CW3E Atmospheric River Colloquium Summer School

Overview and Perspective
WSWC-CDWR S2S Workshop

Will Chapman[1,2]

1. Scripps Institution of Oceanography, University of California at San Diego, La Jolla Ca
2. Center for Western Weather and Water Extremes, UCSD, La Jolla Ca

2016 International Atmospheric Rivers Conference

Scripps Institution of Oceanography - La Jolla, California

8th – 11th August 2016

http://cw3e.ucsd.edu/ARconf2016

Many regions face either drought or flood, or are challenged by regional water management issues. Recent advances in atmospheric sciences and hydrology have identified the key role of atmospheric rivers (AR) in determining the distribution of strong precipitation events in midlatitudes. Combined with related phenomena, warm conveyor belts (WCB) and tropical moisture exports (TME) (Fig. 1), the frequency, position and strength of ARs determines the occurrence of many water extremes. This conference brings together experts across atmospheric, hydrologic, oceanic and polar science, water management and civil engineering to advance the science and explore needs for new information.

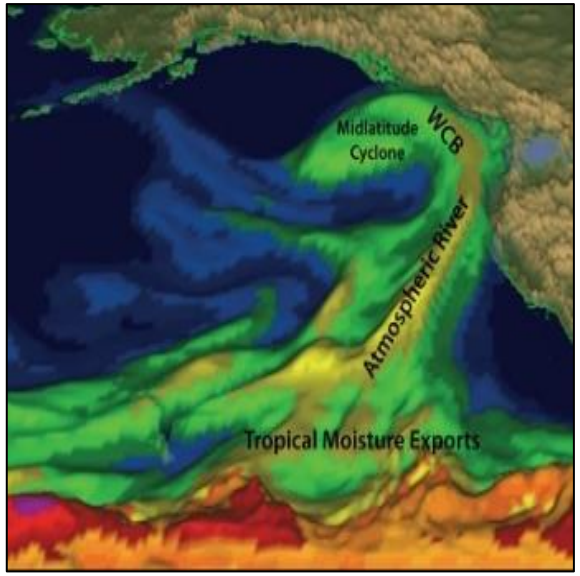


Fig. 1. Depiction of an atmospheric river, interacting with West Coast mountains. Credit: Adapted from NOAA/ESRL Physical Sciences Div. Source: EOS Meeting Report

Center for Western Weather and Water Extremes

Conference Goals

- Evaluate the current state and applications of the science of the mid-latitude atmospheric water cycle, with particular emphasis on ARs and associated processes (e.g., WCB and TME)
- Discuss differing regional perspectives
- Assess current forecasting capabilities
- Plan for future scientific and practical challenges

International organizing committee

Allen White (*NOAA ESRL/PSD; Co-Chair*)
Irina Gorodetskaya (*K.U. Leuven, Belgium; Co-Chair*)
Andrew Martin (*CW3E, Scripps; Co-Chair*)
Maximiliano Viale (*Universidad de Chile; Co-Chair*)
Mike Dettinger (*USGS, CW3E*)
David Lavers (*Scripps Inst. Oceanography/CW3E*)
Nina Oakley (*Desert Research Institute*)
F. Martin Ralph (*Scripps Inst. Oceanography/CW3E*)
Jonathan Rutz (*U. S. National Weather Service*)
Ryan Spackman (*Science and Technology Corporation*)
Heini Wernli (*ETH Zurich*)

