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Advancing Knowledge of the Antarctic Seafloor through Multibeam Data Collection Along Research Vessel Routes.

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Morphobathymetry, a versatile and invaluable hydrographic resource, enriches scientific investigations and deepens our understanding of the Antarctic region across a range of scientific disciplines. Its use benefits scientific disciplines such as geophysics and geodynamics, integrating with other fields of research, revealing complex relationships between the seabed and oceanographic and biological phenomena. The interconnections between seafloor shape, ocean-atmosphere dynamics, and biogeochemical interactions unveil indeed a new dimension of understanding.

Despite data quality does not often meet IHO standards, often due to vessel speed, and the challenges of collecting high-quality data during transits, we emphasize the value of these efforts. ISOBATA's data from Laura Bassi's recent Antarctic expeditions, although insufficient for a comprehensive mapping, effectively fills critical bathymetric gaps in areas typified by remarkable and previously unknown tectonic features.

The ISOBatA project, funded by the Italian National Antarctic Research Program (PNRA), spanned a two-year period with the aim of optimizing data collection on board the Italian icebreaker Laura Bassi during its transits in the Southern Ocean. The project focused on the acquisition of acoustic and magnetometric data, with an emphasis on morphobathymetry. ISOBatA used ship time to reduce the vessel's speed and travel along preferential corridors designated to survey unexplored areas. Additionally, ISOBATA extensively leveraged metadata from previous PNRA expeditions and the IBCSO coverage map, enhancing research efficiency and increasing the amount, quality, and scientific value of gathered data.

New insights from preliminary results of the ISOBATA project include:

1. In the Emerald FZ, data indicates depth differences of up to 1200 meters compared to the IBCSO map.
2. In the areas near the Italian moorings sites (Ross Sea), metadata from previous PNRA surveys were largely used in planning data collection. In the G site, spiral geometries generated gby gouging icebergs illustrate the interplay of tidal rise and geostrophic currents.

In addition, it is worth noting that the sharing of collected data on an international scale makes a significant contribution to expanding our knowledge of the Antarctic seafloor, pushing the boundaries of scientific understanding in this crucial region.