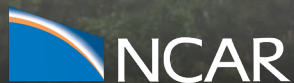


ESPWG Co-chairs Update

CESM Annual Workshop 2025

WG Co-chairs: Stephen Yeager, Kathy Pegen
WG liaison: Sasha Glanville



11 June 2025



Wednesday, June 11th, 13:00 pm - 16:00 pm

* All times are MDT; **Speakers:** 10-12 min. talk. Please leave 3-5 min at the end of your slot for questions.

Time	Topic	Speakers
1:00	Leveraging CESM2 data for machine learning based S2S forecasting	Anisha Pal
1:15	The fidelity of land-atmosphere interactions in CESM	Paul Dirmeyer
1:30	Benefits of an online bias-correction for S2S forecasts	Judith Berner
1:45	Quantifying sources of subseasonal prediction skill in CESM2 within a perfect modeling framework	Abby Jaye
2:00	The impacts of vertical resolution on seasonal predictability in a new CESM suite of seasonal hindcasts	Isla Simpson
2:15	The Influence of Tropical-Extratropical Interactions on Northeast Pacific Marine Heatwave Predictability in CESM	Evan Meeker
2:30	BREAK	
3:00	AMOC and subpolar North Atlantic Ocean predictability in CMIP6 decadal prediction simulations	Dylan Oldenburg (remote)
3:15	2019-2020 Australian bushfire smoke, multi-year La Niña, and implications for the Interdecadal Pacific Oscillation (IPO)	Jerry Meehl
3:30	Efficient Drift Correction of Initialized Predictions	Steve Yeager
3:45	Co-Chairs Update & Discussion	
4:00	ADJOURN	

Posters

	Decadal Predictability for Hydroclimatic Drivers of Wildfires across North America	Samar Minallah
	Breakthrough Data Assimilation Capabilities Available for CESM using DART	Kevin Raeder

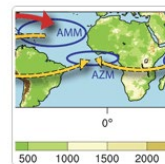
ESPWG Dataset Updates

https://www.cesm.ucar.edu/working_groups/earth-system/

- CESM2 **S2S** CAM single-climo and dual-climo initialization experiments
 - 11-member, 45-day ensembles initialized weekly (1999-2020)
 - Set one or two components (atmosphere, land, or ocean) to climatology, while other(s) are realistic
 - *Ref: Richter et al., 2024 (“Quantifying sources of subseasonal prediction skill in CESM2”)*
 - **NEW**: extension to 2022 (May-Aug)
- CESM2 **SMYLE** backward extension
 - {Feb, May, Aug, Nov} initializations now span 1958-2019
 - 20 member ensemble
- CESM2 **SMYLE** “CLIVAR TBI CoEx” hindcast pacemaker experiments
 - Equivalent to SMYLE, but with regional SST anomaly nudging to Obs (tropical ATL, PAC, IND)
 - Feb. 1 init, 10 member ensemble, 1978-2019

The Tropical Basin Interaction Model Intercomparison Project (TBIMIP)

Ingo Richter , Ping Chang, Ping-Gin Chiu, Gokhan Danabasoglu, Takeshi Doi, Dietmar Dommenges, Guillaume Gastineau, Zoe E. Gillett, Aixue Hu, Takahito Kataoka, Noel S. Keenlyside, Fred Kucharski, Yuko M. Okumura, Wonsun Park, Malte F. Stuecker, Andréa S. Taschetto, Chunzai Wang, Stephen G. Yeager, and Sang-Wook Yeh



Richter et al. (*GMD*, 2025)

ESPWG Dataset Updates

https://www.cesm.ucar.edu/working_groups/earth-system/

- **CESM2 DP**

- Nov. 1 init, 20 member ensemble, 1958-2023
- 10-year hindcasts
- **NEW**: timeseries files to be uploaded to CMIP6Plus