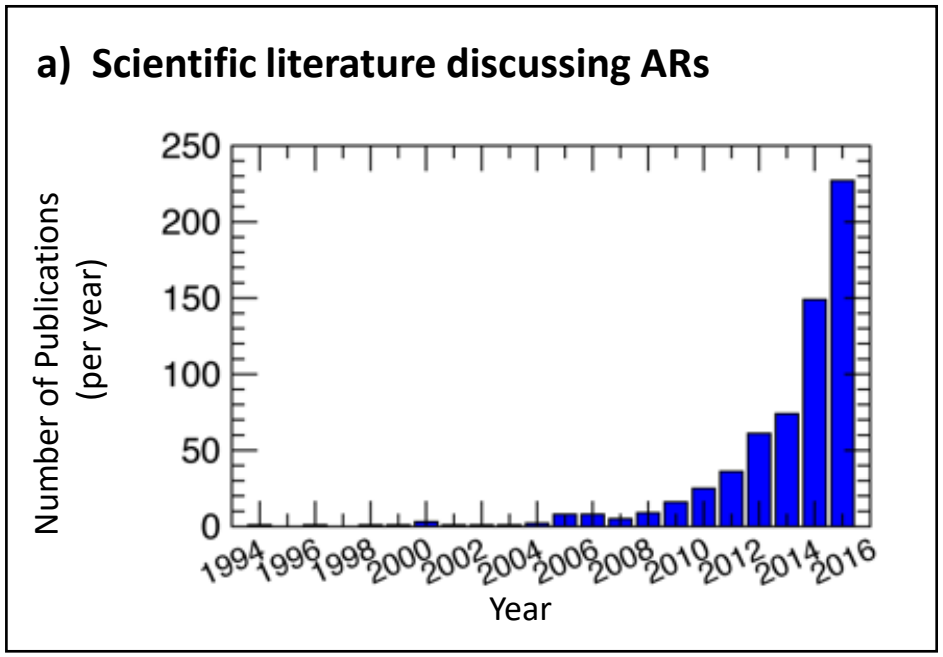
The conference will be held at the beautiful oceanfront venue of the Robert Paine Scripps Forum for Science, Society and the Environment located at the Scripps Inst. of Oceanography, Univ. of CA – San Diego.

Contributions for the 2016 Conference are now invited

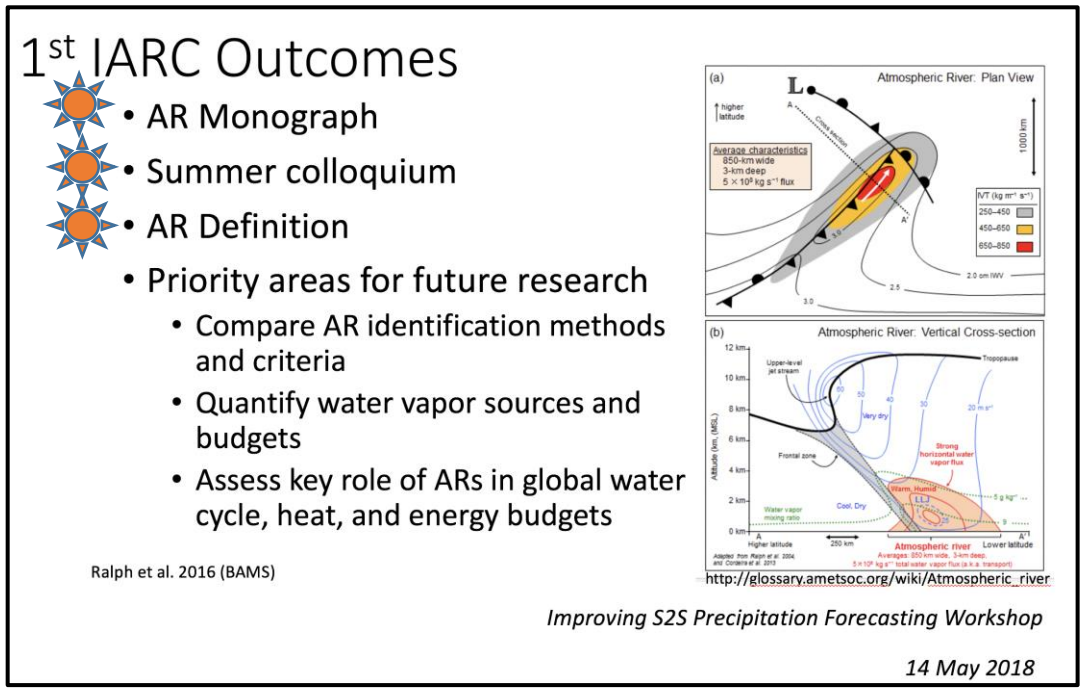
For further information or to submit an abstract, please contact:
Mike Dettinger (mddettin@usgs.gov) or
Mary Tyree (mtyree@ucsd.edu)

1st International Atmospheric Rivers Colloquium and Student Workshop

Recent advances in atmospheric sciences and hydrology have identified the key role of ***Atmospheric Rivers*** (ARs) in determining the distribution of strong precipitation events in mid-latitudes.

