

FIRO 2016 Workshop: Opening Remarks

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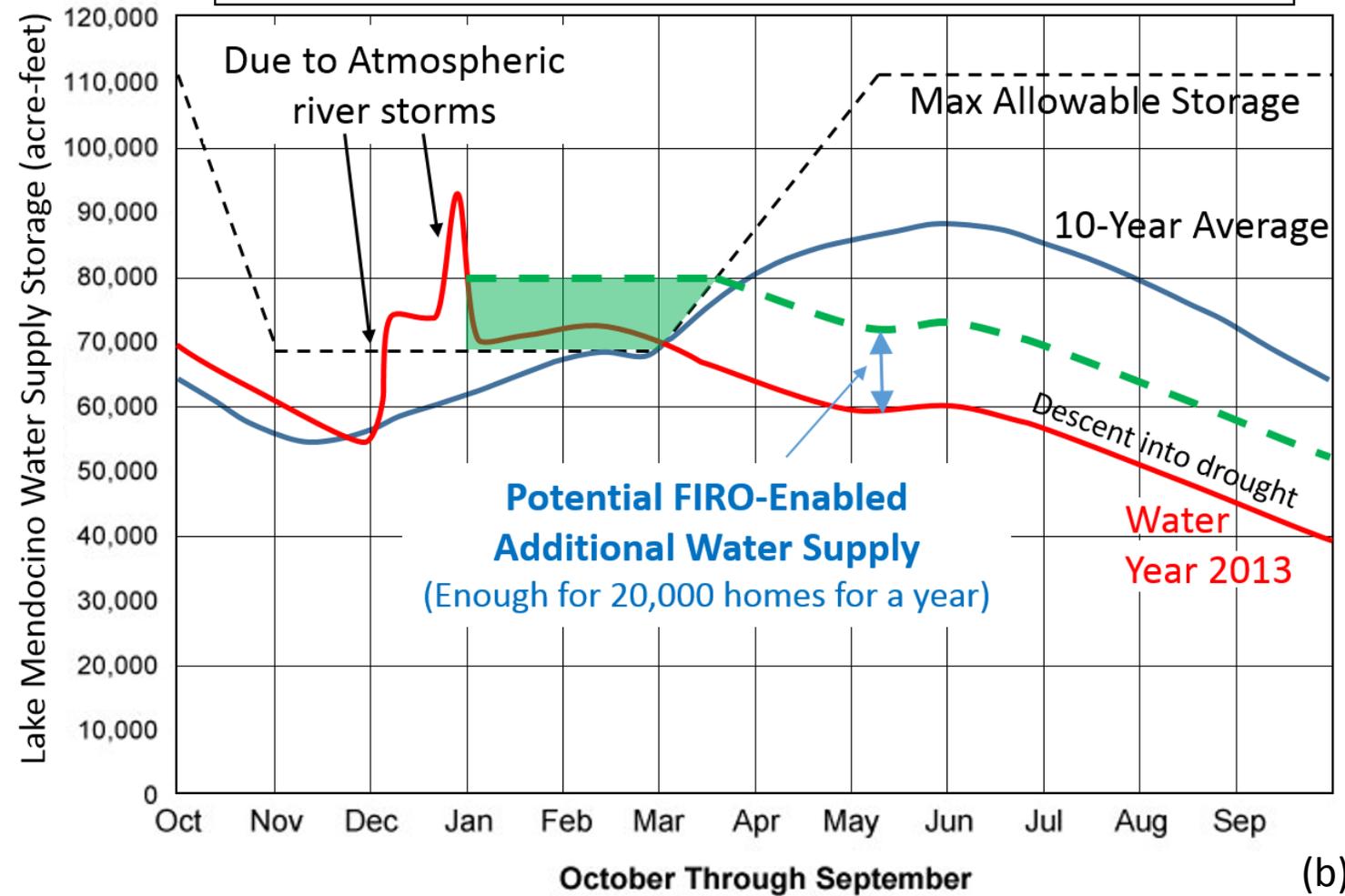
June 2016, La Jolla, CA



