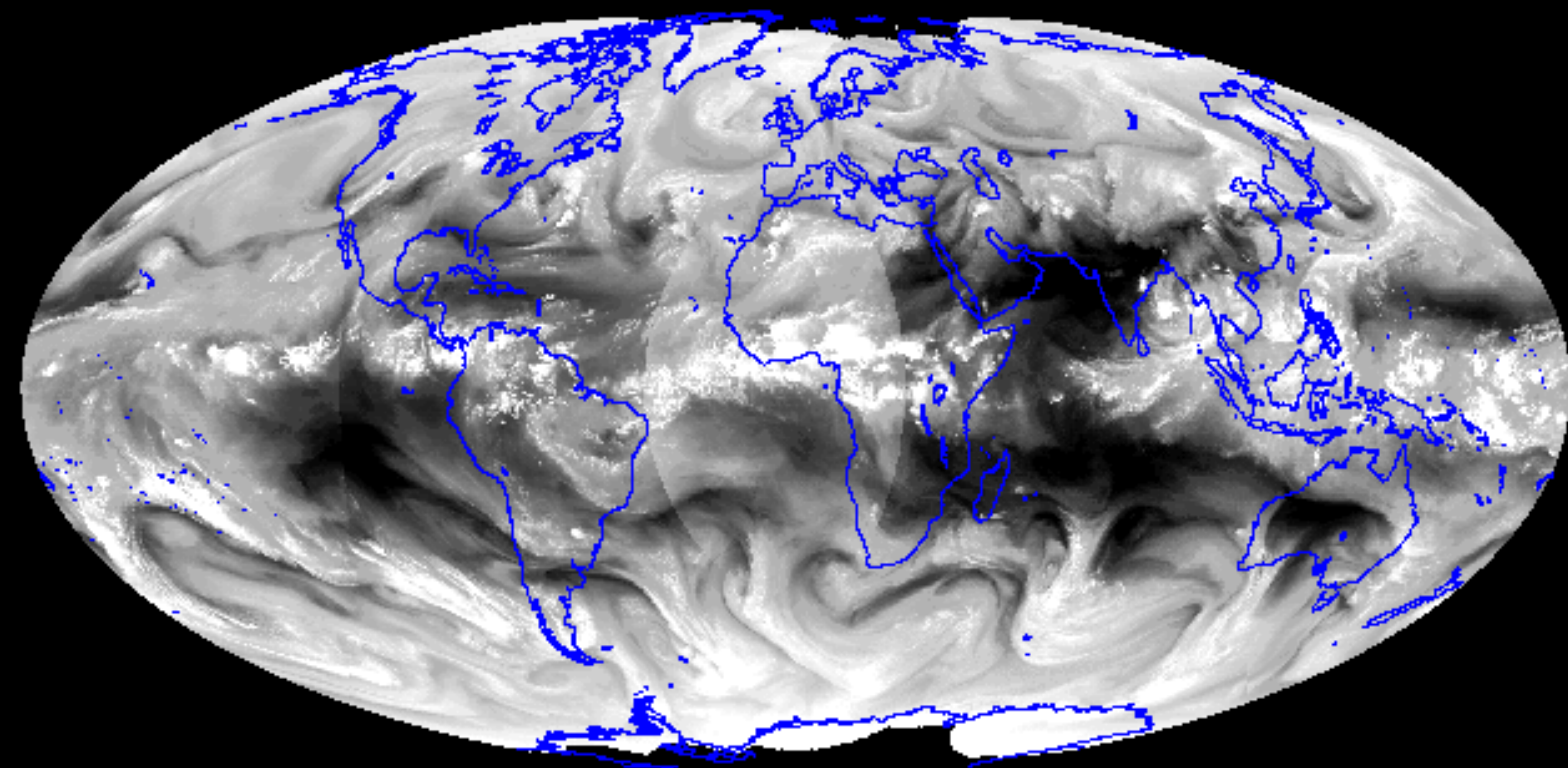


(Personal) Paradigm Shifts re: the Water Cycle... at the climate/weather interface

