



# Monsoons and the ITCZ: the annual cycle in the Holocene and the future

## Agenda

### **DAY 1 PALEO CLIMATE (Sept. 15<sup>th</sup>, Davis Auditorium, Shapiro)**

12noon- 12:45pm: **Sign In**

12:45pm-1:00pm: **Welcome.**

**Michela Biasutti & Aiko Voigt**

1:00pm-1:30pm: **Keynote:** Paleo Observation

**Sandy Harrison** Paleo-Monsoons: Representation and Reality

1:30pm-2:00pm: **Keynote:** Paleo Modeling

**Pascale Braconnot** Afro-Asian monsoon and large scale hydrological changes in the tropics

2:00pm-2:30pm: **Poster Intro**

2:30pm-3:00pm: **Coffee Break**

3:00pm-4:30pm: **Talks**

1. **Bronwen Konecky** Viewing Holocene ITCZ and monsoon dynamics through the lens of modern tropical water isotope signatures

2. **Alyssa Atwood:** Spatial variations of the ITCZ response to North Atlantic freshwater forcing

3. **David McGee** Saharan dust as a recorder of and feedback on North African climate change over the last 25,000 years

4. **Tony Broccoli** The Response of Tropical Climate to Orbital, Ice Sheet, and Greenhouse Gas Forcing

5. **Natalie Burls** Contrasting the Hydrological Cycle in Past and Future Warm Climates

6. **John Chiang** Origins of East Asian monsoon seasonality

4:30pm-5:00pm: **Coffee Break**

5:00pm-6:00pm: **Response (10min) & Discussion**

**David Battisti**

**6:00pm-7:30pm: Poster Viewing and Icebreaker Reception**

1 **Tripti Bhattacharya** Early Medieval Droughts in Mesoamerica: Reconciling Proxies and Dynamics

2 **Christine Chen** Closed-Basin Paleolakes in the Central Andes: Implications for the South American Summer Monsoon During Heinrich Event 1 and the Last Glacial Maximum

3 **Alice Doughty** Modeling orographic precipitation in the Rwenzori Mountains, Uganda

4 **Kenji Izumi** Influence of cloud radiative effects on tropical circulation and hydrological cycle in the Mid-Holocene

5 **Christopher Colose** On the Influence of Interhemispheric Aerosol Forcing Distribution on Tropical Hydroclimate in Last Millennium Simulations

6 **Marco Gaetani** Mid-Holocene summer circulation over North Africa modulated by Saharan dust and vegetation

- 7 **Julia Hargreaves** The Past-to-Future Challenge
- 8 **Allison Jacobel** Deglacial Dust Fluxes in the Equatorial Pacific: Implications for ITCZ movement
- 9 **Wenwen Kong** Seasonality and Westerly Jet Changes in the Holocene East Asian Summer Monsoon
- 10 **Luciana Prado** Changes in the Amazon rainfall regime during the last millennium related to explosive volcanic events impacts on the tropical Atlantic Ocean
- 11 **Harunur Rashid** An expression of Indian summer monsoon change during the last 24,000 years recorded in the radioisotopes of the Andaman Sea marine sediment
- 12 **Anji Seth** The South American Monsoon Variability over the Last Millennium in CMIP5/PMIP3 simulations
- 13 **Chris Skinner** The role of tropical plumes in enhancing Saharan rainfall during the African Humid Period
- 14 **Ny Riavo Voarintsoa** Stronger Monsoon during southward migration of the ITCZ recorded in a Namibian stalagmite

## **DAY 2 Theory & Large Scale (Sept. 16<sup>th</sup>, Davis Aud. Shapiro)**

8:30am-9:00am: **Sign In**

9:00am-9:30am: **Keynote:** ITCZ

**Isaac Held** Factors controlling ITCZ position

9:30am-10:00am: **Keynote:** Monsoons

**Bill Boos** An overview of thermodynamic theories for monsoons

10:00am-10:30am: **Poster Intro**

10:30am-11:00am: **Coffee Break**

11:00am-12:30pm: **Talks**

1. **Aaron Donohoe** The quantitative relationship between ITCZ shifts and inter-hemispheric energy transport; constraints provided by the seasonal cycle.

