARE NOT saved by NGS, nor are they loaded into the NGSIDB.' Below this text, there is a section for file handling: 'Browse PC for HGZ file:' with a file input field containing 'C:\LOCUS\Locus test re' and a 'Browse...' button, followed by 'Run r6run' and 'Run asta' buttons. There are also links to 'Download a clean test file (Unzip the download file)' and 'Download an example error test file (Unzip the download file)'. A 'NOTE' section at the bottom states: 'NOTE: If the intent is to submit the leveling data to NGS for evaluation, publishing of benchmarks, and loading into the NGSIDB, the Project Proposal form must be completed and submitted to NGS and the calibration data for the equipment must be loaded into the NGS equipment database by submitting an Equipment Information Form.'

National Geodetic Survey State Advisors

•State Advisor Study

