

# Briefing to the GLASS Panel: Monsoon Panel and S2S

Paul Dirmeyer

Center for Ocean-Land-Atmosphere Studies  
George Mason University  
Fairfax, Virginia, USA

# Monsoon Panel History

- CLIVAR had 3 monsoons panels (Asia-Australia, Africa, and Americas)
- 3 years ago **combined into one** Monsoon Panel (MP), made joint with GEWEX
  - Partly to consolidate disparate monsoon efforts across WCRP
  - Partly a cost-cutting measure (WCRP pays travel for panel members to meetings)
- The regional panels have been reborn as **Working Groups** under the new MP

# GEWEX-CLIVAR Monsoon Panel

<http://www.clivar.org/clivar-panels/monsoons>

- Members:

Name	Role	Institute	Country
Andrew Turner	Co-Chair	U. Reading	UK
Paul Dirmeyer	Co-Chair	COLA	USA
Alice Grimm	Member	Federal University of Paraná	Brazil
Serge Janicot	Member	IRD Université Pierre et Marie Curie	France
Krishnan, R.	Member	IITM	India
François Mkankam Kamga	Member	Université des Montagnes	Cameroun
Tianjun Zhou	Member	IAP	China
Cathryn Birch	Member	University of Leeds	UK
Françoise Guichard	Member	CNRM-GAME	France
Alessandra Giannini	Member	IRI/Columbia University	USA

Adding 2 members, 1 from A-A WG (Aurel Moise, Australia), 1 from Americas TBD

# Three Regional Working Groups

## Asia-Australia WG

### **Co-Chairs:**

H Annamalai – (IPRC, Hawaii, USA)

Aurel Moise – (BMRC, Australia)

### **Members:**

Andrew Marshal – (BMRC, Australia)

Gill Martin – (Hadley Center, UK)

Bill Boos – (Yale University, USA)

Partha Mukopadhyay – (IITM-Pune, India)

Suryachandra Rao – (IITM-Pune, India)

Randy Wu – (IAP, China)

G Srinivasan – (RIMES, Thailand)

Koh Tieh Young – (SNU, Singapore)

Yi Ming – (GFDL/NOAA, USA)

Brian Mapes (RSMAS-Miami, USA)

## Africa WG

### **Co-Chairs:**

Serge Janicot – (IRD/France & AMMA)

Alessandra Giannini – (IRI/USA)

François Mkankam Kamga – (U Montagnes/Cameroon & CR4D)

### **Members:**

Françoise Guichard – (CNRM & Meteo-France)

Cathryn Birch – (U. Leeds /UK & FCFA)

Benjamin Lamptey – (ACMAD & CR4D)

Fredrick Semazzi – (USA & HyVic)

Mouhamadou Bamba Sylla – (WASCAL & CORDEX)

Pauline Dibi Kangah – (UFHB/Ivory Coast)

Claudine Wenhaji-Ndomeni - (CNR-ISAC/ Italy)

\*1 TBD

## Americas WG

### **Co-Chairs:**

Alice Grimm – (Fed U. Paraná, Brazil)

Iracema Cavalcanti – (CPTEC/INPE, Brazil)

### **Members:**

Francina Dominguez – (U. Illinois, USA)

Manoel A. Gan – (CPTEC/INPE, Brazil)

Marcelo Barreiro – (U. Republica, Uruguay)

Pedro da Silva Dias – (U. São Paulo, Brazil)

Rong Fu – (U. Texas, USA)

Tereza Cavazos – (CICESE, México)

\*2 TBD

# Key Issues Identified by Each WG

## Asia-Australia

- Designing process-based metrics for the A-A monsoon and making these available to the wider community (Toolkit)
- Renewed effort to bring SE Asia & Sri Lanka *winter* monsoon to fore
- Assessing predictive skill in current forecast models (**S2S**)
- Direct engagement with local stakeholders (start: user-needs survey)

## Africa

- Develop process based and user metrics for CMIP5/6
- Variability, predictability, forecast skill at intraseasonal (**exploit S2S**)
- D&A work; climate services

## Americas

- **Exploiting S2S** for the South American monsoon (MJO impacts; onset/demise/active/break prediction)
- Development for process diagnostic of SAMS intraseasonal variability; challenging models
- Provide demonstration forecast products

