Overview of socio-economic benefits study of the NGS Gravity Program

Briefing to FGCS Community

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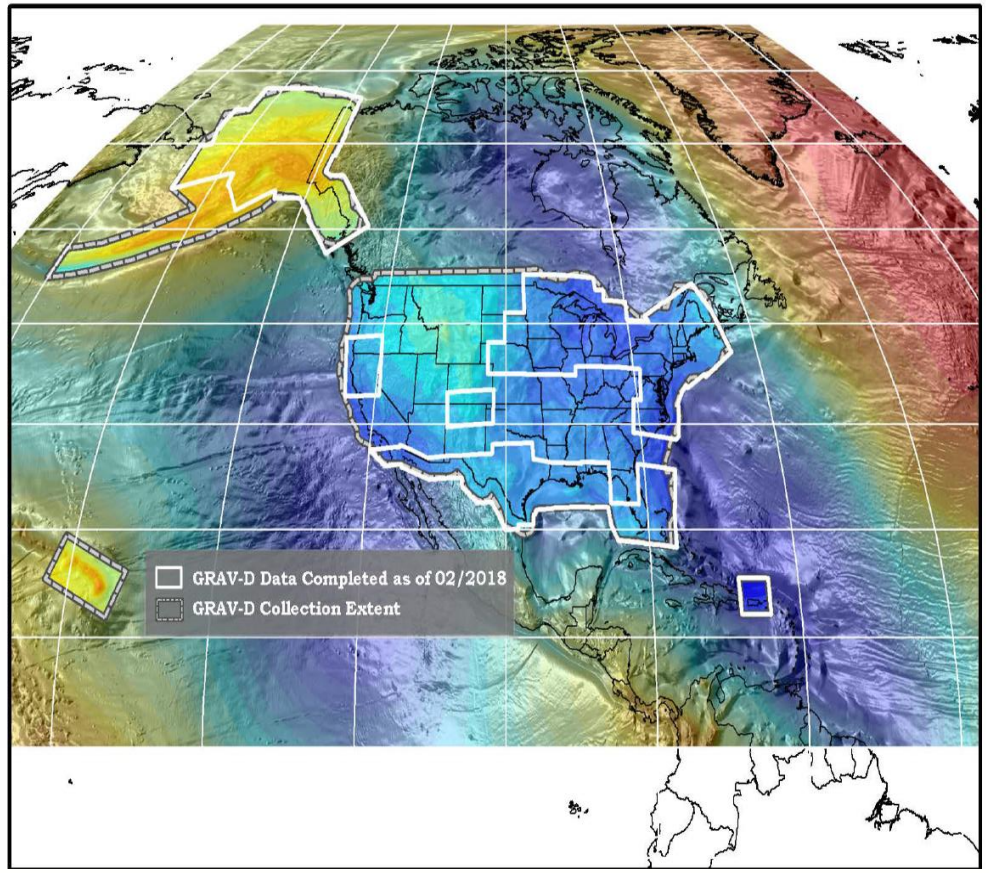
NGS Gravity Program

The **NGS Gravity Program** currently comprises:

- Gravity Data Management
- Collect Gravity Data to Support Geoid Modeling
- Table Mountain Geospatial Observatory
- Geoid Monitoring Service



https://www.ngs.noaa.gov/GRAV-D/

Accuracy of the Gravity Program

- The Gravity Program seeks to support a geoid model with 2 cm or better of elevation accuracy in most areas up to horizontal distances of 200 or 300 km.
  - This includes errors in both GPS and elevation measurement.
- This compares with the current NAVD88 network inaccuracy of as much as a meter or longer in the Continental U.S. and up to 2 m and much more for some mountains in Alaska.

2009 Socioeconomic Study

Location, Location, and Elevation!

NGS Positioning Products Worth Billions!

