Best practices in QA/QC

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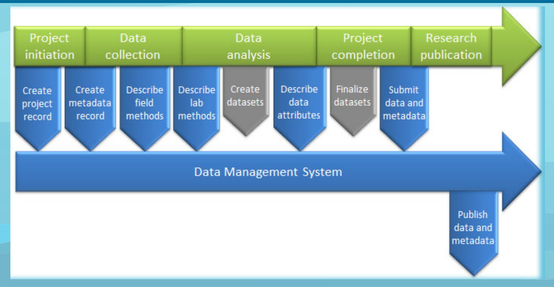
Introduction

One of the today's big challenges is the need to maximize the full potential of observing networks and use them into a vast range of services supporting the 'blue growth'. This requires a harmonization of the qc procedures in order to make all data of the same parameter compatible and comparable. The production of comparable and compatible data requires that laboratories adopt good field and laboratory procedures as part of Quality Assurance/Quality Control (QA/QC) regimes. This includes the selection of validated methodologies for sampling and analysis, mandatory use of reference materials and participation in 'blind' international intercomparison exercises.



From existing documents five levels of Quality Control have been defined:

0 = raw data - Unprocessed instrument/payload data at full resolution including synchronisation methods and excluding communication artifacts
1 = full resolution data reconstructed with calibration coefficients, geo and time referenced
2 = derived geophysical data processed with a minimum QC (e.g. gross range test)
3 = data resampled regularly and with delayed mode QC applied (including climatology comparison)
4 = data quality assured from multiple campaign, measurements or model outputs, or from parameter/ parameter relationships.

Real-Time or Near Real-Time QC

With the development of operational oceanography, the need for real-time data quality control has become of paramount importance. Automated quality control system for physical variables based on documented procedures have been developed during the last decade. Also important is a check against a gridded background, this can be a climatology but near the surface it is advantageous to use an estimate that is evolving over time. The real-time QC targets at data being available with a maximum delay of approximately 24 hours from their transmission.

Living documents on the state-of-the-art QC testing procedures for real-time in-situ current observations are provided as part of the U.S. IOOS Data Management and Communication (DMAC) core services.

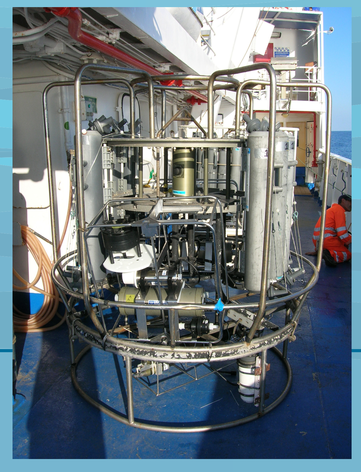
- ◊ **Real-Time Quality Control of Phytoplankton Data**
- ◊ **Real-Time Quality Control of HF Radar Observations**
- ◊ **Real-Time Quality Control of Dissolved Nutrients Observations**
- ◊ **Real-Time Quality Control of Wind Data**
- ◊ **Real-Time Quality Control of Water Level Data**
- ◊ **Real-Time Quality Control of In-Situ Surface Wave Data**
- ◊ **Real-Time Quality Control of Ocean Optics Data**
- ◊ **Real-Time Quality Control of In-Situ Temperature and Salinity**
- ◊ **DataReal-Time Quality Control of Dissolved Oxygen Observations in Coastal Oceans**
- ◊ **Real-Time Quality Control of In-Situ Current Observations**
- ◊ **Manual for Oceanographic Data Quality Control Flags**

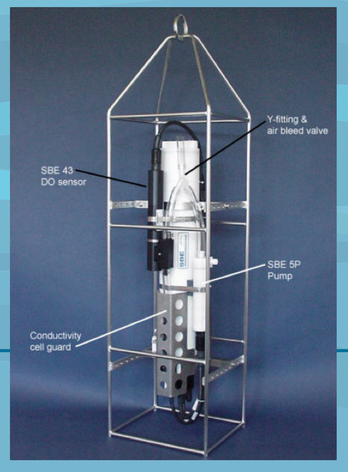
Documentation is listed at url wiki.sp.ismar.cnr.it

Delayed Mode

The "Delayed" Mode (DM) QC uses longer records and generally is available within a few months. It constitutes an updated and in many cases final product. A set of semi-automatic algorithms checks and bias on the acquired data are performed together with a dedicated scientist visually examination of the data sets.

SCOR - Scientific Committee on Oceanic Research
QUASIMEME - Quality Assurance of Information for Marine Environmental Monitoring in Europe
QARTOD - Quality Assurance of Real Time Ocean Data
GO-SHIP - The international Global Ocean Ship-Based Hydrographic Investigations Program
JERICO-HFR - Towards a joint European research infrastructure network for coastal observatories
GLIDERS - Gliders for Research Ocean Observation and Management
ARGO - International Argo Program
RTQC FERRYBOX - Ferry Box Programme
XBT - Ships Of Opportunity
SURFACE DRIFTERS - Global Drifters Programme





This work was funded by the European Commission's Horizon 2020 Research and Innovation programme under grant agreement No 654410, JERICO NEXT.