

# ISSI Working group on “Contemporary regional and global sea level rise: assessment of climate models against observations”

Draft of the Agenda of the first meeting, 11<sup>th</sup>.-14<sup>th</sup> of November 2014, venue: ISSI, Bern

## Attendees:

B. Meyssignac, K.Richter, A.Slangen, N.Champollion, J.Church, O.Andersen, S.Ligtenberg, A.Melet, C. Roberts, C.Agosta.

## Not attending:

B.Marzeion, X.Fettweiss, M.Palmer, F.Landerer, J.Ridley, B.Hamlington

**Location:** Hallerstrasse 6 3012 Bern. Check on <http://www.issibern.ch/localguide/location.html> for the location of the hotel and the venue to the ISSI building

**Comment:** Each presentation (~20 min. + ~20 min. discussion) should be prepared in collaboration with the different experts. Within the presentations, several key points should be addressed:

- Link with the expected outcomes of the ISSI working group (see the end of this agenda as a reminder)
- Identify observation uncertainties and model inaccuracies (or assumptions), which poses the largest problem for the inter-comparison between models and observations. Suggest also key needs to understand and to reduce observation uncertainties and model inaccuracies.
- Identify key issues in comparing observations with climate model simulations
- Identify from your perspective, scientific questions that could be addressed on the basis of the comparison of climate model simulations with sea level observations.

Please feel also free to make any comments or modifications.

## Day 1: 11.11.

**13:30 - 13:50:** Welcome and overview presentation on main scientific issues to be highlighted within this working group (B. Meyssignac)

**13:50 - 14:30:** 20<sup>th</sup> century global sea level rise and contributors from observations (J.Church, B.Marzeion, F.Landerer, A.Melet, M.Palmer, O.Andersen, N.Champollion, B.Meyssignac, B.Hamlington, C.Roberts)

**14:30 - 15:10:** Regional sea level rise from 2D sea level reconstructions and Altimetry ( B.Meyssignac, B.Hamlington, J.Church, F.Landerer)

**15:10 - 15:50:** Global and regional sea level rise from climate models (A.Slangen, A.Melet, M.Palmer, B.Marzeion, K.Richter, J.Ridley, S.Ligtenberg, X.Fettweiss, C.Agosta)

**15:50 - 16:20:** Coffee break

**16:20 - 17:00:** Final remarks of day one, Discussion on objectives of the working group: expected issues and outcomes. Discussions on scientific questions that could be potentially addressed with the results of the working group

**17:00 - 18:00: Welcome Drink offered by ISSI**

## **DAY 2: 12.11.**

**09:00 - 09:40:** Presentation on ocean heat content and thermosteric sea level estimates from observations and ocean reanalysis (what is the associated uncertainty?, how can we estimate the deep ocean warming?) (C.Roberts, M. Palmer, J.Church, O.Andersen)

**09:40 - 10:20:** Presentation on ocean heat content and thermosteric sea level from climate models (problem of drifts in climate simulations) (A.Melet, F.Landerer, C.Roberts, M. Palmer, J.Church)

**10:20 – 11:00:** Presentation on volcano eruptions impact on ocean heat content. (Which correction should be applied to climate model simulations without volcanic activity in control runs?) (J.Church, A.Melet,M.Palmer, C.Roberts)

**11:00 – 11:20:** Coffee break

**11:20 – 12:00:** Presentation on other contributions to 20<sup>th</sup> century sea level rise: solid earth response, atmospheric pressure, barotropic signal on the shelves, groundwater depletion, dam building, (A.Slangen, J.Church, B.Meyssignac, F.Landerer)

**12:00 – 12:40:** Discussion on main objectives, key observation and reanalyses datasets, issues and needs with observations and climate models and definition of key questions about the comparison of thermosteric sea level between observations and climate models.

**12:40 – 14:00:** Lunch break

**14:00 – 14:40:** Presentation on ice sheet mass loss (including Greenland and Antarctica surface mass balance and dynamical mass loss) from observations and models forced with observations (is there any estimate of ice sheet mass loss from observations before the 1990s? What do we know of dynamical changes from observations? was the flow of ice from ice sheets into the ocean really steady until the beginning of the 90s?) (C.Agosta, S.Ligtenberg, N.Champollion, X.Fettweiss, F.Landerer)

**14:40 – 15:20:** Presentation on Greenland (and Antarctica) surface mass balance from climate models ( C.Agosta, X.Fettweiss, J.Ridley, S.Ligtenberg, N.Champollion).

