

ERA-CLIM2 3rd General Assembly Welcome and Introduction

Roberto Buizza

European Centre for Medium-Range Weather Forecasts

Welcome



Welcome .. and thank you to:

- All of you for your help and engagement, especially to the WP Leaders for their leadership role
- All for your work and progress (we will hear more about it ..)
- *M Kacik* for her support and help with the amendment (with the 12-month extension)

After the WS:

- Please let me know if you object that your slides will be made available on ECMWF ERA-CLIM2 project web site: <http://www.ecmwf.int/en/research/projects/era-clim2>

Outline



- 1) Adoption of the Agenda
- 2) Project overview and deliverables' status
- 3) Financials
- 4) Looking ahead in reanalysis production (feeding C3S activities)
- 5) Forthcoming meetings

1. Adoption of the agenda



Monday 16 January (1300-1800), Kleiner Festsaal der Universität Wien		
1230-	Registration (Foyer kleiner Festsaal)	
1300-1315	Welcome	Vice Rector Prof. Regina Hitzenberger
1315-1340	Introduction	Roberto Buizza
1340-1520 WP1 (Global 20th century reanalysis)		
1340-1405	Overview WP1	Patrick Laloyaux
1405-1430	CERA-20C: climate indices, ocean and flux	Eric de Boisseson
1430-1455	CERA-20C: uncertainty estimation	Per Dahlgren
1455-1520	CERA-20C: observation feedback	Yuki Kosaka
1520-1540 Coffee break		
1540-1800 WP1 (Global 20th century reanalysis) and WP5 (Service developments)		
1540-1605	CERA-SAT implementation	Dinand Schepers
1605-1630	PISCES biogeochemical reanalysis	Coralie Perruche
1630-1655	Land carbon reanalysis	Philippe Peylin
1655-1720	Upper-air observations	Per Dahlgren
1720-1745	Overview WP5	Patrick Laloyaux
1745-1800	Questions	
1800-2000 Reception (Erika Weinzierl Saal)		
2000	End of first day	

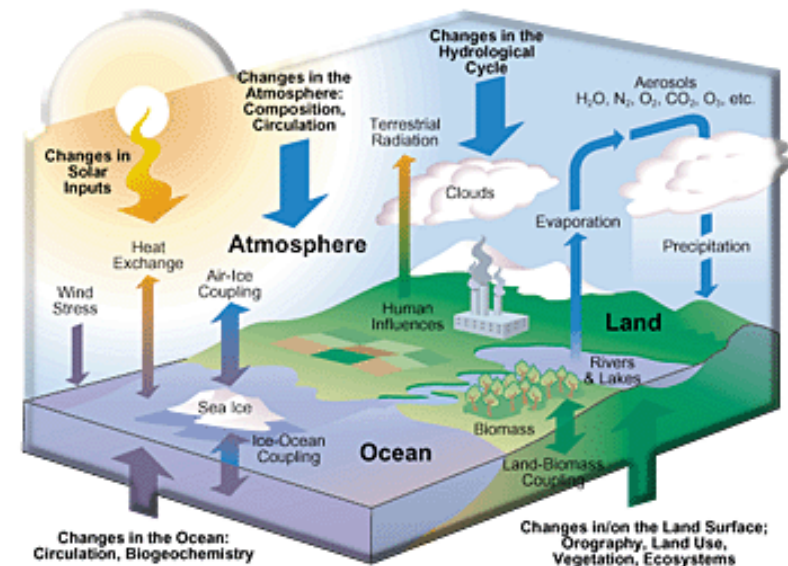
Tuesday 17 January (0900-1800) Elise Richter Saal		
0900-1250 WP2 (Future coupling methods)		
0900-0910	Overview of WP2	M. Martin
0910-0935	WP2.2 – SST assimilation developments	M. Martin
0935-1000	WP2.2 – Sea-ice assimilation developments	C.-E. Testut
1000-1025	WP2.3 – Ocean assimilation algorithm developments	A. Weaver
1025-1050	WP2.3 – Coupled ensemble information	A. Storto
1050-1110 Coffee break		
1110-1135	WP2.4 – Land carbon component developments	P. Peylin
1135-1200	WP2.4 – Ocean carbon component developments	C. Perruche
1200-1225	WP2.5 – Coupled error covariances and bias correction	K. Haines
1225-1250	WP2.5 – Coupled DA in idealised studies	A. Vidard
1250-1430 Lunch break		
1430-1800 WP3 (Earth System Observations)		
1430-1455	WP3 Overview and accomplishments	S. Brönnimann
1455-1520	Upper air deliverables contributed by Météo-France to WP3	S. Jourdain
1520-1555	Updating FFCUL contribution to WP3 (Data Rescue and Global Registry)	M. A. Valente
1555-1620	RIHMI contribution to WP3	A. Sterin
1620-1640 Coffee break		
1640-1705	Data rescue, use of satellites and integrating surface and sub-surface ocean temperature and salinity	N. Rayner
1705-1730	EUMETSAT contribution to WP3	J. Schulz
1730-1755	Historical snow in situ data set and snow cover satellite products	J. Poulain
1900 Dinner at Heurigen "Mayer am Pfarrplatz", Pfarrplatz 2, 1190 Wien		
End of second day		

