



Seventh Framework Programme  
Theme 6 [SPACE]



**Project: 607193 UERRA**

Full project title:  
**Uncertainties in Ensembles of Regional Re-Analyses**

**Deliverable D9.4**  
**Meeting minutes**

WP no:	9
WP leader:	KNMI
Lead beneficiary for deliverable :	SMHI
Name of <u>author</u> /contributors:	Per Undén, Peter Siegmund
Nature:	Report
Dissemination level:	PU
Deliverable month:	48
Submission date: December 21, 2017	Version nr: 1



## Table of Contents

1. 2014 November 27 .....	2
2. 2015 February 2Telecon FP7 space coordination .....	4
3. 2016 March 1 .....	5
4. 2016 June 15 .....	6
5. 2016 September 28, Brussels meetings .....	7
6. 2017 June 21 .....	10
7. 2017 November 1 .....	11
8. Final note .....	11

## Minutes of the Overarching teleconferences

**Per Undén and Peter Siegmund (KNMI)**

During the Project teleconferences were held about 3 times a year with a break of the meetings in the middle of the Project. The short minutes taken during the meetings are listed below.

### 1. 2014 November 27

#### **Telecon for the five C3S precursor projects**

27 November 2014

#### **Participants:**

ERA-CLIM2: Dick Dee (ECMWF)

UERRA: Per Unden (SMHI)

QA4ECV: -

CLIPC: Luis Costa Carvalho (PIK) on behalf of Martin Juckes (STFC)

EUCLEIA: Peter Stott (UKMO)

C3S: Jean-Noel Thepaut (ECMWF)

Albert Klein Tank, Peter Siegmund (KNMI)

Stijn Vermoote (REA)

#### **Action items:**

1. Jean Louis to inform us as soon as the public version of the C3S technical annex becomes available.
2. Albert to populate the web portal for the 5 projects with necessary information, and to contact Martin about the portal design
3. Albert to organize the next telecon in February 2015



## Notes:

### 1. Opening

#### 2. Progress in each FP7 project

- ERA-CLIM2, Dick Dee.

Assembly held at ECMWF last week; weblink of presentations has been sent to all.

- UERRA, Per Uden.

Data recovery of observations goes quite well; reanalysis involves much technical work; slightly different emphasis by DWD.

Will liaise with ERA-CLIM2 for boundary simulations.

- CLIPC, Louis Carvalho.

Workshop on climate portal design held at KNMI two weeks ago; work on architecture of climate impact indicators in connection to socio-economic changes is ongoing; user requirement workshop will be held in Amsterdam on 3 February 2015, where a prototype will be presented.

- EUCLEIA, Peter Stott.

Advisory board is positive about progress so far; Robert Vautard and Peter Stott will organize a side event on attribution at the Paris conference "Our common future under climate change", 7-10 July; next Wednesday a MO attribution statement on the year 2014 (warmest on record) will be issued.

### 3. Status of C3S

Jean-Noel provides a status update. There has been an extraordinary council in October, and the agreement with the EU was signed in November. Work on a procurement plan is ongoing. In February, a workshop will be held on the requirements for the data store. Later in 2015, workshops will follow on climate projections and observations. Part of the ECMWF work for C3S is a replacement of ERA-Interim. Jean-Noel will inform us when the C3S technical annex will be publicly available.

### 4. Coordination plan, web portal, etc.

At the EMS conference in Prague, Albert has presented the 5 projects coordination activity. For the web portal, Martin has sent the link to a first example which is part of the CLIPC website. It is decided that the 'look' must become more overarching and independent of any of the 5 projects. Also, the following information will be added: short summary for each project, joint agenda of meetings, rationale for an overarching activity, and a selection of highlights. Albert will prepare the necessary information and contact Martin about the portal design. The coordinators will then link from their project websites and a link from the Copernicus website will be arranged.

