



Sonia Seneviratne, Graeme Stephens (GEWEX)  
Co-chairs

- The SSG
- Project reports
  - GDAP
  - GASS
  - GLASS
  - GHP
- Update: July GEWEX conference & pan-GEWEX and CLIVAR

Graciously  
sponsored:



## Scientific Steering Group

## International GEWEX Project Office

**GEWEX Data and  
Assessments Panel**

**GEWEX  
Hydroclimatology  
Panel**

**Global Atmospheric  
System Studies**

**Global Land–  
Atmosphere  
System Studies**

**Extremes  
Task Group  
and GC**

**Assessments**

**Regional Hydroclimate  
Projects**

**Parameterization  
Evaluation**

**Benchmarking**

**Water  
Availability  
GC**

**Global Data Products**

**Cross-Cuts**

**Model Diagnosis**

**Model Data Fusion**

**In Situ Observations**

**Global Data Centers**

**Radiation Code  
Comparison**

**Land-Atmosphere  
Coupling**

**WMAC  
WDAC**

**Radiation Code  
Comparison**

**Mission:** To measure and predict global and regional energy and water variations, trends, and extremes (such as heat waves, floods and droughts), through improved observations and modeling of land, atmosphere and their interactions; thereby providing the scientific underpinnings of climate services.

# 2014 GEWEX Scientific Steering Group

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Dr. Graeme Stephens  
Co-Chair of the SSG



Prof. Sonia Seneviratne  
Co-Chair of the SSG

Prof Peter  
Webster  
(Monsoons)

Dr Siegfried  
Schubert  
(GDIS)

Dr. Lisa  
Alexander  
(Extremes)

Proposed new members



Prof. Richard  
Anyah



Dr. Eleanor  
Blyth



Dr. Chia Chou



Prof. Rene  
Garreaud

Dr. Paul  
Poli, ECMWF



Dr. Xin Li



Dr. Kevin  
Trenberth



Prof. Remko  
Uilenjhoet



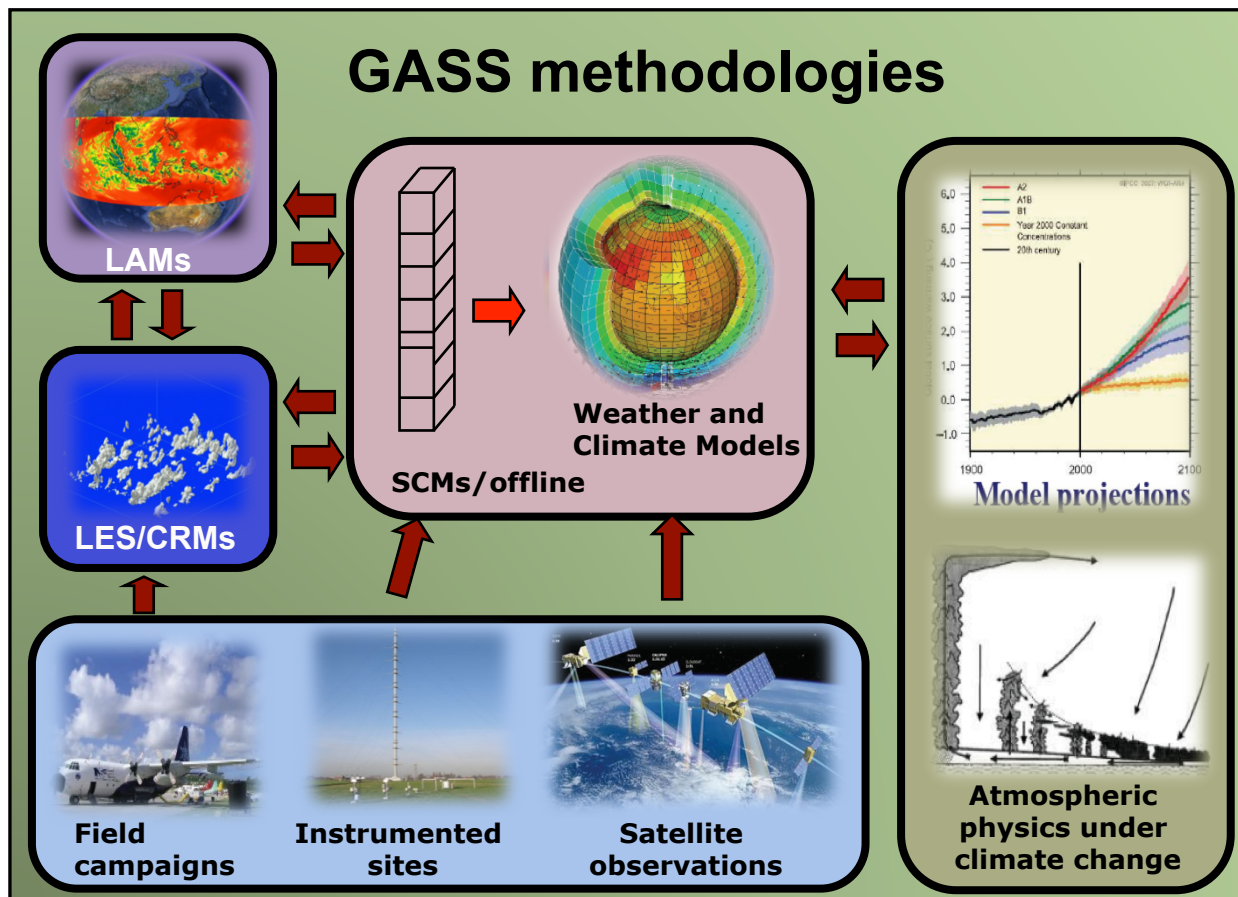
Prof. Howard  
Wheeler



Prof. Minghua  
Zhang

A community who carry out and use **observations**,  
**process studies** and **model experiments** with a  
focused goal of **improving the representation of  
the atmosphere** in weather and climate models.

Working with many model types **bringing together**  
**observations**, **modelling** and **understanding** in **intercomparison**  
**projects**



### Topics of Current Projects (partial list)

Tropical convection (MJO)

Convection in the grey-zone  
(1-5 km)

Land-Atmosphere Interactions  
(DICE)

Stable boundary layers (GABLS)

Cloud microphysics and aerosol  
interactions

Boundary layer cloud  
feedbacks (CGILS)

Polar clouds (ISDAC)

