WP4 short report

ERA-CLIM2 GA 20151211

WP4 deliverables

- 3 have been delivered
  - 4.1(RS bias adjustments), 4.4 (Visualization tool for QC), 4.12 (Land use input data uncertainty)
- 1 is due (upper air data qc, UBERN, 99% done)
- 2 due in month 36
  - 4.5 QC RIHMI, 4.6 Quantifying obs error (UBERN)
- 8 due in month 48
  - 7 depend on availability of CERA-20C, ERA5
  - 5 would profit from ERA-preSAT rerun

Proposed Tasks for 2016

- Reestablish data flow into OFA
  - Convert data from WP3 into odb format
    - ERA-CLIM v2.0 (3x more upper air data than assimilated from this source in ERA-preSAT)
    - Data delivered in August, preprocessors exist
  - Include UA bias adjustments
    - (done in ERA5, preprocessors exist)
- Put upper air OFA on website
  - Maximum value with feedback from ERA-preSAT rerun, but also valuable without

ERA report series

18 The observation feedback archive for the ICOADS and ISPD data sets

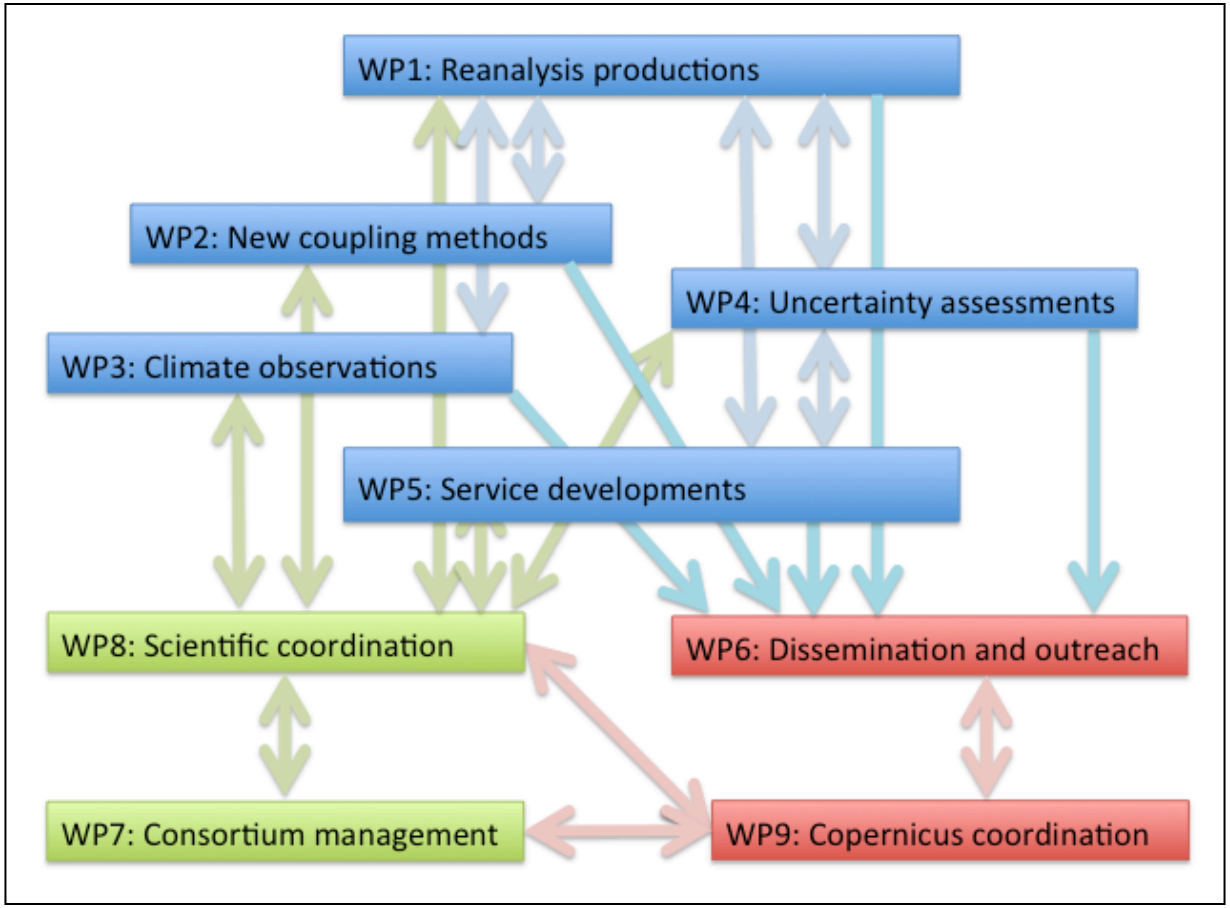
Hans Hersbach, Paul Poli and Dick Dee

Proposed Tasks for 2016

- External near-realtime monitoring of CERA-20C
  - Look at upper air behaviour
  - Look at past extreme events
- External Look at CERA-20C budgets
  - Check realism of air-sea fluxes, precip
  - Specify additional output parameters (meridional fluxes, flux divergences, analysis increments, other observation influence metrics)
- Check fitness for passive assimilation of early satellite data
  - Feasible with ERA5 assimilating model with reasonable amount of work?