Atmospheric arm of



GOES Water-Vapor Channel Imagery



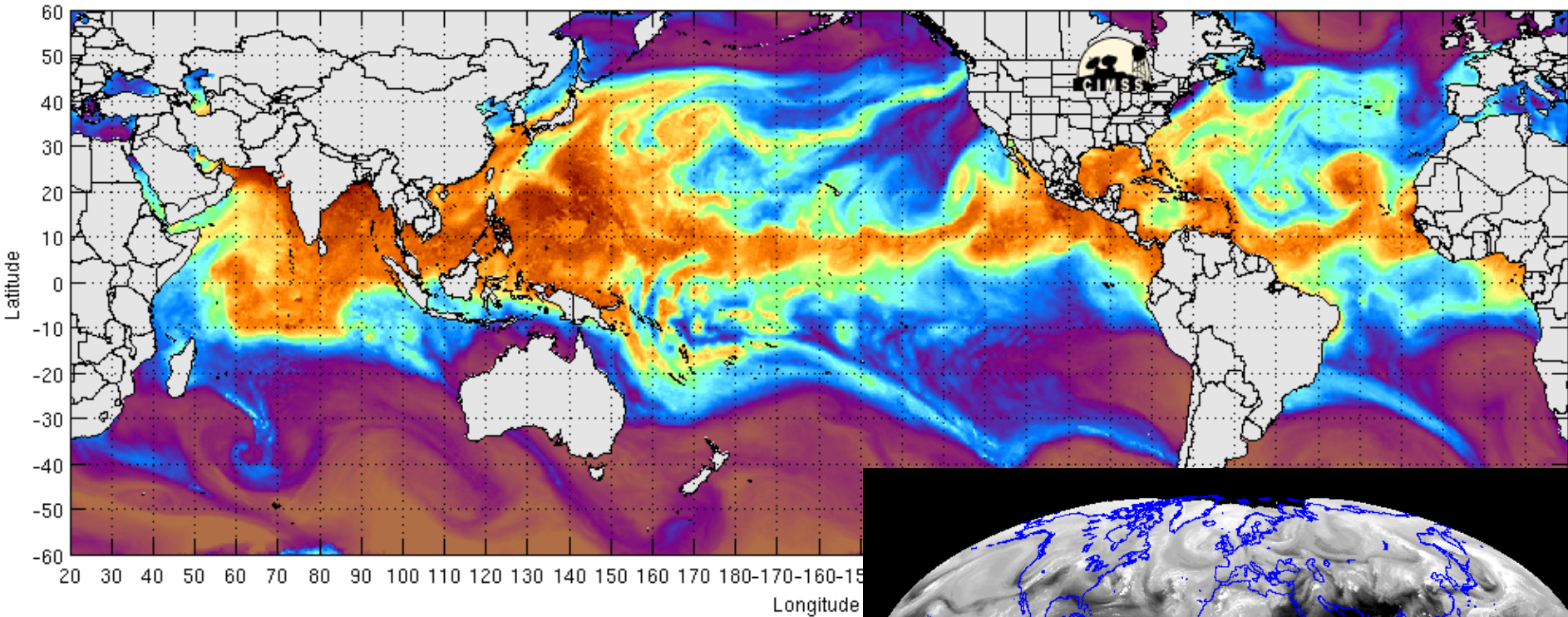
10001 G-8 IMG

3 8 MAY 11128 180000 09826 09681 01.00

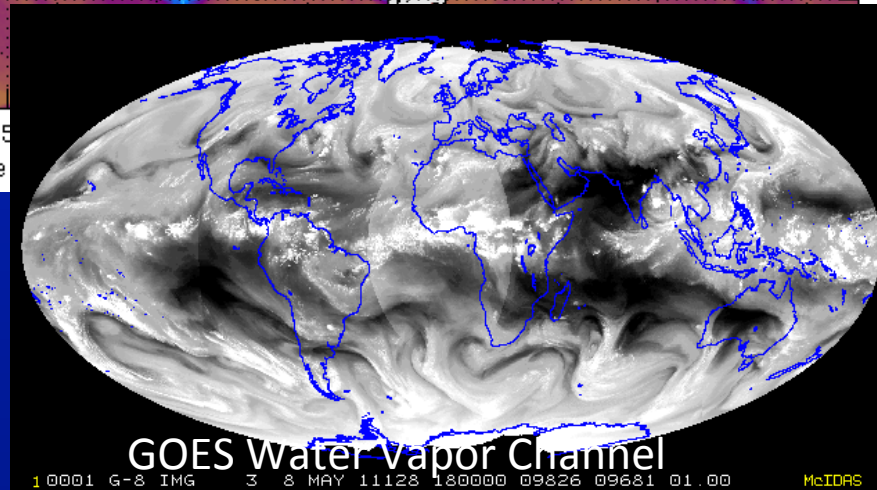
McIDAS

SSM/I Integrated (Total Column) Water Vapor 72 hours beginning on 25 August 2011 (Last Week)

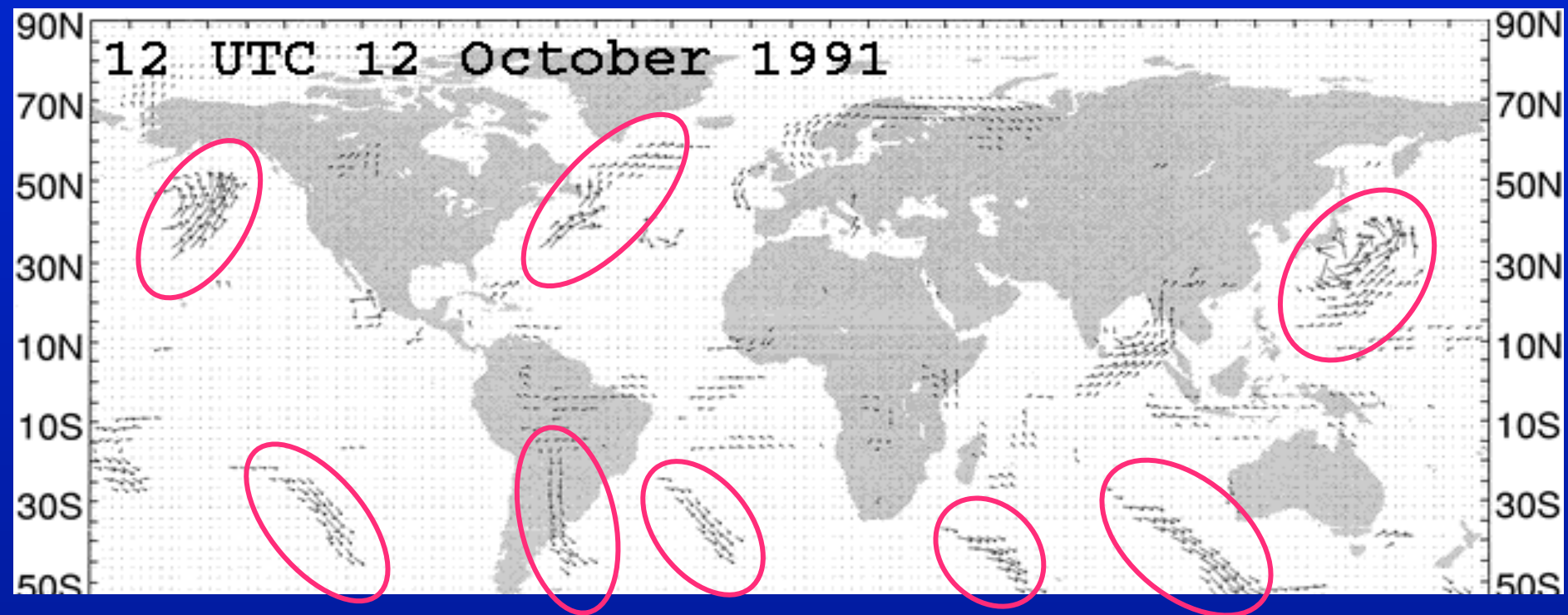
Morphed composite: 2011-08-22 20:00:00 UTC