2. **Martin Singh** Response of the seasonal cycle of tropical precipitation to idealized climate forcings

3. **Elizabeth Maroon** Tropical precipitation in GCM simulations with an idealized subtropical continent

4. **Sugata Narsey** Modelling Large Scale Dynamical Features of the Australian Monsoon

5. **Philippe Peyrille** The annual cycle of the West African Monsoon in a two-dimensional model: Mechanisms of the rainband migration

6. **Benjamin Moebis** The influence of the cloud radiative effect on the double ITCZ bias

12:30pm-2:00pm: **Lunch Break**

2:00pm-2:30pm: **MIP Update**

**Aiko Voigt**

2:30pm-3:30pm: **Response (10min) & Discussion**

**Tiffany Shaw**

3:30pm-4:00pm: **Coffee Break**

4:00pm-5:30pm: **Poster Viewing**

- 1 **Ori Adam** Seasonal and interannual variations of the energy flux equator and ITCZ in the present climate
- 2 **Michael Byrne** Energetic and dynamical constraints on the width of the ITCZ
- 3 **Jesse Day** The Relation of Indian Ocean ITCZ Latitude and the Distribution of Monsoon Rainfall
- 4 **Vishal Dixit** The mechanism governing abrupt jump of the ITCZ in an aqua planet model
- 5 **Ross Dixon** Comparing Tropical Atlantic precipitation variability across CMIP5 models
- 6 **Nicole Feldl** Characterizing the Hadley circulation response through regional climate feedbacks
- 7 **Matt Hawcroft** Inter-Hemispheric Albedo, the ITCZ and the West African Monsoon
- 8 **Shineng Hu** Albedo-elevation compensation in radiative-convective equilibrium: implications for monsoons and climate
- 9 **Sarah Kang** Sensitivity of tropical responses to the latitudinal position of zonally asymmetric thermal forcing in an aqua-planet setting
- 10 **Catherine Pomposi** The role of the tropical Atlantic in the ENSO Sahel rainfall teleconnection
- 11 **Tiffany Shaw** Response of the intertropical convergence zone to zonally-asymmetric subtropical surface forcings
- 12 **Malte Stuecker** A new framework explaining linkages between ENSO and the Monsoon

## **DAY 3 Convection (Sept. 17<sup>th</sup>, Lerner Hall 555)**

8:30am-9:00am: **Sign In**

9:00am-9:30am: **Keynote:** Observations of Convection

**Courtney Schumacher** From Ackee to Acai: The variable characteristics of tropical convective rainfall

9:30am-10:00am: **Keynote** Modeling of Convective Processes

**Tony Del Genio** Cumulus parameterization: Moving away from quasi-equilibrium

10:00am-10:30am: **Poster Intro**

10:30am-11:00am: **Coffee Break**

11:00am-11:30pm: **Keynote** Land Processes

**Pierre Gentine** The life cycle and organization of convection over land

and ocean

11:30am-12:30pm: **Talks**

1. **Larissa Back** The vertical motion profile structure of the ITCZ and its disturbances

2. **Gill Martin** Monsoons and tropical rainfall in the MetUM general circulation model

3. **Nick Klingaman** Using a novel coupled-modelling framework to reduce tropical precipitation biases

4. **David Raymond** Implications of New Observational Results for the Parameterization of Tropical Convection

12:30pm-2:00pm: **Lunch Break**

2:00pm-2:30pm: **Talks**

5. **Naftali Cohen** Interaction between gravity wave breaking over the

Tibetan Plateau and Tropical convection

**6. David Nolan** The structure and variability of the ITCZ with and without cumulus parameterizations as seen in a tropical channel model in an “aquapatch” configuration

2:30pm-3:30pm: **Response (10min) & Discussion**

**Brian Mapes**

3:30pm-4:00pm: **Coffee Break**

4:00pm-5:30pm: **Poster Viewing**

**1 Usama Anber** Modeling the Diurnal Cycle in the Amazon using the Weak Temperature Gradient Approximation

**2 Alexis Berg** The role of soil moisture in the West African Monsoon

**3 Noah Brenowitz** Non-local convergence coupling in stochastic models for tropical convection

**4 Xin Rong Chua** Effects of Anthropogenic Aerosols on Tropical Cyclones

**5 Chimene Daleu** Intercomparison of methods of coupling between convection and large-scale circulation.

**6 Nick Klingaman** Temporal and spatial intermittency of sub-daily tropical precipitation in general circulation models

**7 Kuniaki Inoue** On A Diagnostic Perspective of Gross Moist Stability

**8 Stephanie Johnson** The effect of increased convective entrainment on the Asian monsoon biases and the ITCZ in the MetUM general circulation model