Wednesday 18 January 2017 Elise Richter Saal		
900-1200 WP4 (Quantifying and reducing uncertainties)		
900-920	Radiosonde temperature homogenization	L. Haimberger
920-940	Towards homogenizing land surface data: QC and breakpoint detection	M. A. Valente
940-1000	Hurricanes in ERA-20C and CERA-20C	S. Brönnimann
1000-1020	Reproducing upper air temperature, humidity and wind characteristics in late 1930s-1960s by reanalyses	A. Sterin
1020-1040	Validating daily precipitation totals by means of ETCCDI	M. Ziese
1040-1100 Coffee break		
1100-1120	Homogenization of global radiosonde humidity data	M. Blaschek
1120-1140	Coupled energy budget diagnostics of the Arctic	M. Mayer
1140-1200	Uncertainties on the land carbon cycle re-analysis	P. Peylin
1200-1220 Instructions to Working Groups (break out sessions)		
1220-1400 Lunch break		
1400-1600 Working Groups (break-out sessions, WP1/WP2/WP3/WP4)		
WG1/5 Marietta Blau Saal		
WG2 Sitzungszimmer VAM2		
WG3/4 Erika Weinzierl Saal		
1600-1630 Coffee break		
1630-1830 Report of WG discussions, back in Elise Richter Saal		
1630-1700	Short report from each breakout session	Session chairs
1700-1730	Recommendations from advisors	Sakari Uppala
1730-1830	Discussion	
End of General Assembly		

2. The FP7 ERA-CLIM2 project (2014-2017)



Goal: Production of a consistent 20th-century reanalysis of the coupled Earth-system: atmosphere, land surface, ocean, sea-ice, and the carbon cycle

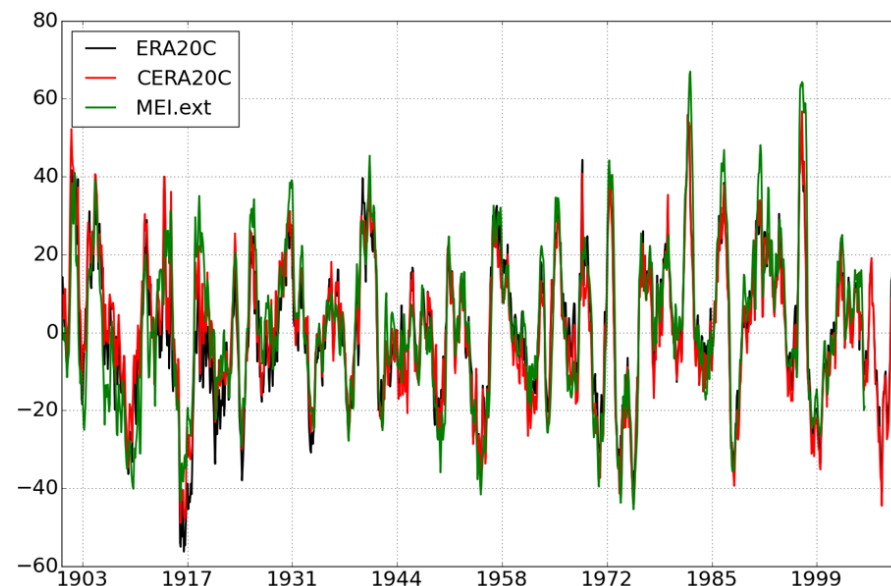


Main components:

- **Production of coupled reanalyses, for 20C and the modern era (WP1)**
- **Research and development in coupled data assimilation (WP2)**
- **Earth system observations for extended climate reanalyses (WP3)**
- **Evaluation of uncertainties in observations and reanalyses (WP4)**
- **Improving access to reanalysis data and input observations (WP5)**

