Quantifying and reducing uncertainties

DWD, ECMWF , FFCUL, RIHMI,
UNIBE, UNIVIE, UVSQ

1) Clarify who takes lead in writing remaining deliverables
2) How to support possible follow-on projects
3) Efforts needed to make tools/data fit for Copernicus

Jan 18, 2017

Status of Deliverables

Deliverable number	Deliverable title	Delivery date
D4.1	RS bias adjustments (UNIVIE)	20
D4.2	Updated RS bias adjustments (UNIVIE)	48
D4.3	QC for observations from FFCUL (FFCUL)	48
D4.4	Visualization tool for QC (FFCUL)	12
D4.5	QC for upper-air, surface, and snow obs. (RIHMI)	36
D4.6	Methodology for quantifying obs error (UBERN)	36
D4.7	Verification of precipitation against GPCC (DWD)	48
D4.8	Global energy, water, carbon cycles (ECMWF,UNIVIE, UVSQ)	48
D4.9	Upper air data qc (UBERN, RIHMI)	24
D4.10	Comparison with other reanalyses (UNIVIE; ECMWF)	48
D4.11	Low frequency variability and trends (ALL)	48
D4.12	Uncertainty of input parameters for carbon budget (UVSQ)	20
D4.13	Confidence intervals on carbon fluxes (UVSQ)	48
D4.14	Comparison of CTESSEL, ORCHIDEE flux estimates (ECMWF, UVSQ, UNIVIE)	48

D4.2
Updated RS bias adjustments (UNIVIE)

- Improvements on RS-T in various aspects
  - Smaller trend heteorogeneity, more stations, extension back to 1939
  - Annually varying adjustments
- Humidity adjustments
  - paper to be submitted
  - not yet comprehensive

D4.3
QC for observations from FFCUL (FFCUL)

- FFCUL leads it, report or paper
- Feed back into source data sets

D4.7 Verification of precipitation against GPCC (DWD)

- Good progress, paper, lead DWD
- GPCC ensemble of gridded precipitation would be great for ensemble verification (e.g. CRPS)

D4.8
Global energy, water, carbon cycles (ECMWF,UNIVIE, UVSQ)

- Several papers on coupled energy budgets
- 3 UNIVIE papers
- UREADING papers
- UVSQ diagnostics ->refer to D4.13, 4.14?
- Story line UNIVIE

D4.10
Comparison with other reanalyses (UNIVIE; ECMWF)

- Self-evaluation in CERA-20C paper
- ERA-preSAT paper
- CERA-SAT: Report sufficient
- Story line UNIVIE

D4.11
Low frequency variability and trends (ALL)

- Who will lead this?
- Major paper or just report?
- Storyline UNIVIE

D4.14 Comparison of CTESSEL, ORCHIDEE flux estimates (ECMWF, UVSQ, UNIVIE)

- I've seen lots of activity in sessions
- Story line LSCE

D3.5-3.7

- Updates of current QC'd data deliverables

- Joint paper like for ERA-CLIM, in situ (upper air, surface, subsurface) and satellite

EUMETSAT deliverables

- Submit to ECMWF except MeteoSat full resolution images
- Evaluation by ECMWF

- Technical report??

Upper air data base

- Ensure continuous updating, versioning
- Data format should be fit for Copernicus Climate Data Store and for assimilation into reanalyses
- Upper air data inventory?
- CHUAN 2.1?
- Surface data base currently prepared, „inspired" by odb

Upper air data base

- Most recent additions currently QC'd by Alexander Sterin

- Then will be sent to Leo, Per for homogenization/conversion into odb format

Update/synchronize inventories

- 6-monthly
- Refers to both upper air and surface
- Include Finnish snow data into inventory
- FFCUL, METEO-France take care of that – should become COPERNICUS activity

Key issues to be addressed in possible follow-on project

- Assimilation in presence of strong observation density gradients
- Coupled diagnostics, flux validation
- „Ultimate" solution for RS-T using GPS-RO as reference – GAIA-CLIM
- Evaluation of ensembles
  - apply EMOS, BMA to reanalysis ensembles, observation ensembles?
- Prove positive impact of rescued data

continued

- Update and include new ISPD version
- Continue data rescue (e.g. METEOSAT1 images, whaling log books) and feedback analysis
- Rescued data often not in shape to be assimilated or not CDR
- Carbon data assimilation? Feasible?
- Coupled long term SST assimilation

Achievements to be promoted into Copernicus

- Homogenized UA data consistent with GPS-RO – consistent anchor back to beyond 2001
- Energy budget diagnostics
- After further tests: RH and wind homogeneity adjustments.
- Feed QC flags into sources

- WP2-WP4 interaction
- Meteorological input for carbon models crucial
- CRUNCEP increases Primary production fluxes by 50% compared to CERA20C, net fluxes sometimes opposite
- Soil freezing important for co2 fluxes in extratropical boreal regions