(a)

Forecast-Informed Reservoir Operations Concept

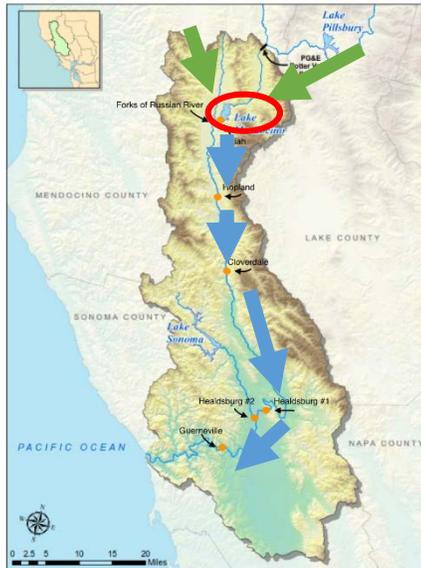
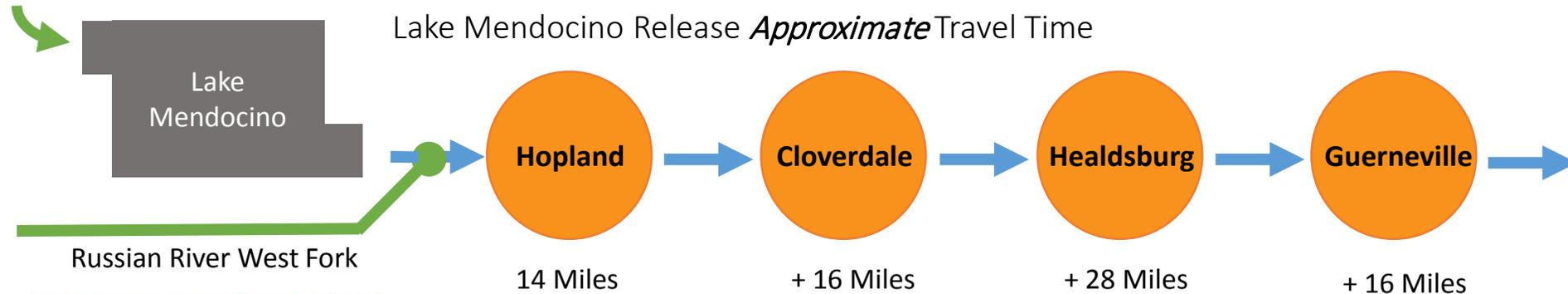
Hypothetical estimate of extra water retained unless an atmospheric river storm is predicted to hit the watershed; requires reliable AR prediction at 5-day lead time



(b)

How much forecast lead time is required to enable FIRO on Lake Mendocino?

10,000 AF could be released at 2500 cfs, which would take **2 days**



Total travel time ranges from 26hrs to 85hrs depending on flow rate (74miles traveled)*