SSM/I = Special Sensor Microwave Imager



Zhu & Newell 1998: *Diagnostic study using ECMWF (model-based) forecasts*



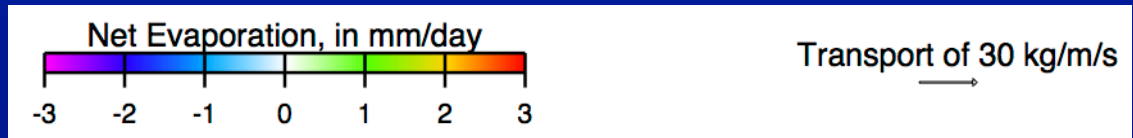
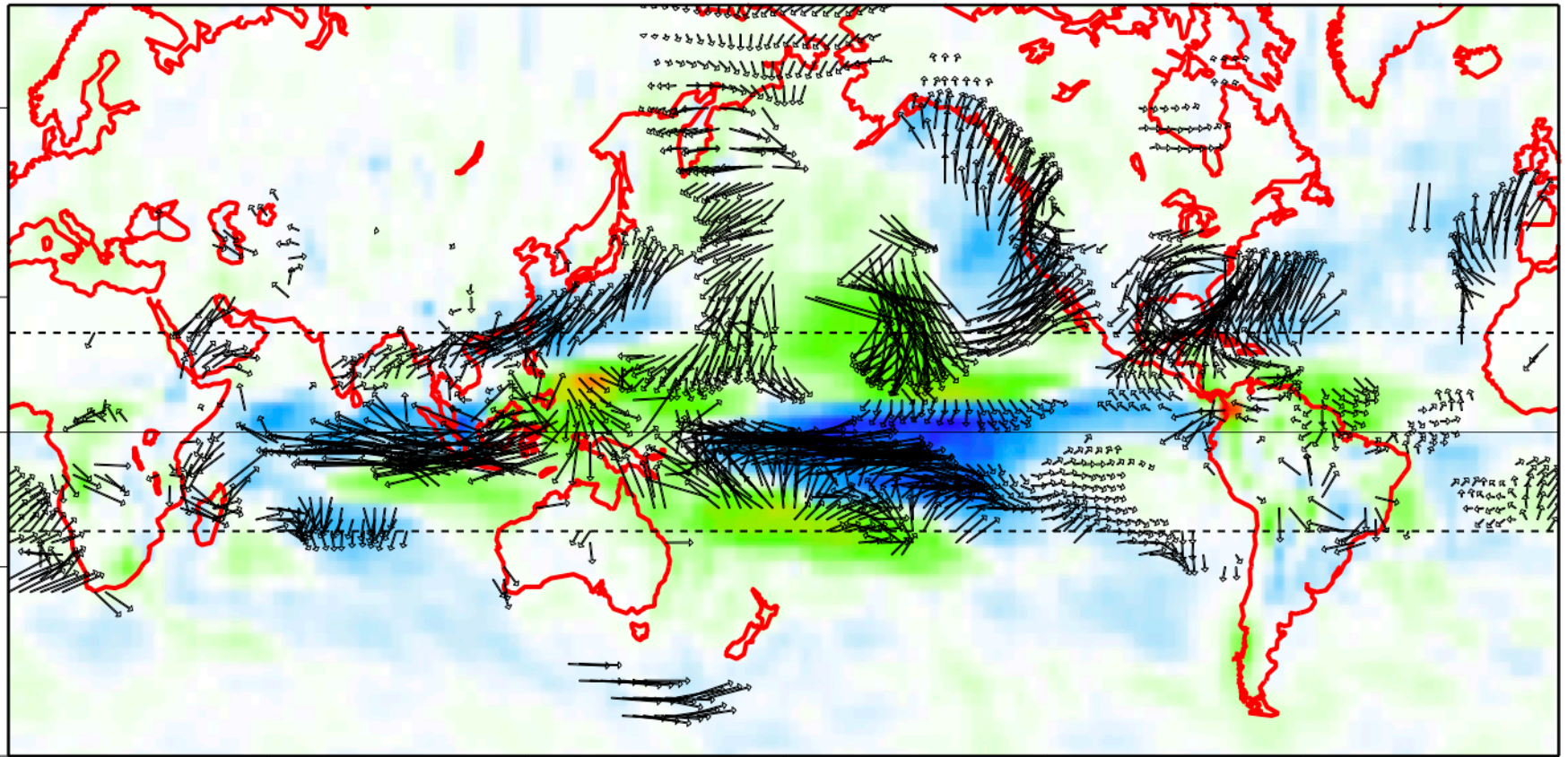
Atmospheric rivers contain 95% of poleward water vapor flux outside the Tropics, in <10% of the zonal circumference

NOTE: This burst-i-ness is an emergent property in models & nature.

Atmospheric Vapor Transports associated with Nino3.4 SSTs, 1948-2000

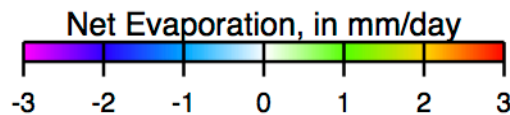
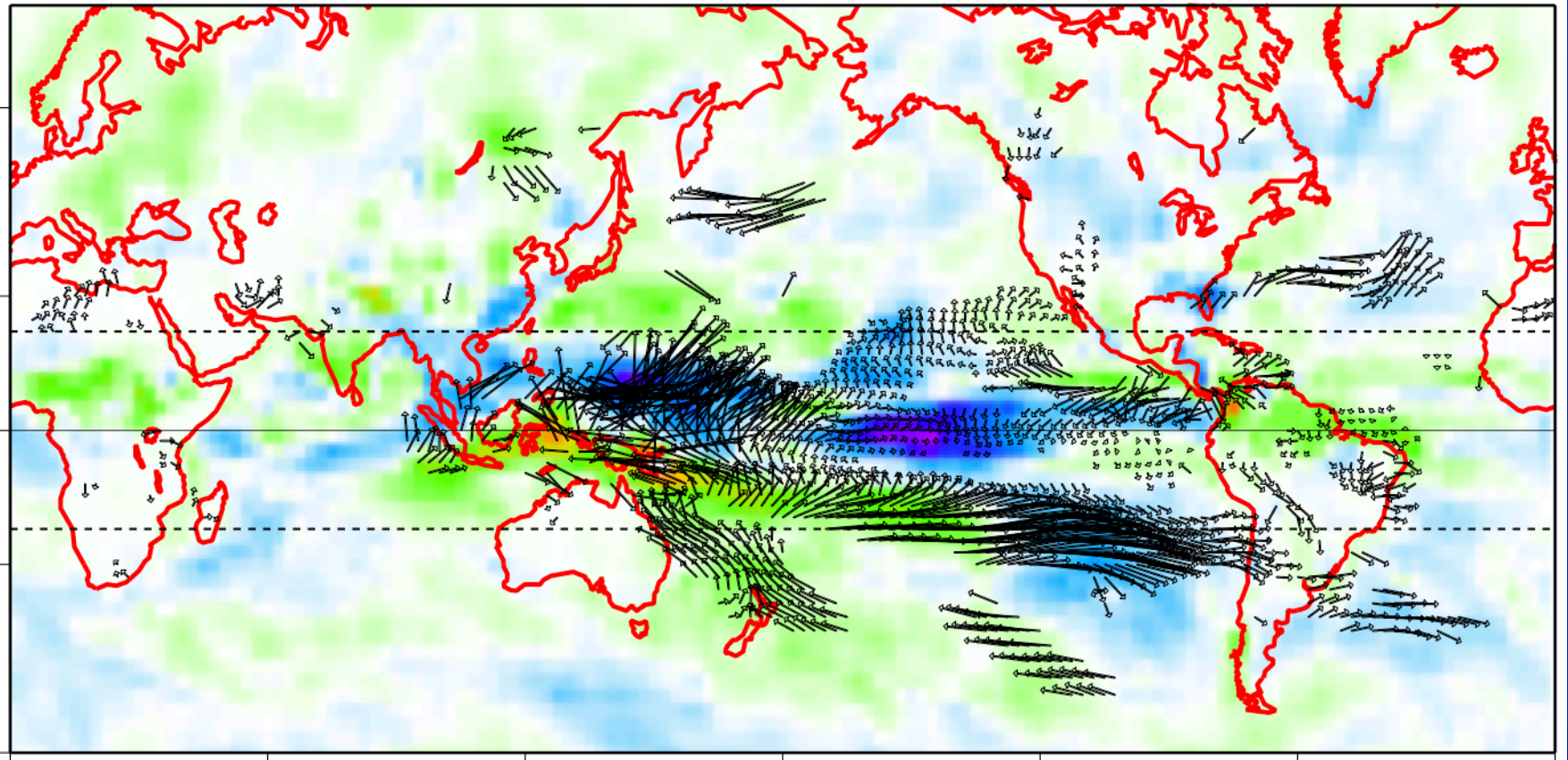
DECEMBER-FEBRUARY WET-DAY REGRESSION COEFFICIENTS

(Only transports that correlate at 99% level are shown.)