# Training and workshops

- MP (Turner, Dirmeyer) and Asia-Australia WG (Moise, Annamalai) involved in design and steering of science of Asia-Pacific monsoon training workshop led by WCRP (Boram Lee)
  - Planned for Jeju, Republic of Korea, January 2017
  - Steered toward S2S topic area, for EC research & forecasting community
- Successful series of ICTP/IITM/COLA monsoon “targeted training” workshops have come to a close
  - Most recent, June 2016 in Trieste, with heavy involvement from MP & A-A WG members
  - Will explore with Fred Kucharski at ICTP mechanisms for further series of (regional-oriented?) monsoon workshops
- Prioritize Americas activity for a workshop, targeting sources e.g. semi-annual US CLIVAR call

# Project office

<http://www.clivar.org/organization/icpo>

- CLIVAR has a split project office – most functions are at the Qingdao, China location where the Exec. Director Valery Detemmerman and Dep. Exec. Director Nico Caltabiano sit.
- There is also the Int'l CLIVAR Monsoon Project Office (ICMPO) in Pune, India, Rokkam Rao Director.
- A long twisted political story why this is so.
- The Monsoon Panel is served by the Pune office.
- Ongoing issues with ICMPO's functionality.

# Leadership / Future

- MP Co-Chair appointments for Dirmeyer and Turner officially end December 2016.
- Turner willing to stay an additional year, Dirmeyer rotating off.
- **Looking for a GEWEX individual to co-chair beginning 2017.**
- Next panel meeting IUGG Cape Town September 2017.
  - **Specific interest from MP and CLIVAR to have GLASS and GASS representation at that panel meeting, explore collaborations.**



- Questions on Monsoon Panel?

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# Subseasonal-to-Seasonal (S2S)

- **International S2S Prediction Project:** <http://s2sprediction.net/>
  - **Operational forecast centers** (11) participate, provide ensemble historical **re-forecasts and near-real-time forecasts** – 10 currently have data online, last (KMA) by end of this year.
  - Each center follows its own operational protocols, output data are supposed to meet S2S standards (mandatory variables, units, etc.)
  - Data re-distributed by ECMWF (primary) and CMA (secondary); IRI (limited subset); primarily **daily means**, multiple ensemble members, out to 30-60 days; forecasts initialized 1-7 times per week.
  - This is all in the classical GLACE “wheelhouse” of timescales where land-atmosphere coupling is believed to be strongest, potentially a tremendous treasure trove for GLASS research.

# S2S Steering Group

## **Co-Chairs:**

Frederic Vitart – (ECMWF, UK)

Andrew Robertson – (IRI, USA)

## **Members:**

Harry Hendon – (CAWCR, Australia)

Arun Kumar – (NCEP, USA)

Hai Lin – (EC, Canada)

Yuhei Takaya – (JMA, Japan)

Duane Waliser – (JPL NASA, USA)

Tongwen Wu – (CMA, China)

Anca Brookshaw – (UKMO, UK)

Willem Landman – (U. of Pretoria, South Africa)

Cristiana Stan (George Mason University, USA)

## **Ex-Officio:**

Hyun-Suk Kang – (KMA, Korea)

Paolo Ruti – (WMO, WWRP)

Michel Rixen – (WMO, WCRP)

## **Liaisons:**

Richard Graham, UKMO, UCBS, UK

Oscar ALVES, CAWCR, WWRP Working Group on Predictability, Dynamics & Ensemble Forecasting (PDEF), Australia

Daryl D. KLEIST, Univ. of Maryland, WWRP Data Assimilation and Observing Systems Working Group (DAOS), USA

Caio Coelho, CPTEC, Joint Working Group on Forecast Verification Research (JWGFVR), Brazil

Jean-Pierre CERON, Meteo-France, WMO Commissions for Climatology (CCL), France

Joanne Robbins, UKMO, Working Group on Societal and Economic Research Applications (SERA), UK