Proposed Tasks for 2016

- Carbon component
  - WP1, UVSQ I believe good collaboration
- Small WP3/WP4 workshop at ECMWF in April
  - Assessment of progress in CERA20C
  - Feasibility of CERA-SAT
  - Feasibility of ERA-preSAT rerun or ERA-5 backwards extension


WP1: Reanalysis productions
WP2: New coupling methods
WP4: Uncertainty assessments
WP3: Climate observations
WP5: Service developments
WP8: Scientific coordination
WP6: Dissemination and outreach
WP7: Consortium management
WP9: Copernicus coordination

Topics discussed in WP3/4

- Steps to ensure that available data are available through OFA – who is responsible?
- Which digitized data can be made available for assimilation in near future ~Q3 2016?
- Should we prioritize an ERA-preSAT rerun over five years of CERA-SAT?
- What will be preferable from the users' perspective?
- What should be postponed into ERA-CLIM3?

Topics discussed in WP3/4

- Recalculation resolution? T511 would be better
- Quality of surface pressure bias correction
- Bias corrections: Homogenization for RS-T and RS-wind are available
- Snow data have large climate impact – satellite based snow estimates crucial
- Soil moisture analysis
- Radiosonde winds for comparison with satellite winds.

From ERA-CLIM2 proposal

- Additional information about the usage and assimilation of observations is fundamental to a full understanding of uncertainties in many applications. Nevertheless, it has always been very difficult, if not impossible, for users to access this type of information.
- The ERA-CLIM project has addressed this shortcoming by developing the **Observation Feedback Archive** (OFA).
- It **will continue to be maintained, developed, and supported in ERA-CLIM2**, and will provide a permanent source of information about the quality of the observational record.

Current status

- OFA is great for surface data
- The OFA for upper air data is scattered over many places, incomplete, hard to access
- Responsibility for ingestion of newly digitized data is currently unclear
- Using upper air background departure statistics for QC is still too challenging, especially if they have not been assimilated
- Could that be changed until the end of ERA-CLIM2?

Global Reanalyses

- ERA-20C (Jan 1900 - Dec 2010)
- ERA-Interim (Jan 1979 - present)
- ERA-Interim/LAND (Jan 1979 - Dec 2010)
- ERA-20CM (Jan 1900 - Dec 2010)
  - Final
  - Experimental
- ERA-40 (Sep 1957 - Aug 2002)
- ERA-15 (Jan 1979 - Dec 1993)

Observation Feedback

- ERA-20C (Jan 1900 - Dec 2010)
- ISPD v2.2
- ICOADS v2.5.1 with interpolated NOAA 20CR feedback

Multi-model

- S2S (NEW: Reforecasts added)
- TIGGE
- TIGGE LAM

Upper air

Deliverable	Description (Lead beneficiary)	Delivery month		Comment
		Original	Amended	
D4.1	RS bias adjustments (UNIVIE)	12	20	**delivered**
D4.2	Updated RS bias adjustments (UNIVIE)	36	48	ERA5 and a ERA-preSAT rerun are expected to be much better reference than previous reanalyses but are not available in month 36. Value of deliverable would be significantly degraded
D4.3	QC for obs from FFCUL (FFCUL)	36	48	FFCUL had difficulties in personnel recruitment and works hard on digitization of Chilean and other data. This has priority for now. QC aspect would improve a lot if 12 months more are available
D4.4	Visualization tool for QC (FFCUL)	12	12	**delivered**
D4.5	QC for upper-air, surface, and snow obs. (RIHMI)	36	36	no impact expected
D4.6	Methodology for quantifying obs error (UBERN)	36	36	no impact expected
D4.7	Verification of precipitation against GPCC (DWD)	36	48	Data set will be ready but validation of ERA5, CERA-20C would not be possible
D4.8	Global energy, water, carbon cycles (ECMWF,UNIVIE, UVSQ)	36	48	Evaluations without ERA5, CERA-20C would be much less innovative
D4.9	Upper air data qc (UBERN, RIHMI)	24	24	no impact expected
D4.10	Comparison with other reanalyses (UNIVIE; ECMWF)	36	48	Comparisons without ERA5, CERA-20C would be much less innovative
D4.11	Low frequency variability and trends (ALL)	36	48	Without completed ERA5, CERA-20C many evaluations would have to be based on data not created in ERA-CLIM2
D4.12	Uncertainty of input parameters for carbon budget (UVSQ)	12	20	**delivered**
D4.13	Confidence intervals on carbon fluxes (UVSQ)	36	48	Those would have to be based on existing ERA-20C, not new CERA-20C
D4.14	Comparison of CTESSEL, ORCHIDEE flux estimates (ECMWF, UVSQ, UNIVIE)	36	48	This could be done partly with unfinished CERA-20C but much value would be added if complete CERA-20C set were available

From ERA-CLIM proposal

- Together with other in-situ and remote-sensing datasets available from existing data archives, **the observations collected for ERA-CLIM will be included in a newly developed Observation Feedback Archive.**
- **Quality feedback information** for this archive, including data departures and bias estimates, **will be generated during several new pilot reanalyses**, as well as from existing reanalysis datasets.
- The **pilot reanalyses** and the Observation Feedback Archive will be made available to users world-wide as a **unique resource for climate research** and observational studies of the Earth system.