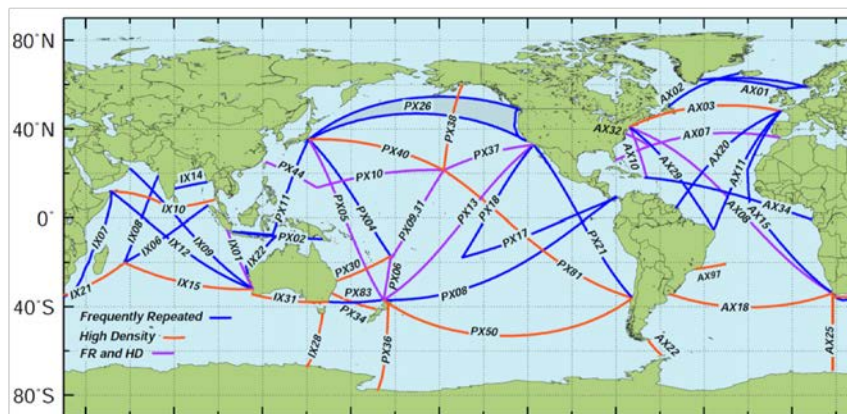# The XBT Network

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The Ship Of Opportunity Program (SOOP) is an international effort that supports the implementation of a network of cargo vessels, cruise ships, and research vessels to deploy scientific instruments that collect oceanographic observations. The most important component of this effort is the Expandable Bathy Thermograph (XBT) network. XBTs are deployed along fixed pre-established transects, which are repeated at least 4 times per year, to measure water temperature profiles from the sea surface to a maximum depth of 850 m. The XBT network currently in place has been recommended by the international scientific community during. The countries that provide the largest contributions to this program are the United States, Australia, France, South Africa, Brazil, Germany, Italy, and Japan. In average, approximately 20,000 are deployed per year, of which AOML is involved in some aspect of the logistics, operations, data processing, etc, of about 90% of them. AOML leads or co-leads with its international collaborators the implementation and operations of 12 Atlantic Ocean transects.

These XBT temperature measurements are used to monitor changes of key surface and subsurface currents, to study meridional heat transport in all ocean basins, and to supplement other observational platforms to assess the variability of the upper ocean heat content. All XBT transects have been justified base on our understanding of how the upper ocean dynamics and thermal structure may be linked to long-term climate signals, extreme weather events, ecosystem assessments, etc. Most of the data obtained though this project are distributed into the GTS within 24 hours of its acquisition, providing critical input for weather and climate forecasts models and scientific applications. XBT data are distributed to NOAA/NODC and to other data distribution centers.

This project also involves activities aimed to the continuous development of new technologies in support of the operations carried out as part of the XBT network. During recent years the engineering group at AOML has developed new equipment for the automatic deployment of several models of XBTs during cruises with high rate of deployments, for the transmission of data in real-time using different satellite networks, and for the substitution of several components to carry out cost-effective operations. In addition, AOML scientists continue working on XBT fall rate studies and collaborating with Lockheed Martin Sippican to develop a new, upgraded, XBT probe that will be able to provide climate quality observations.

Recommended XBT network