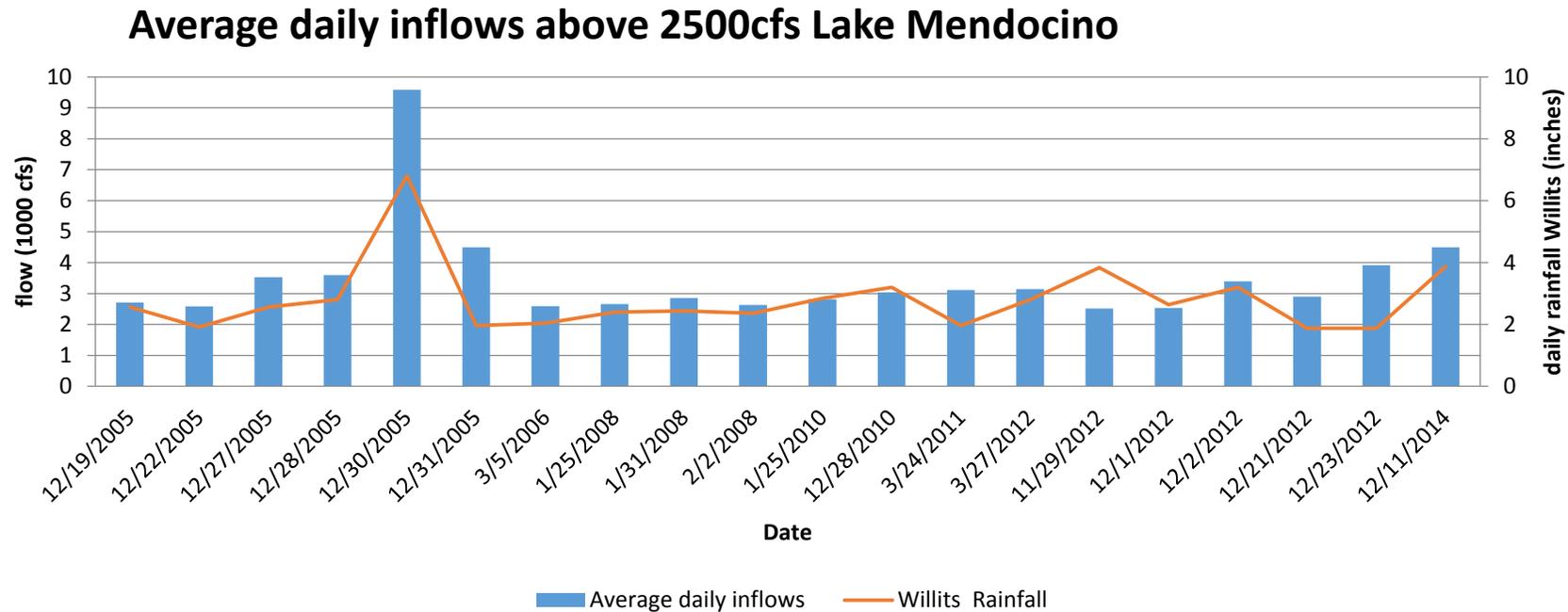
Bottom Line: It takes 2 days to release 10,000 AF at 2500 cfs, plus 1.1 to 3.5 days for water released from Lake Mendocino to get past vulnerable communities downstream. In situations this would be needed, travel times will be on the short end of range.

- This sets a forecast lead time requirement of 3-5 days to predict landfalling atmospheric rivers.

*Uses information from Coyote Valley Dam and Lake Mendocino Water Control Manual (1986)