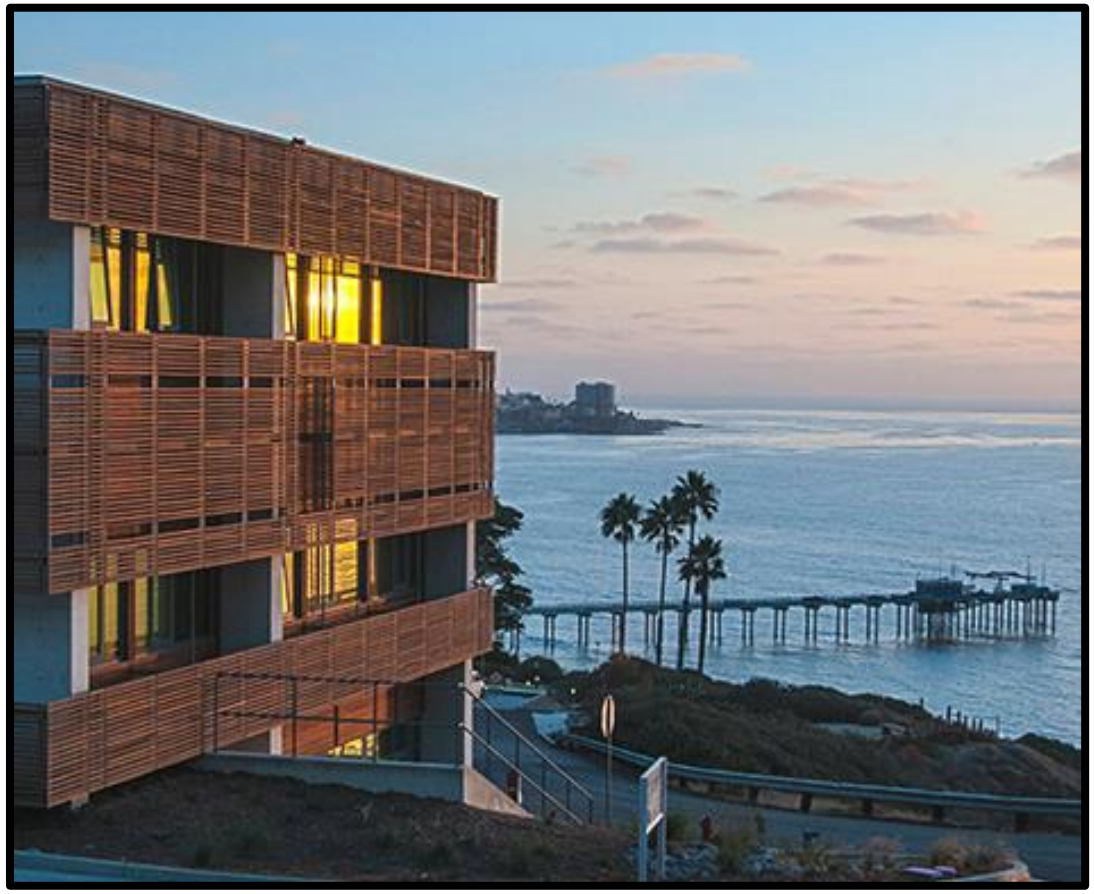


Ralph et al. 2016 (BAMS)



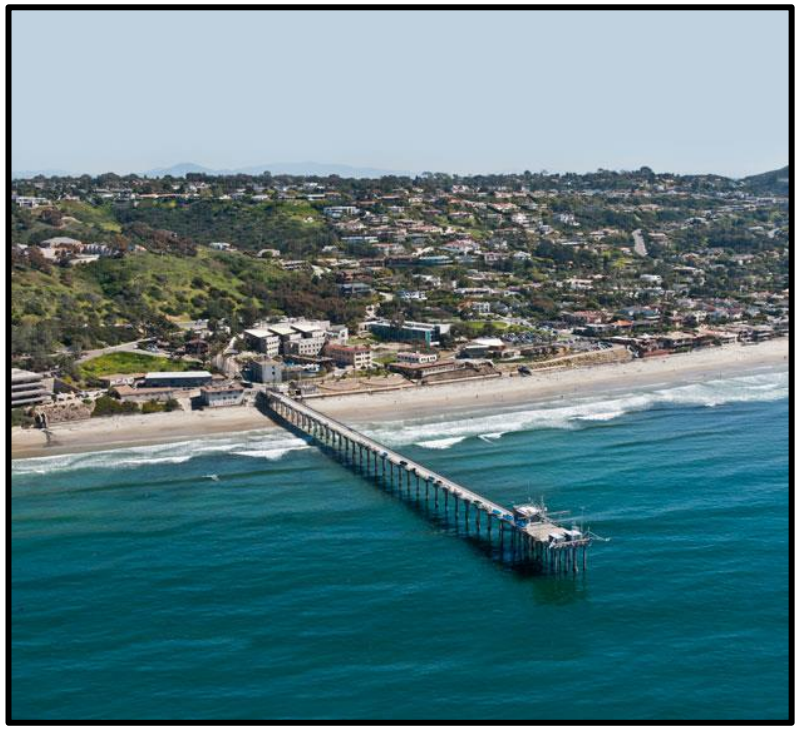
Goal:

