**The International Quality Controlled Ocean Database initiative (IQuOD): a community effort towards climate quality in situ observations**

***Matthew D. Palmer1, Catia M. Domingues2 and the IQuOD Science Team***

***1****Met Office Hadley Centre, Exeter, United Kingdom*

**2***Institute for Marine and Antarctic Studies, University of Tasmania, Australia*

Historical ocean profile observations provide a critical element for a host of ocean and climate research activities. These include providing initial conditions for seasonal-to-decadal prediction systems, evaluating past variations in sea level and Earth’s energy imbalance, ocean state estimation and climate model evaluation and development. The International Quality controlled Ocean Database (IQuOD) initiative represents a community effort to create the most globally complete profile dataset, with comprehensive metadata and uncertainty information to promote progress in all of the above research avenues. Internationally agreed “best practice” approaches to data quality control will be developed, documented and shared with the wider research community through open-source code bases. The freely available IQuOD database will be based on, and served alongside, the World Ocean Database – the most complete and widely used ocean profile database in the world.

IQuOD aims to extract maximum value from the historical ocean observations and help inform data practices for current and future climate observing systems through: (1) development of community best practice automated quality control procedures; (2) development of community best practice expert quality control procedures; (3) development of uncertainty estimates for each observation in a profile; (4) development of algorithms to populate missing profile metadata, e.g., to facilitate improved XBT bias corrections; (5) assembly and distribution of the IQuOD database; and (6) knowledge transfer and capacity building through international collaboration. While the initial focus of IQuOD activities is on temperature observations, these efforts are designed to set a template to expand later into other variables, such as salinity and oxygen.