POTENTIAL FIELD POOL EQUIPMENT (PFPE) 2022 ACTIVITIES REPORT

Dedication to: Mr. Randy Harr

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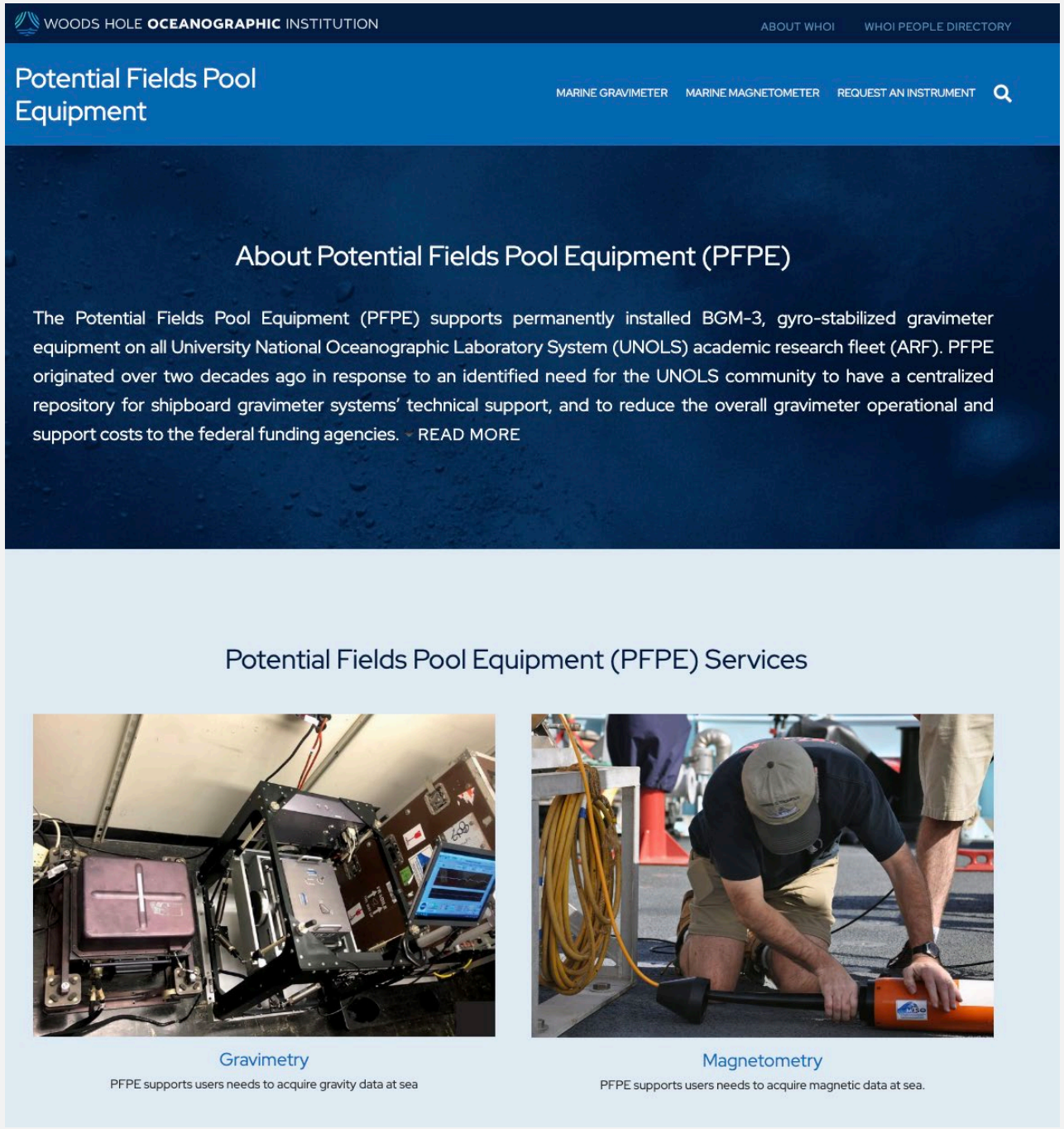
11.02.2022 RVTEC

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



GRAVITY DATA FROM UNOLS ARF

WHY IMPORTANT?