2. Key achievements of past 9 months: WP1

- CERA-20C dataset is completed (1901-2010)
- CERA-SAT production has started (2008-2016)
- Ocean carbon reanalysis forced by ERA-20C is completed
 - assessment of the sea-air CO₂ flux shows promising results when compared to observations, better assessment of the interannual variability is required
- Ocean carbon reanalysis forced by CERA-20C scheduled for 2017
- Land carbon reanalysis based on ORCHIDEE forced by CERA-20C is completed
- Consolidation of the ORCHIDEE model for land carbon reanalyses
- Land carbon reanalyses based on the consolidated ORCHIDEE, forced by CERA-20C and CERA-SAT are scheduled for 2017



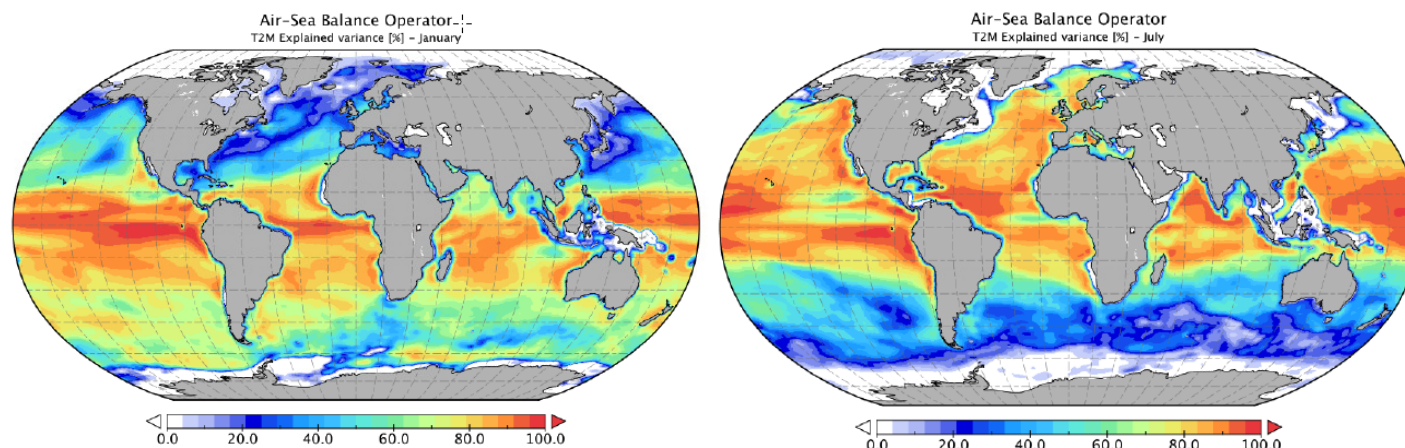
Timeseries of the multivariate ENSO index for ERA-20C, CERA-20C and the Wolter & Timlin observational product (MEI.ext)

The El Niño and La Niña events are captured by the two reanalyses

2. Key achievements of past 9 months: WP2

- Many WP2 contributions to the WMO Coupled Data Assimilation Workshop in Toulouse, Oct 2016:
 - 6 oral presentations from WP2 partners
 - Breakout discussion on challenges and priorities for coupled DA for reanalysis.
- Deliverable D2.4 completed by CMCC: “Strongly coupled data assimilation experiments with linearized ocean-atmosphere balance relationships and hybrid covariances”

