



Impact studies regarding data buoys

- In 2008 a workshop was undertaken to assess the impacts of all observing systems on NWP, **Fourth WMO Workshop on the Impact of Various Observing Systems on NWP**, Geneva, Switzerland, 19-21 May 2008
- http://www.wmo.int/pages/prog/www/OSY/Reports/NWP-4_Geneva2008_index.html

- **In 2005, ECMWF showed positive impact of TAO wind data on the model**, especially when anemometer height is used (http://www.jcommops.org/dbcp/doc/dribu_wind.pdf)

- **At the 12th session of the COSNA Scientific Evaluation Group**, Reading, UK, 21-22 May 2002, it was reported that:
 - The impact of hourly surface pressure and also wind observations (SYNOP, SHIP and DRIBU) had been evaluated in the context of ECMWF's operational 4D-Var data assimilation system. The study period was 1-31 May 2001. The globally available observations from the main synoptic hours at 00, 06, 12 and 18 UTC were used in the experiments. Only the data from the intermediate hours were excluded. The hourly surface observations are found to have a positive impact in the short-range forecast in those areas where such data are available (i.e. the North Atlantic and the southern oceans where other data are relatively sparse). The global exchange of all hourly surface observations for use in a 4D-Var system appears to be beneficial for NWP.
 - An Observing System Evaluation (OSE) was run for the period of 10 July to 31 July 2001, using the DWD's 4th generation Global-Modell (GME). The following results were obtained:
 - Withholding all surface observations (synop, ship, buoys) results in a large deterioration of the forecast quality.
 - Benefit is higher in the Southern Hemisphere and Tropics than in the Northern Hemisphere.
 - Impact of ships or buoys alone is less but noticeable
 - As opposed to winter cases, benefit of buoys are slightly higher than ships in the Northern Hemisphere.
 - Benefit of buoys is slightly greater than that of ships in the Southern Hemisphere.
 - Neither ship or buoy observations had any impact in the Tropics.
 - In individual cases, ships or buoys have a significant impact on the forecast quality for Europe and the whole Northern Hemisphere.
 - Overall, the impact for the summer period is less than for the winter period.

- **Climate SST Observations and Analyses: A Component of the NOAA FY02 Climate Observations and Services Initiative**

- **Impact of Drifting Buoys on an NWP forecast for 29 September 1995 (UKMO)**

- **Proceedings of the CGC/WMO workshop on impact studies. Geneva, 7-9 April 1997:**
 - Impact of observations on operational NWP models at NMC/CMA (including impact of real time SST on 72h 500 hPa geopotential field.
 - Recent Data Impact Studies at UKMO - a review. This includes a paragraph on impact from drifting buoys.
 - Most recent impact studies at Météo France. This includes a paragraph on buoy impact study (**Erreur ! Référence de lien hypertexte non valide.**).
 - The effect of radiosonde and buoy reduction on numerical prediction products at the South African Weather Bureau. The paper mentions that "the degradation of forecasts when the buoys are omitted is roughly half a day. However, improvements still need to be made to the quality control routines for buoy data."
 - Among meeting's conclusions: "some significant benefits could also be drawn from an improvement of the surface network over the data sparse areas of the oceans (for example by deploying more buoys), although the priority should be given to the upper air whenever possible".

- **Proceedings of the second CGC/WMO Workshop on the impact of various observing systems on numerical weather prediction. Toulouse, 6-8 March 2000.**
 - Noticable impact, in particular in short range, with improvements in Southern Hemisphere scores equal to half a day in forecast skill have been found from SH drifters (p) (study undertaken in response to OPAG-IOS ET-ODRRGOS request).
 - PAOBS and drifters combined provide positive impact in SH, over and above the effect coming from the drifters alone (one study by BMRC).

- **Hemispheric Observing System Research and Predictability Experiment (THORPEX)**
 - A 5 to 10 year international and interagency experiment
 - Test hypothesis that the accuracy of NH cool season 2-10 day forecasts can be significantly improved by additional observations in critical areas of the extra-tropical oceanic storm-tracks and other data-sparse remote areas, and that cost effective new in situ observing systems can be developed to provide these required observations
 - THORPEX includes coordination for the technical development and testing of candidate in situ and remote sensing observing systems (driftsondes, aerosondes, and buoys). It includes design of cost-effective strategies for their deployment.
 - Ocean moored buoys will be deployed in the NorthEast Pacific Ocean (5 buoys in 2001-2005).
 - Design of a buoy mounted profiler

- **Ongoing studies:**

- **EUCOS** - <http://www.eucos.net/>
 - **GODAE Observing System evaluations and simulation experiments** - <http://www.godae.org/OSSE-OSE-home.html>
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