

An Updated Surface Gravity Prediction Model (xGRAV20)

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Key words: Reference frames; Reference systems

SUMMARY

In support of a new vertical datum, the National Oceanic and Atmospheric Administration's (NOAA) National Geodetic Survey (NGS) is modernizing a number of products and models that fall within the datum. This paper will focus on the newly released surface gravity model, xGRAV20. This is the initial BETA release of what ultimately will be an official surface gravity model, GRAV2022.

This new model is based on approximately 10 million terrestrial gravity observations and a high resolution digital elevation model (DEM). The model can be used for estimating geodetic leveling corrections and in other geodetic and geophysical applications where an absolute gravimeter is not available. This paper will highlight the model methodology and will present an external validation using independent, high-accuracy absolute gravity data acquired by the NGS Geoid Slope Validation Surveys in Texas, Iowa, and Colorado and other high-quality absolute gravity throughout the U.S. and its territories. Two additional elements will also be investigated in this paper: 1) the estimated uncertainty of the surface gravity model, and 2) the inclusion of a time-dependent gravity component.

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FIG e-Working Week 2021
Smart Surveyors for Land and Water Management - Challenges in a New Reality
Virtually in the Netherlands, 21–25 June 2021