Indian Ocean Observing System (IndOOS) review - XBT network

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Existing observing systems
TOGA/WOCE XBT network from 1983

Meyers et al. 1995
XBT lines in operation

- **Active (32):** regularly sampled with public data
- **Limited active (2):** regularly sampled, but only limited data availability
- **Not active (3):** presently not sampled, but reactivation desired
2015 XBT deployments – data availability

Location of Global XBT Deployments during 2015

ACML participation
Other institutions

NOAA/AOML

CSIRO
## Data availability

<table>
<thead>
<tr>
<th>Line</th>
<th>Status</th>
<th>Data years</th>
<th>Number of transects per year</th>
<th>Operator</th>
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<tbody>
<tr>
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<td>1990-1998</td>
<td>LD</td>
<td>-</td>
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Geostrophic transport of the ITF

Meyers et al. 1995

Wijffels and Meyers 2008
ITF transport compared with ORA-S5

Michael Mayer
ECMWF
IX12 – Somali Current + Seychelles Dome

Feng and Meyers 2003
XBT line and 20C isothermal depth
Recommendations

- Maintain the Frequently Repeated IX01, PX02 and IX22 XBT lines: permits monitoring geostrophic mass and heat transport of the ITF into the Indian Ocean;
- Enhance thermosalinograph measurement along the IX01 line (e.g. Phillips et al., 2005);
- Enhance Argo deployment density along IX01 XBT line to better resolve salinity variability related to the ITF;
- Maintain the High Resolution IX21 XBT line to monitor the long term changes of the Agulhas Current system.
- Reactivate the Frequently Repeated IX12 XBT line to detect long term changes in the tropical thermocline ridge as well as the boundary current system in the Arabian Sea.
Recommendations

• Maintain the Frequently Repeated IX08 and IX14 (Bay of Bengal) XBT lines which are important for model testing, ENSO, Indian Ocean Dipole, and Asian monsoon associated tropical ocean variability and prediction, and heat content and climate change estimates (Smith et al, 2001). Further, encourage the public release of XBT data along these two transects that are maintained by India.

• The implementation of automatic XBT launchers in the Indian Ocean, such as AXIS – the Automated eXpendable Instrument System (Frantantoni et al., 2017) that is operational in the Atlantic XBT program and the SIO Autolauncher that is operational on US maintained lines in the Pacific and Indian (IX21) Oceans, needs to be more fully explored to alleviate crew intervention on the SOOP vessels (Andres et al., this report).

• The installation of ADCP velocity measuring instruments on ships that participate in the XBT network should be encouraged where possible. Combined with simultaneous velocity measurements from hull-mounted ADCPs, this could provide a powerful way to monitor the upper ocean heat transport across key transects, such as the ITF, the Agulhas Current, and across the southern Indian Ocean (Beal, this report).