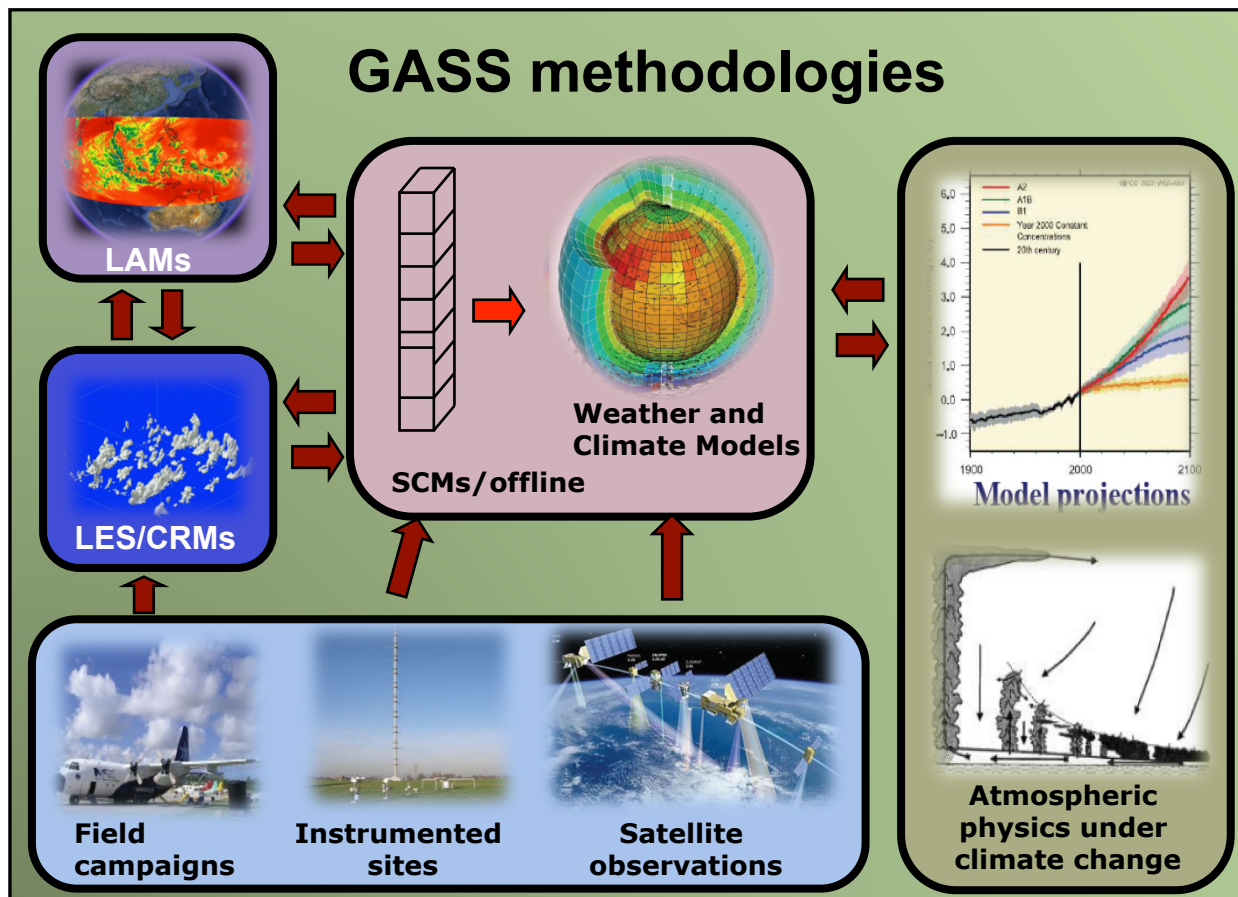
CAUSES for US warm bias

Weak-Temperature Gradient  
modeling of tropical  
convection



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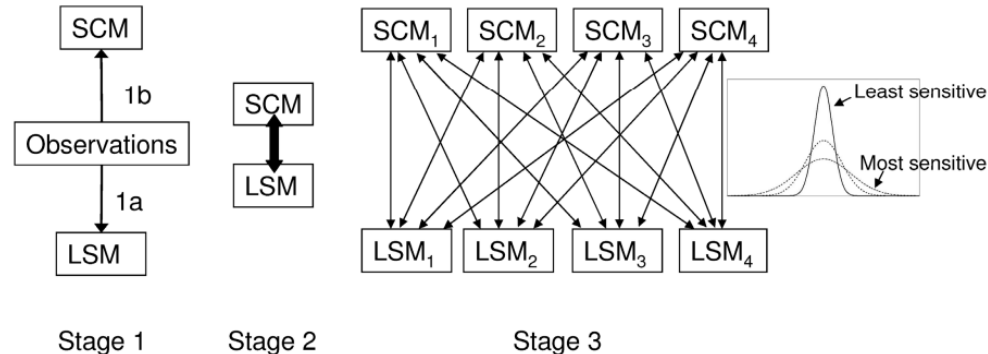
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# Diurnal Land-Atmosphere Coupling Experiment (DICE)

*M. J. Best (UKMO) and A. P. Lock (UKMO)*

## Overview

- Joint GLASS/GASS activity bringing together land and boundary layer modeling communities together
- Case study focused on 3 consecutive diurnal cycles with no clouds from CASES 99 (Kansas) (prior GABLS case)



## Motivation and Questions

- Intercomparison study involving single columns models (SCM) of the atmosphere and land-surface model (LSM)
- **Stage 1:** Evaluate LSM and SCM stand-alone performance against observations
- **Stage 2:** What is the impact of coupling?
- **Stage 3:** How sensitive are different LSM and SCM to variations in forcing and why are some models more sensitive than others?

## Preliminary Results

- Climatological vegetation leads to large errors in simulated evaporation overwhelming any signal resulting from coupling
- Case being modified to control for this factor
- Still there are some interesting differences in models' sensitivity to changes in forcing that are likely to be important in GCMs and need to be understood

# Diurnal land/atmosphere coupling experiment (DICE)

A joint GASS-GLASS project

Martin Best, Adrian  
Lock et al.

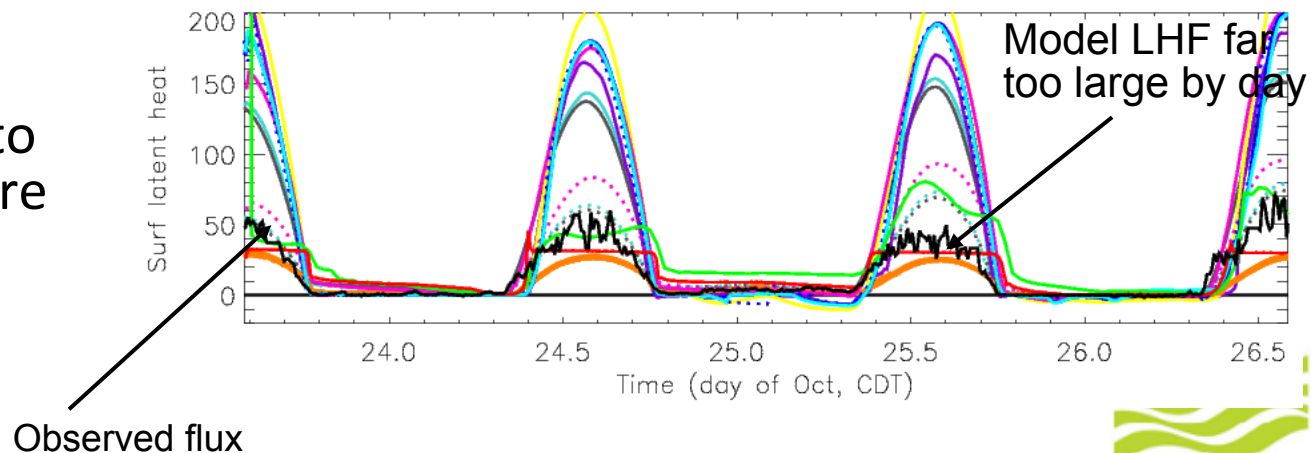
Climatological vegetation  
(influenced by NDVI) in LSMs  
lead to large errors in  
evaporation (3X over SGP)

This currently dominates any  
signal of the impact of  
coupling

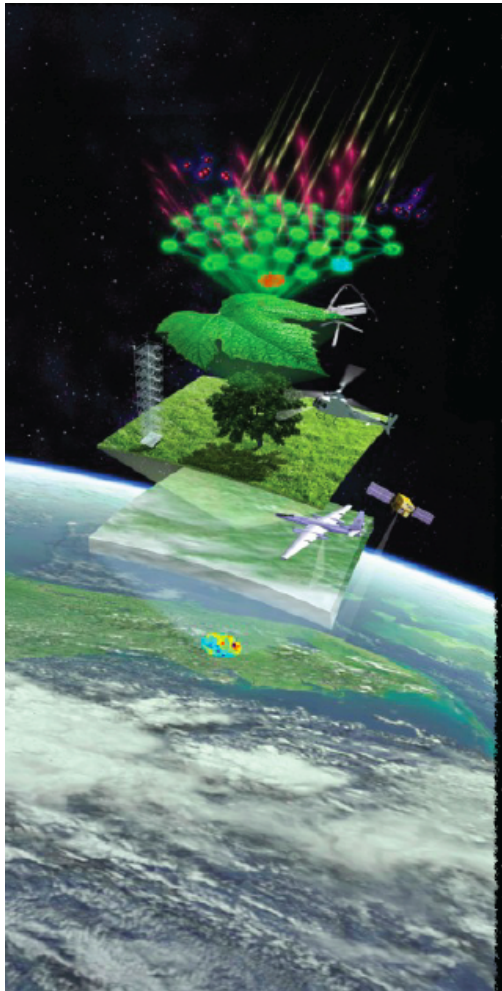
GLAS community are  
considering how best to  
constrain this in a future  
iteration of this case  
(hopefully early 2014)



CASES-99 experiment (Southern Great Plains, USA)



NDVI is used to constrain models and implies vegetation is alive whereas in reality the vegetation is transitioning to dormancy – this is the major source of LHF error. Fluorescence captures this transition and if used would better constrain model fluxes closer to observed – there is a ready user community (ie pull) for these data.

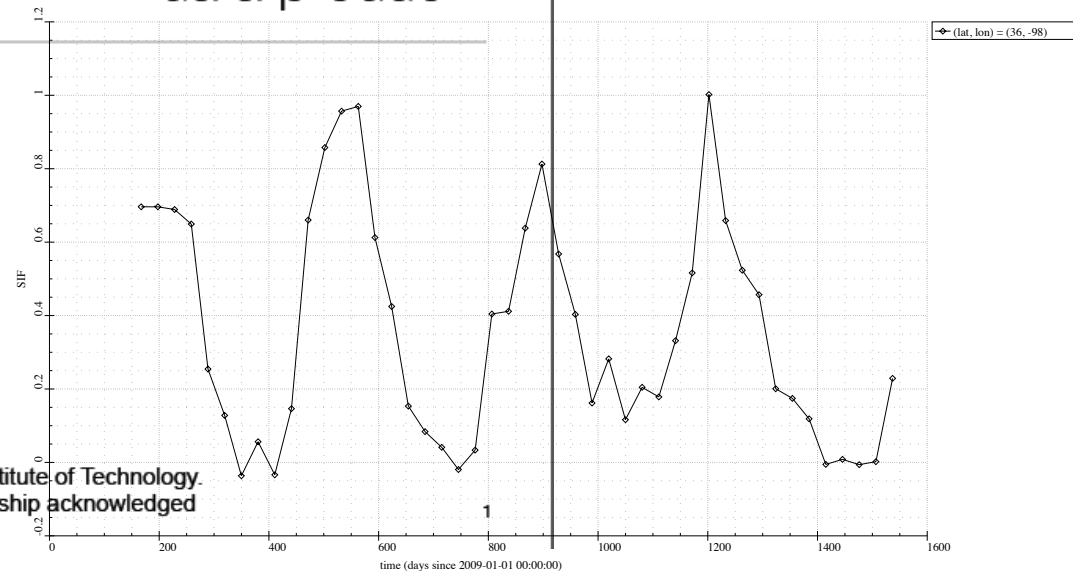


## A new capability grown out of GOSAT and to flourish under OCOC

Solar induced chlorophyll  
fluorescence (SIF)

