Issue 6, January 2017

NSRS Modernization News

For all issues of **NSRS Modernization News**, visit:
geodesy.noaa.gov/datums/newdatums/TrackOurProgress.shtml

Decision Points

The National Geodetic Survey (NGS), through a series of both internal debates and external discussions with the Canadian Geodetic Survey, has finalized certain key decisions in the replacement of the three NAD 83 reference frames, and in the replacement of the various vertical datums of the NSRS. These decisions cover both the science and nomenclature of the changes coming in 2022.

Four Terrestrial Reference Frames

Replacing the three existing NAD 83 reference frames will be four plate-fixed *terrestrial reference frames.* The tectonic plate for each frame may be inferred from their names, which are:

North American Terrestrial Reference Frame of 2022 (NATRF2022)

Pacific Terrestrial Reference Frame of 2022 (PTRF2022)

Mariana Terrestrial Reference Frame of 2022 (MTRF2022)

Caribbean Terrestrial Reference Frame of 2022 (CTRF2022)

Relationship to the IGS Frame

Each of the above four frames will be identical to the latest IGS reference frame (as available in 2022) at an epoch to be determined. Away from that epoch, the four frames will relate to the IGS frame through the definition of an Euler Pole rotation specific to that plate. All Continuously Operating Reference Stations (CORS) velocities which deviate from the rotation of a rigid plate will be captured in a residual 3-D velocity model.

Heights and Other Physical Coordinates

A *geopotential datum* will be created which will contain all of the necessary information to provide mutually consistent orthometric heights, geoid undulations, gravity anomalies, deflections of the vertical, and all other geodetic coordinates related to the gravity field. This geopotential datum will be called:

North American-Pacific Geopotential Datum of 2022 (NAPGD2022)

Geoid Model

Within NAPGD2022, a variety of products will exist. The most prominent of these products will be a *time-dependent model of the geoid,* provided in three regions (the first covering the entirety of North and Central America, Hawaii, Alaska, Greenland, and the Caribbean; the second covering American Samoa; and the third covering Guam and the Commonwealth of the Mariana Islands). The name of this model will be:

GEOID2022

Further Information

A comprehensive white paper, outlining the technical details of the above decisions, is currently being drafted in NGS and we plan for it to be ready by the upcoming 2017 Geospatial Summit. In addition, details may be released on the NGS website and through our email listserv.

GRAV-D progress last quarter: up 3.0% to 58.4%
Ahead of Schedule!

Recently: Texas, Florida

Schedule: 56%