



imgw

Institut für Meteorologie
und Geophysik



**universität
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ERA-CLIM Status report WG4

Leopold Haimberger

November 21, 2014

Main tasks

- making optimal use of observations in reanalysis, and providing end users with meaningful information about uncertainties in reanalysis products.
- involves a range of activities,
 - quality control and error estimation for input observations,
 - work on bias correction and homogenisation of data records,
 - various quality assessment of reanalysis products based on independent observations and comparisons with other reanalyses and high-level observational products.

No.	WP or task name	Month																																					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36		
WP 4	Quantifying and reducing uncertainties																																						
Task 4.1	Quality control, bias adjustment and homogenisation of input observations																																						
Task 4.2	Diagnostics and uncertainty assessments of reanalysis output																																						

Progress in bias correction

- Surface pressure bias correction working, Homogeneity analysis tool also used by obs providers
- ERA-PreSat extremely useful for analysis of upper air data homogeneity
- Offline adjustment of in situ upper air data:
 - Availability of three reanalyses (2 surface pressure only) facilitates attribution of bias changes
 - Accessibility of early radiosonde data (via odb2) has never been easier
 - T-adjustment before 1958 progressing but not yet stable
 - Wind adjustments are published.
 - Analysis of radiosonde humidity has started

Progress

- Variational BC of radiosonde data
 - Wind direction bias correction:
 - Implemented but not sufficiently tested
 - convergence rate needs to be improved.
 - Temperature bias correction:
 - Extensive offline tests of bias model to be used
 - Metadata are too often not reliable enough for grouping of radiosonde stations
 - Implemented in IFS but not yet tested
- QC of observations
 - Quantification of observation errors
 - Usefulness of Desrozier's method has been demonstrated
 - Its application will soon become technically a lot easier

Progress in diagnostics

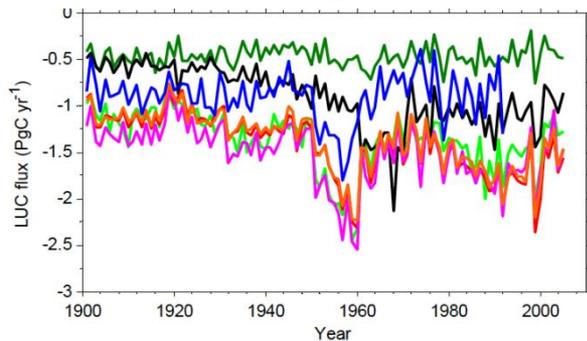
- Immediate availability of assimilations to external users has proven to be very beneficial
 - Typhoon analysis diagnostics
 - Surface pressure and sea ice diagnostics
- Diagnosis of time-varying input fields, fluxes and budget quantities is ongoing -demonstrated its value
- Intense work on precipitation obs back to 1900
 - Uncertainty estimates, ensembles of observations
- Many new diagnostics related to coupled analysis and carbon have been shown during these two days
- Contacted Per Uden (UERRA) regarding a workshop on uncertainties late in the project

Land carbon cycle uncertainties from:

Forcing error

- Estimate impact on land C fluxes of
- Land Use Change
 - Meteo forcing

Net flux from different LUC (PgC/yr)

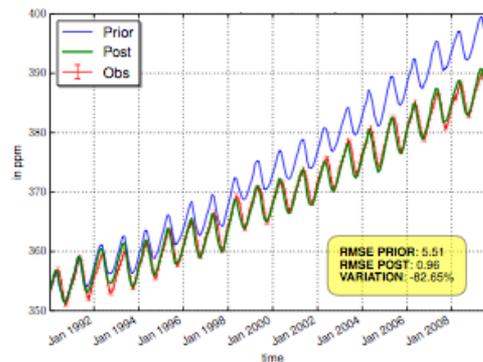


→ Large impact of LUC

Model param. Error

- Optimize model parameter using a 4D-var system with
- Atm. CO₂ data
 - FluxNet data
 - MODIS-NDVI

MLO Atm. CO₂

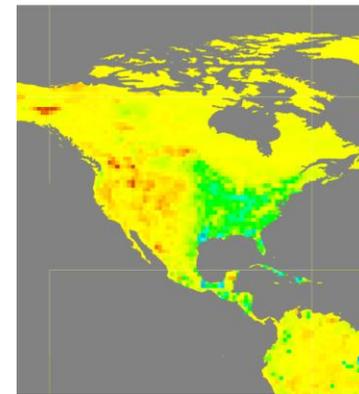


→ Derived parameter uncertainties

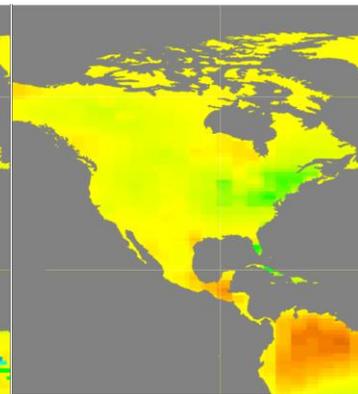
Model structure error

- Comparison between ORCHIDEE / CTESSEL and other models
- Atm. Inversions
 - Other Land models

ORCHIDEE



MACCII-Inv



→ Differences to inform on model error

Status of Deliverables

T4.1 - Quality control, bias adjustment and homogenisation of input observations [Months: 1-36]

UNIVIE, ECMWF, UBERN, FFCUL

The objective of this task is to assess and improve the quality of input observations used for reanalysis. This includes quality control, bias adjustment and homogenisation of observations. Deliverables are Observation Quality Assessment (ORA) reports. Contributions from the participants are as follows:

D4.1	Radiosonde bias adjustments	WP4	5	8.00	Report	PU	12
D4.4	Visualisation tool for QC	WP4	6	10.00	Report	PU	12
D4.12	Input uncertainties for carbon estimates	WP4	16	6.00	Report	PU	12

- Radiosonde bias adjustments calculated offline available for temperature and wind
- Offline humidity homogenization has just started
- Online bias adjustment: Tests of underlying bias model ongoing, implementation in IFS mostly done, testing delayed.
- Visualization tool for QC of Portuguese surface data has been delivered
- Input uncertainties for Carbon estimates: delivered.
- Other deliverables due at end of project

Work plan

- No formal change in organization needed
- Radiosonde T/wind bias adj. for CERA-SAT
- Continue budget diagnostics.
 - Coupled diagnostics - horizontal ocean transports
 - ASSW in April 2015, Keep eye on atmosphere
- Questionnaire on catalogue for diagnostics
- OFA, WebAPI, NetCDF
 - Observation error diagnostics, external flux fields
 - Will foster usage, improve deliverables
 - Will help sharing the enormous monitoring responsibility