A bonus OCO-2 data product

© 2014 California Institute of Technology.  
Government sponsorship acknowledged



# **GASS Participation in WCRP Grand Challenges**

## **Clouds, Circulation, and Climate Sensitivity Grand Challenge**

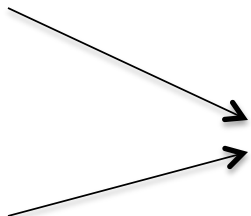
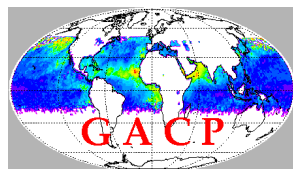
- Radiative-convective equilibrium project to study convective aggregation
- Diagnostic study of radiative forcing in CMIP-class (“climate change”) models
- Weak-temperature gradient project to study the interactions of tropical convection with the large-scale circulation (with applications to regional climate change in tropical precipitation)
- Grey-Zone study for the representation of convection

## **Water Availability Grand Challenge** *(more provisional)*

- CAUSES: Evaluation of the contribution atmospheric errors in precipitation and radiation processes to errors in simulated summertime climate
- Evaluation of water cycle processes in high-resolution model (prospective HiRes project)

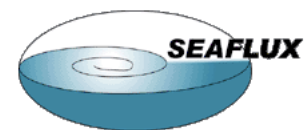


## GEWEX Reference Products (pre-Integration)



Validation

BSRN



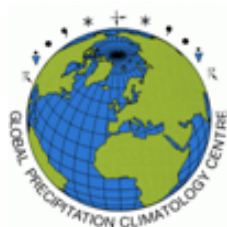
Validation

Ships/Buoys



Validation

Towers



+



# A WDAC Proposal for Structured Data Set Quality Assessments



Jörg Schulz (EUMETSAT)

# Current Assessment

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## Aerosols

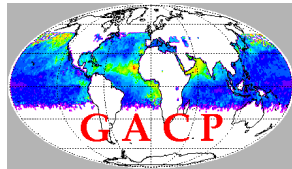
- Currently assessing differences between new sensors such as MODIS, MISR and Calipso that have new and unique capabilities. GACP being assessed but is not the main driver.

## Water Vapor

- T, q profiles are needed to study 3D atmosphere and to use it as input for ISCCP, SRB and Sfc. Fluxes, but no single source is available. Panel considering all aspects together.
- Next meeting in Fort Collins, Colorado on 30 Sep. – 2 Oct.

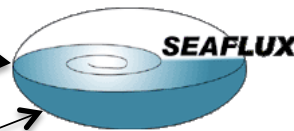
# Searching for consistency: GEWEX Integrated Products

Common Ancillary Data



Validation

BSRN



Validation

Buoys/Ships



Validation

Towers



+



Common Output w. Uncertainty

# Contributions to the WCRP Grand Challenges

**Provision of skillful future climate information on regional scales** The panel focuses on process studies at regional scales that would be essential to verify that the regional climate models are indeed capturing the key elements of each region's unique physics.

**Improved understanding of the interactions of clouds, aerosols, precipitation, and radiation and their contributions to climate**

**sensitivity** GDAP Integrated Product and science articles it plans to publish go directly to answering questions about these interactions. The data sets are made specifically to test co-variance of these parameters in the real world. This will be further strengthened under the PROES initiative.

**Past and future changes in water availability-** GDAP can help with past precipitation and current sensitivity to external forcings.

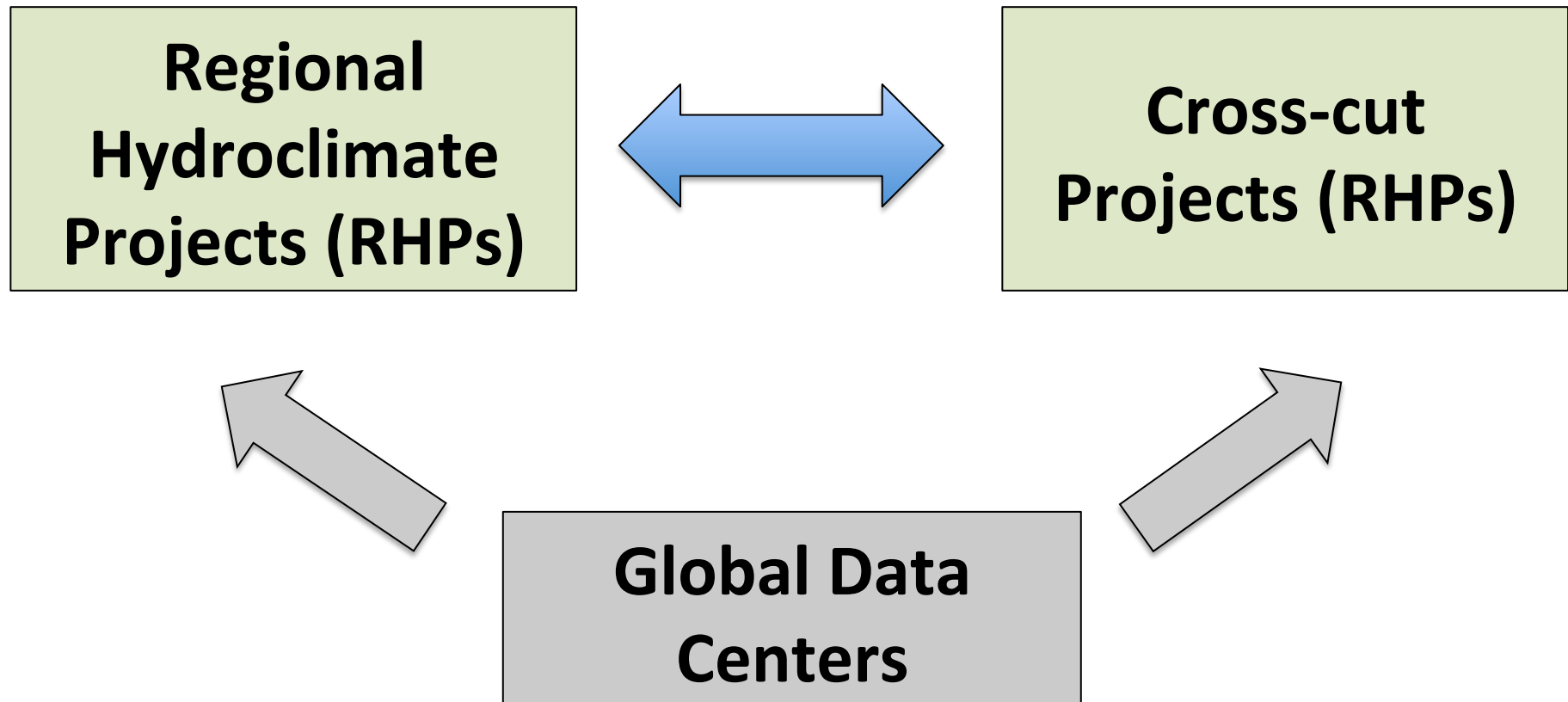
**Understanding and predicting weather and climate extremes** GDAP global products have been re-engineered to 1 degree, 3 hour resolution so that extremes and processes related to extremes may be seen in the data.



# Cooperation with other WCRP projects

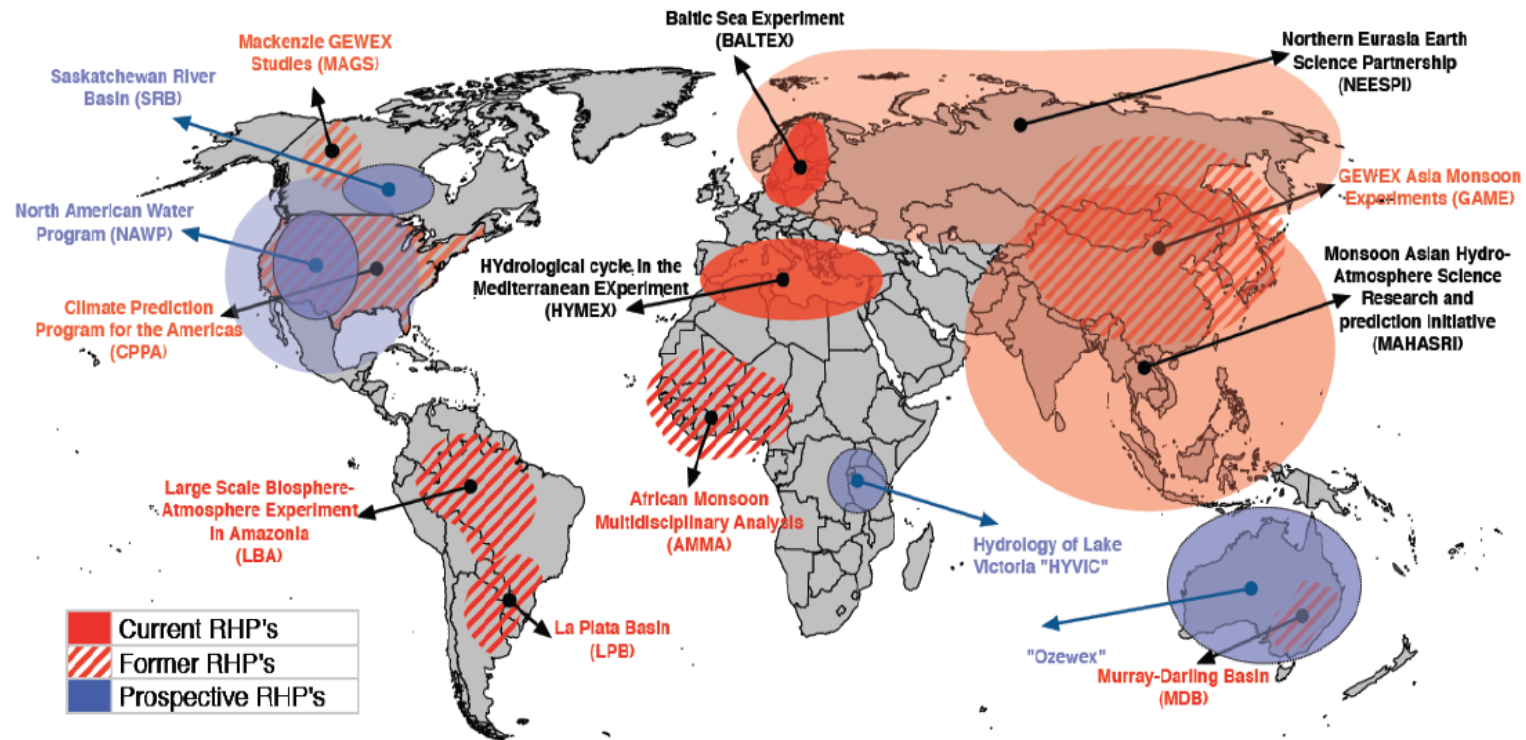
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- The SeaFlux product is being developed with input from the CLIVAR community and joint Workshops are being held.
- The SPARC community is being consulted about their evaluation of upper tropospheric humidity products to be integrated with the GDAP Water Vapor Assessment.
- Coordination with CLiC on high altitude W&E budgets is clearly desirable. Some options from SSG meeting.
- The LandFlux activity, while not coordinated with IGBP at the project level, is well coordinated at the working level as there is tremendous overlap in the researchers involved. Further coordination is not seen as helpful.