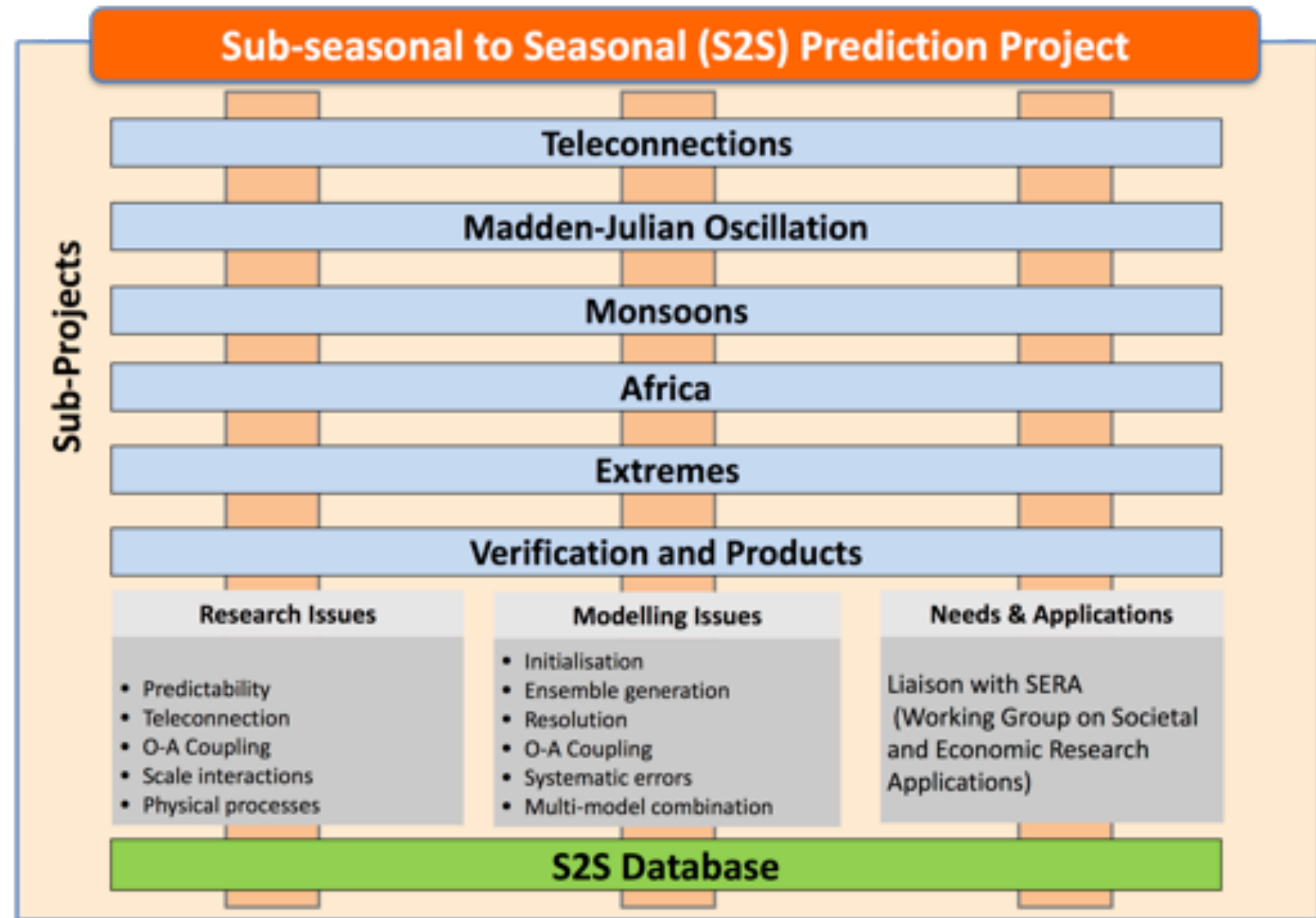
Paul Dirmeyer, George Mason University/ COLA, GEWEX/Global Land/ Atmosphere System Study (GLASS), USA

Steve Woolnough, University of Reading, GEWEX/Global Atmospheric System Study (GASS), UK

In-Sik Kang, SNU, WCRP Joint Scientific Committee (JSC), Korea

# S2S Subprojects

- Teleconnections is a new subproject, just started this year.
- Others are ongoing.
- All represent specific scientific applications of S2S data.
- Each has leadership / membership, a science plan and a Wiki page at [s2sprediction.net](http://s2sprediction.net)
- Represent another point for GLASS interests to interface with S2S.

