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TITLE: The Global Ocean Ship-Based Hydrographic Investigations Program (GO-SHIP): A Platform for Integrated Multidisciplinary Ocean Science

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ABSTRACT:

The Global Ocean Ship-Based Hydrographic Investigations Program (GO-SHIP) provides a globally coordinated network and oversight of 55 sustained decadal repeat hydrographic reference (core) lines as part of the global ocean/climate observing systems (GOOS/GCOS) for study of physical oceanography, the ocean carbon, oxygen and nutrient cycles, and marine biogeochemistry. GO-SHIP enables assessment of the ocean sequestration of heat and carbon, changing ocean circulation and ventilation patterns, and their effects on ocean health and Earth's climate. Rapid quality control and open data release along with incorporation of the GO-SHIP effort in the Joint Technical Commission for Oceanography and Marine Meteorology (JCOMM) in situ Observing Programs Support Center (JCOMMOPS) have increased the profile of, and participation in, the program and led to increased data use for a range of efforts. In addition to scientific discovery, GO-SHIP provides climate-quality observations, often at the point of deployment, but also for ongoing calibration of measurements from existing and new autonomous platforms. This includes biogeochemical observations for the nascent array of biogeochemical (BGC)-Argo floats; temperature and salinity for Deep Argo; and salinity for the core Argo array. GO-SHIP provides the relevant suite of global, full depth, high quality observations and co-located deployment opportunities that, for the foreseeable future, remain crucial to maintenance and evolution of Argo's unique contribution to climate science. The evolution of GO-SHIP from a program primarily focused on physical climate to increased emphasis on ocean health and sustainability, in support of UN Sustainable Development Goal 14, has put an emphasis on the addition of essential ocean variables (EOVs) for biology and ecosystems in the program measurement suite. In conjunction with novel automated measurement systems, ocean color, particulate matter, and phytoplankton enumeration are being explored as GO-SHIP variables. The addition of biological and ecosystem measurements will enable GO-SHIP to determine trends and variability in these key indicators of ocean health. The active and adaptive GO-SHIP community has sustained the network, quality and relevance of the global repeat hydrography effort through societally important scientific results, increased exposure, and interoperability with new efforts and opportunities within the community.

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