- **CESM2 MDP**

- Nov. 1 init, 10 member ensemble, {1960, 1965, ..., 2015}
- 20-year hindcasts

Ongoing/Planned ESPWG Allocation Usage

- ✓ CESM2-SMYLE backward extensions to 1958
- ✓ CESM2-MDP
- ✓ ClimoIC hindcasts for CESM2-S2S, CESM2-SMYLE, CESM2-DP
 - CESM2-S2S land/atmosphere coupling sensitivity experiments (Fowler/Glanville/Richter)
 - CESM2-S2S w/ online deterministic bias correction & stochastic physics (Berner/Chapman)
 - CESM2-DP mixed resolution experiments
 - CESM2 coupled MOV-mechanism experiments (DCPP CMIP7)
 - CESM3-SMYLE case study experiments
 - CESM3-S2S and CESM3-SMYLE partial reforecast sets

Open Workshop on Understanding and Predicting Annual to Multi-Decadal Climate Variations

- 18-20 November, 2025 in Bologna, Italy (hybrid option)
- **Abstract Submission Deadline: 15 July**
- www.upcliv-workshop.eu

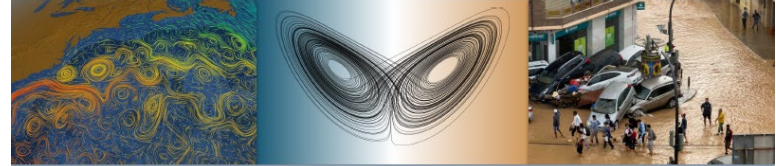
Open Workshop on *Understanding and Predicting Annual to Multi-Decadal Climate Variations*

Bologna, Italy & online, 18–20 November, 2025



Call for abstracts: www.upcliv-workshop.eu

Deadline for abstract submission: 15 July, 2025



In a world stricken by unprecedented climate anomalies and impactful weather extremes, there is an increasing need for reliable climate predictions on multiple forecast horizons. Even though large-ensemble predictions exhibiting statistically significant skill in various aspects have been developed, and are produced operationally by several centers globally, **there are still important gaps in understanding** the origins and the limits of the associated predictability. In particular, the fundamental drivers of historical and future climate variations are still, in part, poorly understood and often mis-represented in the climate models, limiting our confidence in predictions and projections. Hence, an integrated attribution and prediction is needed, in which the drivers of forecast signals are understood and model fidelity is assessed regarding the representation of relevant processes, to improve confidence in predictions of regional climate extremes.

This workshop focuses on **climate variations on annual to multi-decadal timescales (1–30 years)** and invites contributions on a wide range of topics, including: skill assessments of predictions; studies on the role of external forcings and climate variability; investigations on the mechanisms underlying specific aspects of predictability; prediction and predictability of climate extremes; evaluations of novel post-processing methods and new modelling techniques; studies on integrated attribution and prediction of climate and extremes. Around these themes, we also welcome studies employing explainable artificial intelligence and machine learning approaches.

This workshop is jointly organized by three Horizon Europe projects ([ASPECT](#), [EXPECT](#), [IAC](#)) together with the World Climate Research Programme's [DCPP](#) and [EPESC](#) groups working on integrated attribution, prediction and projection. Given a degree of overlap between the aims and the scope of the individual entities involved, this workshop also aims at providing new opportunities for closer collaboration.

Sessions

- Understanding and attributing historical climate variations and extremes
- Forecast evaluation (extremes, anomalies, trends, windows of opportunity)
- New methods in prediction (modelling, initialization, AI/ML, post-processing)
- Mechanisms underlying predictability and their representation in forecast systems

Scientific Organizing Committee

- Panos Athanasiadis • Roberto Bilbao • Remy Bonnet • Annalisa Cherchi • Markus Donat
- Kirsten Findell • Noel Keenlyside • Wolfgang Müller • Dario Nicoli • Pablo Ortega
- Scott Osprey • James Risbey • Jon Robson • Doug Smith
- Lara Wallberg • Antje Weisheimer • Stephen Yeager

Open Discussion

Get Involved!

- Analyze ESPWG datasets
- Propose new experiments that can utilize ESPWG compute allocation
- Share your work at future meetings

Contacts:

- Steve Yeager (yeager@ucar.edu)
- Kathy Pegion: (kpegion@gmu.edu)
- Sasha Glanville (sglanvil@ucar.edu)
- https://www.cesm.ucar.edu/working_groups/earth-system/