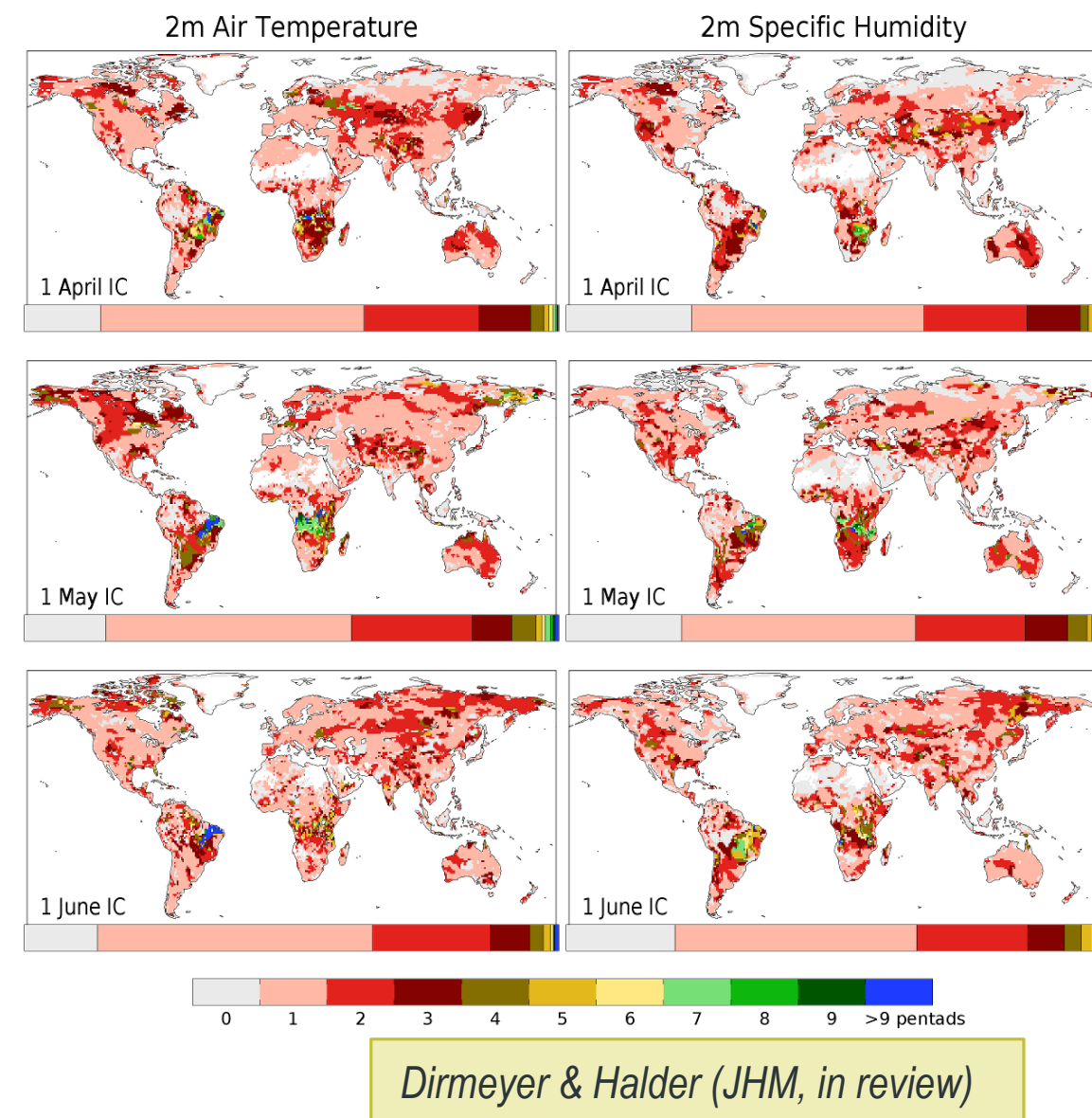


# GLASS-y Issues with S2S

- Only 5 of 10 active S2S models are reporting soil moisture.
  - ECMWF, CMA, HMCR and NCEP report 20cm and 1m, BoM only 20cm
  - F. Vitart inquired to other centers, some “amusing” answers:
    - UKMO introducing new land initialization (currently climo soil moisture!), will report SM after that change, by Jan 2017.
    - Météo-France say LSM is so primitive, not worthwhile (*Aaron?!?!).*
    - EnvironmentCanada say their model levels don’t correspond – we have given them guidance on vertical interpolation.
    - No responses yet from Japan, Italy, Korea.
- Only 1 model reporting surface fluxes! (they were *optional* variables)