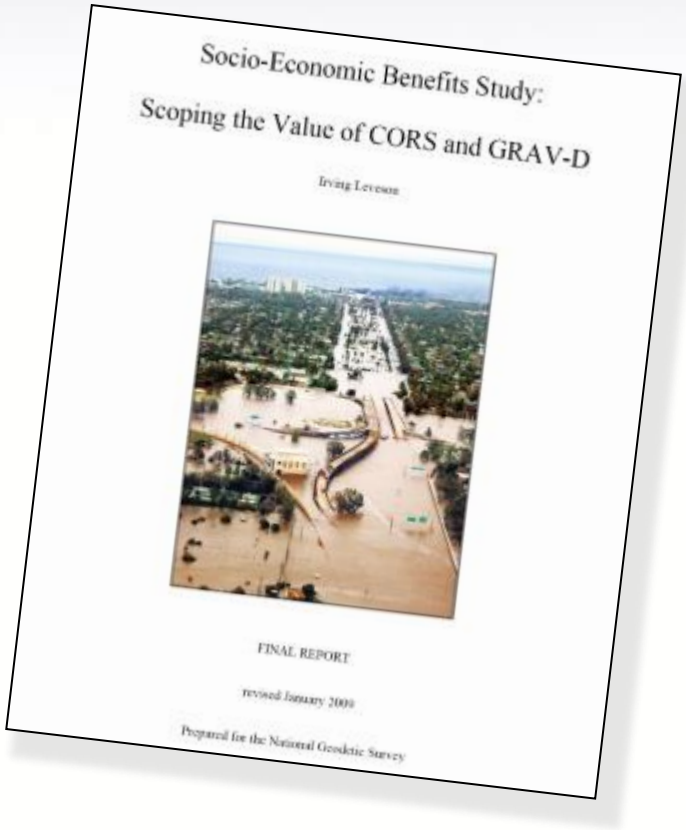
https://www.ngs.noaa.gov/PUBS_LIB/Socio-EconomicBenefitsofCORSandGRAV-D.pdf

Rollout to Congress June 15, 2009

NSRS worth $2.4 billion per year,
$22 billion over 15 years at a discounted rate.

CORS worth $758 million per year;
$6.9 billion over 15 years at a discounted rate.

GRAV-D worth $522 million per year
through implementation of a new national vertical datum; $4.8 billion over 15 years at a discounted rate, including $2.2 billion for improved floodplain management alone.