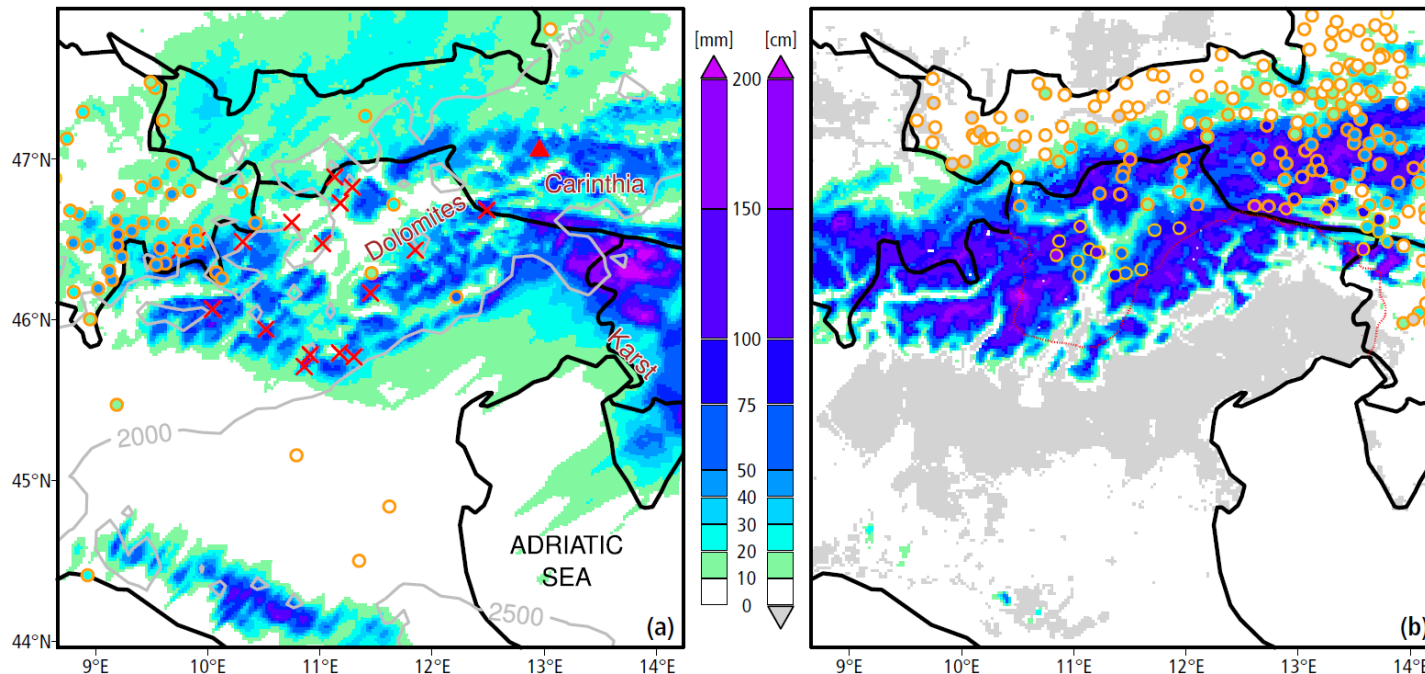
Towards strongly coupled DA:
Variance explained for 2m air temp from a *linearised air-sea balance operator*



- Paper published on carbon cycle assimilation (Peylin et al., GMD).
- Progress on other upcoming deliverables – see later presentations.

2. Key achievements of past 9 months: WP3

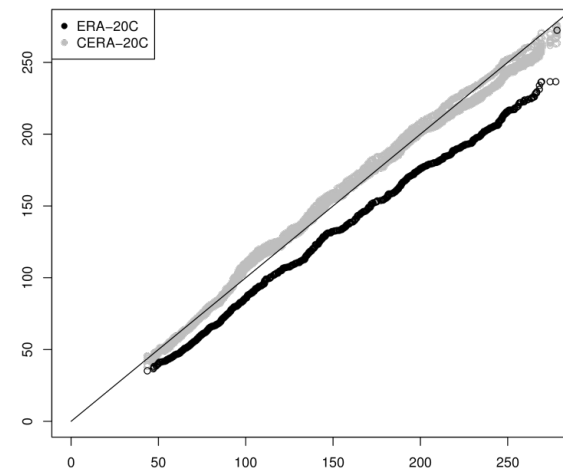
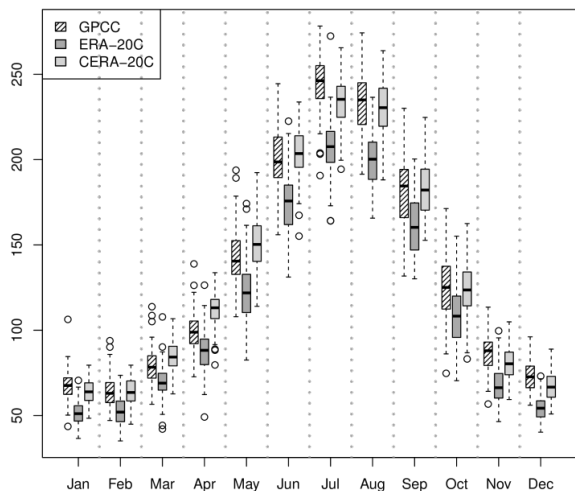
- Conference: Observations for Reanalyses (22 June 2016, Maynooth, Ireland, together with ACRE meeting)
- Continuation of data rescue: Deliverable 3.4
- RTTOV updates and ocean database updates delivered, early satellite data almost
- Case study “Avalanches during the winter of 1916”: ERA-CLIM2 data rescue, ERA20C reanalysis, and dynamical downscaling



2. Key achievements of past 9 months: WP4

Goal: Optimize use of input data, estimate and reduce uncertainties in reanalyses and their input data

Example: ERA-20C and CERA-20C monthly precipitation ensemble vs GPCP precipitation over Indian Monsoon region