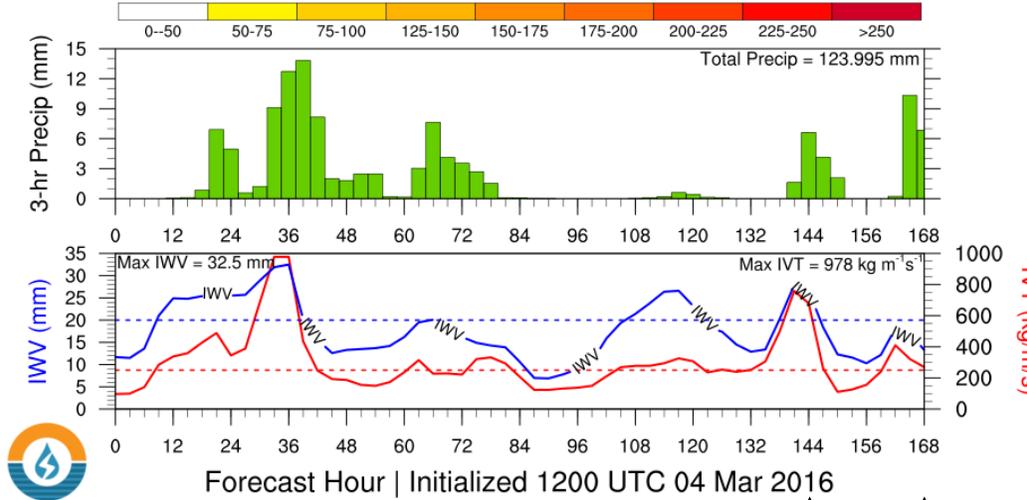
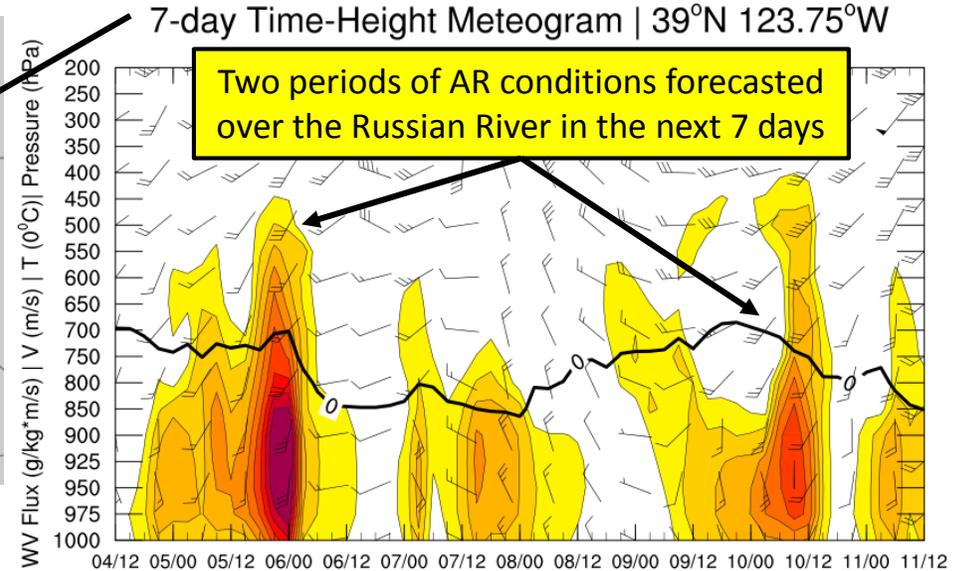
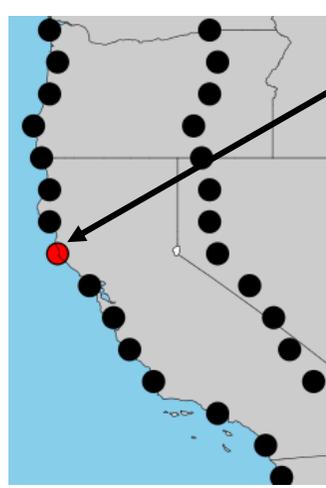