# More Issues with S2S

- No current reportage on land surface initialization.
  - Crucial for understanding sources of skill in S2S forecasts
  - Significant forecast skill of  $T_{2m}$  and  $q_{2m}$  in CFSv2 extended 1-3 pentads over >75% of land by realistic land initialization (right).
- Drafting “survey questions” for op modeling centers
  - Well-worded questions to find out how land surface states are initialized.
  - Will also ask about BCs (soils and veg data sets, etc.) LSM documentation.
  - What else? (see / respond to email on subject).



# N.Am. Subseasonal Experiment (**SubX**)

- New NOAA-sponsored effort (co-sponsors: ONR, NASA/MAP, and NWS/STI), follow on to NMME
  - NMME was a seasonal prediction experiment focused on monthly mean model output and coupled ocean-atmosphere models
  - SubX is subseasonal, **daily output**, coupled land-atmosphere models, some coupled oceans too (but not all); **more consistent than Int'l S2S**
  - Not just operational models: NASA/GSFC (GEOS5), NCAR (CCSM4), NRL (Navy ESM), in addition to NCEP (both CFSv2 and GEFS) and EC.
  - **Require land surface to be initialized realistically!** (hip-hip-horray!)
  - **SM, surface fluxes to be required!** (hip-hip-horray!)
  - Data (historical reforecasts and n.r.t. forecasts) to be redistributed by IRI.
  - Don't expect complete reforecast data sets before the end of 2017.

# SubX Personnel

## **Core Team:**

### **PI:**

Ben Kirtman (University of Miami – RSMAS)

### **co-PIs:**

Kathy Pegion (George Mason University)

Andy Robertson (Columbia University IRI)

Robert Burgman (Florida International University)

Hai Lin (Environment Canada)

Jon Gottschalck (NOAA/NCEP/CPC)

Dan Collins (NOAA/NCEP/CPC)

## **Modeling PIs:**

**GEFS:** Yuejian Zhu, Malaquias Pena, Wei Li, Hong Guan, and Xiqiong Zhou (NOAA/NCEP/EMC)

**GEOS5:** Deepthi Achuthavarier, Randal Koster and Jelena Marshak (NASA Goddard Space Flight Center)

**CCSM4:** Ben Kirtman (University of Miami – RSMAS), Kathy Pegion (George Mason University), Rong Fu (University of Texas, Austin)

**Navy:** Neil Barton (Naval Research Laboratory Monterey) and Joseph Metzger (Naval Research Laboratory Stennis)



# NOAA S2S Prediction Research

- NOAA Climate Project Office sponsored grants 2016-2019
  - 14 proposals have been funded in response to an announcement of opportunity focused on S2S prediction research.
  - The science complement to SubX; most projects are focused on using both SubX and S2S data
  - CPO customarily herds PIs into Task Forces to foster collaboration
  - Kickoff meeting of the NOAA **S2S Prediction Task Force** will be in early December at IRI/LDEO in conjunction with a workshop on S2S predictability of extremes <http://iri.columbia.edu/s2s-extremes-workshop-2016/> and the Int'l S2S SG annual meeting.

