# POTENTIAL FIELD POOL EQUIPMENT (PFPE) 2022 ACTIVITIES REPORT

Dedication to: Mr. Randy Harr

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11.02.2022 RVTEC

Potential Fields Pool Equipment

MARINE GRAVIMETER MARINE MAGNETOMETER REQUEST AN INSTRUMENT Q

#### About Potential Fields Pool Equipment (PFPE)

The Potential Fields Pool Equipment (PFPE) supports permanently installed BGM-3, gyro-stabilized gravimeter equipment on all University National Oceanographic Laboratory System (UNOLS) academic research fleet (ARF). PFPE originated over two decades ago in response to an identified need for the UNOLS community to have a centralized repository for shipboard gravimeter systems' technical support, and to reduce the overall gravimeter operational and support costs to the federal funding agencies. \* READ MORE

#### Potential Fields Pool Equipment (PFPE) Services



Gravimetry PFPE supports users needs to acquire gravity data at sea



Magnetometry PFPE supports users needs to acquire magnetic data at sea.

PFPE MISSIONS OPERATE AND MAINTAIN POTENTIAL FIELD EQUIPMENT ON UNOLS VESSELS+ TO OBTAIN SCIENCE-GRADE DATA



We share and support a mission to both science community and general public:

\*Gravity data from your vessel are *knowledge*, and the knowledge is our *power* to address 21<sup>st</sup> century Earth and ocean sciences, national security, resource and hazard management, etc.

KeyI : The health of instrument/working gravimeters Key2 : Data density from ship of opportunity for underway data and gravity ties in domestic/international ports. To refine our understanding on the shape of Earth, we need gravity data from your vessels!!



(National Geospatial Agency)



#### WELCOME TO THE OFFICE OF GEOMATICS

Welcome to the new Office of Geomatics website. For quick access to data, apps and services, please select from the tabbed menu below. For more detailed information about each product, please choose from the menu bar at the top of the screen.

## Gantley, R., Metzger, A. et al., 2021 (AGU G35B-0303)

### "Earth Gravitational Model (EGM)

This division in the Office of Geomatics at NGA is responsible for collecting, processing, and evaluating gravity data (free-air and Bouguer gravity anomalies). These data are then used to compute gravimetric quantities such as mean gravity anomalies, geoid heights, deflections of the vertical, and gravity disturbances. All of these quantities are used in World Geodetic System 1984 support, navigation systems, mapping projects, and different types of surveys. An Earth Gravitational Model (EGM) is set of geopotential coefficients used in a spherical harmonic expansion to create a global potential surface to coincide with Mean Sea Level (MSL). This surface is called a geoid and it fluctuates above and below the reference ellipsoid surface established by WGS 84."

## 2022-PFPE ACTIVITIES

## BGM3 Gravimeters:

R/Vs Sikuliaq, Revelle, Ride, Thompson, Langseth, Kilo Moana, Armstrong, Atlantis, Palmer, & Healey [S. Ride BGM3 is on shore]

- **DgS Gravimeters**: (DgS-ATIM system: "DgS" = Dynamic Gravity Systems, LLC.). ITAR free, next gen. gravimeter on Global/Ocean class vessels (and smaller vessels too as needed).
- 2021: 4 side-by-side tests of BGM3 and DGS gravimeters were conducted between Sept. 2020 to present to assess operational capabilities and data comparability: Armstrong (AR47 and AR49), TGT(TN391), and Healey (HLY21TD).
- 2022:Thompson DgS (NSF funded) meter + BGM3, the model case side-by-side test.
- 2022: Revelle DgS (NSF funded) meter installation completed on Oct. 29<sup>th</sup> + BGM3.
- 2022: Atlantis –DgS (NGA funded) meter installed, issues found, and currently tested at manufacture (due Charleston port call) + BGM3.
- 2022: Palmer –DgS (NSF funded) meter will be installed in December port call, Lyttleton, NZ, + BGM3.

# → More on the new DgS meter practices during the PFPE Breakout Session (3-3:50 today, Alder Hall 106)

2022-PFPE UPDATES NGA geodetic team resurveyed the absolute gravity station located within the WHOI building (Bigelow) on Village Campus & newly established one on Quisset Campus (David Center)





NGA geodetic team Reestablished the relative gravity tie locations on the WHOI dock (A-C).