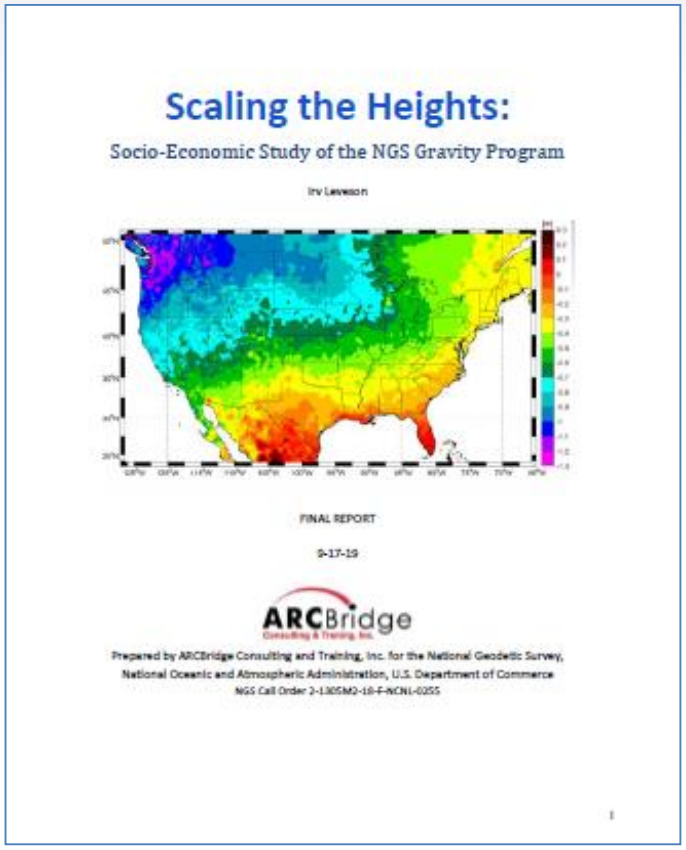


2019 Study of the Gravity Program "SCALING THE HEIGHTS"

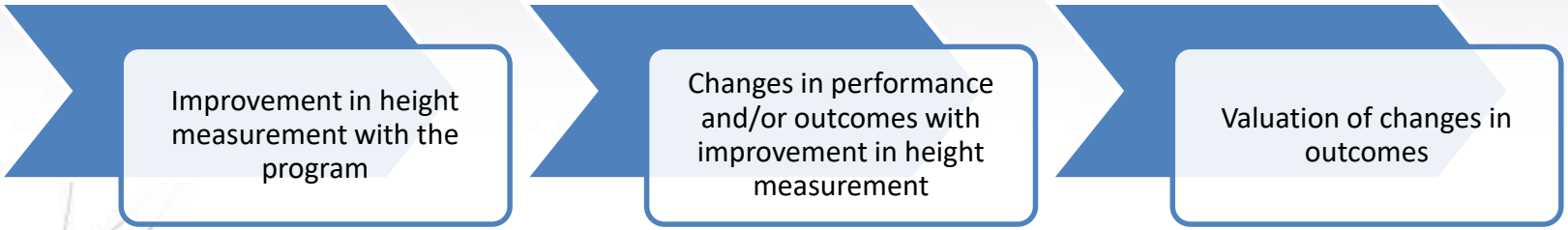
https://www.ngs.noaa.gov/library/pdfs/NGS-Gravity-Program-Socio-Economic-Report.pdf

The 2019 study conservatively estimated the value of the NGS gravity program—upon adoption of the new vertical reference system—to be:

$4.2 - $13.3 billion over ten years, with a middle scenario of **$8.7 billion.**



Benefit Determination



Benefits are measured by comparison with outcomes that would have been expected in the absence of the program.

The Benefit Analysis Includes:

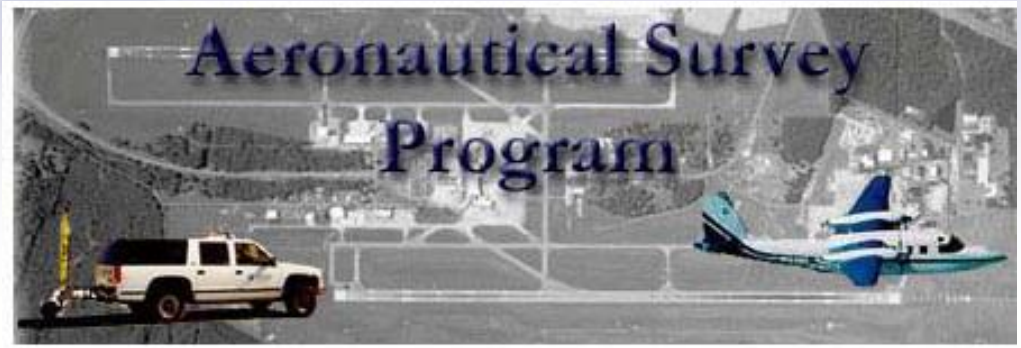
- Potential Economic Benefits (including multiplier effects on the rest of the economy).
- Economic Benefit Scenarios for rates of adoption in each year.
- Consideration of Impacts on Jobs and Non-Economic Benefits.

Benefits of the Gravity Program Are Expected to Be Very Large

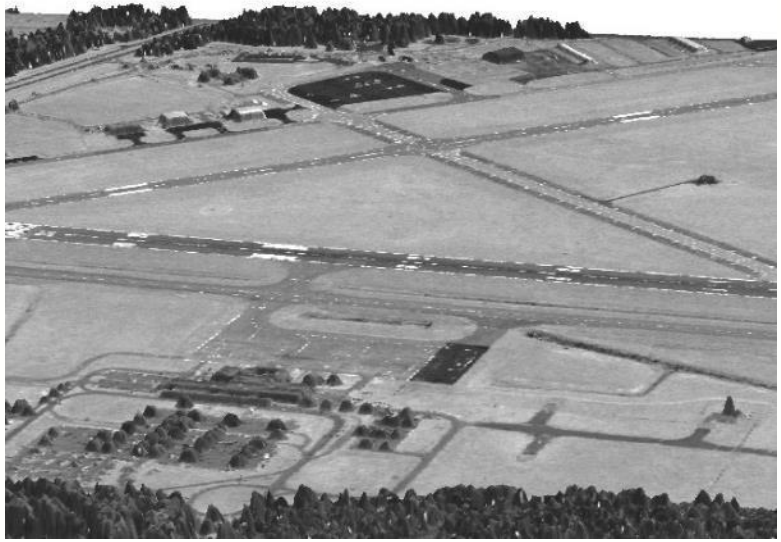
- The measurement of benefits focused on reductions in costs of geospatial activities and construction projects as a whole.
- Under the baseline scenario for adoption the economic benefits through the first 10 years of the program is $8.7 billion for the middle scenario, with a range between $4.2 and $13.3 billion between the lower and upper paths.
- Economic benefits would be much higher under more rapid adoption scenarios. For the highest adoption rate the upper end of the range exceeds $33 billion.
- The societal benefits of the program are also much greater than these economic figures indicate because the program enables important safety-of-life and environmental benefits