### 5. Planned meetings (to be added to the web portal)

10-11 December 2014. CHARM meeting, ECMWF, Reading.

15-16 January 2015: CORE-CLIMAX meeting, REA, Brussels.

27-28 January 2015: UERRA General Assembly, Tortosa, Spain.

3 February 2015: CLIPC user requirements workshop, Amsterdam.

3-6 March 2015: C3S workshop, ECMWF, Reading.

2-3 June 2015: CLIPC General Assembly, Dortmund.

29 June – 3 July 2015: ERA-CLIM2 workshop on data for reanalyses, ECMWF, Reading.

### 6. Any other business

None



## 2. 2015 February 2Telecon FP7 space coordination

9 February 2015

### Participants:

ERA-CLIM2: Dick Dee (ECMWF)

UERRA: Per Unden (SMHI)

QA4ECV: Folkert Boersma (KNMI)

CLIPC: Martin Juckes (STFC)

EUCLEIA: -

C3S: -

EC: Monika Kacik

Albert Klein Tank, Gé Verver, Peter Siegmund (KNMI)

### Action items

1. Albert to prepare the necessary information for the web portal and contact Martin about the portal design.
2. Albert to draft a coordination plan, to be discussed at the next telecon.
3. Albert to organize the next telecon in April 2015
4. Action on deliverables, Albert/Monika. Albert will send around. To be discussed at next telecon.

### Notes:

1. Opening
2. Progress in each FP7 Project
  - ERA-CLIM2, Dick Dee  
Advisory board reports good progress. Recommendations are to think about managing user expectations, and to foster cooperation with other projects, such as CORE-CLIMAX. The CORE-CLIMAX meeting in Brussels has been attended.  
A workshop on observations is planned in the first week of July.
  - UERRA, Per Unden  
Two weeks ago the UERRA General Assembly was held, in Spain.  
Archiving the data needs attention.
  - QA4ECV, Folkert Boersma  
Recently there the Assembly was held, in Mainz.  
The advisory board recommended to apply a more common definition of uncertainty, and to apply a more common data format, as used by ESA and EUMETSAT.
  - CLIPC, Martin Juckes  
Meetings have been organized on portals, one-stop-shop architecture for climate data, and user requirements.
  - Monika Kacik.  
Noted that present stage is too early for going into details.
3. Copernicus  
Martin and Gé attended the meeting last week in Brussels. Some information on the coming calls was given, but the meeting particularly enabled networking on creating consortia. Information on the procurement plan was given. There is no need for



geographical spread of participants to calls. A list of timings of coming calls is available on the web.

Dick mentions that ECWMF is creating a new department for Copernicus activities. ERA5 will replace ERA-INTERIM, with a T639 (40 km) resolution. Ensemble runs at lower resolution will provide uncertainty information. By the end of 2016 at least 30 years will be available; ERA5 will go back in time at least to 1979, and possibly, over three years, to 1948.

4. Any other business.  
None

### 3. 2016 March 1

#### Overarching Coordination FP7 Copernicus climate change projects

##### ***Actions and upcoming events, from the conference call on 1 March 2016***

##### Participants:

Monika Kacik (EC), Jean-Noel Thepaut (ECMWF; C3S), Dick Dee (ECMWF; C3S), Roberto Buizza (ECMWF; ERA-CLIM2), Per Unden (SMHI; UERRA), Folkert Boersma (KNMI; Q4ECV), Martin Juckes (STFC; CLIPC), Peter Stott (Met Office; EUCLEIA), Albert Klein Tank (KNMI, Chair), Gé Verver (KNMI), Peter Siegmund (KNMI)