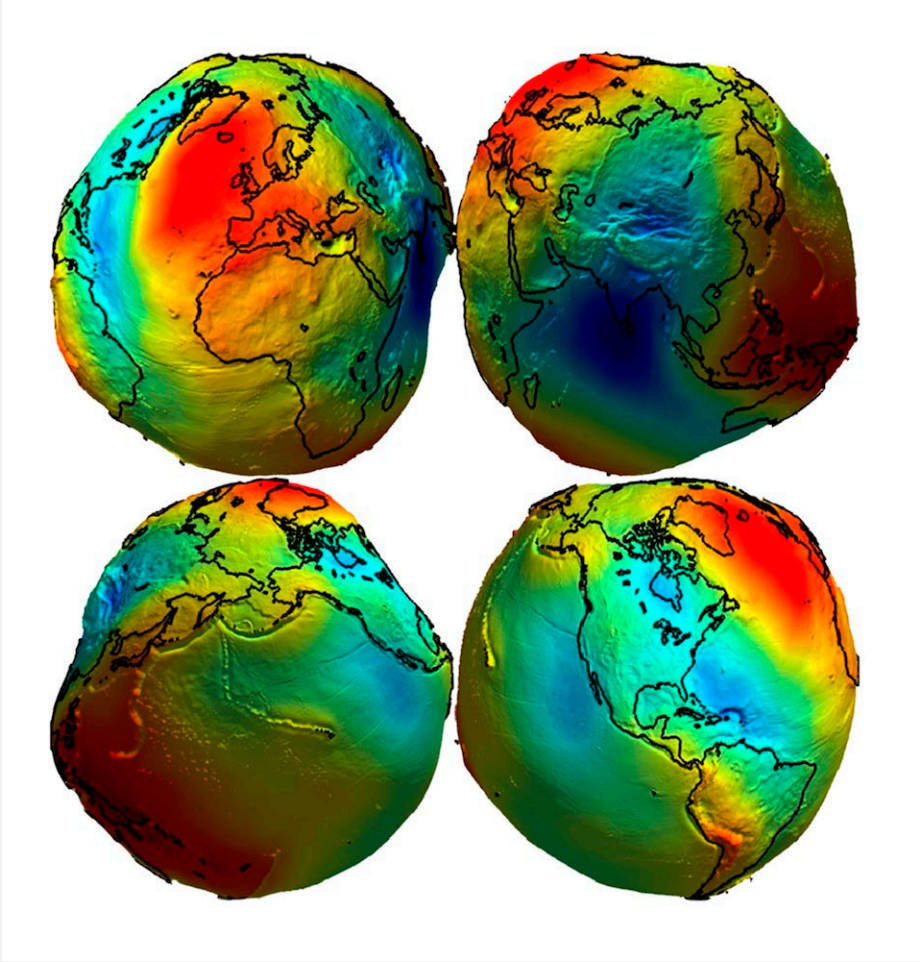
We share and support a mission to both science community and general public:

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

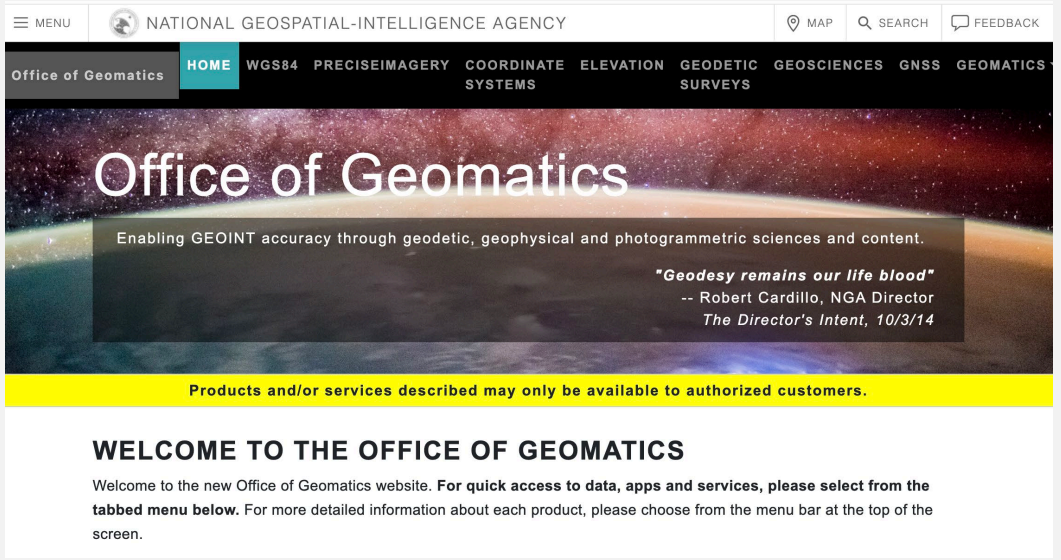
Key1 : The health of instrument/*working gravimeters*

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)



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**:

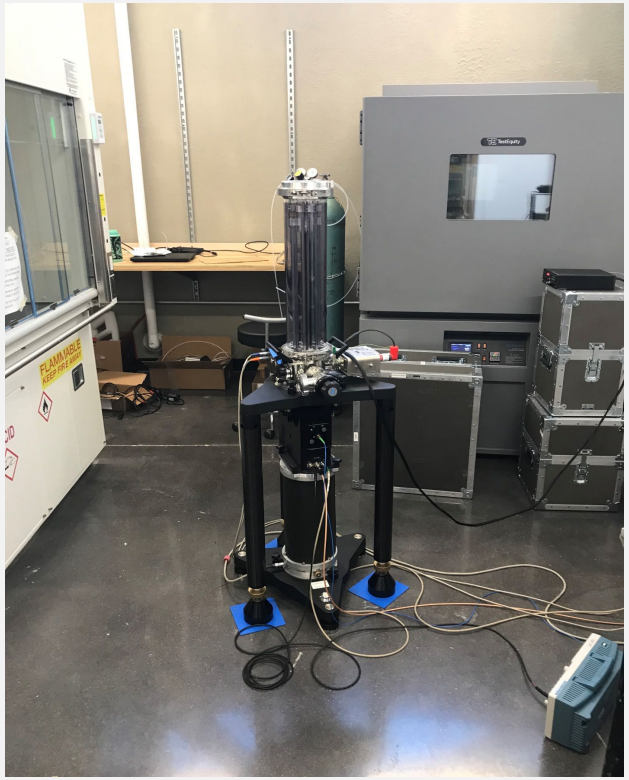
  R/Vs Sikuliaq, Revelle, Ride, Thompson, Langseth, Kilo Moana, Armstrong, Atlantis, Palmer, & Healey [S. Ride BGM3 is on shore]

- **DgS Gravimeters**: (DgS-AT1M 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. 29th + 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 Halll 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).