# Sponsored Projects

PI	Title
Barnes, Libby	Forecasting North Pacific Blocking and Atmospheric River Probabilities: Sensitivity to Model Physics and the MJO
Camargo, Suzana	The relationship of tropical cyclones to MJO and ENSO in the S2S database
Chang, Edmund	Understanding the Sources of Subseasonal Predictability of Extratropical Cyclone Activity and Improving Their Representation in Forecast Systems
DeMott, Charlotte	Collaborative Research: Assessing Oceanic Predictability Sources for MJO Propagation
Ford, Trent	North American Heat Wave Predictability: Assessing the Role of Land Surface Initialization on S2S and NMME Model Forecasts
Furtado, Jason	Investigating the Underlying Mechanisms and Predictability of the MJO-NAM Linkage in the NMME Phase-2 Models
Guo, Zhichang	Improving subseasonal to seasonal forecast skill of North American precipitation and surface air temperature using multi-model strategy
Hoover, Brent	Prediction, Sensitivity, and Dynamics of Subseasonal To Seasonal Phenomena Diagnosed Through Linear Inverse Models, Their Adjoint, and Numerical Weather Prediction Models
Kumar, Arun	Exploring Pathways to improve MJO Predictions
Andrea Lang	A categorical assessment of forecast skill, uncertainty and biases in extended-range ensemble forecasts of stratospheric regime changes
Perlwitz, Judy	Role of stratospheric processes in predicting ENSO-NAO connections on subseasonal time scale
Szunyogh, Istvan	Investigation of the Effects of Oceanic Mesoscale Eddies on the Midlatitude Storm Tracks and Their Predictability
Wang, Shuguang	Madden Julian Oscillation - the Maritime Continent barrier and seamless verification
Wang, Zhuo	Variability of Rossby Wave Breaking and its Impacts on the Large-scale Circulation and Extreme Weather: Implications for S2S Prediction and Predictability

# S2S Prediction Task Force

*\* includes co-Is, SubX and CTB Pls.*

## **Lead:**

Elizabeth Barnes – (Colorado State U)

## **Co-Leads:**

Paul Dirmeyer – (George Mason U/COLA)

Edmund Chang – (SUNY Stony Brook)

Andrea Lang – (SUNY Albany)

## **Pls:**

Suzana Camargo – (LDEO)

Charlotte DeMott – (Colorado State U)

Trent Ford – (U So. Illinois)

Jason Furtado – (U Oklahoma)

Zhichang Guo – (George Mason U/COLA)

Brent Hoover – (U Wisconsin / CIMMS)

Arun Kumar – (NOAA/NCEP/CPC)

Judy Perlwitz – (ESRL)

Istvan Szunyogh (Texas A&M U)

Shuguang Yang (Columbia U)

Zhuo Wang (U. Illinois)

## **Other Members\*:**

Deepthi Achuthavarier (NASA/GSFC)

Julio Bacmeister (NCAR)

Cory Baggett (Colorado State U)

Neil Barton (Naval Res. Lab.)

Stan Benjamin (NOAA/ESRL/PSD)

Uma Bhatt (U Alaska Fairbanks)

Rob Burgman (Florida Intl. U)

Ping Chang (Texas A&M U)

Dan Collins (NOAA/NCEP/CPC)

Tim DelSole (George Mason U/COLA)

Rong Fu (U Texas)

Jon Gottschalck (NOAA/NCEP/CPC)

Hyemi Kim (SUNY Stony Brook)

Ben Kirtman (U Miama / RSMAS)

Rany Koster (NASA/GSFC)

Nick Klingaman (U Reading)

Chia-Ying Lee (IRI / Columbia U)

Michelle L'Heureux (NOAA/NCEP/CPC)

Wei Li (NOAA/NCEP/EMC)

Eric Maloney (Colorado State U)

Mike Morgan (U Wisconsin)

Matt Newman (NOAA/ESRL/PSD)

Kathy Pegion (George Mason U / COLA)

Malaquias Peña (NOAA/NCEP/EMC)

Melinda Peng (Naval Res. Lab.)

Jadwiga Richter (NCAR)

Andy Robertson (IRI / Columbia U)

R. Saravanan (Texas A&M U)

Adam Sobel (LDEO / Columbia U)

Lantao Sun (NOAA/ESRL/PSD)

Mike Tippett (Columbia U)

Joe Tribbia (NCAR)

Dan Vimont (U Wisconsin)

Frédéric Vitart (ECMWF)

Wanqiu Wang (NOAA/NCEP/CPC)

Minghua Zhang (SUNY Stony Brook)

Jieshun Zhu (NOAA/NCEP/CPC)

Yuejian Zhu (NOAA/NCEP/EMC)

- Questions on S2S?

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