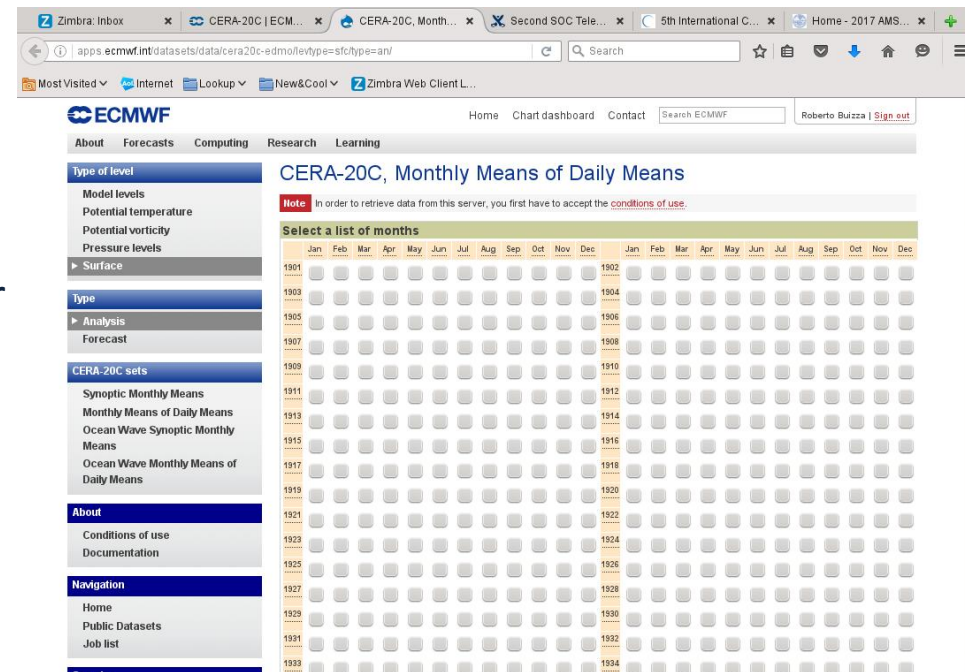


- Precip validation with DWD data has progressed quite far
- ERA-preSAT paper submitted, successful joint conference with ACRE in Maynooth
- Good progress in coupled evaluation of oceanic and atmospheric reanalysis data
- QC for newly digitised upper air, surface, snow data from Russia and other countries almost completed
- CHUAN v2.0 data merged with available data, feedback data for all time series calculated for various full and surface data only reanalyses
- Good progress in RS-T homogenization back to 1939, RS-H homogenization back to 1979

2. Key achievements of past 9 months: WP5



- Technical development in MARS to support archiving and retrieval of NetCDF format has been done: we are able to archive and retrieve NEMO monthly means in NetCDF.
- The consolidation of CERA-20C data into the user version has started, and will be done in phases:
 - Complete: Atmospheric and wave monthly means: 30 Tbytes. Available via the Public Data Server
 - In progress: Atmospheric and wave analysis (all members) and ensemble means and standard deviation: 200 Tbytes. Expected end Jan 2017
 - Followed by forecast (all members), observation feedback and ocean component: Over 1 Pbyte. Expected for month 42.
- We have extended the framework of the Public Data Server to report on registered users and access statistics, such as volume and fields retrieved. This has been done using other datasets, but the reporting will be available for the access to CERA-20C during 2017.



2. Project status: deliverables WP1



D1.1	CERA-20C	24	36	Delivered.
D1.2	CERA-20C/Carbon	36	48	Extension allows carbon reanalyses to use atmospheric forcings from ERA20C.
D1.3	CERA-SAT	36	48 (partially)	Extension allows to establish the CERA-SAT system, and run it for a subperiod (number of years to be confirmed once system is up and running) between 1979 and 2016 depending of HPC resources and production speed
D1.4	CERA-SAT/Land	36	48 (partially)	Extension allows CERA-SAT/Land system to be implemented and run over a subperiod between 1979 and 2016 depending of HPC resources and production speed.
D1.5	Status report WP1	8	8	Delivered

