What Is Height Modernization:

Height Modernization is the establishment of accurate, reliable heights using GPS Technology in conjunction with traditional leveling, gravity, and remote sensing information

The Height Modernization Program

In 1998, congress directed the National Geodetic Survey (NGS) to conduct a national Height Modernization Study. NGS is the nation's positioning agency within the National Oceanic and Atmospheric Administration (NOAA), under U. S. Department of Commerce.

The purpose of the study was to determine the effectiveness of Height Modernization in California and North Carolina; and determine potential benefits to the nation. Since the directive, NGS has had to modify its program operations, due to modern society's need for geographic data that is spatially referenced - horizontally and vertically.

Height Modernization Program objectives:

- determine accurate floodplains
- study runoff amounts and effects
- improve agricultural yields
- manage coastal resources
- improve transportation systems

In order to accomplish our program goals, we need accurate, easily accessible information on: terrain elevations, coastal and inland waters, buildings, roads, pipelines, aircraft, ships, etc.; as well as information on how these heights behave over time.

Why Is Height Modernization Needed

- to aid in designing and constructing roads and buildings
- to aid in the transport of goods and people; by auto, ship or plane
- for Flood Insurance Rate Maps (FIRM) modernization
- to determine High Water marks
- to replace intensive, high cost leveling with new, cost-efficient GPS technology
- to decrease survey costs associated with Flood Plain, and other mapping and GIS activities.

Height Modernization Saves Money

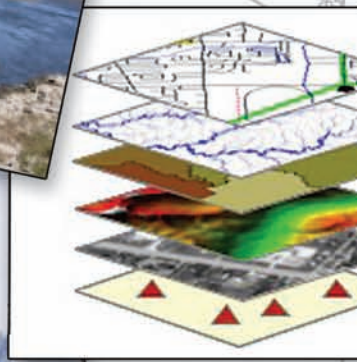
- Reduces cost to countries with quality control analysis of photogrammetry
- Saves hundreds of thousands of dollars by updating flood plain maps with more accurate elevation data
- Eliminates the cost of Flood Hazard Certification fees
- Correctly identifies property owners who reside in flood plains, to determine their need for flood insurance

Height Modernization Saves Lives

- Aids in safely landing aircraft, during low visibility conditions
- Alerts emergency management planners of sinking storm evacuation routes, susceptible to storm surges
- Provides ships with safe under-keel and overhead clearance, to avoid dangerous collisions
- Determines the exact location of snow-covered highways, to expedite snow removal by snow plows.

Height Modernization Protects the Environment

- Monitors tectonic plate movement
- Monitors ground and surface water movement
- Makes Flood Plain mapping possible
- Uses fertilizer and pesticide efficiently (precision farming), while minimizing pollution and related cleanup costs
- Meets Homeland Security needs, including safety monitoring
- Updates heights on Emergency Evacuation Routes



The Benefits of Height Modernization (HM)

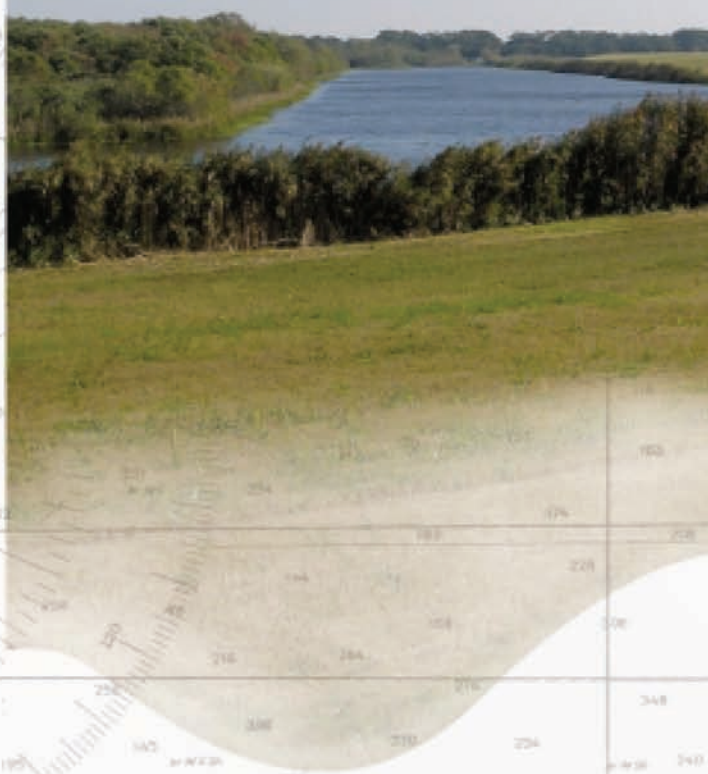
- In FEMA's National Flood Insurance Program, risk is measured by elevations. Hence, accuracy is critical – to home and business owners, insurance companies, mortgage lenders, the real estate industry, and real estate development companies. HM improves flood plain and insurance rate maps accuracy, allowing smarter planning, development, and risk management.
- Accurate survey control widely available, and easily accessible, reduces future survey costs, and improves geospatial-related data accuracy - such as in geographic information systems (GIS), remote sensing information, road and building construction, and evacuation route monitoring.
- Water resources (ground water vs. surface water) in areas susceptible to subsidence, deformation, or erosion, can be easily monitored and better managed.
- Accurate positions and "positioning" provide the basis for Intelligent Transportation Systems (highways, rail, air, water) and improve safety and efficiency. Dynamic water levels referenced to accurate land elevations, and integration of surface weather and water, benefit commerce and transportation, as well.
- Precision agriculture applies GPS technology and management strategies to individual fields: to protect the environment, improve productivity, and save time and money. Terrain modeling derived from GPS/remove sensing data, results in more accurate field boundaries and slope (contour) management for land use.
- GIS integrating, planting, and yield rates, results in well-defined fertilizer and pesticide applications, saves resources, and reduces run-off; benefiting agricultural and environmental interests.

Outreach/Education

NGS conducts a variety of Height Modernization outreach and educational programs, in conjunction with the cooperative efforts of professional societies, universities; and international, federal, state, and local organizations –

- GPS-Derived, Heights Workshop
- Height Modernization Workshop
- Height Modernization User Forums

Height Modernization



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