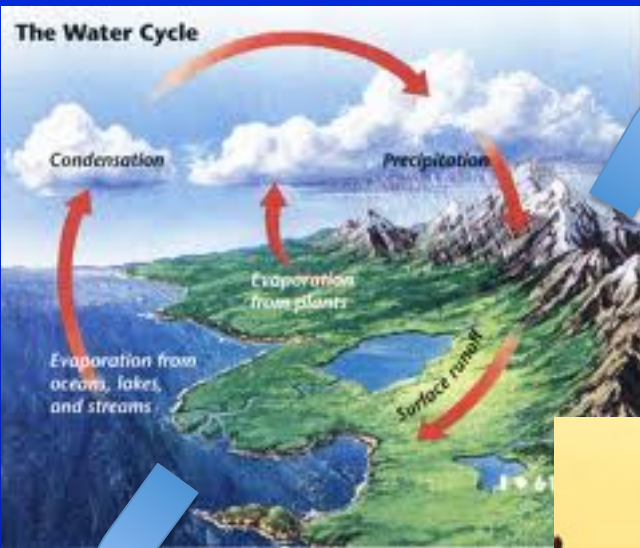
Atmospheric Vapor Transports associated with Nino3.4 SSTs, 1948-2000

JULY-AUGUST REGRESSION COEFFICIENTS



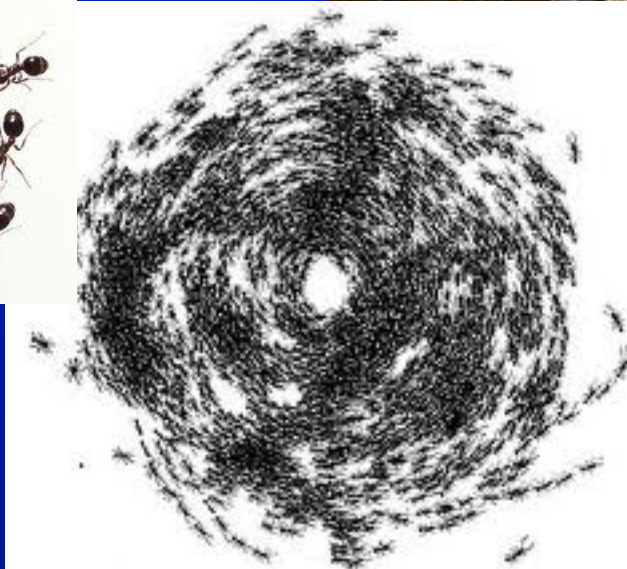
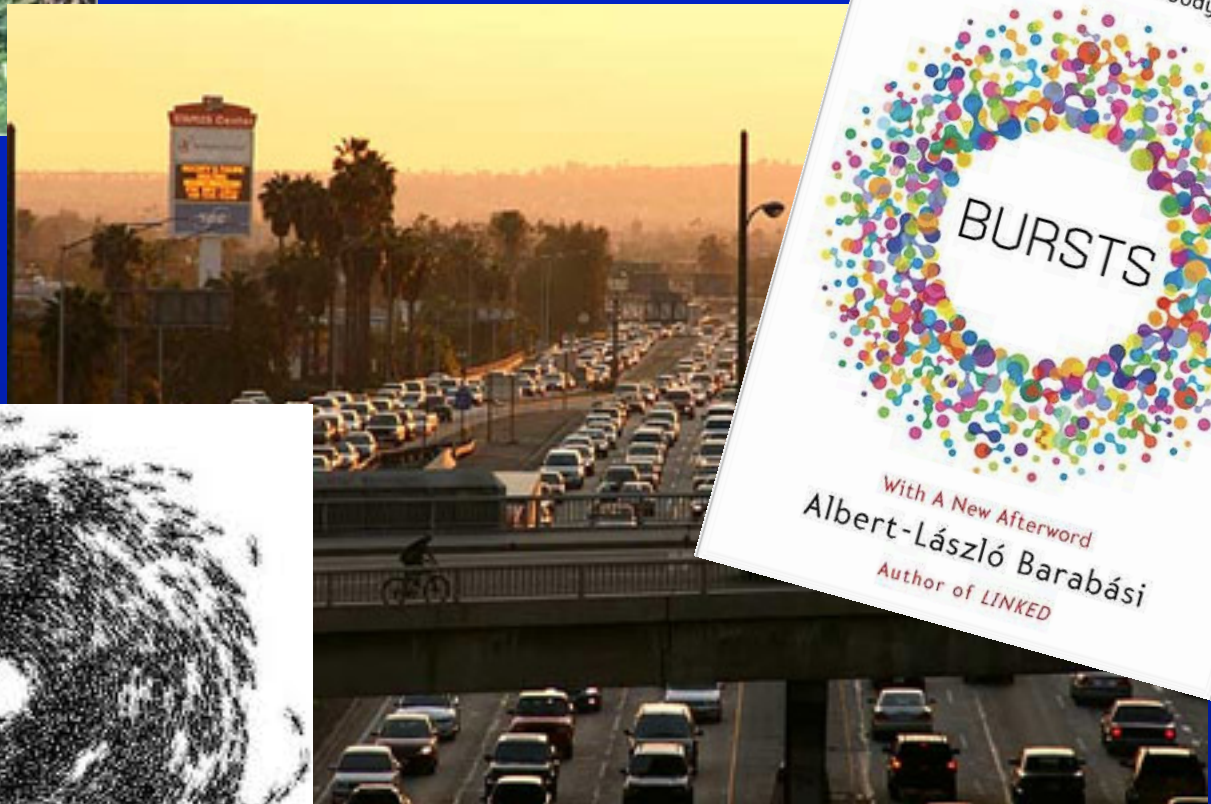
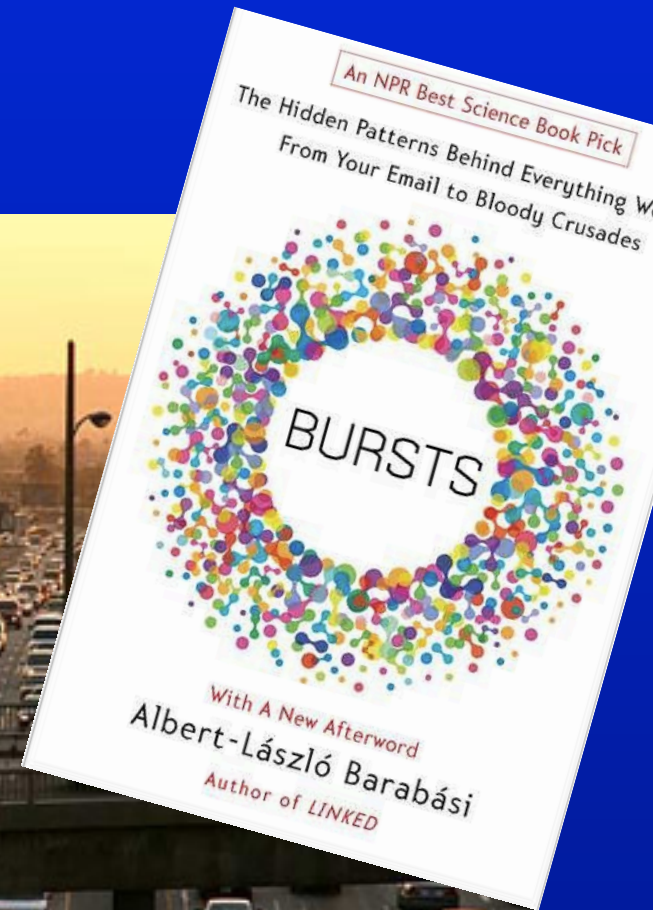
Transport of 30 kg/m/s