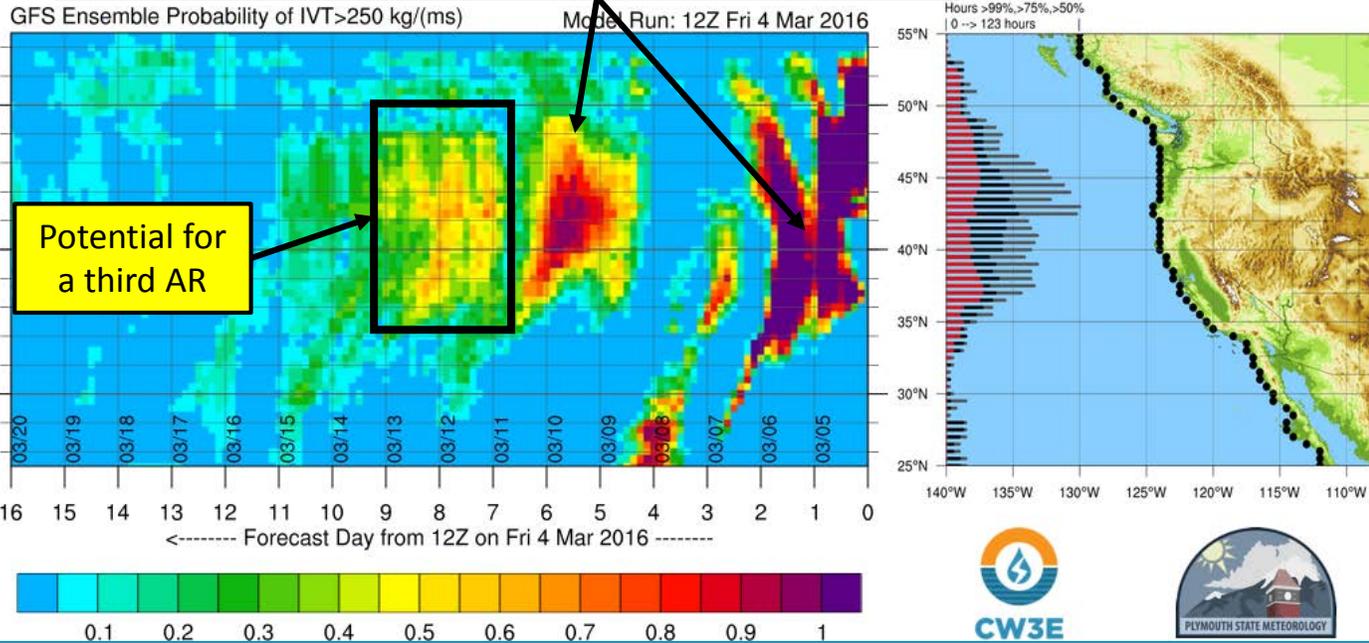
High Flows into Lake Mendocino and Willits daily rainfall – Requires 2” or more in 24hrs



