

SPECIAL PROJECT PROGRESS REPORT

Reporting year 2009

Project Title: Bias estimation of historic in situ upper air data

Computer Project Account: Spathh00

Principal Investigator(s): Leopold Haimberger

Affiliation: University of Vienna

Name of ECMWF scientist(s) collaborating to the project (if applicable) S. Uppala, D. Dee

Start date of the project: 1.1.2009

Expected end date: 31.12.2011

Computer resources allocated/used for the current year and the previous one (if applicable)

Please answer for all project resources

| | | Previous year | | Current year | |
|--|----------|---------------|------|--------------|------|
| | | Allocated | Used | Allocated | Used |
| High Performance Computing Facility | (units) | | | 5000 | 23 |
| Data storage capacity | (Gbytes) | | | 200 | 100 |

Summary of project objectives

(10 lines max)

RAOBCORE (Radiosonde Observation Correction using Reanalyses, Haimberger et al. 2008) adjustments for radiosonde temperature are used as input in ERA-Interim. They need to be improved and substantially extended before they can meet the needs of reanalyses in the years to come. The proposed new project has two major aims: (i) the extension of homogeneity adjustments to radiosonde wind and humidity and back to the 1930s, (ii) implementation and testing of "online bias estimation" methods for radiosonde data during the data assimilation process. Such methods work well for satellite radiances but have not yet been applied to conventional upper air data. If these could be used for radiosonde data, at least from 1979 onwards, it would substantially facilitate the reanalysis process.

Summary of problems encountered (if any)

Summary of results of the current year (from July of previous year to June of current year)

Since this project has just started, there are few results yet that can be reported. The current status of radiosonde homogenization may be seen from the final report of special project "Homogenization of the global radiosonde temperature and wind dataset" that ended in December 2008.

Collaboration with scientists from NCAR (June Wang, Aiguo Dai) and MetOffice (P. Thorne) could be established on radiosonde humidity homogenization, within a project titled "Homogenization of Global Radiosonde Humidity Data", that will be funded by the NOAA Climate Program Office.

Funds from the Austrian Wissenschaftsfonds for 2 PhD students and 2 diploma students for three years have been granted in June 2009. These funds and the computer resources provided by ECMWF will provide a firm basis for reaching the aims of the special project.

List of publications/reports from the project with complete references

Summary of plans for the continuation of the project

In the next few months, it will be tried to ingest early radiosonde data that have not been available in ERA-40 into databases that can be used by the ECMWF ERA-Interim data assimilation system. At the same time, a PhD student from Vienna will be made familiar with the ECMWF online bias correction system, to be able to change codes and perform assimilation experiments.

In Vienna, the RAOBCORE method will be rewritten to allow homogenization of temperature, humidity and wind in one run.

Reference:

Haimberger, L., C. Tavalato and S. Sperka, 2008: Towards elimination of the warm bias in historic radiosonde temperature records - some new results from a comprehensive intercomparison of upper air data, *J. Climate* **21**, 4587–4606