# GHP: Regional Hydroclimate Projects

## GEWEX REGIONAL HYDROCLIMATE PROJECTS



### Completed

MAGS, CPPA, GAME, LBA,  
LPB, MDB, AMMA, BALTEX

### Active

NEESPI, MAHASRI  
HyMEX, SaskRB

### Proposed

HYVIC, Baltic-Earth  
NAWP, OzEWEX

# GHP: Cross-cut Projects

- Push GEWEX grand science questions
- Cross-cut projects should also test and evaluate applications of the knowledge produced in RHPs.
- Keep completed RHPs involved
- CC projects are also a tool for collaboration with other GEWEX panels and WCRP projects.
- Generate interactions between RHPs
- A way for the broader Community to get involved in GEWEX/GHP.
- GHP calls for volunteers to propose and lead Cross-cut projects. Only a short proposal to the panel is needed.

# GHP and GEWEX science questions

GEWEX Science Questions		Regional Hydroclimate Projects					Cross-cut activities
		BALTEX-II	MAHASRI	NEESPI	HyMex	SaskRB	
<b>Observations and Predictions of Precipitation</b>	How well can precipitation be described?	y	y	y	y	y	Sub-daily precipitation
	How do changes in climate affect the characteristics?	y	y	y	y	y	High elevation precipitation
	How much confidence do we have in predictions?	y	y		y		Phase transition precipitation
<b>Global Water Resource Systems</b>	How do changes in the land surface and hydrology influence water resources?	y	y	y	y	y	
	How does climate change impact water resource systems?	y	y	y	y	y	Climate change and water resources
	How can new observations lead to improved management?		y			y	
<b>Changes in extremes</b>	Observing system requirements		y	y	y	y	Drought
	Modelling capabilities				y	y	
	Modelling processes involved in extremes				y	y	Seasonal Hydrologic prediction
	Improved early warning systems		y			y	Regional climate model evaluation
<b>Water and energy cycles</b>	Can we balance the budget at TOA?						
	Can we balance the budgets at the surface?				y		LSM validation and benchmarking
	Can we track the changes over time?				y		GDAP integrated product evaluation
	Can we relate changes and processes?						
	Cloud-aerosol-precipitation feedbacks						



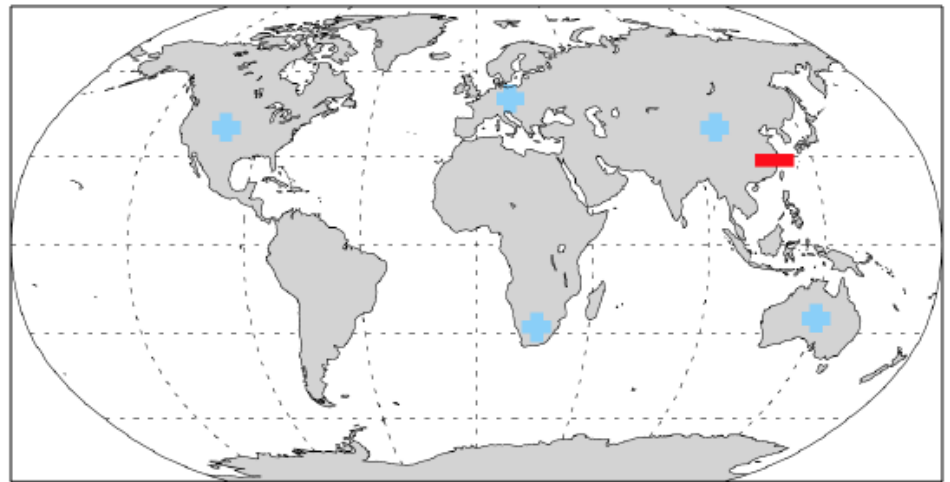
# GHP and GEWEX science questions

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		BALTEX-II	MAHASRI	NEESPI	HyMex	SaskRB	
Observations and Predictions of Precipitation	How well can precipitation be described?	y	y	y	y	y	Sub-daily precipitation
	How do changes in climate affect the characteristics?	y	y	y	y	y	High elevation precipitation
	How much confidence do we have in predictions?	y	y		y		Phase transition precipitation
Global Water Resource Systems	How do changes in the land surface and hydrology affect water resources?	y	y	y	y	y	Climate change and water resources
	How do changes in climate affect water resources?					y	
	How do changes in water resources affect climate?					y	
Changes in extremes	How do changes in climate affect extremes?					y	Drought
	How do changes in extremes affect climate?					y	Seasonal Hydrologic prediction
	Modelling processes involved in extremes				y	y	Regional climate model evaluation
	Improved early warning systems		y			y	LSM validation and benchmarking
Water and energy cycles	Can we balance the budget at TOA?						GDAP integrated product evaluation
	Can we balance the budgets at the surface?				y		
	Can we track the changes over time?				y		
	Can we relate changes and processes?						
	Cloud-aerosol-precipitation feedbacks						

Important contributions to WCRP Water availability GC & Extremes GC

# Sub-daily precipitation CC project

- GHP: Review of sub-daily precipitation covering observations and modelling with focus on extremes (subm. to Rev. of Geophysics)
- While only limited regions of the globe have been studied, most show an increase in sub-daily extreme rainfall over the last few decades (but with regional and seasonal variations)

