Rea Time Multiple Ocean Reanalysis Intercomparison
(http://www.cpc.ncep.noaa.gov/products/GODAS/multiora_body.html)

Yan Xue, Magdalena Balmaseda, Yosuke Fujii

Background
There is a substantial data decline from the TAO/TRITON array since summer 2012 (Fig. 1). It is not clear how much the data loss has impacted the quality of ocean reanalyses that are being routinely produced at operational centers around the world. The tropical Pacific subsurface temperature analysis has been routinely used in monitoring the thermal structure of ENSO in support of official ENSO predictions at operational centers. When there is a large data gap in the TAO/TRITON array, subsurface temperature analyses from various ocean data assimilation systems likely diverge, and the spread of ocean reanalyses may be as large as signal. The goal of this project is to monitor the spread of subsurface temperature analyses, particularly along the equatorial belt with an aim for ENSO monitoring, and to provide this information in real time so that forecasters can have an informed knowledge of the quality of ocean reanalyses.

This project was motivated by the TPOS2020 workshop on a future sustained tropical Pacific ocean observing system for research and forecasting (www.ioc-goos.org/tpos2020). Although it has a focus on the tropical Pacific, it is also designed to be expandable for the global ocean for various applications such as monitoring climate modes beyond ENSO and ecosystem applications. Monitoring the spread of ocean reanalyses in the global ocean is also useful for design of global ocean observing systems, which could be adjusted in times to accommodate the real time requirements from operational centers.
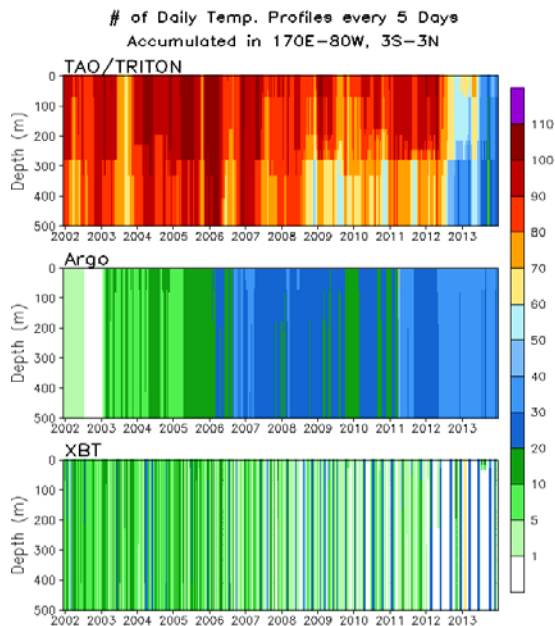

Fig. 1. Time evolution of number of daily temperature profiles assimilated by the NCEP GODAS every five days in the region of 170W-80W, 3S-3N. Top panel: TAO/TRITON; middle panel: Argo; bottom panel: XBT.

Plan

We plan to intercompare ocean temperature anomalies from difference ocean reanalyses. Temperature anomalies will be based on the 1981-2010 base period recommended by World Meteorological Organization (WMO). The data will be interpolated into a common grid. We will focus on the upper 300 m of the global ocean. Each center will provide **monthly** temperature anomalies at the following grids:

X: 0.5 1.5 2.5 3.5 ……… 359.5, at 1 degree interval
Y: -75 -74 -73 ……. 75, at 1 degree interval
Z: 5m, 15m, 25m, 35m, ………… 305m, at 10 m interval

The data can be in either netCDF format or binary format. The data is arranged one file for each year from 1979 to 2014.

To prepare netCDF files, please download the netCDF files from ECMWF as references:
ftp ftp.cpc.ncep.noaa.gov
cd /home/people/cpc/wd52yx/ftp/multi_ora/ECMWF

To prepare binary format files, please download the files from JMA as references:
ftp ftp.cpc.ncep.noaa.gov
cd /home/people/cpc/wd52yx/ftp/multi_ora/JMA

Please provide yearly files starting from 1979 if it is possible. The 2014 yearly file will be updated at the beginning of each month. Please let us know the schedule of your monthly data update. We will do an ensemble of multiple ocean reanalyses for a preliminary update on the **5th** day of each month, and then redo it for a research quality update on the **17th** day of each month.

Products

A preliminary web page has been set up. Please email Yan.Xue@noaa.gov, cc magdalena.balmaseda@ecmwf.int, yfujii@mri-jma.go.jp for any comments and suggestions.

Users

All operational centers that make ENSO prediction can benefit from the real time products. The products are also useful for sponsors of ocean observation systems such as NOAA's Climate

Observation Division, JEMSTEC, ……..

Contributing ocean reanalysis products

Any ocean reanalysis product that runs in real time is welcome to join the project. Table 1 shows a list of real time ocean reanlsysis around the world that can potentially contribute to the muti-model products.

Name	Period	Monthly mean update schedule	contact person	web site
NCEP (GODAS)	Jan 1979-present	2nd day of each month	Yan Xue	http://www.cpc.ncep.noaa.gov/products/GODAS/
ECMWF	Jan 1979-present	2nd day of each month	Magdalena Balmaseda	http://www.ecmwf.int/en/research/climate-reanalysis/ocean-reanalysis
JMA	Jan 1979-present	4-8th day of each month.	Ichiro Ishikawa/ Yosuke Fujii	http://ds.data.jma.go.jp/tcc/tcc/products/elnino/move_mricom_doc.html
GFDL	Jan 1979-present	5th day	Xiaosong Yang Rich Gudgel Gabriel Vecchi	ftp://nomads.gfdl.noaa.gov/9/ECDA/ecda/GFDL-CM2.1-ECDA/CM2.1R-ECDA-v3.1-1960/mon/ocean
GMAO	Jan 1979-present	5th day	Guilaume Vernieres	http://gmao.gsfc.nasa.gov/research/ocean
BOM	Jan 1979-present		Oscar Alves Yonghong Yin	
MERCATOR				
UKMET				