A horizontal black arrow pointing to the right, used as a scale reference for the transport vectors on the map.



What then IS the right way to conceptualize the atmospheric arm of the water cycle?

?

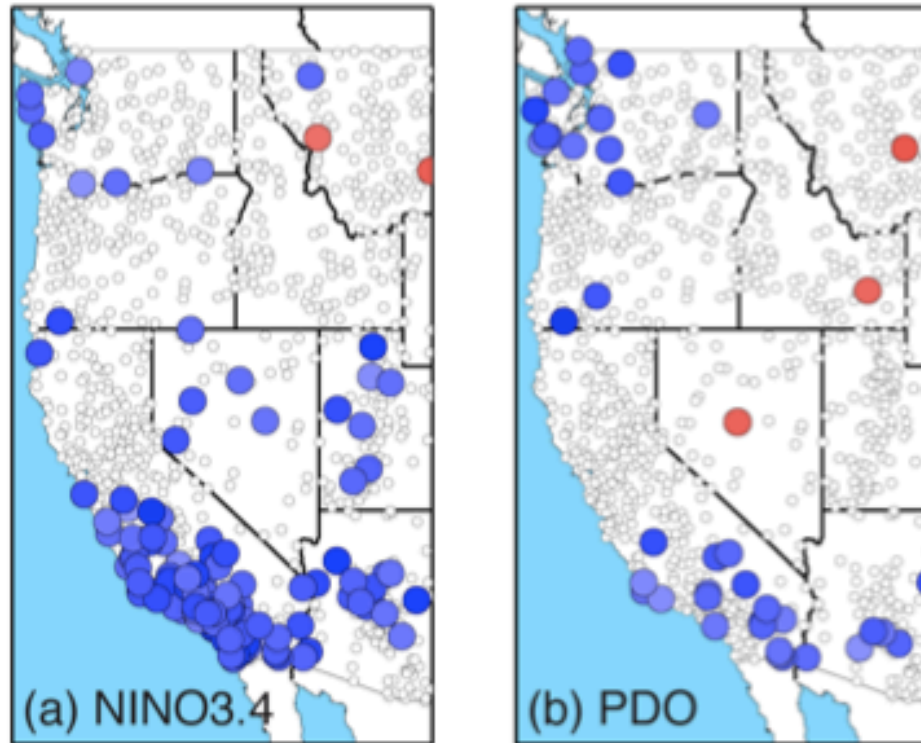


?

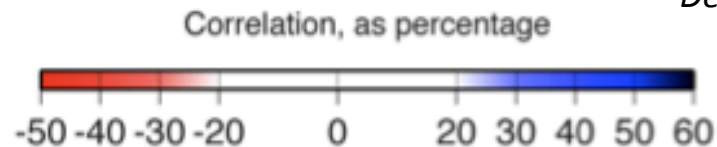
The atmospheric part of the water cycle is much more “burst-y” than we tend to conceptualize!