**9 Ji Nie** Modeling interactions between the quasi-geostrophic vertical motion and convection in a single column

**10 Coumba Niang** Influence of Madden-Julian Oscillation (MJO) on Rainfall Variability over West Africa at Intraseasonal Timescale

**11 Salvatore Pascale** The Impact of Gulf Surges on the North American Monsoon and Their Modulation by Tropical and Extra-Tropical Waves

**12 Dan Shaevitz** The interaction of large-scale dynamics and convection during the July 2010 and September 2014 floods of northeast Pakistan

**13 M.V. Subrahmanyam** Interannual variations of Findlater Jet over Arabian Sea and associated rainfall in India during summer monsoon

**14 Sulian Thual** Asymmetric intraseasonal events in the stochastic skeleton MJO model with seasonal cycle

**15 Qiu Yang** A Multi-Scale Model for the Intraseasonal Impact of the Diurnal Cycle over the Maritime Continent on the Madden-Julian Oscillation.

**16 Sungduk Yu** Response of the double ITCZ / cold tongue bias to varying the orientation and extent of embedded cloud resolving models in the SuperParameterized CESM

## **DAY 4 Projections (Sept. 18<sup>th</sup>, Lerner Hall 555)**

8:15am-8:45am: **Sign In \*\*\*note early start time!**

8:45am-9:15am: **Keynote:** ITCZ Projections

**Shang-Ping Xie**

9:15am-9:45am: **Keynote:** Monsoon Projections

**Simona Bordoni**

9:45am-10:15am: **Posters Intro**

10:15am- 10:45am: **Coffee Break**

10:45am-12:30pm: **Talks**

1. **Yen-Ting Hwang** The Influence of Ocean in Hadley Circulation and Tropical Precipitation in a Warming Climate

2. **Katinka Bellomo** Evidence for Weakening of Tropical Atmospheric Circulation from Cloud Datasets

3. **Abby Swann** Ecoclimate Teleconnections: Land surface forcing and atmospheric responses.

4. **Jack Scheff** Will greenhouse warming cause global terrestrial drying? Theory, model, observation, and paleoclimate perspectives

5. **Juergen Bader** Northern-hemispheric differential warming is the key to understanding the discrepancies in the projected Sahel rainfall

6. **Yi Ming** Observational constraints on GCM-simulated Sahel rainfall response to uniform ocean warming

7. **Kenneth Sperber** Present-Day Biases in the Annual Cycle of Monsoon Rainfall and Projections of Future Climate

12:30pm-2:00pm: **Lunch Break**

2:00pm-3:00pm: **Response (10min) & Discussion**

**Michela Biasutti**

3:00pm-3:30pm: **Coffee Break**

3:30pm-5:00pm: **Posters Viewing.**

~~1 **Moetasim Ashfaq** Decreasing frequency of monsoon depressions in the 21st century~~

2 **Leila Carvalho** Intraseasonal Oscillations and the Indian Summer Monsoon: the present climate and future projections with GFDL coupled model.

3 **Marco Gaetani** West African Monsoon dynamics and precipitation in idealized simulations: SST warming vs CO2 increase

4 **Gill Martin** Understanding regional uncertainty in CMIP5 tropical precipitation projections

5 **Jong-yeon Park** Dominant impact of anthropogenic Mediterranean warming on present and future Sahel rainfall

6 **Romain Roehrig** Overview of the West African monsoon in CMIP5 and updated models

7 **Hansi Singh** An Analysis of Tropical Precipitation using Numerical Water Tracers in a Global Climate Model: Insights on the Pre-Industrial Mean State and Perturbations from CO2-Doubling

8 **Lakemariam Y. Worku** Climate Change Impact on Variability of Rainfall Intensity in Upper Blue Nile Basin

5:00pm-6:00pm: **Synthesis Discussion Organizing Committee**

6:00pm: **CONFERENCE ENDS**

**Acknowledgements:** We gratefully acknowledge the support of the [Columbia Climate Center](#), the [Columbia Initiative on Extreme Weather and Climate](#), the [WCRP Grand Challenge on Clouds, Circulation, and Climate Sensitivity](#), and [The National Science Foundation GEO directorate](#), and in particular the programs for [Climate and Large Scale Dynamics \(CLD\)](#) and [Paleoclimate](#). Hayley Martinez and Pamela Vreeland ([Earth Institute](#)) have handled all logistic planning.



