



Level 1 data are of highest priority. GO-SHIP recommends that level 1 data should be collected at least once per decade on all sections. Sections occupied at higher frequencies (yearly, biennial) do not need to undertake all level 1 measurement on all re-occupations.

**Level 1 data:**

- CTD pressure, temperature, salinity (calculated from conductivity, temperature and pressure)
- CTD oxygen (sensor)
- Bottle salinity
- Nutrients by standard auto analyzer ( $\text{NO}_3/\text{NO}_2$ ,  $\text{PO}_4$ ,  $\text{SiO}_3$ )
- Dissolved oxygen
- Dissolved inorganic carbon (DIC)\*
- Total Alkalinity (TALK)\*
- pH\*
- \*(note any two of the above carbon related observations)
- Chlorofluorocarbons (CFC-11, -12) and  $\text{SF}_6$
- Surface underway system (T, S,  $\text{pCO}_2$ )
- ADCP shipboard
- ADCP lowered
- Underway navigation and bathymetry
- Meteorological data.

Level 2 data are highly desirable. GO-SHIP recommends that level 2 should be collected when possible.

**Level 2 data:**

- Discrete  $\text{pCO}_2$
- $^{14}\text{C}$  (by AMS)
- $\text{CCl}_4$
- $\delta^{13}\text{C}$  of DIC
- Dissolved organic carbon
- Dissolved organic nitrogen
- Fe/trace metals
- CTD Transmissometer
- Surface underway system (nutrients,  $\text{O}_2$ , Chl, skin temperature).

**Level 3 data** are ancillary measurements are done according to opportunity and space available. They should not significantly interfere with Level 1 or 2 data collection, and may be regional or specific to an individual cruise.

The GO-SHIP data policy for its basic parameter set is stringent and geared towards rapid, open dissemination, with a clear structure for all data to undergo quality control, and to be sent to and available from recognized data centers. A summary of the data types and data management structures can be found on the GO-SHIP website ([www.go-ship.org](http://www.go-ship.org)). (Links to national programs can be found on the GO-SHIP website.)

### **GO-SHIP: Indian Ocean**

GO-SHIP has a number of lines in the Indian Ocean that are part of the global decadal survey. A number of these lines have national commitment for occupation during the IIOE-2 timeframe (Table 1). Collaboration between GO-SHIP and IIOE-2 provides a unique opportunity for (1) addition of measurement (level 3) to the GO-SHIP observation suite and (2) leveraging national support to complete the Indian Ocean survey.

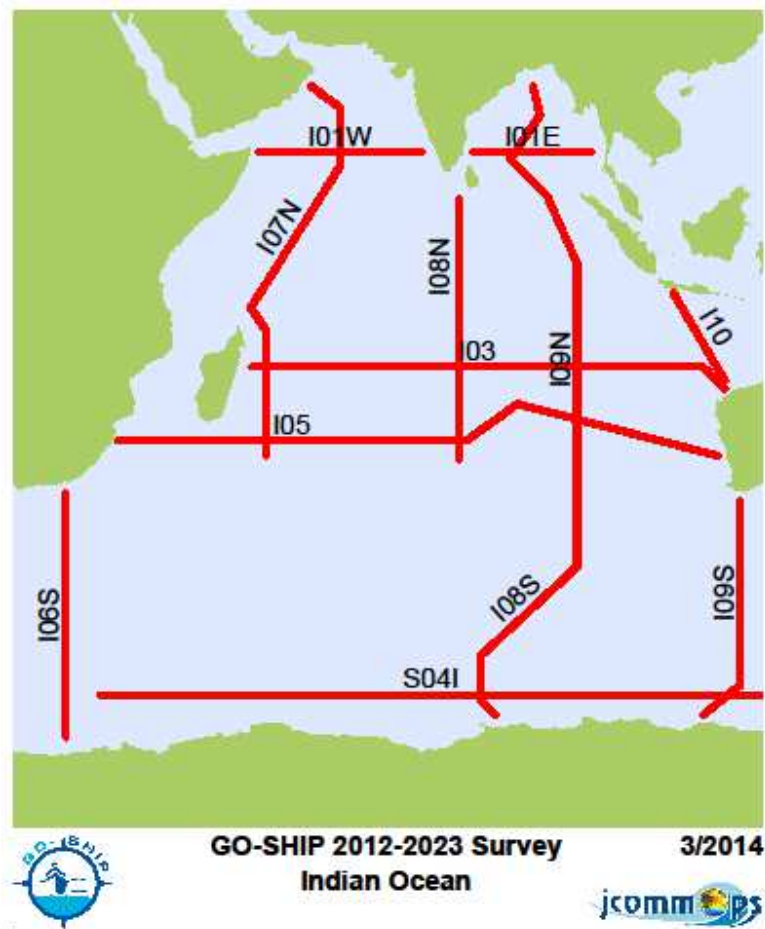


Figure 2 GO-SHIP section that will be part of the IIOE-2. Some sections have national commitments (see table 1).

Table 1. GO-SHIP sections to be occupied during IIOE-2.

GO-SHIP section	Nominal location	Year	Country
I08S	95°E south of 32°S	2015-2016	U.S.A.
I09N	95°E north of 32°S	2015-2016	U.S.A.
I01E	10°N Bay of Bengal	2016	U.S.A.
I09S	115°E	2017	Australia
I05	32°S	2018	U.S.A.
I06S	30°E	2019	U.S.A.
I08N	90°E north of 32°S	2015 or 2018	Japan/India
I07N	60°E	No commitment (due to security reasons)	See ^
I10/IR06	Java to NW Australia (110°E)	2015 or 2018	Japan
I03	20°S Australia to Madagascar	No commitment	See #
S04I	62°S	No commitment	
I01W	10°N Arabian Sea	No commitment	

^ Although not in the USA planning, they will do the section if international security warnings are removed.

# Under discussion between Indian partners and UK IIOE2.

### **Summary**

GO-SHIP is an integral component of the IIOE-2 project, providing high quality, comprehensive sampling of the Indian Ocean along dedicated repeated hydrographic lines. It will provide the fourth comprehensive high-quality survey after GEOECS, WOCE/WHP, and CLIVAR CO2/GO-SHIP from which the anthropogenic climate change signals into the deep and intermediate ocean can be quantified. Working with the IIOE-2, GO-SHIP suggests we define a list of ancillary measurements that can be included in the Indian Ocean. These ancillary measurements may include improved biological sampling including bio-optical and water samples, and nutrients dynamics focuses on the large denitrification signal in the Northern Indian Ocean.

Any proposed additional data collection that adds ship-time to GO-SHIP voyages should be agreed upon no later than 18 months in advance of a voyages in order to work with national funding agencies to gain the additional ship time and/or support for the technical groups to participate on the voyage.