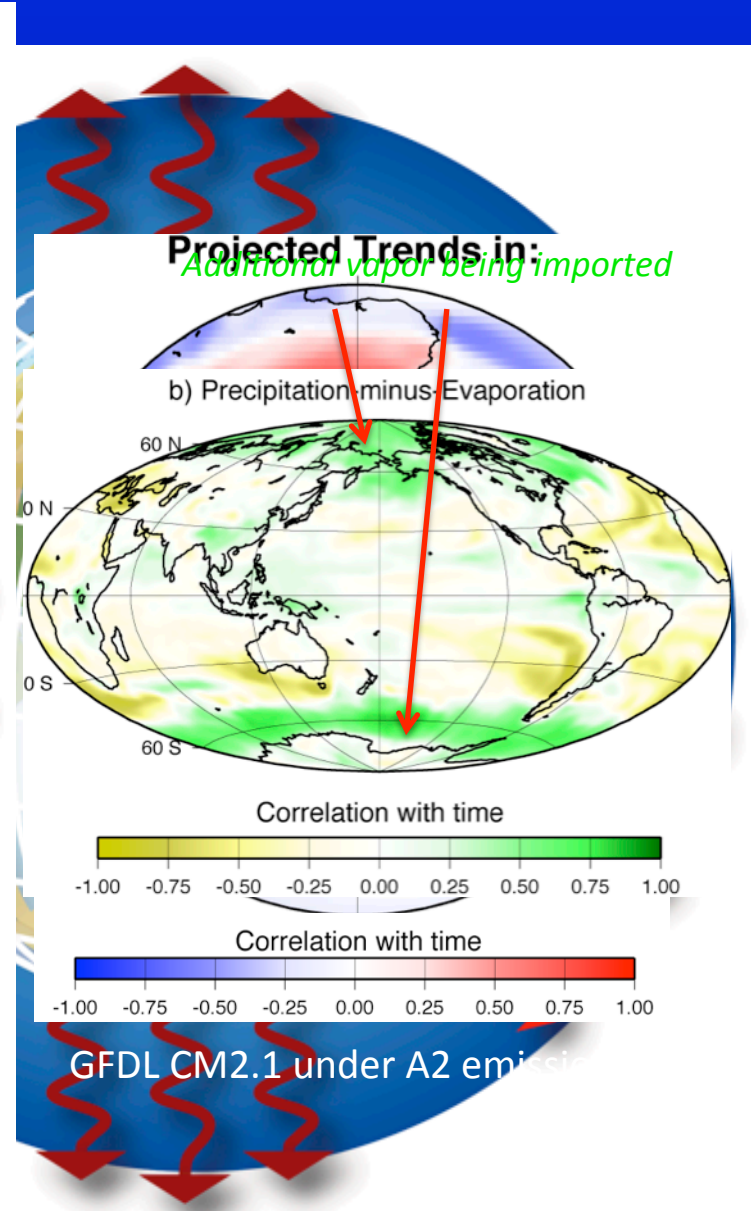
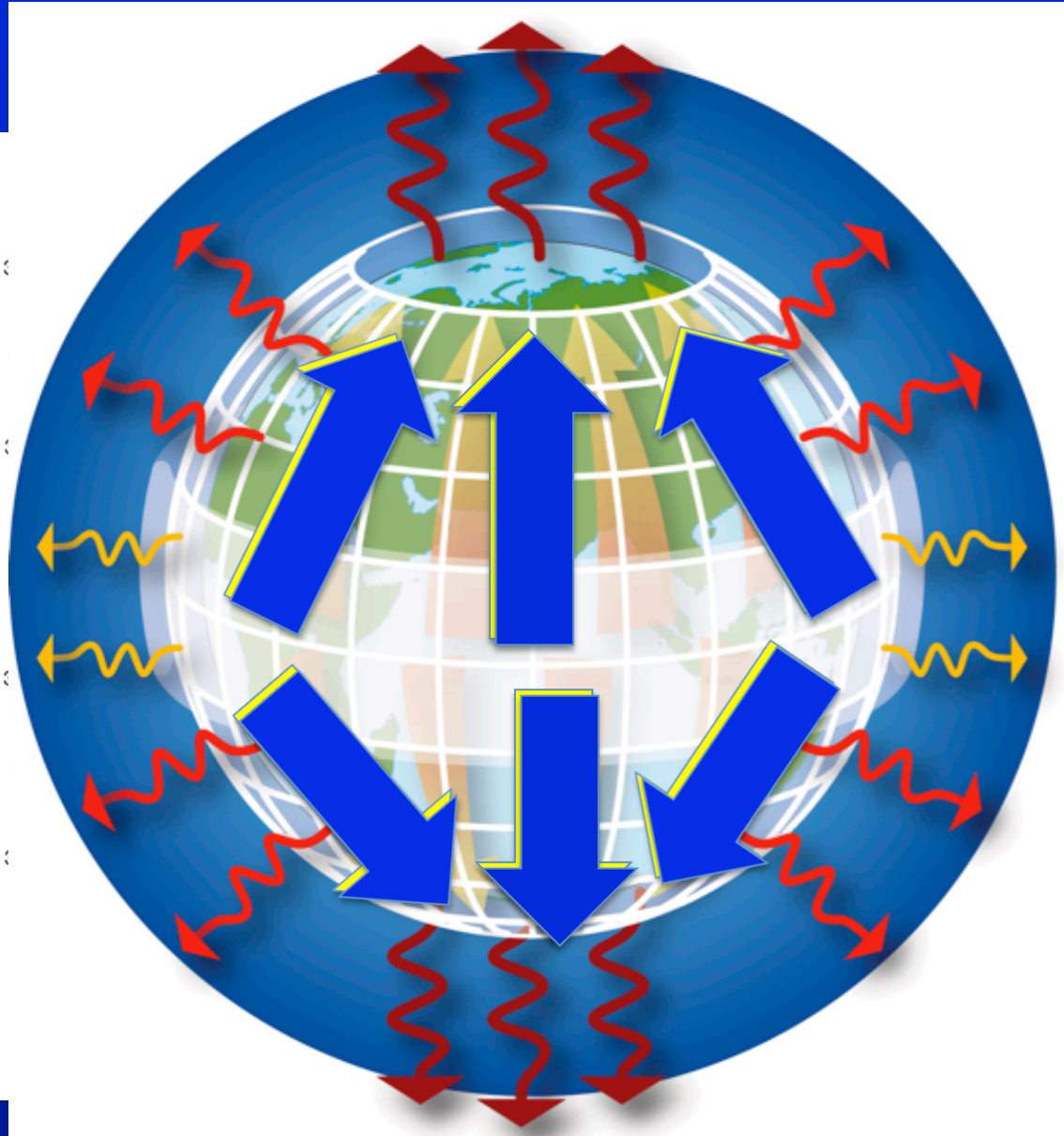
How does the fraction of annual precipitation derived from landfalling ARs vary with tropical-Pacific modes?

CORRELATIONS OF AR PRECIPITATION (days 0 to +1) CONTRIBUTIONS WITH:



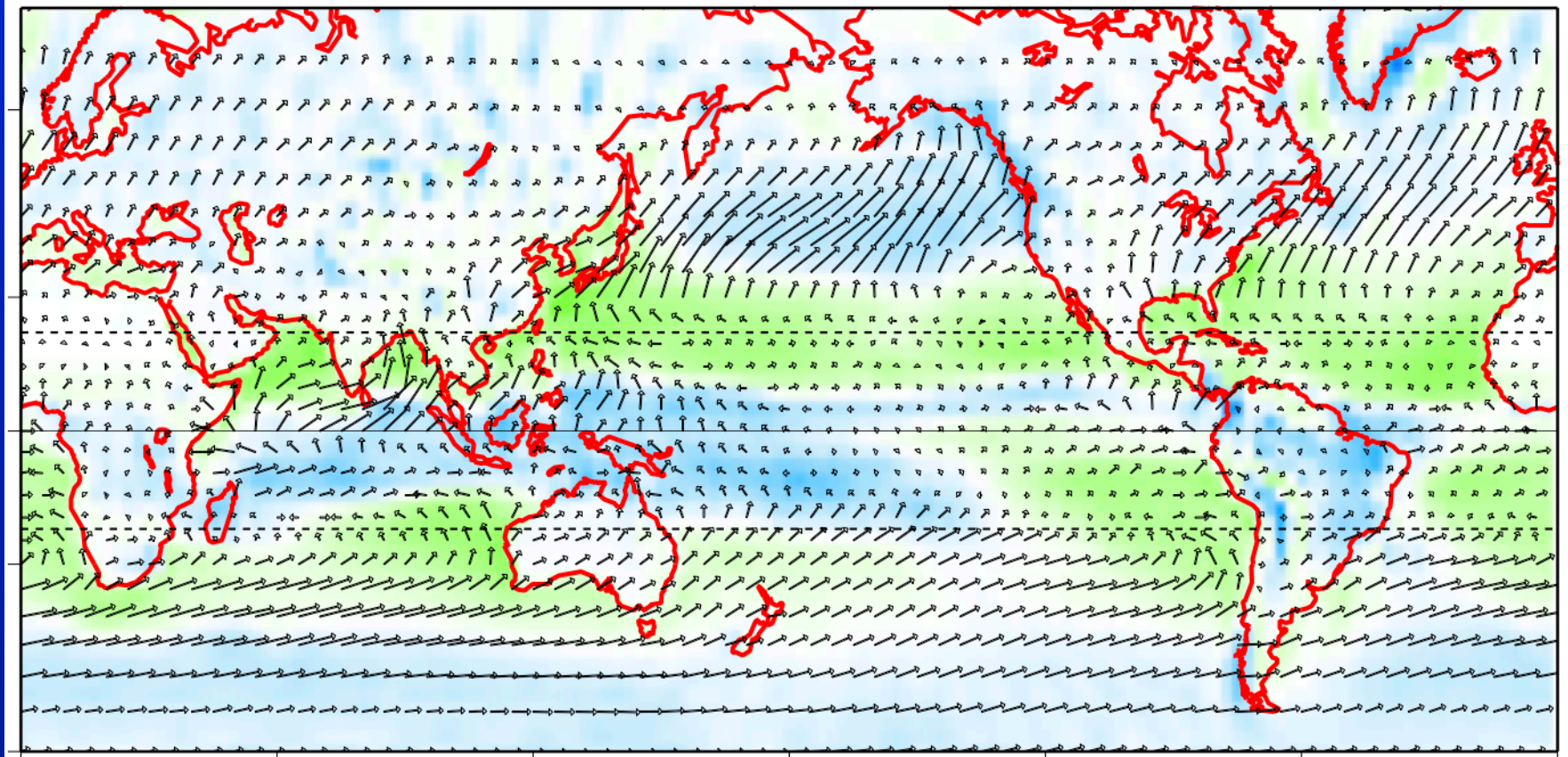
Dettinger et al., 2011, Water



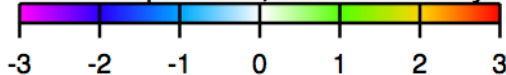


Seasonal Cycle of Atmospheric Vapor Transports, 1948-2000

MEAN DECEMBER-FEBRUARY RATES



Net Evaporation, in 10s mm/day

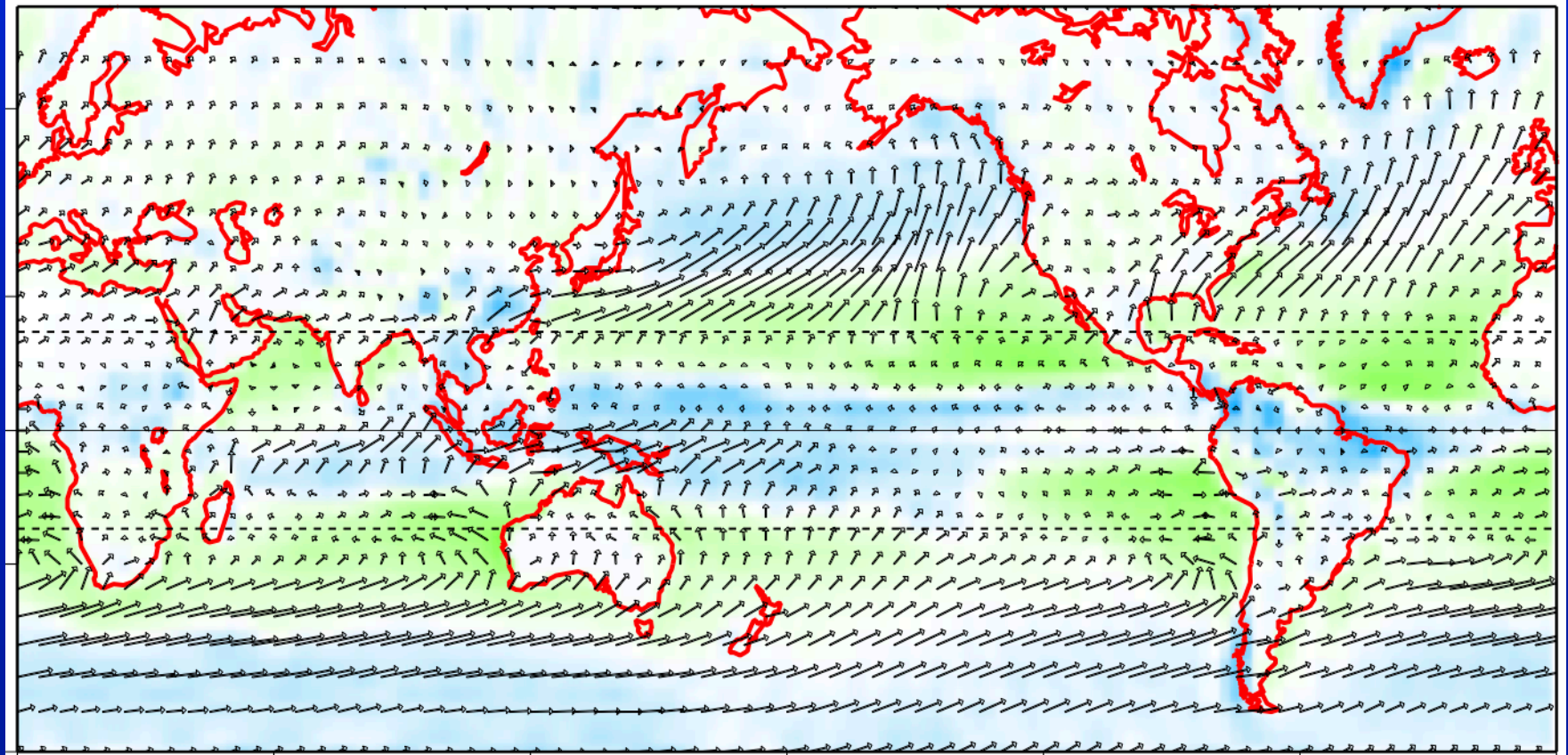


Transport of 300 kg/m/s

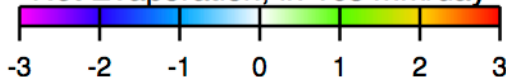


Seasonal Cycle of Atmospheric Vapor Transports, 1948-2000

MEAN MARCH-MAY RATES



Net Evaporation, in 10s mm/day