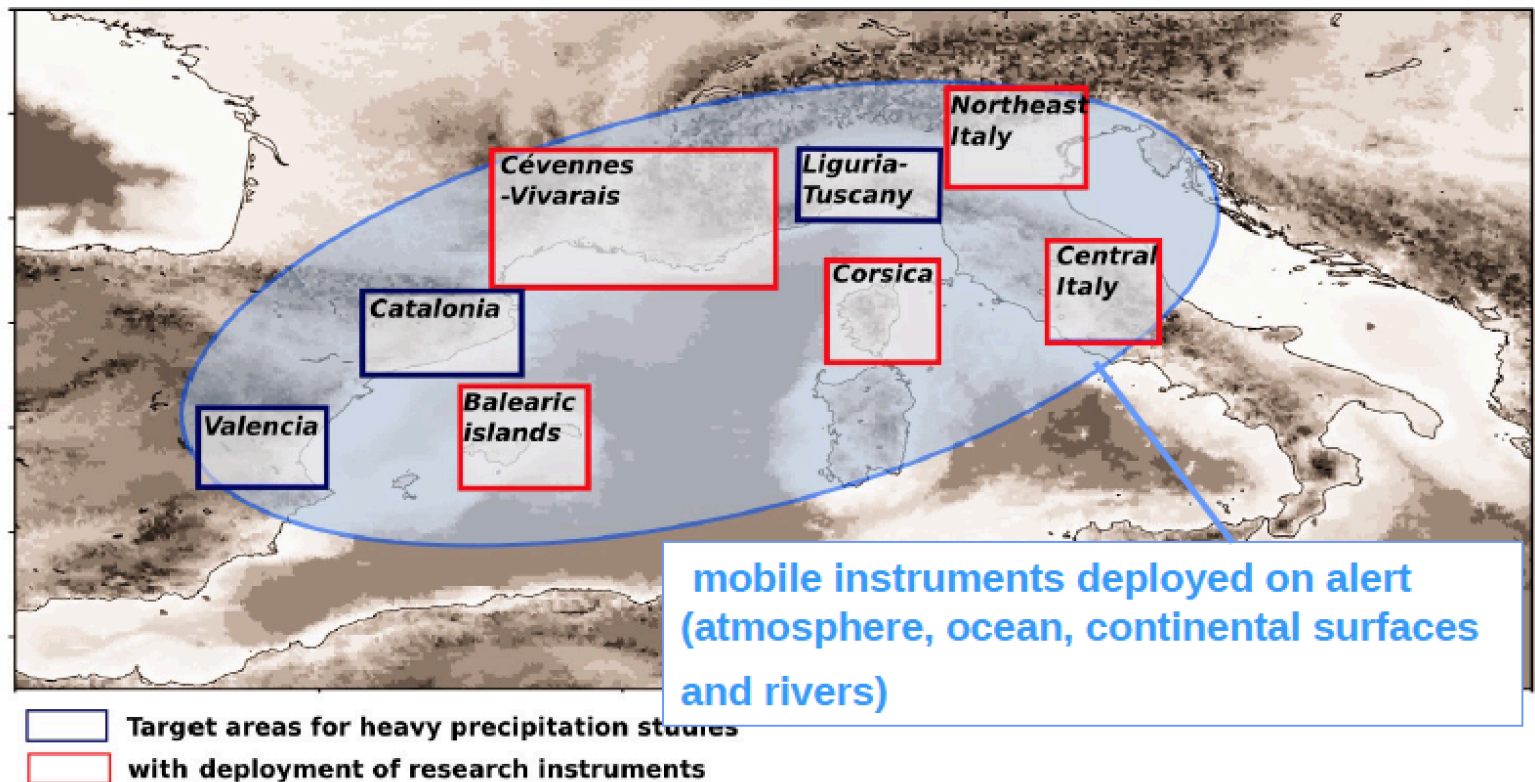


Regional trends in observed sub-daily extreme rainfall based on published studies

*(Westra et al., submitted)*

# RHPs: HYMEX

**SOP1 dedicated to heavy precipitation and floods in  
NorthWestern Mediterranean: 5 Sept. to 5 Nov. 2012**



**~200 instruments**

**~300 scientists in the field**

# GHP: Upcoming plans and meetings

- Parallel GHP-GDIS (Global Drought Information System) meeting in Pasadena with one joint day (December 10-13, 2014): Potential for interactions regarding regional drought projects (GDIS also planning first regional applications)
- Interactions with WGRC; first exchanges at Montevideo meeting; further discussions planned within PanGEWEX/Pan-CLIVAR meeting; high potential for interactions (e.g. within HyVIC, Hymex)
- Proposed new Soil-GEWEX initiative of relevance to GHP wrt integration of regional observatories (e.g. critical zone observatories, lysimeter measurement network)

# GHP: Conclusions

- GHP is an essential element in GEWEX's strategy to answer key questions on the energy and water cycle.
- The strategy to address GEWEX's scientific questions is through regional hydrometeorological projects and cross-cut activities.
- The regional focus of GHP also allows it to reach out to applications and transform our knowledge into actionable information.
- The panel has gone through a reorganization and is thus looking for volunteers and opportunities for:
  - Building new RHPs
  - Proposing cross cut projects

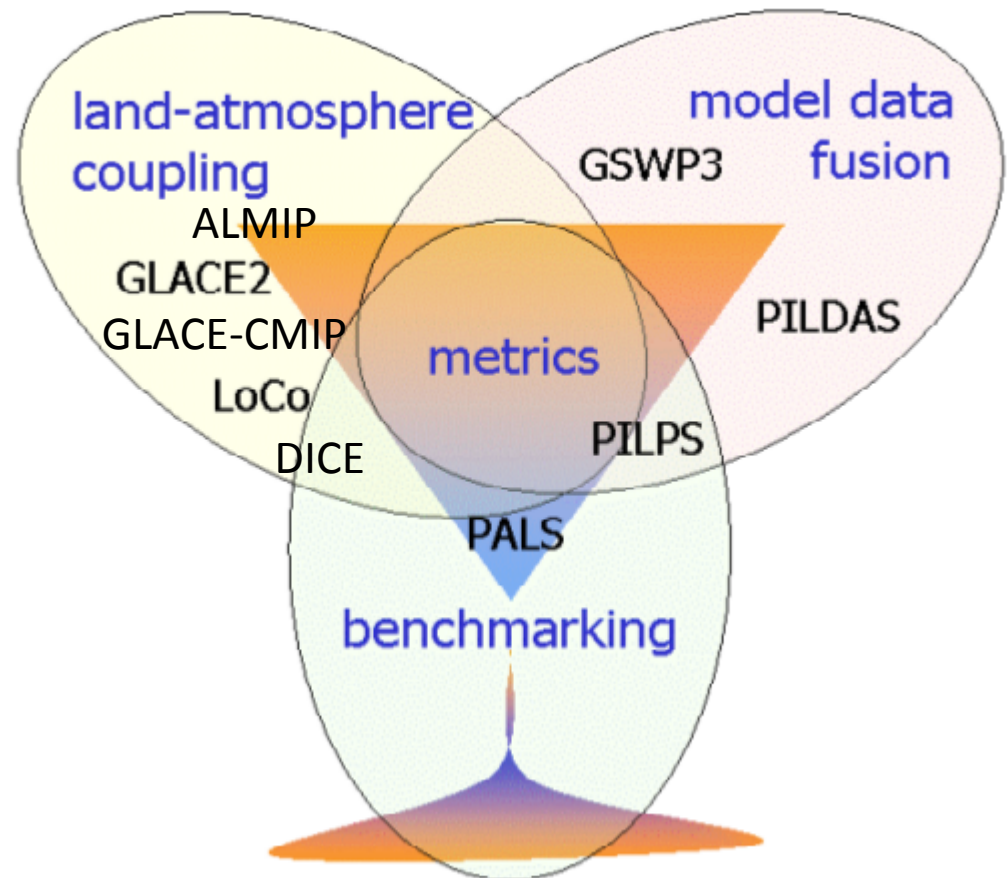


# Global Land-Atmosphere System Studies (GLASS)

The aim of GLASS is to promote community activities that improve:

1. our best estimates and the model representation of state variables
2. our understanding of land/atmosphere feedbacks
3. our understanding of the role of land surface in predictability.

To best achieve these aims, GLASS has been re-structured into three elements:



# On-going GLASS projects

- **GSWP3** – Links to carbon and impact communities
- **GLACE-CMIP** – Joint with ILEAPS
- **LoCo Working Group**
- **PALS/Benchmarking (PLUMBER)** – Links to GHP
- **DICE** – Joint with GASS
- **ALMIP2** – Links to GHP
- **PILDAS** – Links to WGNE
- **LUCID/LUCID2/LUMIP** – Links to iLEAPS

## Revising Forcing data for EXP1 (*long-term retrospective*)

### Dynamical Global Downscaling

- \* Spectral Nudging using GSM (Yoshimura and Kanamitsu, 2008)
- \* Single Ensemble Correction (Yoshimura And Kanamitsu, 2013)
- \* Vertically Weighted Damping (Hong and Chang, 2012)

### Two-pass Ensemble Bias Correction

- \* Non-parametric Daily Correction (Kim et al., in prep.)
- \* Parametric Monthly Correction (Watanabe et al., 2012)

**GSWP3  
EXP1  
Forcing**

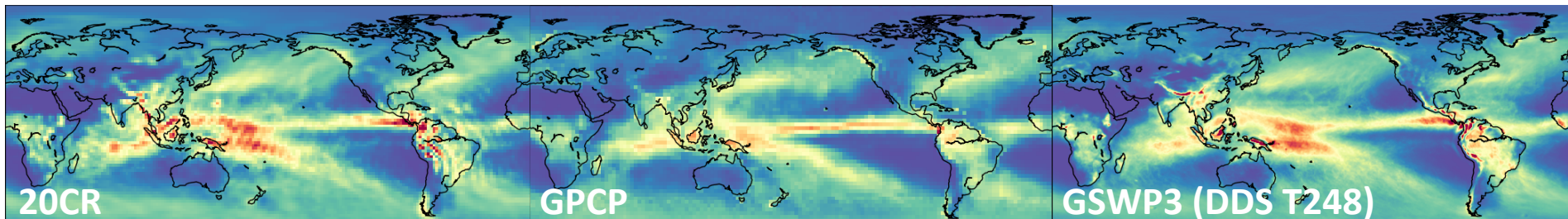
20CR (Compo et al., 2011)  
1901-2010 6hr /  $2^\circ \times 2^\circ$  (91x180)



Observations (Prcp: GPCC, GPCP,  
CPC-Unified; Tair: CRU; Rad.: SRB)