Next Up in FY2019:
NGS Aeronautical Survey Program

Anticipated in FY2020 will be a study of NGS' Aeronautical Survey Program.



The **NGS ASP** provides the FAA with critical runway, obstruction, navigation aid, and airport feature information needed to safely fly into airports.



https://www.ngs.noaa.gov/AERO/aero.html

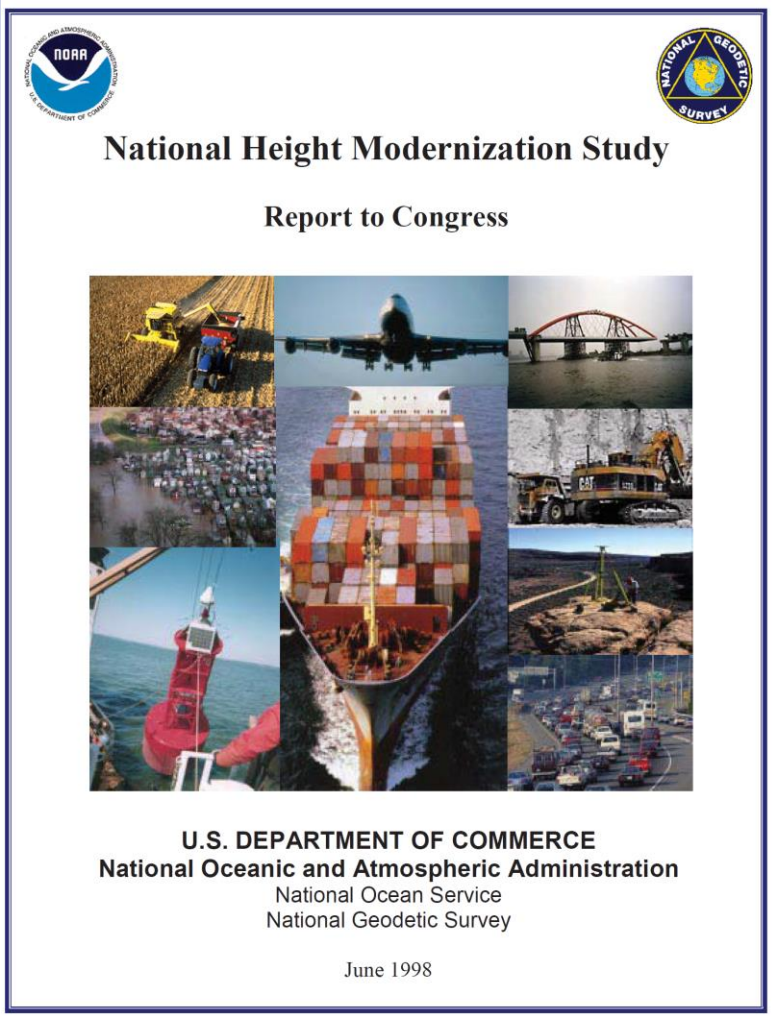
THANK YOU!

Questions?

Background
Previous NGS Socio-economic Studies

Our first study: "Height Mod"

- 1998 Height Mod Report to Congress
- Estimated "value to constituents" from a modernized National Height System at over $12 billion.
- State-by-state earmark funding began 2001, by 2007 stood at 10 states/year
- 2008 First year "National Height Mod" budget line in President's Budget
- 2010 GRAV-D begins under "Height Modernization" that will lead to a new Geopotential ("Vertical") Datum in 2022.