To provide the next generation of atmospheric scientists with an in depth look at the cutting edge techniques in understanding, monitoring, and predicting atmospheric rivers (ARs) and their associated high-impact weather, **using the AR monograph** that is in preparation as a framework. To achieve this goal, the colloquium summer school will bring a diverse group of students together, at different stages in their education and with experience in various disciplines relevant to ARs, to learn from an international group of scientists studying ARs.



What/When/Where

- Atmospheric River Colloquium (~50 folks [Faculty, Researchers, Post-Docs, Students])
- June 24th – July 5th, 2019
- Scripps Institution of Oceanography – UCSD La Jolla, Ca.



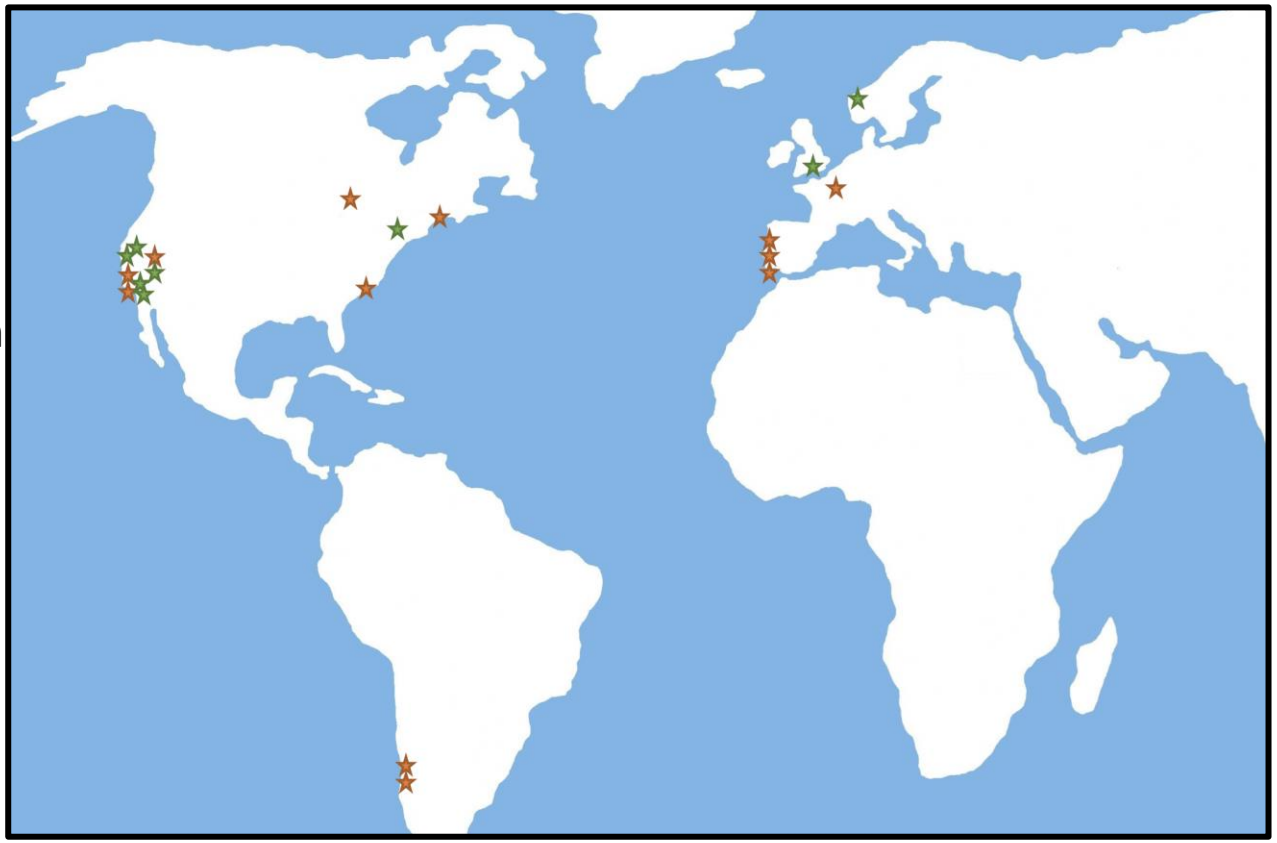
– International Steering Committee –

- Christoph Boehm (University of Cologne - Student)
- Diego Campos (University of Chile; Dirección Meteorológica de Chile - Student)
- Will Chapman (Scripps Inst. Oceanography/CW3E - Student)
- Irina Gorodetskaya (University of Aveiro)
- Jason Cordeira (Plymouth State University)
- Rene Garreaud (University of Chile)
- Ashley Payne (University of Michigan)
- F. Martin Ralph (Scripps Inst. Oceanography/CW3E)
- Alexandre M. Ramos (University of Lisbon)
- Jonathan Rutz(NOAA National Weather Service Western Region)
- Carolina Viceto (University of Aveiro - Student)
- Anna M. Wilson(Scripps Inst. Oceanography/CW3E)

The steering committee that is organizing the colloquium summer school is composed of an international group of instructors and student representatives. The steering committee solicited input from students who attended the 2nd International Atmospheric Rivers Conference (IARC) and the Student Forecasting Workshop that followed.

– 17 International Instructors –

Irina Gorodetskaya (University of Aveiro)
Jason Cordeira (Plymouth State University)
Rene Garreaud (University of Chile)
Ashley Payne (University of Michigan)
Jeanine Jones (CDWR)
F. Martin Ralph (Scripps Inst. Oceanography/CW3E)
Alexandre M. Ramos (University of Lisbon)
Jonathan Rutz(NOAA National Weather Service Western Region
David Lavers (ECMWF – U.K.)
Sasha Gershunov (Scripps Inst. Oceanography/CW3E)
Mike Dettinger (USGS - Water Resources Mission Area)
Bill Neff (CIRES – Colorado)
Hans Christian Steen-Larsen (University of Bergen)