$0.5^\circ \times 0.5^\circ$   
1901-2010 3hr



### Schedule (2014)

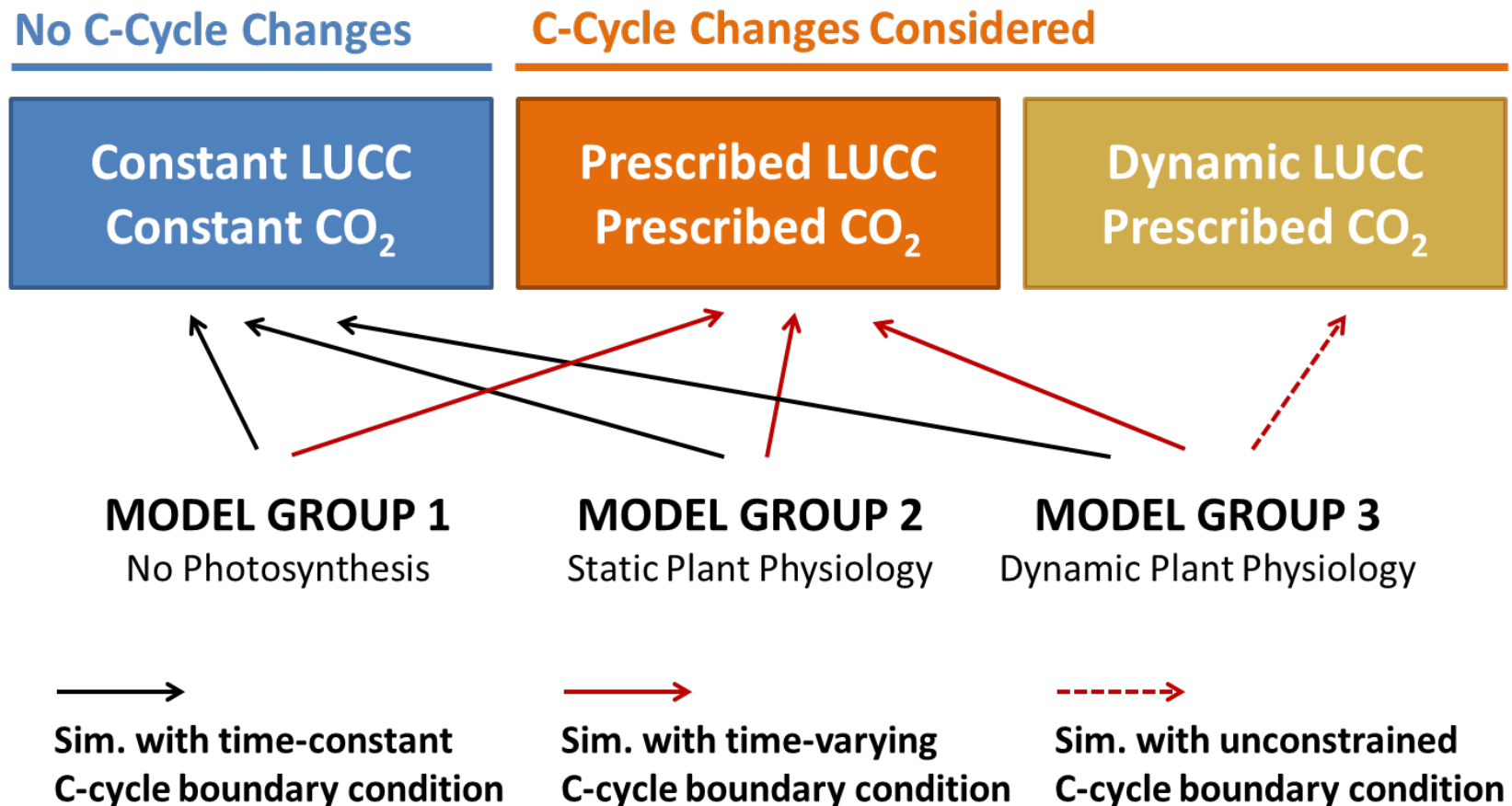
May : distributed EXP1 forcing

July : First preliminary results

December : EXP1 completed

(H. Kim, T. Oki, U. Tokyo)

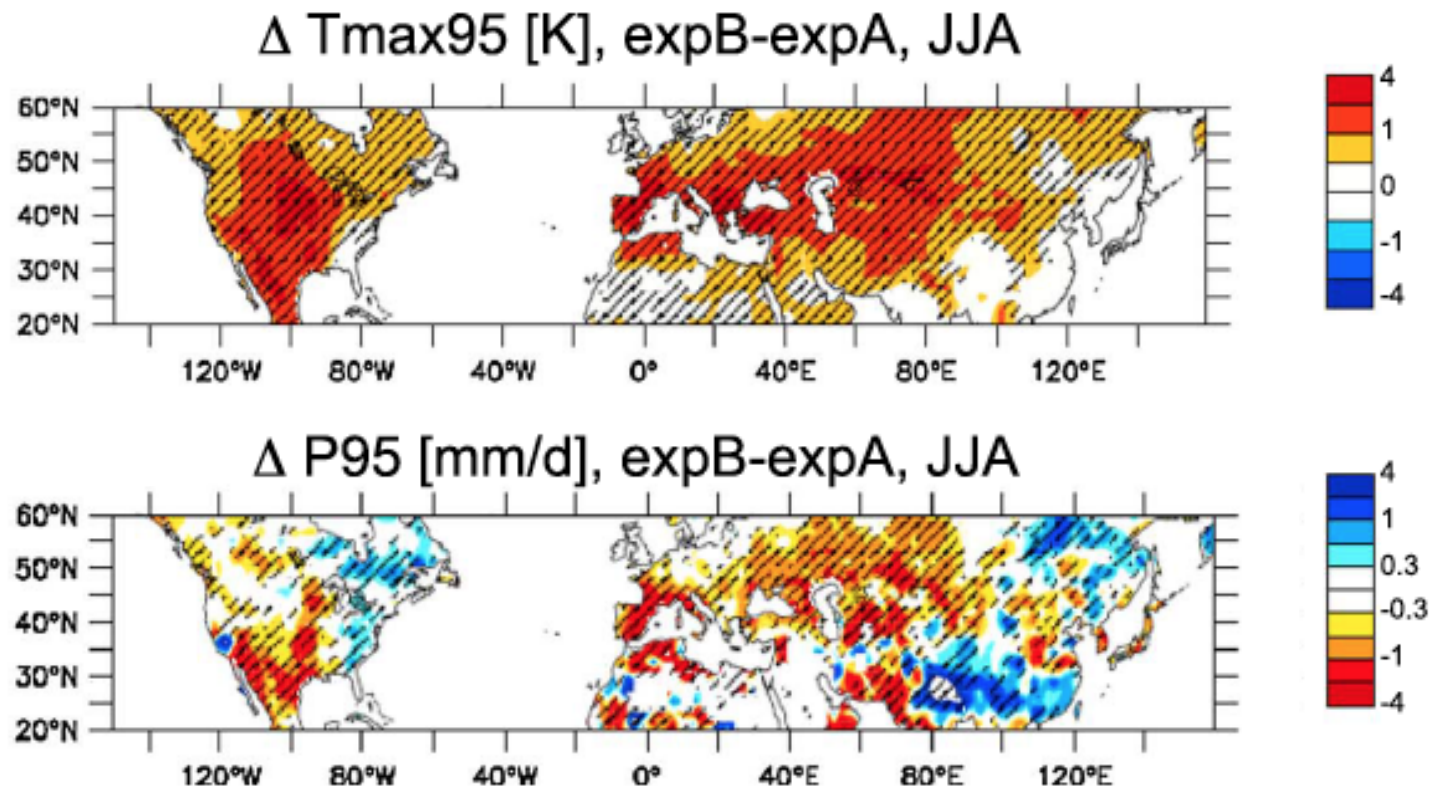
# Global Soil Wetness Project Phase 3 (GSWP3)



Possible consideration in context of CMIP6 (together with LUMIP)

# Global Land-Atmosphere Coupling Experiment-CMIP (GLACE-CMIP)

Contribution of mean soil moisture change to change in T and P extremes (late 21<sup>st</sup> century-late 20<sup>th</sup> century): GLACE-CMIP5



CMIP5 based analysis completed; participating models:  
MPI-ESM, CESM, IPSL, EC-EARTH, GFDL, (ACCESS)

*Seneviratne et al. 2013, GRL*



# LoCo Diagnostics

Results from dry/wet extremes show that the choice of LSM is critical for dry regimes, but that both PBL and LSM are comparable influences on the coupled behavior during wet regimes.

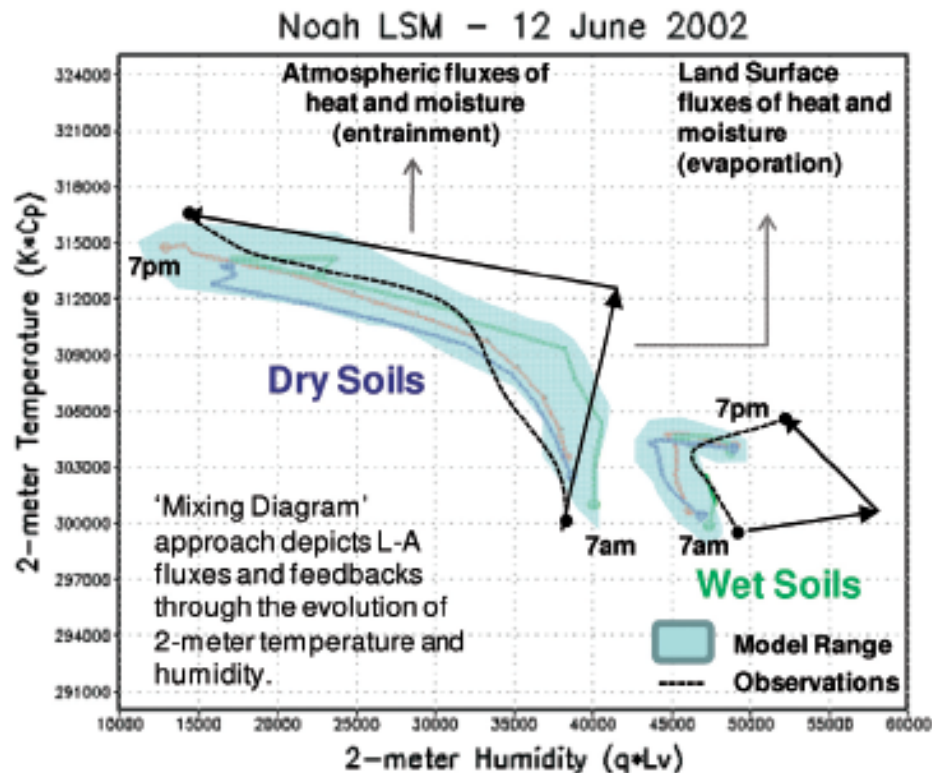


Fig. 1: The soil moisture influence on the coupled land-PBL system is significant, and can be captured using integrative metrics of water and energy states and fluxes. Results here are based on high-resolution mesoscale model (LIS-WRF) vs. observations, and show the interplay of soil moisture, ET, and PBL growth that is critical to capture in coupled models.