##### **Actions**

<i>No.</i>	<i>Actionee</i>	<i>Action</i>	<i>deadline</i>	<i>status</i>
1603.1	All project coordinators	provide (update of) the lessons learnt deliverable to Albert	31 Mar 2016	
1603.2	Albert	draft introduction and summary, and distribute for comments learned	30 Apr 2016	
1603.3	Jean Noel	provide update of C3S procurement plan dates when available	30 Apr 2016	
1603.4	Martin	send around information about the ClipC workshop in February 2016 in Hamburg	31 Mar 2016	done
1603.5	Monika	provide window of dates for the joint meeting in Brussels to be held in the autumn of 2016 and liaise with Albert about organization	31 Mar 2016	

##### **Upcoming events**

<i>No.</i>	<i>date</i>	<i>event</i>
1603.1	10-11 Mar 2016	EUCLEIA WP meeting at KNMI to coordinate test cases
1603.2	25 April 2016	ERA-CLIM2 Review (Participants: EU, Project External Reviewer(s), Coordinator, WP Leaders)
1603.4	26 April 2016	ERA-CLIM2 Progress Report Meeting (Participants: Coordinator, WP leaders, plus few others, eg C3S, ..)
1603.4	19-20 May 2016	C3S workshop on regional re-analysis, Reading
1603.5	Autumn 2016	meeting of all FP7 Copernicus Climate Change projects in Brussels to inform the EC; combine with meeting on vocabulary/definitions (e.g. uncertainty, errors) use across projects.



1603.6	23-24 Nov 2016	GA-UERRA: showcases + meeting at ECMWF
1603.7	29 Nov- 1 Dec 2016	EUCLEIA meeting (final)

## 4. 2016 June 15

### Overarching Coordination FP7 Copernicus climate change projects

#### ***Actions and upcoming events, from the conference call on 15 June 2016***

##### Participants:

Jean-Noel Thepaut (ECMWF; C3S), Per Uden (SMHI; UERRA), Martin Jukes (STFC; CLIPC), Nikos Christidis (Met Office; EUCLEIA), Albert Klein Tank (KNMI, Chair), Gé Verver (KNMI), Peter Siegmund (KNMI)

Unable to attend:  
Monika Kacik (EC), Roberto Buizza (ECMWF; ERA-CLIM2), Folkert Boersma (KNMI; QA4ECV), Peter Stott (Met Office; EUCLEIA)

##### **Actions**

<i>No.</i>	<i>Actionee</i>	<i>Action</i>	<i>deadline</i>	<i>status</i>
1603.1	All project coordinators	provide (update of) the lessons learned deliverable to Albert	31 Mar 2016	done
1603.2	Albert	draft introduction and summary, and distribute for comments learned	30 Apr 2016	done
1603.3	Jean Noel	provide update of C3S procurement plan dates when available	30 Apr 2016	done
1603.4	Martin	send around information about the ClipC workshop in February 2016 in Hamburg	31 Mar 2016	done
1603.5	Monika	provide window of dates for the joint meeting in Brussels to be held in the autumn of 2016 and liaise with Albert about organization	31 Mar 2016	done
0616.1	Martin	Provide lessons learned deliverable to Albert and Peter	24 June	done
0616.2	Folkert	Provide comments on Common lessons learned to Peter	24 June	done
0616.3	All	Suggest for the meeting on 28-29 September in Brussels per project three experts, one for each the following three topics: 5. Technical expert from inside the project 6. User communication expert from inside the project 7. User communication expert from outside the project		

##### **Upcoming events**

<i>No.</i>	<i>date</i>	<i>event</i>
1	28-29 September 2016	Expert meeting "EU research projects and communication of uncertainties relevant for the C3s", Brussels
2	18-21 Oct 2016	ERA-CLIM2: Workshop on Coupled Data Assimilation, co-organized with Météo-France and the WMO; WP2 Progress Meeting; Toulouse
3	20 October 2016	CLIPC Dissemination and Evaluation Workshop, Brussels
4	23-24 Nov 2016	UERRA: showcases + GA, ECMWF



5	29 Nov- 1 Dec 2016	EUCLEIA meeting (final)
6	16-19 Jan 2017	ERA-CLIM2: GA, Wien (To Be Confirmed)
7	19 Jan 2017	ERA-CLIM2 36th month Technical Review Meeting, Wien.