National Height Modernization Study

Report to Congress

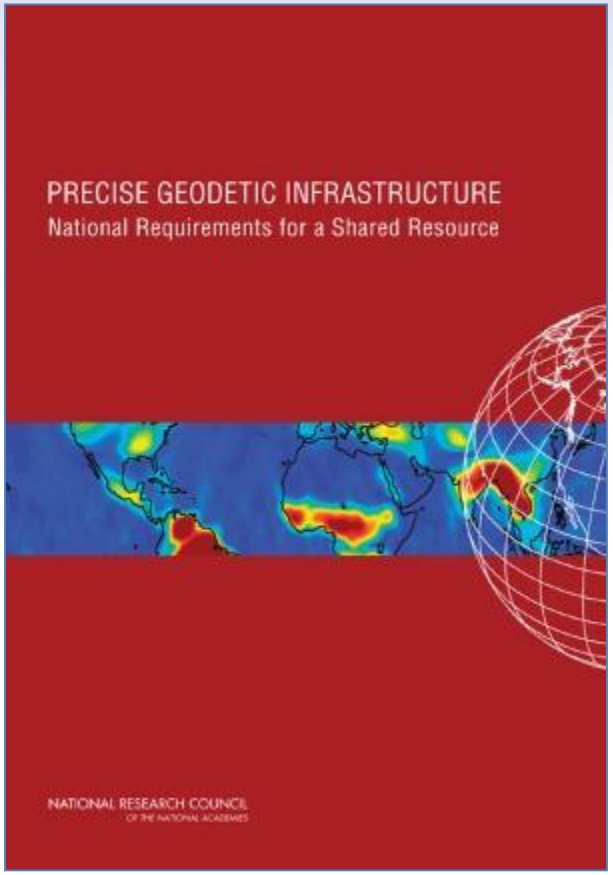
U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Service
National Geodetic Survey

June 1998

Complete report available at:
https://geodesy.noaa.gov/PUBS_LIB/1998heightmodstudy.pdf

Precise Geodetic Infrastructure
National Requirements for a Shared Resource

2010 National Research Council (NRC) Report commissioned by NGS, NASA, U.S. Naval Observatory, U.S. Geological Survey, National Geospatial Intelligence Agency, and the National Science Foundation.



Made recommendations that included specific support for GRAV-D and CORS:

- Make the most of existing instruments
- Augment current infrastructure
- Collaborate on the global stage
- Maintain the ITRF
- Investigate workforce and education challenges
- Establish a federal geodetic service

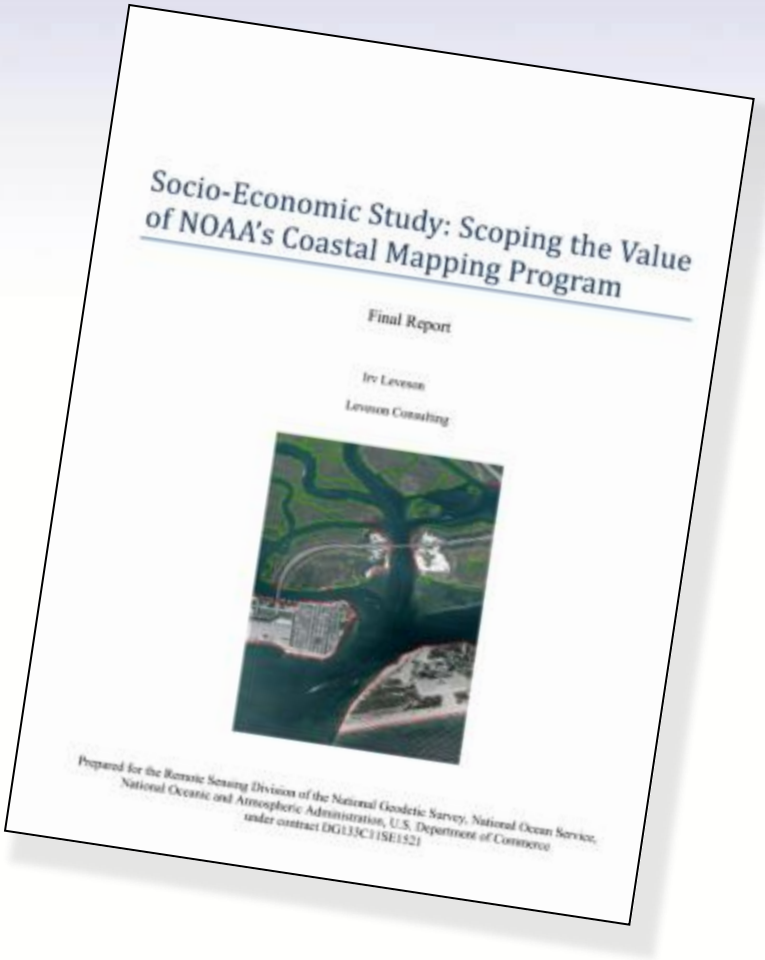
A four-page summary of the report is available at:
http://dels.nas.edu/resources/static-assets/materials-based-on-reports/reports-in-brief/GeodeticInfrastructure-ReportBrief-Final.pdf
The complete pdf is available here (click on download free pdf): http://www.nap.edu/catalog.php?record_id=12954