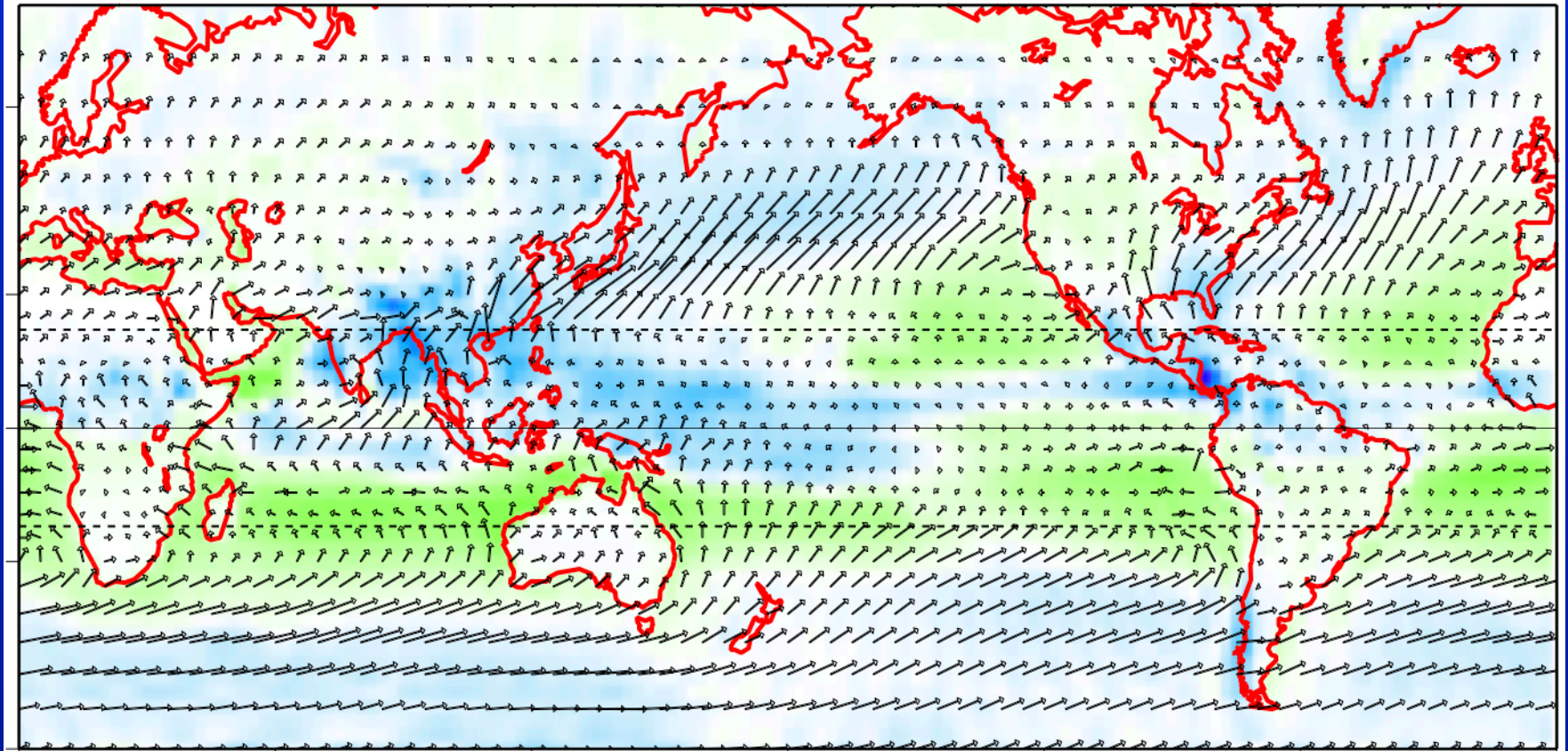


Transport of 300 kg/m/s

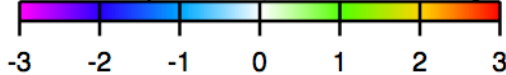


Seasonal Cycle of Atmospheric Vapor Transports, 1948-2000

MEAN JUNE-AUGUST RATES



Net Evaporation, in 10s mm/day

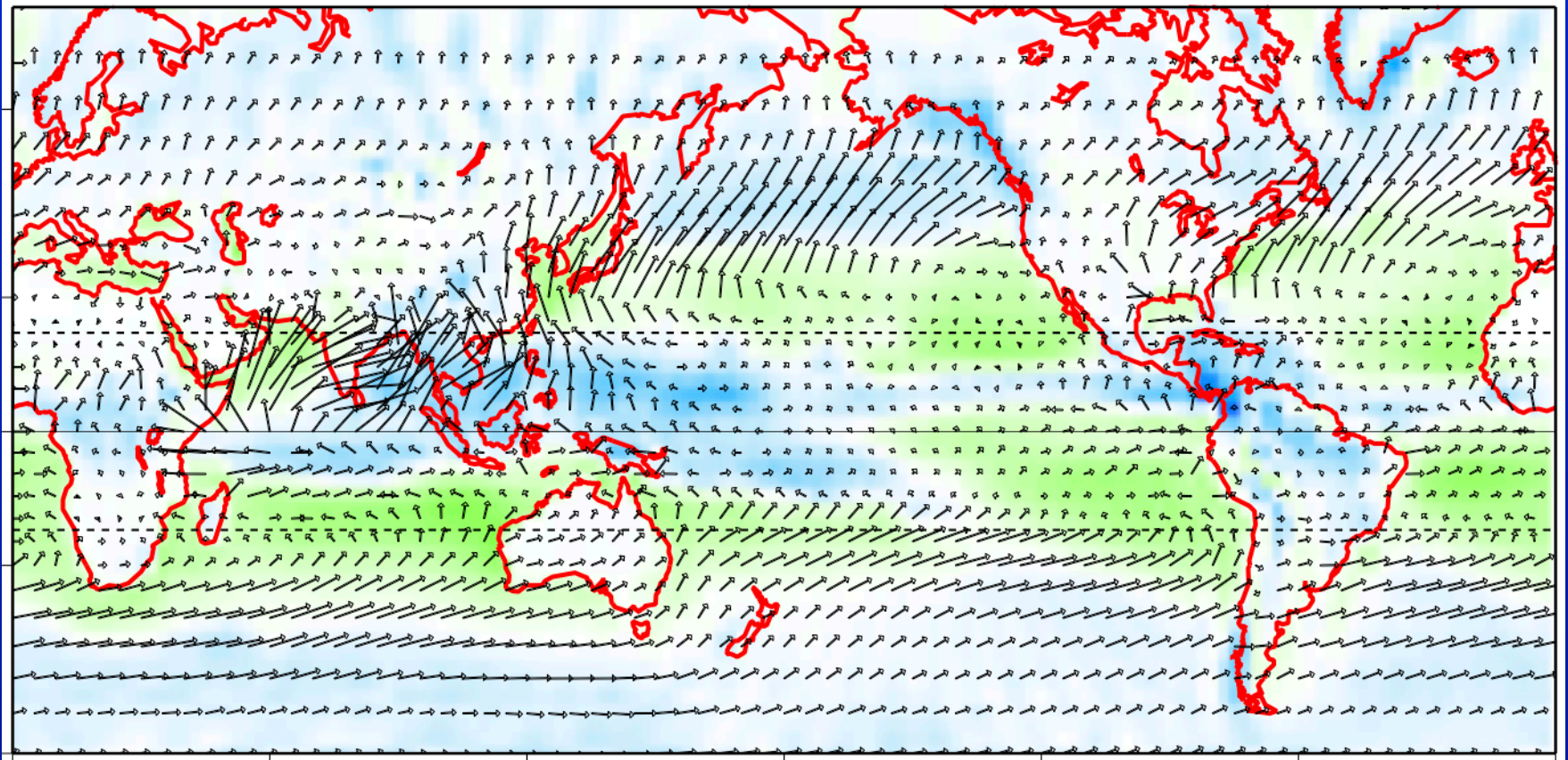


Transport of 300 kg/m/s

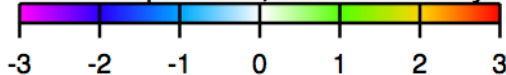


Seasonal Cycle of Atmospheric Vapor Transports, 1948-2000

MEAN SEPTEMBER-NOVEMBER RATES



Net Evaporation, in 10s mm/day



Transport of 300 kg/m/s