Sarah Aarons (Scripps Inst. Oceanography/CW3E)
Duane Waliser (Jet Propulsion Laboratory)
Andy Martin (Portland State University)
Larry Schick (USACE retired)
Lance Bosart (SUNY Albany)



– 30 International Students –

<u>Home Continent: (count)</u>

North America: (13)

South America: (3)

Europe: (10)

Asia: (4)

The colloquium offers an opportunity to provide the next generation of scientists in atmospheric and hydrologic areas an in depth look at the cutting edge techniques in understanding, monitoring, and predicting ***Atmospheric Rivers*** and their associated high impact weather, taught by a diverse group of international collaborators.

Topics / Schedule

- Subseasonal to Seasonal Prediction
- Teleconnections
- Atmospheric River Dynamics
- AR Hydrology
- Tracking, Modeling and Forecasting
- Impacts
- Future Climate

Atmospheric Rivers Colloquium Summer School (24 June - 5 July 2019) (V8)

	8.30-10.00	10.00-10.30	10.30-12.00	12.00-13.00	13.00-14.30	14.30-15.00	15.00-16.30	Afternoon
24 June – Mon					Registration & Welcome	Break	Introduction	Icebreaker
25 June - Tues	AR definition (Marty)	Break	Tracking of ARs (Jon, Ashley)	Lunch	ARs Recon & Obs (David, Marty, Anna, Irina)	Break	ARs Recon & Obs (David, Marty, Anna, Irina)	
26 June - Wed	Hydrology (David, Mike, Rene)	Break	Hydrology (David, Mike, Rene)	Lunch	Climate (**Past**) (Jon, Ashley, Larry)	Break	**projects introduction**	
27 June - Thu	Forecast (14-d) (Jon, David)	Break	Polar/teleconnections (Irina, Bill)	Lunch	Polar/teleconnections (Irina, Bill)	Break	**project**	
28 June - Fri	Impacts (Jon, Alex, Rene)	Break	Impacts (Jon, Alex, Rene)	Lunch	Isotopes & Lagrangian (Hans, Alex)	Break	**project**	Beer afternoon
29 June - Sat	Pier Visit and radiosonde	NWS visit	NWS visit					Dinner
30 June -Sun								
1 July - Mon	Atmos Dynamics (Lance, Jay)	Break	Atmos Dynamics (Lance, Jay)	Lunch	WRF Modeling (Andy)	Break	**project**	
2 July - Tue	S2S (Duane, Jeanine)	Break	Ops - & Eng (Jeanine, Marty, Larry)	Lunch	Ops - & Eng (Jeanine, Marty, Larry)	Break	**project**	
3 July - Wed	Aerosol & Chemistry (Kim, Andy, Sarah)	Break	Climate (**Present**) (Alex, Sasha, ??)	Lunch	Climate (**Future**) (Duane, Alex)	Break	**project**	Beer afternoon
4 July - Thu				Barbecue				
5 July - Fri	Students presentations	Break	Students presentations	Lunch	Students presentations	Break	Final Remarks & Feedback	

