Status Report to DPC-10 WOCE Surface Meteorology Data DAC/Surface Flux SAC

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Achievements and successes in 1996

During the past year of operation, we focused on collecting and processing surface meteorology data from WOCE R/V's. These data have been released to the WOCE community. The FSU WOCE DAC Handbook of Quality Control Procedures and Methods was distributed in Spring 1996. Evaluation of NCEP reanalysis wind fields in the tropical Pacific and Indian oceans highlighted deficiencies with the reanalysis products. Indian ocean flux fields were updated. Flux-field technique improvements are completed. Additional work is underway to analyze the FSU tropical wind products in light of available TAO data. As detailed in this report, we are active in all phases of our plan towards established a world center for surface meteorology data and fluxes useful for WOCE-related studies.

DAC Data Holdings, Data Collection, and Data Products

Our master table of WOCE surface meteorology data to collect and process was updated to reflect additional cruises and plans. We have had excellent success in collecting data (**Table 1**). Particularly successful were efforts concentrated on obtaining Pacific data sets (in anticipation of the Pacific workshop) from Japanese and Canadian investigators. Contact has been made to responsible parties representing nearly 75% of all WOCE-specific surface meteorology data. In order to align collection/processing efforts with current WOCE workshop plans, our focus this past year has been on Pacific cruises, with many new cruise datasets obtained from Japanese and Canadian investigators and data centers. Additionally, 18-CD-ROM's of surface meteorology data from many years of cruises (in the Atlantic) by the *Meteor* have been sent to us. Significant amounts of high resolution (continuous means each 1-5 minutes) data continue to be forwarded to WOCE-MET.

In our data collection efforts, we have encountered a few dozen underway salinity and bathymetry data sets. We have forwarded the data/information streams to the appropriate DAC's.

The WOCE DAC Handbook of Quality Control Procedures and Methods reference document for our quality control procedures was distributed as a WOCE document in spring 1996. Many datasets were brought to the WOCE Pacific Workshop in August 1996, and others have since been released.

Other progress in DAC activities include processing/analysis of IMET (and similar) data from various US research vessels. We continue to work with ship technicians in suggesting improvements to the IMET recording system to facilitate better and more accurate IMET data. We have focused on computing earth-relative winds, and have new discoveries (paper in preparation) which will lead to improved wind calculations. In a pilot study, WOCE winds are being used to validate ERS-1 surface winds. The data recorded during WOCE are proving to be very valuable in these evaluations. NASA is sponsoring a project using IMET-type data for geophysical validation of NSCAT winds.

SAC Activities

Production of monthly mean fields of pseudo-stress for the Indian and tropical Pacific continues. These are used regularly for ENSO predictions.

The Indian ocean analyses [monthly mean values of most surface met variables (e.g. winds, temperatures, humidity) and turbulent fluxes (wind stress, sensible and latent heat)] were updated to cover years 1990-1993. Updates for more recent years are planned.

A paper evaluating NCEP reanalysis winds in the tropical Pacific is nearing completion; results were presented in San Francisco-AGU. Initial results also appear in the US WOCE 1996 report. NCEP reanalysis winds are in general too weak and provide very poor divergence/convergence patterns. Reanalysis winds in the eastern tropical Pacific are particularly suspect. These conclusions are true for climatologies and anomalies. Consideration is being given to producing synthesized reanalysis-FSU wind fields.

A paper analyzing the historical tropical Pacific analyses and the impact of the TAO array vs. the volunteer observing fleet is underway jointly with PMEL. Already it is clear this will be a critical work detailing the historical incorporation and assessment of TAO data on FSU analyses.

We are continually improving our analysis technique. A paper describing one new improvement, i.e. objective parameter estimation using linearized cross-validation, is in preparation. Testing of the technique for application to major ocean basins in underway.

Plans for the coming year

During the next year of operation, we anticipate continued processing of underway data. However, we intend to increase our focus on producing fields of surface meteorology variables and fluxes. We will concentrate on becoming a clearing house for surface flux field information. Information regarding surface flux products from reanalysis efforts, etc. will be available through the SAC. Arrangements are made already for WOCE-MET to act as the distribution site for archived and operational US Navy ocean surface flux fields. Enhancements to existing browsing capabilities on the DAC and SAC WWW pages will be implemented to allow data visualization. We are discussing distributing a newsletter to interested parties detailing our data holdings and scientific findings - it is not clear what media (paper, electronic) will be utilized. Finally, we intend to submit a number of publishable scientific papers on wind processing techniques, our Pacific wind analyses, reanalysis field evaluation, and variational scheme improvements.

Table 1. Data collection status at FSU WOCE DAC for surface meteorology (November, 1996).

Year(s) of WOCE Cruises	Number of WOCE cruise segments recording surface meteorology data	Data source is known (Number of segments)	Data at FSU DAC (Number of segments)	Known high resolution (15 minute means or better) data sets (Number of segments)
1985-1988	8	3	3	0
1989	25	21	20	3
1990	40	35	30	10
1991	89	75	73	21
1992	109	85	70	32
1993	89	56	41	16
1994	90	57	43	21
1995	85	72	32	29
1996	6	4	0	0
TOTAL	541	408 (75%)	312 (58%)	132 (24%)