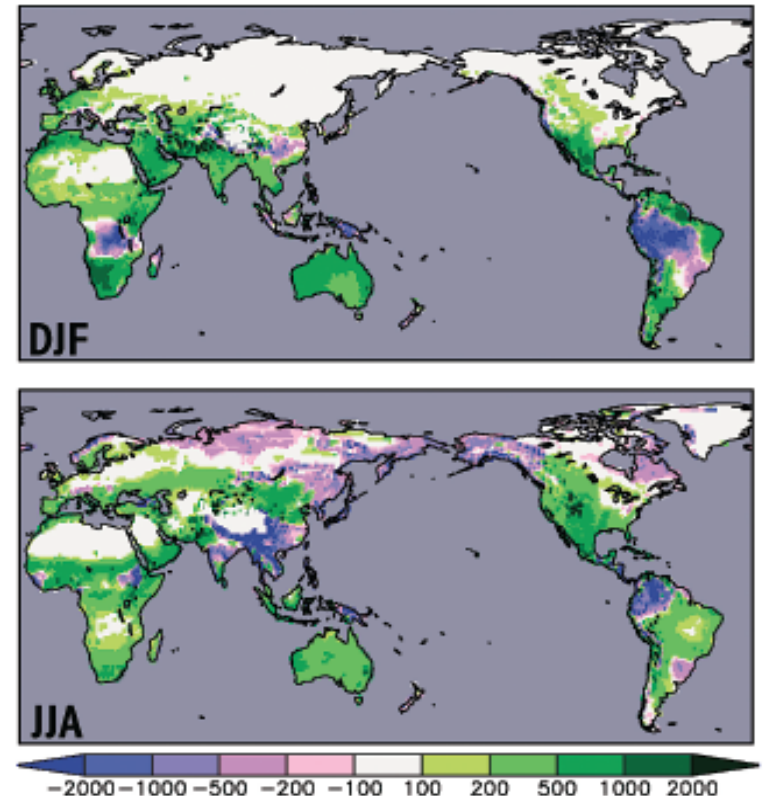
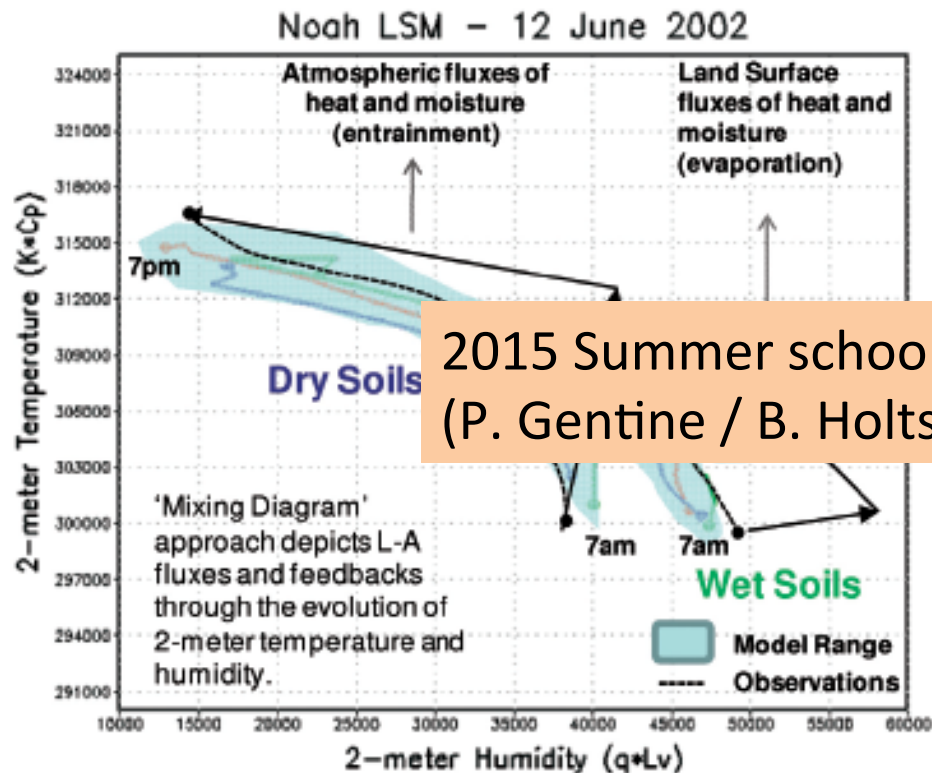


Fig. 2: 'Two-legged' metric depicting the combined strength of the soil moisture control on evapotranspiration and surface flux control on PBL growth, based on a 47-year simulation of the ECMWF GCM. Positive values indicate strong land surface and soil moisture contributions to the atmosphere.

# LoCo Diagnostics

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2015 Summer school planned  
(P. Gentine / B. Holtslag)

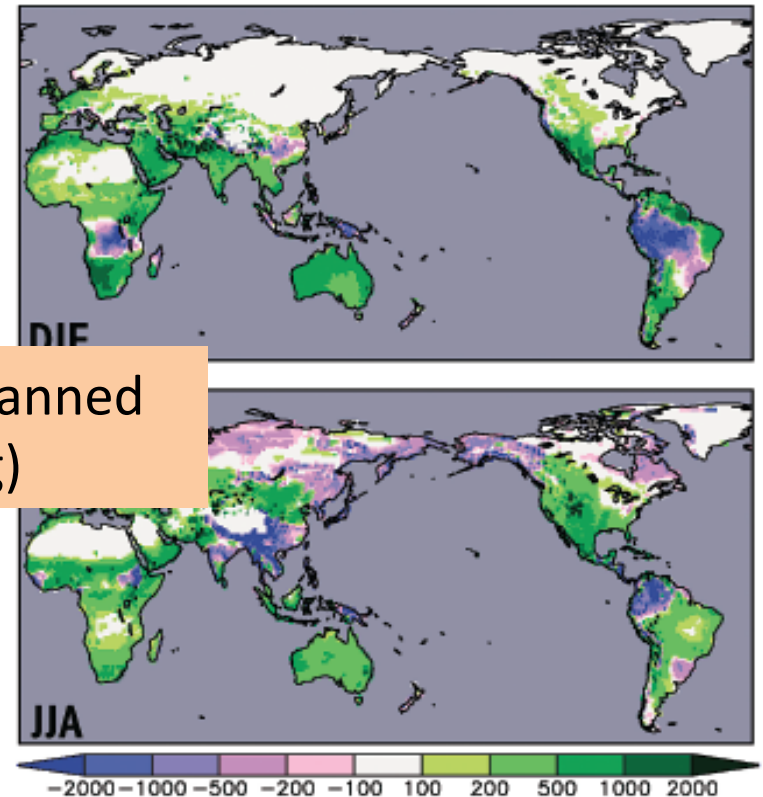


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# Protocol for the Analysis of Land Surface models (PALS)

**GOAL:** An online, automated land surface benchmarking tool. PALS provides standardised reference experiments – users download model driving data, upload simulations. PALS compares results to observational data, other model results and reference benchmarks. PALS provides a standardised testing environment for model comparisons and internal model development programs.



# JSC-34 Action items

## **Action 37**

To evaluate WCRP efforts on surface fluxes relative to the Action Plan developed by WOAP in consultation with across CLIVAR, GEWEX, WGNE, and SOLAS, as posted on the WCRP website. Core Projects to nominate representatives to surface flux discussion in early 2014. GEWEX and CLIVAR to consider joint session making scientific progress on surface fluxes at 2014 Pan-GEWEX/CLIVAR meetings. WDAC to include a specific agenda item on fluxes at its next session and seek ways to reinvigorate this effort.

Deadline: Report to JSC 35

Joerg Schultz (GDAP) is participating in WDAC and contributed to WDAC report

## **Action 48**

Request GEWEX Chair, the GDAP/GHP Chairs, and Organising Committee of the LAC Conference to ensure that the outcomes of the forthcoming (September 2013) GDAP/GHP meeting in Rio de Janeiro contribute to the successful conduct of the Montevideo LAC Conference. To request the GEWEX Panels to adjust agenda of the meetings in Rio to include issues of importance for LAC Conference.

Deadline: September 2013

High-altitude precipitation initiative grew out of Rio meeting

# JSC-34 Action items

## **Action 49**

Request GEWEX SSG to consider strengthening GEWEX SSG expertise and ways of expanding GEWEX activities in the domains of applications of climate knowledge in water resource management and research in the land-atmosphere interactions, near-surface hydrology, climate effects of subsurface topography/properties, etc.