## 5. 2016 September 28, Brussels meetings

### Notes Brussels 28-29 sept 2016

#### **Albert intro**

Title: Uncertainties in the context of climate services. FP7/H2020 Copernicus Climate Change projects.

Rondje.

Alberts intro slide: GERICS workshop. Aim. Metrology. Focus on climate change; incl.dimension. Communication, also soft skills. Outcome: report at day 2, workshop report.

**Juliana Otto, CLIPC.** Good timing of this workshop, BAMS paper is ready.

Uncertainty analysis. Identify, qual ass, quant asses. As done by European food safety authority.

Qual asses: questionnaire, user consultation; Degree of confidence: low (red), orange, green. Confidence fact sheet.

Quant. Asses. Test, sufficient models must pass, then robust.

Assessing uncert.: methods, scale, category.

Communication uncert. User engagement, user preferences, language.

3 Lessons learned. Transparency; traceable chain of documentation. Layering (tailor for different users).

Disclosure (document all known unknowns/uncertainties).

Chain of providers and users (most users are also provider).

Barriers. Uncert=barrier to action. Each has own method for treating uncert. Presenting uncert is a challenge.

Sometimes uncertainty is the message.

Future challenge: validation of (or check) communication; guidance.

Qs. Peter Stott: who are the end users?

Buizza: 25 years ensemble NWP. Lot of experience. Use that.

Martin J: use stepwise approach.

#### **Peter Stott, EUCLEIA**

Demonstrate potential for operational attribution. Test cases: heat waves, cold spells, droughts, floods, storm surges. GJvO is involved.

Multiple methods, sometimes apparently contradictory results due to differently defined 'attribution'.

Highlights of progress. BAMS annual report explaining extreme events from a climate perspective.

NAS report on attribution of extremes (released this year)

Media: want easy understandable results, from someone they trust.

FAR fraction of attributable risk.

Lessons Learned. Transparency. Layering. Disclosure.

Qs.Heat wave Russia: chance increases due to CC, magnitude does not increase. Good communication important.

Nice figure illustrating for which phenomena attribution can be assessed with some confidence

#### **Patrick Laloyaux, ERA-CLIM2**



Evaluate uncertainties: model space, obs space.

Ideally: ensemble standard dev equal to rms error (truth=oper analysis). Ensemble underestimates real error. (model space). A larger ensemble does not (always) help. Obs/FG errors are correctly specified (obs space)

Both model fields and feedback files are disseminated.

Qs. How do we deal with that we underestimate uncertainty? Smaller uncertainties not always indicate a better product. A better uncertainty estimate may yield larger uncertainties because more sources of uncertainty are taken into account. This might be confusing for users.

**Chris Merchant, FIDUCIO:** Fidelity and uncertainty in climate records from Earth Observations Metrology.

What? Conceptual clarity. Tracability: chain of calibration (propagation). Rigorous methods.

Calibration equation. Uncertainty: time dependent.

See <http://www.fiduceo.eu/vocabulary>

Errors: Random, structured random, systematic, harmonization. Relative contributions: f(time).

Correlation structures. Bias corrections may introduce error structures

FCDR: Fundamental Climate Data Records.

**Peter Thorne, Tijl Verhoelst, GAIACLIM**

Two measurements of the same quantity, A and B (e.g. satellite and in-situ measurement). Both have uncertainty. In addition there is a co-location uncertainty = Tijl's subject. Auxillary info (trajectories, PV). Two-step approach: both minimizing the location mismatch and quantifying the mismatch (e.g. by observation simulations).

**Steven Compernelle, Jean-Christopher Lambert, QA4ECV**

Harmonization of uncertainty: assure quality by the provider; enable assessment of quality by users

QA assurance framework. Traceability chains.

Uncertainty: quality indicator. Tracability charts are part of the validation server.