**15:20 – 16:00:**

**16:00 – 16:30:** Coffee break

**16:30 -18:00:** Final remarks, Discussion on main objectives, key observation and models (forced with reanalyses datasets) for ice sheet mass loss. Discussion on how ice sheet mass loss should be computed from climate models and definition of key questions about the comparison between observations and climate models.

### **DAY 3: 13.11.**

**09:00 - 09:40:** Presentation on glaciers ice melt from observations and models forced with observations (Why recent estimates of glaciers ice melt from in situ measurement are higher than estimates from icesat and GRACE?, role of the NAO in recent glaciers ice melt?, what can explain the acceleration in glaciers ice melt observed in the 30s?) merged with the Presentation on glaciers ice melt from climate models (How does it work?) (K.Richter, B.Marzeion, S.Ligtenberg, N.Champollion, F.Landerer)

**09:40 - 10:20:** Presentation on the role of Antarctica and Greenland peripheral glaciers (small ice caps or glaciers?, which model should be used? How can we avoid double counting) (S.Ligtenberg, X.Fettweiss, C.Agosta, J.Ridley)

**10:20 – 11:00:** Discussion on how we could estimate the ice sheet mass loss due to dynamical changes from climate models? (What has been done in the literature so far? Is it satisfactory?) (all)

**11:00 – 11:20:** Coffee break

**11:20 – 12:00:** Presentation on natural and anthropogenic variability in glaciers ice melt (K. Richter, B.Marzeion, J.Ridley)

**12:00 – 12:40:** Final remarks, Discussion on main objectives, key observation and models (forced with reanalyses datasets) for glaciers ice melt. Discussion on how glaciers ice melt should be computed from climate models and definition of key questions about the comparison between observations and climate models.

**12:40 – 14:00:** Lunch break

**14:00 – 14:40:** Presentation on natural and anthropogenic variability in thermosteric sea level (How can we separate both variability?) (K. Richter, M. Palmer, B.Meyssignac, C.Roberts)

**14:40 – 15:20:** Presentation on variability in sea level due to the internal variability of the climate system. (How can we estimate it? How can we compare models with observations while they have different realizations of the internal variability?) (C.Roberts, M.Palmer, K.Richter, B.Meyssignac)

**15:20 – 16:00:** Presentation on the comparison method between observations and models. (How do we validate models against observations? How many climate models (and which climate models) should be analysed in this working group? Which metrics should we use? How can we estimate an Ensemble mean? Should we rank models and choose a sub selection that give “good” simulations of sea level rise? ) (K.Richter, A.Slangen, J.Church, M.Palmer , B.Meyssignac, C.Roberts)

**16:00 – 16:30:** Coffee break

**16:30 -18:00:** Final remarks, Discussion on main objectives, issues and recommendations concerning the comparison method that should be used in this working group to intercompare observations with climate models.

**19:30: Dinner at Restaurant Rosengarten, Alter Aargauerstalden 31b 3006 Bern, Tel: +41 31 331 32 06 <http://www.rosengarten.be/>**

#### **DAY 4: 14.11.**

**09:00 - 13:00:** Working group activity to develop final agreement on the methodology to adopt, on key datasets to use for observations and key models to use to compute sea level and its contributors from climate models.

**11:00 - 13:00:** Discussion of future perspectives : scientific paper, open key issues, funding opportunities, second ISSI meeting.

**13:00** : End of the meeting

### **Expected outcomes of the ISSI working group on “Contemporary regional and global sea level rise: assessment of climate models against observations”**

The immediate outcome of our team’s work is expected to be 2 papers: (1) A review paper on the use of GCMs outputs for understanding sea level variations over the 20th century; (2) A paper on the validation of CMIP5 GCMs against observations of sea level rise over the 20th century. The longer-term outcome is the publication of several papers that address sea level related problems on the basis of the few GCMs that are consistent with sea level observations over the 20th century. Examples of these scientific questions include: new sea level projections in 2100 with reduced uncertainties; assessing how the leading modes of sea level variability from validated GCMs help to characterize the internal variability in sea level changes and provide a constraint on the emergent pattern of dynamic sea level change; establishing what the timescales are on which we might expect the patterns associated with Greenland surface mass loss to emerge from the variability in regional sea level; and others...