Topics / Schedule

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  Prediction
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						reak	projects introduction	
						reak	project	
						reak	project	Beer afternoon
								Dinner
						reak	project	
						reak	project	
						reak	project	Beer afternoon
						reak	Final Remarks & Feedback	

The colloquium summer school agenda will allow students to interact with the leaders in AR science, gaining hands-on experience as well as participating in specially crafted lecture sessions. Outcomes for participants will include improved understanding of

(1) the fundamental dynamics and physics associated with ARs, including their role in the water cycle and impacts in different regions across the globe;

(2) the techniques to detect, observe, model, and forecast ARs at all relevant time scales, including in future climate scenarios; and

(3) applications of AR science to water management, engineering, and hazard resilience.

Projects

The structure of each day of the colloquium summer school will contain expert-led classroom lectures and hands on exercises, **with students participating in a small-group targeted project with the goal of advancing the current science and connecting students through research**.

Atmospheric River Colloquium

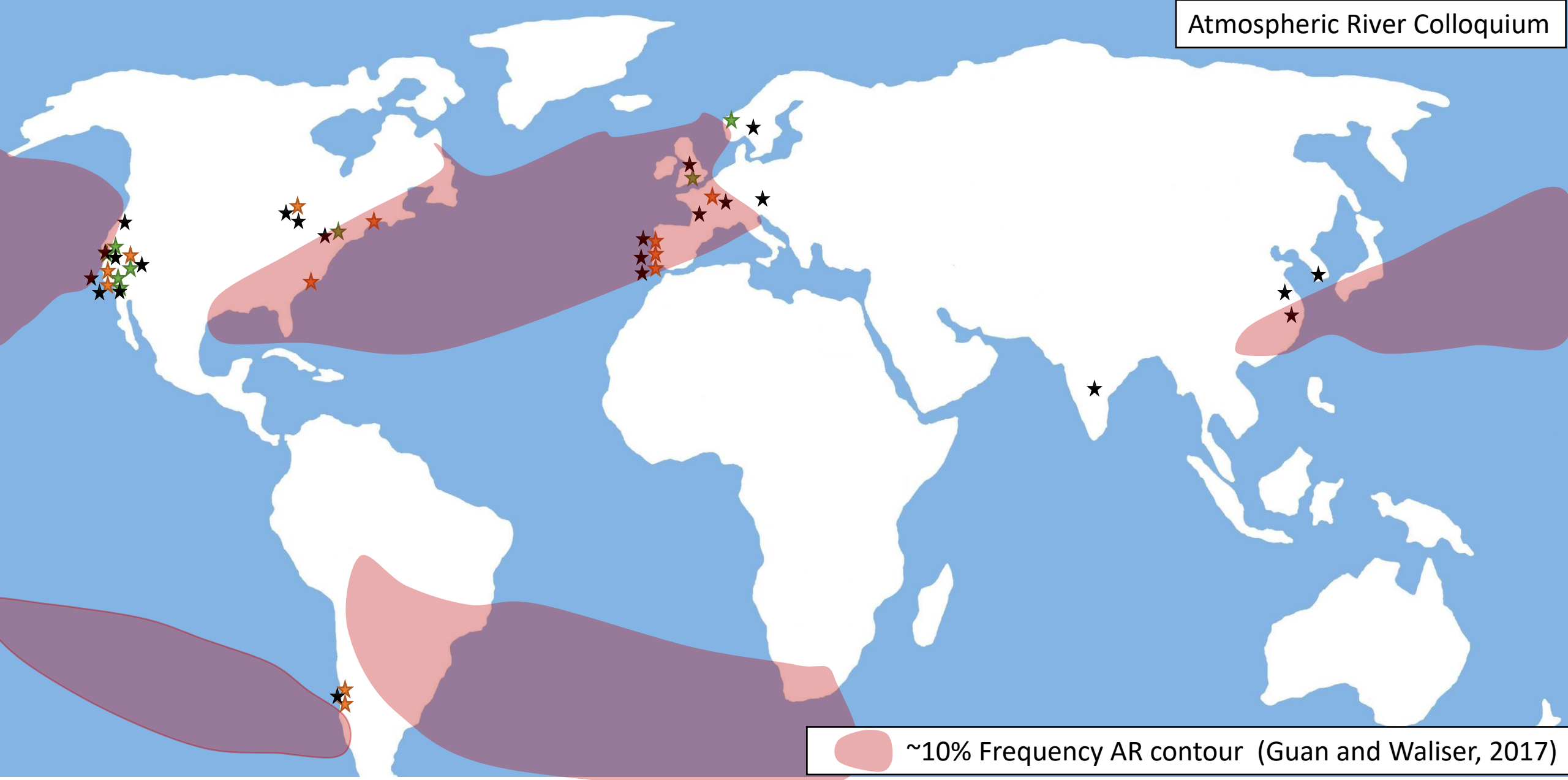
*Steering Committee

Atmospheric River Colloquium

★Instructors, ★Steering Committee

Atmospheric River Colloquium

★Students, ★Instructors, ★Steering Committee



*Students, *Instructors, *Steering Committee

Thank You.

Thank you to the USACE for helping to sponsor this event.

Center for Western Weather and Water Extremes
SCRIPPS INSTITUTION OF OCEANOGRAPHY AT UC SAN DIEGO

2019 Atmospheric River Colloquium Summer School

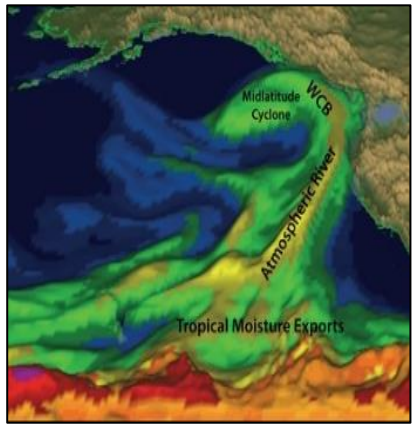
Scripps Institution of Oceanography, La Jolla

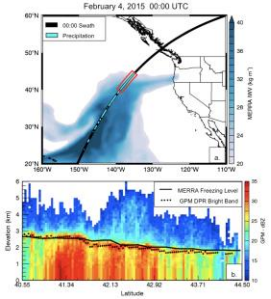