Coastal Mapping Program Benefits

Total economic benefits estimated **in excess of $200 million per year**

Combined direct and indirect **return of $35 for every $1** in program cost

CMP supports ~1500 jobs including 40 full-time jobs (CMP and contractors)



https://geodesy.noaa.gov/web/news/Big_Benefits_from_NGS_Coastal_Mapping.shtml

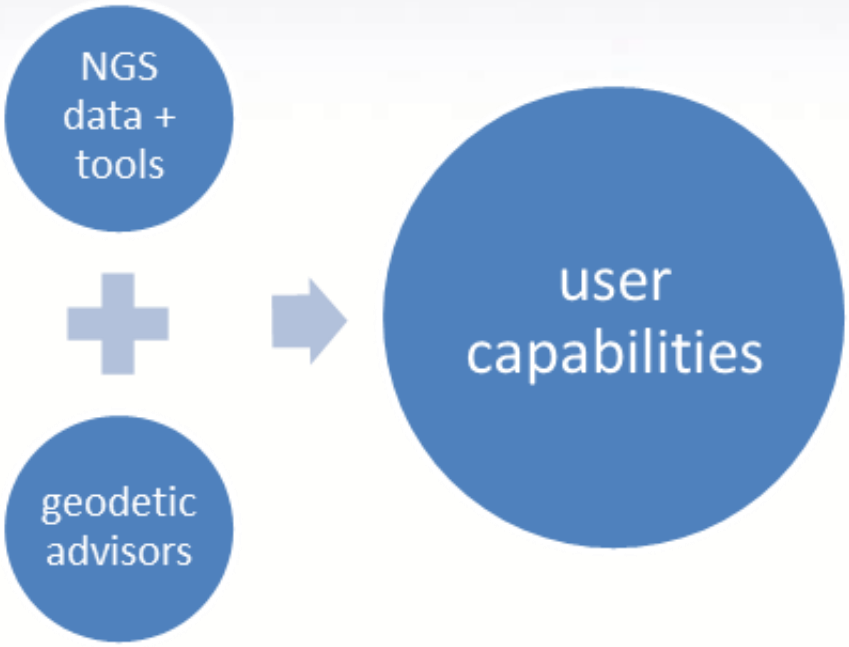
UNDERWAY:

NGS Regional Geodetic Advisor Program

2018 Regional Advisor Program Socioeconomic Study
The **NGS Geodetic Advisor Program** currently provides benefits of services to clients ranging from **$18.6 - $38.7 million annually**.

In addition, the training effort of Geodetic advisors for **OPUS Projects**, a major online tool for precise positioning, is estimated to be **$1.4 - $1.9 million annually**.

https://geodesy.noaa.gov/ADVISORS/



Study located here: https://www.ngs.noaa.gov/PUBS_LIB/reg-geodetic-advisor-prog-socio-economic-scoping-study-6-1-18.pdf