Consistency in uncertainty. Many 'dictionaries'. Naming convention. Content. Methods of calculation.

VIM/GUM guides assessment of uncertainty in measurements. Also input from GAIA-CLIM (e.g. co-location matching)

VIM vocabulary OK for measurements, but does not apply well for re-analyses and projections. Also, the terminologies should differ from one type of user to another.

Circulaire on uncertainties for QA4ECV data producers.

Juliana: Different users, different languages. Accept that. But: define your quantities. Error: measured minus reference value. Uncertainty: non-negative number...[VIM].

**C3S**

C3S\_311a: 4 lots, 6 bids (lot 2 and lot 3 both 2 bids)

I-DARE in C3S: kopie of overname?

C3S\_51 EQC on ECV: contract negotiated (build frameworks based on Feducio, EQ4ECV, GAIA-CLIM)

C3S\_511 (EQC on observations and re-analyses): PIN published (this time more practical than the previous EQC calls that were more on designing a framework. Now it should be more on inter-comparisons and assessments)

**CCI Pascal Lecomte:**

VIM /GUM adopted by CCI (but it does not cover all aspects (as remarked earlier)

**Albert:** how to wrap up?

Roberto: different time scales, variables; interesting meeting. How to use what we know now to design next generation obs systems.

Per: provide links to presentations at some website.

Chris: obs community might get input (uncertainty information) from reanalysis comm.

Monika: tomorrow present: DG klima, DG grow,...: they are now talking with users on future work, make use of that tomorrow.

Monika: when will report will be available? In case for BAMS it must be ready within 2 months.





Project: 607193 - UERRA

Proposal to make a document of this meeting building on the BAMS paper (which was very conceptual...). It should answer questions like: "What does it mean in reality", and "How to do it"  
Proposal to make links to all presentations

## 29 september

**Bernard Pinty, DG GROW**

3 subjects: Past (obs), future (model), society (sectoral information systems)  
Proof of concept: 2015-2017

**Jean-noel Thepaut, C3S**

CDS, SIS, eval&Q-control, outreach  
overview of started/in preparation/not started  
EQC workshop planned in June 2017  
Attribution workshop planned October 2017 (?check slides)  
Scientific basis: GCOS-195, IPCC, ...  
ESA CCI (climate change initiative)  
March 2017: first C3S general assembly, Toulouse  
Service contracts (Copernicus): less flexible, more costs covered, vs grants (H2020)

**Pascal Lecomte, ESA**

ECVs; CCI+

**Roberto Buizza, ERA-CLIM2**

WP3: DARE; registry of metadata (Antonia)  
Future research needs: need for more DARE, particularly oceanic  
Coupled ocean/atmosphere is needed to account for the heat storage ( ref made to the recent 'hiatus')

**Per Unden, UERRA**

Has a DARE component (WP1; Manola)

**Martin Juckes, CLIPC**

**Folkert Boersma, QA4ECV**

**Peter Stott, EUCLEIA**

BAMS, explaining extreme events of 2014 from a climate perspective.

**Albert: discussion from day 1.**

**Uncertainties: in obs; in model projections.**

Martin: VIM/GUM: in decision making context: people use assessments, not VIM/GUM.  
Although you can link one to the other. Different groups different approach.  
Create confidence in uncertainty assessment. It is valuable information. Use the right words. Confidence.  
Fidelity. Not: probability.  
Educated users want transparency. Uncertainty info brings confidence.  
Uncertainty: also meant for climate sceptics. Uncertainty means that we know more, not less.  
Many decision makers are used to deal with uncertainty.  
Martin: important: 2-way communication. Info is too complex to be summarized.  
People want to know: what does it mean for me. That's a gap to overcome.  
Provide info in some format.

**3 questions for day 2**

Thepaut. Research does not always lead to operational results, research can fail.  
EC: is making a gap analysis for future observations.  
'It's a bit fragmented'. A more formalized process to facilitate research serving the development of operational services. EQC pillar should play a role.