24th June – 5th July, 2019

Registration Deadline: April 15, 2019

http://cw3e.ucsd.edu/ar_colloquium_2019

Recent advances in atmospheric sciences and hydrology have identified the key role of ***Atmospheric Rivers*** (ARs) in determining the distribution of strong precipitation events in mid-latitudes. The colloquium offers an opportunity to provide the next generation of scientists in atmospheric and hydrologic areas an in depth look at the cutting edge techniques in understanding, monitoring, and predicting ***Atmospheric Rivers*** and their associated high impact weather, taught by a diverse group of international collaborators.





2019 Atmospheric River Colloquium Summer School

- The colloquium will allow students to interact with a group of international lecturers, experts in AR science, participating in specially crafted lectures as well as gaining hands-on and practical experience via projects.
- Outcomes will include improved understanding of **(1)** the dynamics and physics associated with ARs, including their role in the water cycle and regional impacts across the globe; **(2)** the techniques to detect, observe, model, and forecast ARs at all relevant time scales, including future climate scenarios; and **(3)** applications of AR science to water management, engineering, and hazard resilience.

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The colloquium summer school will be held at Scripps Inst. of Oceanography; University of California at San Diego. ***Attendees are expected to participate in colloquium lunch discussions. Food will be available for purchase on campus.***

SCRIPPS INSTITUTION OF OCEANOGRAPHY
UC San Diego

Applications are now open
http://cw3e.ucsd.edu/ar_colloquium_2019

Students and early Post-Docs are invited to attend. Scholarships are available.

For further information, please contact:
Anna Wilson anna-m-wilson@ucsd.edu or
Alexandre Ramos amramos@fc.ul.pt