AR Forecast Tools

- Two ARs forecasted over the Russian River using the AR Landfall Tool and 7-day Meteograms
- Strong AR forecasted with high confidence at 6-7 day lead time
- AR Landfall tool shows potential for an AR at 7-9 day lead time
- Timing of landfall conditions based on AROs was within 6 hours of forecasted time for all three events

GFS Ensemble showed high confidence of two periods of AR conditions over the Russian River in the next 7 days



CW3E UCSD Scripps CW3E; Contact B.Kawzenuk/M. Ralph

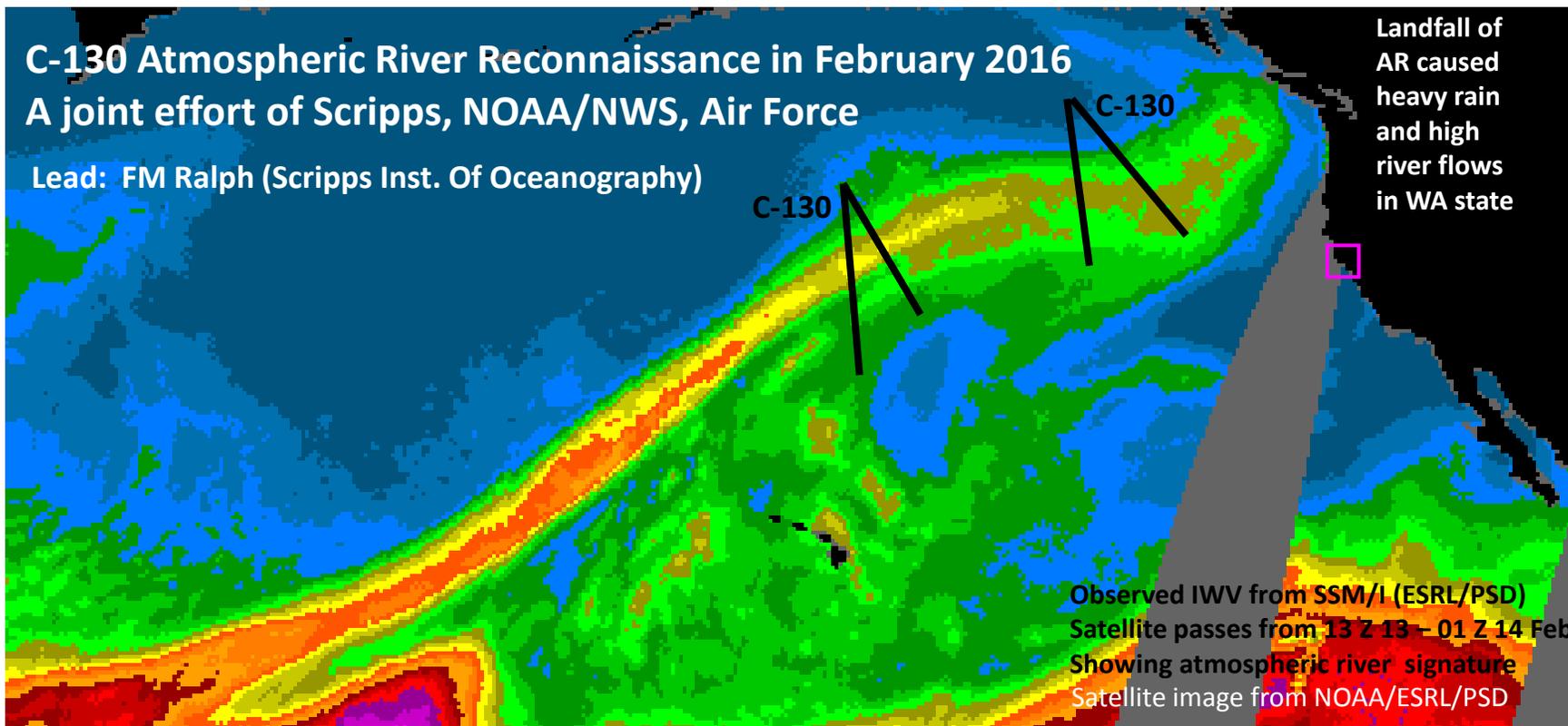
6-7 day lead time



C-130 Atmospheric River Reconnaissance in February 2016

A joint effort of Scripps, NOAA/NWS, Air Force

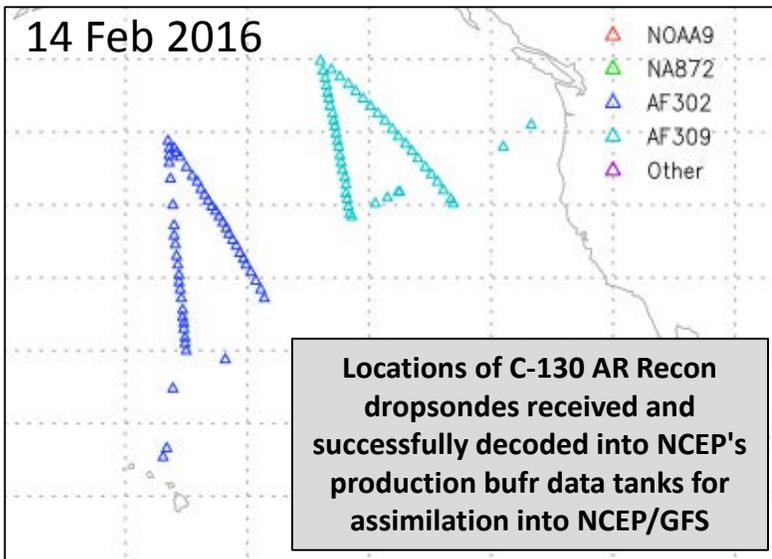
Lead: FM Ralph (Scripps Inst. Of Oceanography)