There is a gap of 'initialized projections' covering the climate between 5-10 years from now. No clear products up to now (Roberto Buizza: focus on 1-5 years ahead, with a coupled system)

## Wrap-up

## 6. 2017 June 21

### Overarching Coordination FP7 Copernicus climate change projects

#### *Actions and upcoming events, from the conference call on 15 June 2016*

##### Participants:

Per Unden (SMHI; UERRA), Martin Jukes (STFC; CLIPC), Folkert Boersma (KNMI; QA4ECV), Monika Kacik (EC), Albert Klein Tank (KNMI, Chair), Peter Siegmund (KNMI)

Unable \_\_\_\_\_ to \_\_\_\_\_ attend:  
Jean-Noel Thepaut (ECMWF; C3S), Roberto Buizza (ECMWF; ERA-CLIM2), Peter Stott (Met Office; EUCLEIA), Nikos Christidis (Met Office; EUCLEIA), Gé Verver (KNMI)

##### QA4ECV

8. Now in last year, month 42.
9. Working on QA system
10. Working on land albedo ECV
11. Working on NO<sub>2</sub>, CO, formaldehyde; test look good. Nice new result is a climate signal in formaldehyde, from increase in boreal forests.
12. Copernicus proposal has not been selected for negotiations.

##### CLIPC

- Project finished in late 2016
- Some partners have follow-on activities as part of C3S
- STFC submitted research infrastructure proposal to H2020

##### UERRA

- Recent review meeting held in Brussels
- SMHI-lead proposal selected for negotiations about C3S regional reanalysis service
- Other partners already started follow-on work in C3S
- Final General Assembly at 29 November 2017.

##### Uncertainty document

Albert waives the plan to draft an uncertainty document as was foreseen from the workshop in Brussels in September 2016. The participants understand this.

##### Questions raised in the telco for Jean-Noel

- Would JNT be so kind to provide us with a short update on the most relevant developments in the C3S? Especially those pertaining to the 5 FP7 projects on ECV generation, Quality Assurance and climate change attribution.
- Are there any new or still open calls on Quality Assurance, and is there any news on Climate Data Store population beyond the first batch of ECVs selected?



- Can ECMWF identify strong/useful assets potentially valuable to C3S from the 5 FP7 projects which are not linked to C3S at this moment?
- Is there any future H2020 call which relates to the C3S with a focus on future service development similar to the 5 FP7 precursor projects?

## 7. 2017 November 1

### Overarching Coordination FP7 Copernicus climate change projects

**Conference call on 1 November 2017**

#### Participants:

Per Unden (SMHI; UERRA), Albert Klein Tank (KNMI, Chair), Peter Siegmund (KNMI), Dick Dee (ECMWF; C3S), Roberto Buizza (ECMWF; ERA-CLIM2)

Unable to attend:

Jean-Noel Thepaut (ECMWF; C3S), Peter Stott (Met Office; EUCLEIA), Gé Verver (KNMI), Martin Juckes (STFC; CLIPC), Folkert Boersma (KNMI; QA4ECV), Monika Kacik (EC).

#### ERA-CLIM2

- Finishes this year
- Work proceeding well
- Reanalysis finished last summer
- General Assembly in Univ. Bern on 12-13 December

#### UERRA

- Finishes this year
- General Assembly in Tarragona on 28-29 November

#### C3S

- CDW ready for launch, February-March 2018
- In November workshop for alpha-users, providing feedback
- Evaluating proposals on ECV products
- Tender for consolidating QA and QC in CDS
- Not aware of future EU calls.

In principle there will be one final telcon for this group, in February 2018.

## 8. Final note

The teleconferences were agreed to be useful and it is intended to continue with another one early in 2018 in order to summarize the experiences and recommendations. The D 9.3 Lessons learned can be built on or continued in some form to be used for the future.