



GRAV-D: Gravity for the Redefinition of the American Vertical Datum

NOAA's National Geodetic Survey (NGS)

has initiated an ambitious program to re-define the vertical datum of the United States by the year 2021. The project is titled Gravity for the Redefinition of the American Vertical Datum, or GRAV-D.

Why do we need a new vertical datum?

- The new gravity-based vertical datum will be accurate at the 2-cm level throughout most of the United States. The current vertical datum, NAVD 88, is known to be biased by approximately 50-cm, with a 1-m tilt across the conterminous United States.
- Orthometric heights—unlike ellipsoidal heights—may be used to accurately predict water-flow patterns, land slide/slump risk, and other factors affected by Earth's gravity field.
- Currently, the Global Positioning System (GPS) provides only ellipsoidal heights, but a new GRAV-D-derived datum will facilitate rapid access to orthometric heights.
- The GRAV-D Project will provide \$4.8 billion in socio-economic benefits to the United States including costs avoided by improved floodplain maps and management.

GRAV-D consists of three major campaigns.

First: A high-resolution “snapshot” of gravity in the United States. The entire United States and its holdings will be flown in the following order of priority: Puerto Rico and the Virgin Islands, Alaska, the Gulf coast, the Great Lakes, the east and west coasts of the continental United States, Hawaii, the American Pacific island

holdings, and the interior of the continental United States. To see your state's progress, go to: <http://geodesy.noaa.gov/GRAV-D/data.shtml>.

Second: A low-resolution “movie” of gravity changes. Primarily a terrestrial campaign, the second phase will involve periodic visits to Absolute Gravity sites to monitor changes in gravity over time. This phase will allow time-dependent geoid modeling—and thus time-dependent orthometric height monitoring—through Global Navigation Satellite System (GNSS) technology. A steering committee comprised of members of the scientific community will advise NGS on this project phase.

Third: Regional partnership surveys. The GRAV-D Project seeks to collaborate with local partners (governmental, commercial, and academic) willing to support airborne or terrestrial surveys or to monitor local variations in the gravity field. Please see our contact information, below, if your organization would like to participate.

For more information, contact NGS:

- **On the Web**
<http://geodesy.noaa.gov/GRAV-D>
- **By email**
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