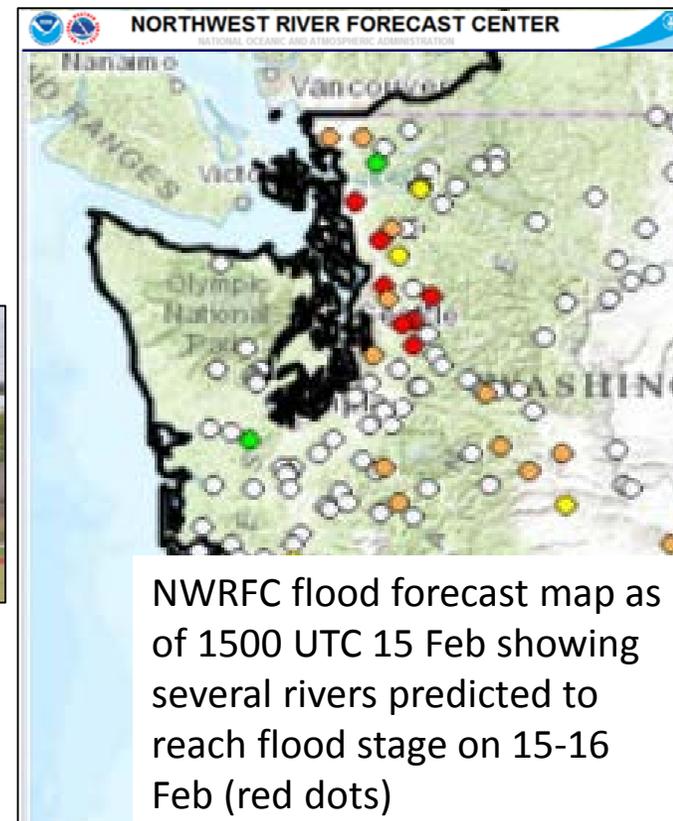
Center for Western Weather and Water Extremes

1st C-130 AR Recon Mission
13-14 Feb 2016

Dropsondes released for the
0000 UTC 14 Feb 2016
GFS data assimilation window



<http://www.emc.ncep.noaa.gov/cmb/stokes/drops/maps/>





2016 International Atmospheric Rivers Conference

Scripps Institution of Oceanography - La Jolla, California
8th – 11th August 2016

CW3E.UCSD.EDU

<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.

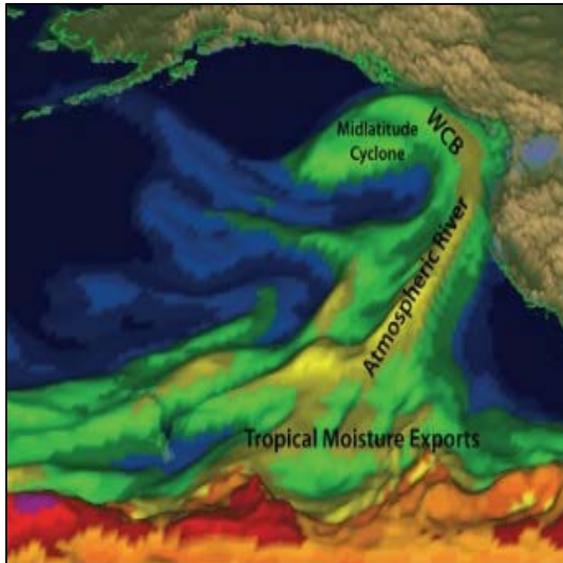


Fig. 1. Depiction of an atmospheric river, interacting with West Coast mountains. Credit: Adapted from NOAA/ESRL Physical Sciences Div. Source: EOS Meeting Report

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, Netherlands; *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:

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Mary Tyree (mtyree@ucsd.edu)



Center for Western Weather
and Water Extremes



FIRO Science Task Group - Members

- **Marty Ralph group co-lead (Scripps)**
- **Cary Talbot group co-lead (USACE/ERDC)**
- Mike Anderson (DWR)
- David Boughton (NOAA)
- Levi Brekke (USBR)
- Mike Dettinger (USGS)
- Alan Flint (USGS)
- Lorrie Flint (USGS)
- Josh Fuller (NOAA)
- Pat Rutten (NOAA)
- Robin Webb (NOAA)