Status: **Delivered** **Delayed**

2. Project status: deliverables WP2



D2.1	SST assimilation code (METO)	27	39	Extension allows more time for testing of developments
D2.2	Sea-ice assimilation code (MERC0)	27	39	Extension allows testing to be done in more recent version of system
D2.3	Ensemble B NEMOVAR code (CERFACS)	34	46	Extension allows higher quality deliverable
D2.4	Report on ensemble covariances in coupled DA (CMCC)	24	36	Delivered
D2.5	Report on 4D-Var tests (INRIA)	27	39	Extension allows higher quality deliverable
D2.6	Report on land carbon model optimisation (UVSQ)	34	46	Delay of the production of the climate reanalysis in WP1 puts some constraint on the C cycle reanalysis
D2.7	Report on ocean biogeochemical coupling methods (MERC0)	34	46	Extension allows higher quality deliverable
D2.8	Report on strengths/weaknesses of coupled DA (UREAD)	18	18	Delivered
D2.9	Report on coupled error covariances (METO)	18	18	Delivered
D2.10	Report on coupled model drift and bias correction (UREAD)	34	46	Extension makes it possible to deliver a high quality report
D2.11	Report on fully coupled DA (INRIA)	34	46	Extension allows higher quality deliverable
D2.12	Status report (METO)	8	8	Delivered

Status: **Delivered** **Delayed**

2. Project status: deliverables WP3

D3.1	Data catalogue (UBERN)	6	6	delivered
D3.2	Priorities for data rescue (UBERN)	6	6	delivered
D3.3	Meta-database update (UBERN)	36	48	continuous
D3.4	In-situ data for reanalysis (UBERN)	24	36	Spanish Ebro and North African upper air not in time
D3.5	In-situ data (other) (UBERN)	30	42	Chile data not in time
D3.6	Quality-controlled version of D3.4 (UBERN)	36	48	Shift in deadlines allows more data from French overseas, International days
D3.7	Quality-controlled version of D3.5 (UBERN)	33	48	Shift in deadlines allows more data from French overseas, International days
D3.8	RTTOV updates (METO)	36	36	delivered
D3.9	Early satellite data (METO)	36	36	To be submitted by end of January (METO);
D3.10	AVHRR polar winds (EUMST)	24	36	Expected in M48 - Delayed due to updates of operational EUMETSAT algorithm and delayed new compute environment at EUMETSAT; it will cause no other delays for the project; Expected in M42 - EUMETSAT Climate Monitoring Satellite Application Facility (CM-SAF) did deliver an ATBD and a preliminary version of the data record but not the processor to EUMETSAT; furthermore, the early version of data had issues that resulted in the need to update the inter-satellite calibration method; it will cause no further delays to the project's deliverables;
D3.11	SSM/T2 and AMSU-B/MHS radiance data (EUMST)	24	24	Expected in M42 - Recalibration of Meteosat IR channels is finished; what is still missing is the integration into the original image files, which is delayed due to the delayed delivery of the new compute environment at EUMETSAT; this will cause a delay in deliverable D3.13;
D3.12	Geostationary radiance data (EUMST)	36	36	Expected in M48 - This will be delayed due to dependence on D3.12; this will not cause any delay to other project's deliverables;
D3.13	AMV from MFG (EUMST)	36	42	Expected in M48 - Delayed due to error found in GRAS reprocessed data; a second processing of the GRAS mission data has been performed but other mission data are pending the processing.
D3.14	Radio occultation data (EUMST)	36	36	
D3.15	HadISST2 update (METO)	18	18	delivered
D3.16	Ice thickness data (METO)	12	12	delivered
D3.17	Ocean database update (METO)	24	30	delivered
D3.18	Snow data product (FMI)	24	36	Expected in M42 - FMI investigation on the optimum set of calculation parameters of SWE assimilation system is still going on (a detailed investigation needed in order to obtain an improved product when compared with the original GlobSnow SWE Climate Data Record).
D3.19	Quality controlled version of snow data base (in situ) (FMI)	36	48	Extension allows higher quality deliverable
D3.20	HadISD update (METO)	12	12	delivered

Status: Delivered Delayed

2. Project status: deliverables WP4



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	To be delivered by end of Jan
D4.6	Methodology for quantifying obs error (UBERN)	36	36	delivered
D4.7	Verification of precipitation against GPCP (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	delivered
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

Status: **Delivered** **Delayed**

2. Project status: deliverables WP5-WP6-WP9



D5.1	NetCDF in MARS	12	30	Design, specifications and technical work completed.
D5.2	CERA data services	24	48	Consolidation of data into user version in progress. Monthly means released. Expected completion for month 48, as in revised plan and discussed during the M27 Review Meeting.
D5.3	Report on data services	24	48	Technical work complete based on ERA-20C. D5.3 will report on data services for year 2017. xpected completion for month 48, as in revised plan and discussed during the M27 Review Meeting.
D6.1	Project web site	10	10	delivered
D6.2	Project brief 1	12	12	delivered
D6.3	Workshop report 1	19	19	delivered
D6.4	Project brochure	22	36	Expected in M39
D6.5	Policy brief 2	24	36	To be delivered by end of Jan
D6.6	Workshop report 2	31	31	
D6.7	Policy brief 3	36	48	
D6.8	Dissemination plan	4	4	delivered
D6.9	Policy brief 4	n/a	48	
D9.1	Coordination plan	36	48	
D9.2	Common web page	6	6	delivered
D9.3	Common lessons learned	24	24	delivered
D9.4	Meeting minutes	36	48	