Deadline: to report in advance of JSC-35

Addressed with: New SSG members (Seneviratne, Uilenjhoet) and planned new initiative “GEWEX-Soils” (to be discussed at Pan-GEWEX meeting)

# GEWEX Science Conference and PanGEWEX/PanCLIVAR meeting

## *Trending Now: Water*

7<sup>th</sup> International Scientific  
Conference on the  
Global Water and Energy Cycle

World Forum  
The Hague, The Netherlands  
14-17 July 2014



# GEWEX

Pan-GEWEX Meeting, 17-18 July 2014  
World Forum, The Hague

# GEWEX Science Conference

**1. Advancing climate system knowledge through new observations and field experiments**

Philippe Drobinski, Jeff Walker

**2. Advances in analysis of observations, reanalysis and model results to improve energy and water cycle processes**

Joerg Schulz, Mike Bosilovich, Mitch Moncrieff

**3. Modeling, predicting, and attributing climate extremes**

Gabi Hegerl, Adam Scaife, Sonia Seneviratne

**4. Observations and changes in climate extremes**

Xuebin Zhang, Ron Stewart, Olga Zolina

**5. Progress towards closing global and regional water and energy budgets**

Norm Loeb, Taikan Oki, Pete Robertson

**6. Progress and challenges for predicting monsoon precipitation**

Harry Hendon, Dave Gochis, Jun Matsumoto

**7. Characterizing, validating, and improving the water cycle in models**

Yukari Takayabu, Paul O'Gorman

**8. Analyzing, validating, and improving global precipitation products**

Robert Adler, George Huffman

**Water GC  
(Obs)**

**Extremes GC  
(Obs and modelling)**

**Water GC  
(Obs and modelling)**



**9. Use of climate information and predictions in hydrology and water resources management**

Eric Wood, Marc Bierkens, Jan Verkade

**10. Land Surface Model benchmarking and development**

Martin Best, David Lawrence, Eleanor Blyth

**11. The role of land parameters (and land cover change) on weather and climate prediction**

Shinjiro Kanae, Mike Ek, Andy Pitman

**12. High resolution hydrological processes, including sub-surface waters, in land surface models**

Taikan Oki, Paul Bates, Soroosh Sorooshian

**13. Modeling anthropogenic impacts of land-water-management in Land Surface Models**

Richard Harding, Justin Sheffield, Sue Grimmond

**14. Data-assimilation in land surface and hydrological models**

Rolf Reichle, Patricia deRosnay

**15. Biosphere, water, carbon, and the climate system**

Markus Reichstein, Steven Stitch

**16. New satellite observations for water cycle research and their utility in Land Surface Model development**

Jay Famiglietti, Xin Li, Dai Yamazaki

Land surface  
and  
hydrological  
modelling

Land-  
atmosphere  
interactions

Water GC

**18. Hydrology of high elevation areas**

John Pomeroy, Richard Essery, Ma Yaoming

→ Cryosphere GC

**19. Land precipitation and drought: observations, modeling, errors and uncertainty**

Remy Roca, Olga Zolina, Vincenzo Levizzani

→ **Extremes GC  
(Droughts)**

**20. Cloud to rainfall transitions - Linking multi-parameter observations to processes and models**

Chris Kummerow, Bjorn Stevens, Jay Mace, Hugh Morrison, Ben Shipway

**21. The coupling of clouds, precipitation, and radiation to the large-scale circulation**

Sandrine Bony, Chris Bretherton

**22. Improving the representation of precipitation, cloud, and radiation processes in atmospheric models**

Jon Petch, Robert Pincus, Steve Woolnough

Clouds,  
Circulation,  
and CS GC

**23. Improving the understanding and modeling of the land-atmosphere interface**

Paul Dirmeyer, Bert Holtzlag, Adrian Lock, Joe Santanello

→ **Land-atmosphere  
interactions**



# Pan-GEWEX meeting

**Thursday afternoon, July 17: Pan-GEWEX Plenary**

## **Cross-Cutting Pan-GEWEX topics, “new themes”**

**Question to be addressed: New challenges and potential for stronger interactions across communities**

14:00-14:10: Introduction (Stephens, Seneviratne)

14:10-14:20: WCRP future and plans: The role of GEWEX (David Carlson)

14:20-14:30: GEWEX as a contribution to NASA Earth Sciences [Jack Kaye/Jared Entin (TBC), NASA], 10 minutes

14:30-15:30: 2 parallel themes: (20mn+20mn invited talks, 20 min discussion led by discussion leaders)

### 1) **High-resolution modelling**

Invited speakers: Roy Rasmussen, Pier-Luigi Vidale

Discussion leads: Steve Klein, Jon Petch

### 2) **Land use and land cover modeling within CMIP6 (LUCID, LUMIP, GSWP3)**

Invited speakers: George Hurtt, Nathalie de Noblet-Ducoudré

Discussion leads: Dave Lawrence, Aaron Boone

15:30-16:00: Coffee break

# Pan-GEWEX meeting

16:00-17:00: 2 parallel themes (20mn+20mn invited talks, 20 mn discussion)

3) Water isotopes

Invited speakers: David Noone, Huub Savenije

Discussion leads: Jason Evans, Bart van den Hurk

4) Carbon-water cycle interactions

Invited speakers: Philippe Ciais, Christian Frankenberg

Discussion leads: Eleanor Blyth, Markus Reichstein

17:00-18:00: 1 theme (20mn+20mn invited talk, 20mn discussion)

5) Surface energy and water balances

Invited speakers: Martin Wild, Justin Sheffield

Discussion leads: Joerg Schulz, Carlos Jimenez

18:00-18:10 Closing words (Seneviratne, Stephens)

**Discussion leads to prepare presentation and short report on discussions to be presented at SSG meetings on Saturday**

# Pan-GEWEX meeting

**Friday morning, July 18: Pan-GEWEX / Pan-CLIVAR plenary**

## **Plenary 8h00-13h30**

8h00-8h05: Introduction (L. Goddard, S. Seneviratne)

8h05-8h10: GEWEX overview (S. Seneviratne, G. Stephens)

8h10-8h15: CLIVAR overview (L. Goddard, D. Stammer)

1st discussion block: Regional climate and extremes (10+5mn for each speaker): Chairs: S. Seneviratne, D. Stammer

8h20-8h50: Regional climate projects, activities and challenges (C. Goodess, J. Polcher)

8h50-9h20: Modeling and observing changes in Extremes (X. Zhang, L. Alexander)

9h20-9h50: Drought (T. Oki, S. Schubert)

9h50-10h20: Heavy precipitation (R. Adler, J. Evans)

10h20-10h30: Final discussion

10h30-11h00: Coffee break

2<sup>nd</sup> discussion block: Large-scale circulation, predictability, and air-sea fluxes (10+5mn for each speaker): Chairs: L. Goddard, G. Stephens

11h00-11h30 Air-Sea Fluxes (S. Gulev, CA Clayson)

11h30-12h00 Monsoons (P. Webster, A. Turner)

12h00-12h30 Circulation and climate dynamics (T. Schneider, M. Collins)

12h30 -13h15 Seasonal to decadal variability and predictability (P. Dirmeyer, F. Doblas Reyes, Y. Kushnir)

13h15-13h25: Final discussion

13h25-13h30: Closing words (D. Stammer, G. Stephens)

**Discussion leads to prepare a short report on the discussions, which will be discussed at the joint GEWEX-CLIVAR SSG meeting on Saturday morning**

# Pan-GEWEX meeting

## **Saturday, July 19: SSG meetings**

8h30h-10h00: *Joint GEWEX and CLIVAR SSG meeting*

8h30-8h40: Monsoons: Goddard, Stephens

8h40-8h50: Extremes: Seneviratne, Stammer

8h50-9h00: Regional climate information: Goodess, Polcher, Goddard

9h00-9h10: S2S prediction/predictability: Stephens, Hawkins

9h10-9h20: Surface fluxes: Kummerow, Gulev

9h20-9h30: Sea level GC: Stammer, Stephens

9h30-10h00: General discussion

10h00-10h30: Coffee break



# Pan-GEWEX meeting

10h30-13h: GEWEX SSG meeting

10h30-11h20: *Reports and discussion on “new themes” discussions from Pan-GEWEX meeting*

10h30-10h40: High-resolution modelling: Petch, Klein

10h40-10h50: LULCC modeling: Lawrence, Boone

10h50-11h00: Water isotopes: Evans, van den Hurk

11h00-11h10: Carbon-water cycle interactions: Blyth, Reichstein

11h10-11h20: Surface energy and water balances: Schulz, Jimenez

11h20-11h40: Discussion

11h40-12h20: *Reports from GEWEX Panels (10mn each)*

11h40-11h50: GASS: Petch, Klein

11h50-12h00: GDAP: Kummerow, Schulz

12h00-12h10: GHP: Evans, Polcher

12h10-12h20: GLASS: Boone, Santanello

12h20-12h50: Other updates on potential new activities (Seneviratne, Stephens)

12h50-13h00: Wrap-up (next SSG meeting, varia)

# Conclusions

GEWEX involves a dynamic and active community:

- Large contributions to WCRP GCs (in particular Water availability GC and Extremes GC, but also to Clouds, circulation and climate sensitivity GC, Cryosphere GC, Regional information GC, and potentially Sea level GC)
- Varied and in-depth work on land-atmosphere interactions (observations and modeling), and overall water and energy cycle research
- Interactions with other WCRP bodies (mostly CLIVAR, CliC, WGSIP, WGCM, WGNE, WGRC) as well as other programs (e.g. IGBP / ILEAPS, WMO)
- New initiatives (HiRES, PROES, GEWEX-soils, high-lat precip,...) are designed to enhance project cross cuts.