



Core Measurements, Categories and Submission Timelines

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The Committee of the Global Ocean Ship-based Hydrographic Investigations Program (GO-SHIP, www.go-ship.org) has grouped GO-SHIP cruises in three different categories, and measurements in three levels of different importance.

Decadal full GO-SHIP: Level 1 data are of highest priority to fulfill the scientific objectives of the GO-SHIP cruises. Level 1 data should be collected at least once per decade on all lines of the GO-SHIP network.

Cruises which are repeated at higher frequency (categories below) may collect limited parameters, but full level 1 remains the GO-SHIP recommendation for cruises of all categories.

High Frequency GO-SHIP: Regular GO-SHIP lines occupied at higher frequencies (yearly, biennial) with limited parameters, but with at least one decadal full GO-SHIP cruise. High frequency cruises must i) occupy the regular line end-to-end, ii) full depth, and iii) comply with the data policy.

Associated GO-SHIP: Repeat hydrographic sections off regular GO-SHIP lines and not necessarily coast-to-coast or coast-to-ice, which i) deliver high quality data, ii) establish full depth stations below 2000m at least every 240nm, iii) are repeated on decadal frequency or more, at least once per decade with sufficient level 1 parameters to quantify decadal change in inorganic carbon and heat inventories, iv) at a minimum resolution of 60nm, and v) comply with the data policy.

Level 1 data:

- Dissolved inorganic carbon (DIC)
- Total Alkalinity (TALK)
- pH
(Note: any two of the above)
- CTD pressure, temperature, salinity (calculated)
- CTD oxygen (sensor)
- Bottle salinity
- Nutrients by standard auto analyzer (NO_3/NO_2 , PO_4 , SiO_3)
- Dissolved oxygen
- Chlorofluorocarbons (CFC-11, -12, -113) and SF_6
- Surface underway system (T, S, pCO_2)
- ADCP shipboard
- ADCP lowered
- Underway navigation and bathymetry
- Meteorological data

Level 2 data:

Level 2 data are highly desirable as augmentation and addition for the science objectives executed on GO-SHIP cruises. GO-SHIP recommends that level 2 data should be collected when possible.

- Discrete pCO_2
- ^{14}C by AMS
- CCl_4
- $\delta^{13}\text{C}$ of DIC
- Dissolved organic carbon
- Dissolved organic nitrogen
- Fe/trace metals
- CTD Transmissometer
- Surface underway system (pCO_2 , nutrients, O_2 , Chl, skin temperature)

Level 3 data (examples):

Level 3 data are ancillary measurements that often benefit from being taken in conjunction with the core measurements and/or address a scientific question unique to the region of investigation. They are collected according to opportunity and space available. They should not significantly interfere with sampling of level 1 or 2 parameters, and may be regional or specific to an individual cruise.

- Chlorophyll
- Primary production
- HPLC pigments
- $\delta^{15}\text{N}$
- NO_3
- ^{32}Si
- $\delta^{18}\text{O}$ of H_2O
- Experimental continuous analyzers
(such as pH, DIC, and TALK, and O_2/Ar)
- NH_4
- Low level nutrients
- Total organic phosphorus
- Upper ocean optical
- Isotopes of O_2
- N_2 , Ar, O_2
- Methyl halides
- DMS

Data Policy Timelines

All level 1, 2, and 3 data obtained on GO-SHIP cruises shall be openly accessible to the community at large. The following timelines for submission of data are in place. All data should be publically available preferably through a central data management site. CCHDO (cchdo.ucsd.edu) has agreed to serve all GO-SHIP data.

Within 5 weeks of the cruise, released to the relevant data management structure:

- Preliminary CTD (pressure, temperature, salinity, oxygen if measured)
- A merged bottle data file including preliminary discrete salinity, oxygen, nutrients (and inorganic carbon system components)
- Preliminary CFC-11, CFC-12, CFC-113, SF₆
- Underway data, including continuous (1-minute) navigation, bathymetry, shipboard meteorological measurements, temperature, salinity, pCO₂ (if measured).
- Shipboard ADCP data

Within 6 months of the cruise, presuming the 5-week releases of CTD and discrete salinity data:

- Final salinity, oxygen, nutrients, CFC, CTD data
- Final underway data
- Final shipboard ADCP data
- Final carbon system parameters (Total CO₂ and Total Alkalinity required; pH, pCO₂ if measured)
- CDOM if measured
- Lowered ADCP (if measured)
- Any other Level 2 measurements

Within 6 months of shore-based analysis:

- Tritium/helium
- ¹⁴C and ¹³C
- DON if measured

Within 2 years of analysis:

- Any other (level 3) observations. Those based on discrete bottle samples should be submitted to the hydrographic data management structure and merged with the other bottle data.
- Underway data should be submitted to the underway data management structure to be merged with the Level 1 and 2 underway data.
- Other discrete sampling programs that are likely to be carried out on many of the cruises, such as transmissometry and optics, should be submitted to the relevant data management groups (examples are a JGOFS SMP project for global transmissometry, and the NASA DAC for optics).