Status: **Delivered** **Delayed**

3. Financials



With the extension of the project the payments are as following:

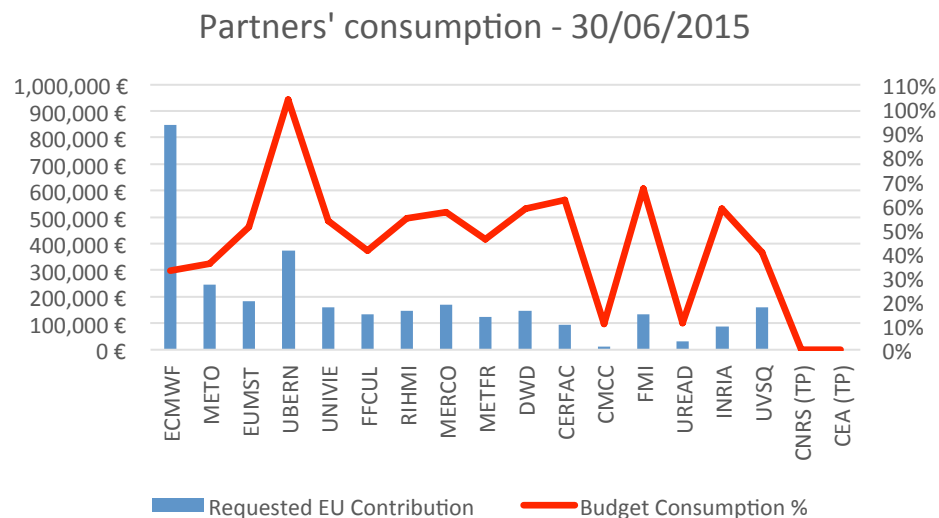
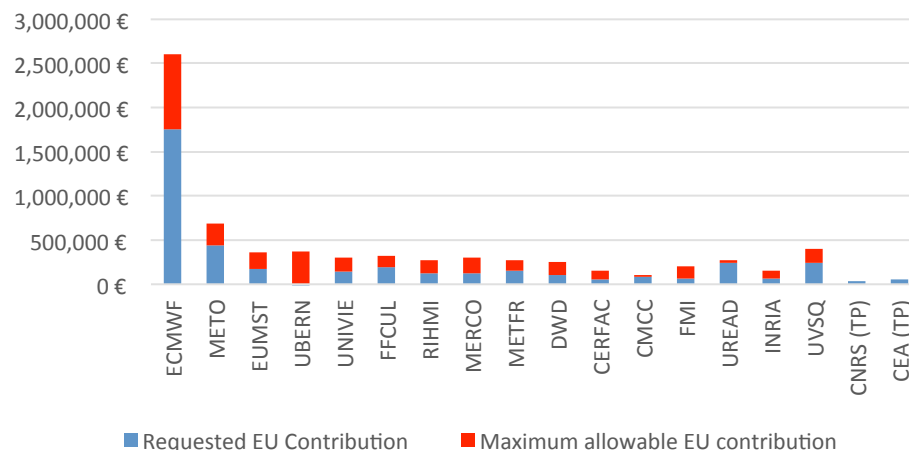
1. Pre-financing (60% with retention of 5% guarantee fund) – Q1-2014
2. First interim after month 18 (up to 90% of the budget) – To be paid in the coming days/weeks
3. Final payment after month 48 (remaining balance)

The first interim payment was already received by the partners on 3 March 2016. So all partners should have received 90% of their agreed reimbursements. With the ongoing reporting now the consumption is balancing these payments or go even beyond.

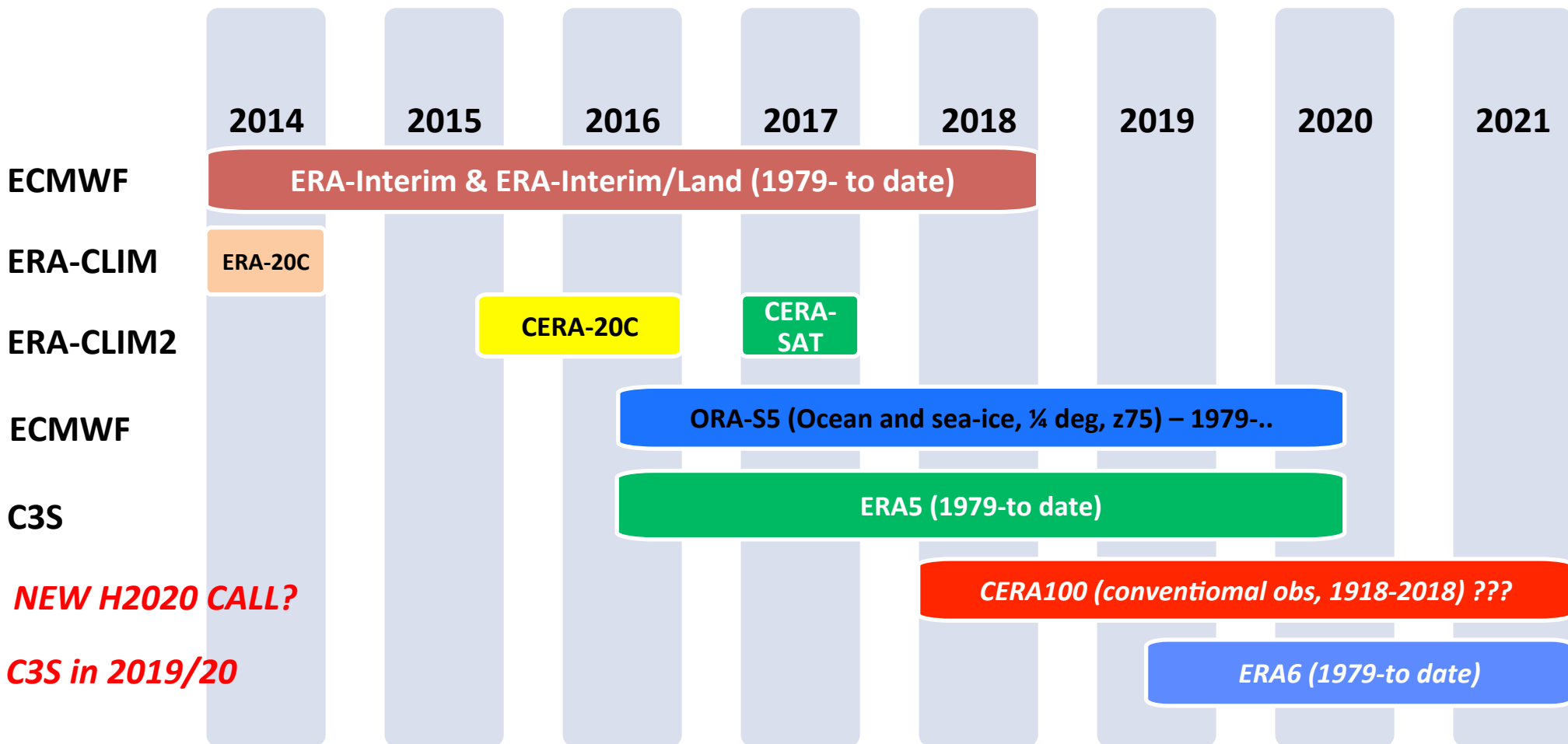
The following graphs illustrates the budget consumption at 30/06/2015, when partners reported to Coordinator.

The next reporting update is expected in Feb 2017, with consumptions up to 31/12/2016.

Partners' total and consumed budget (30/6/15)



4. ECMWF reanalysis production



5. Forthcoming ERA-CLIM2 meetings



ERA-CLIM2 WSs and GAs:

- 16-18 Jan 2017: ERA-CLIM2 3rd General Assembly (Univ. of Vienna - Austria)
- 19 Jan 2017: ERA-CLIM2 M36 Review Meeting (Univ. of Vienna - Austria)
- *12-14 Dec 2017 - ERA-CLIM2 4th General Assembly (Univ. of Bern - Switzerland) – Meeting starting at 13.30 on Tuesday 12 Dec*
- *15 Dec 2017 (Friday; am only) - M48 Review Meeting (Univ. of Bern - Switzerland)*

Related WSs/Seminars/Conferences:

- 97th AMS Annual Meeting (22-26 Jan 2017; Seattle, US)
- EGU Meeting (23-28 Apr 2017; Vienna, Austria)
- ECMWF Annual Seminar on ‘Ensemble prediction: past, present and future’ (Reading, UK)
- 5th International Conference on Reanalysis (ICR5; 13-19 Nov 2017; Rome, Italy)