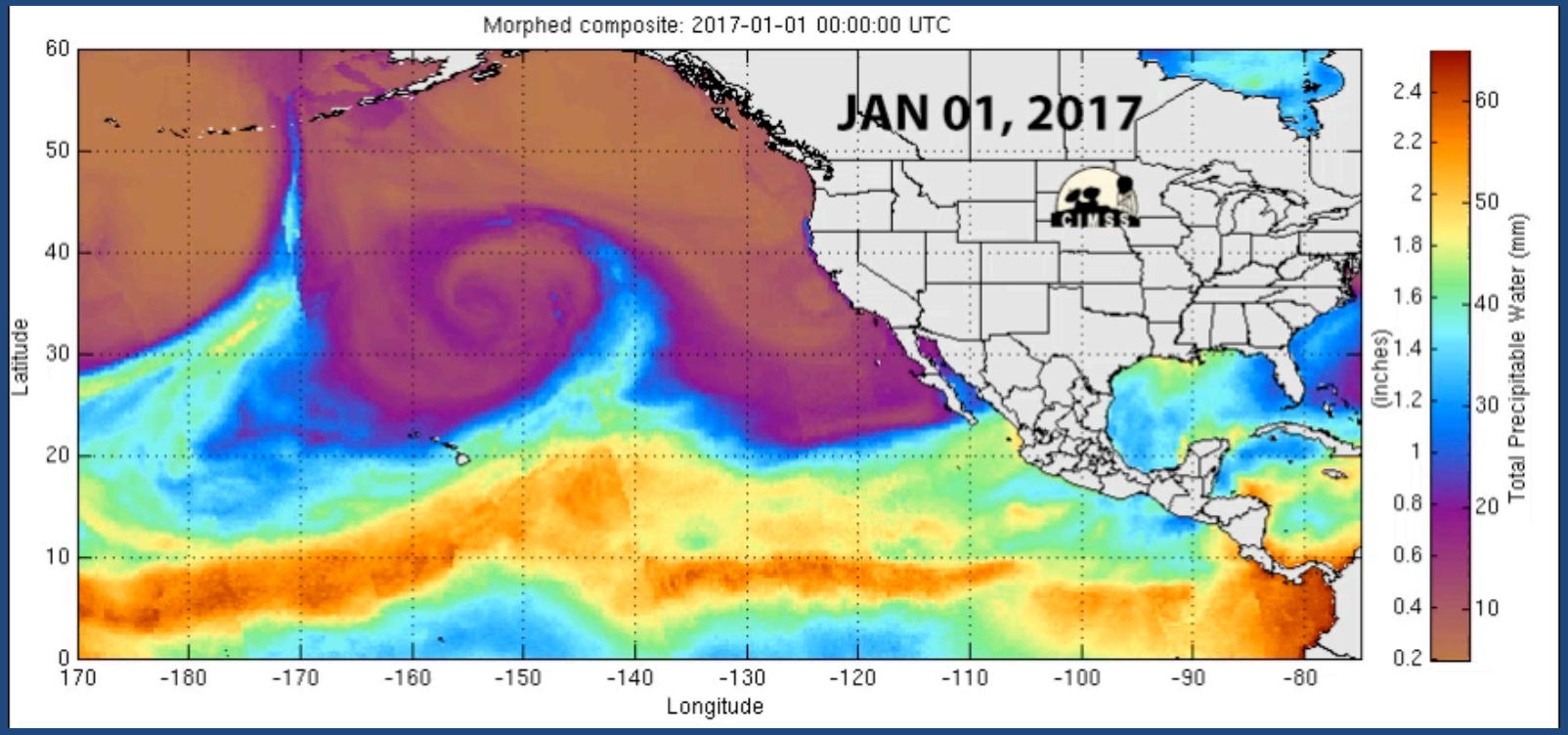
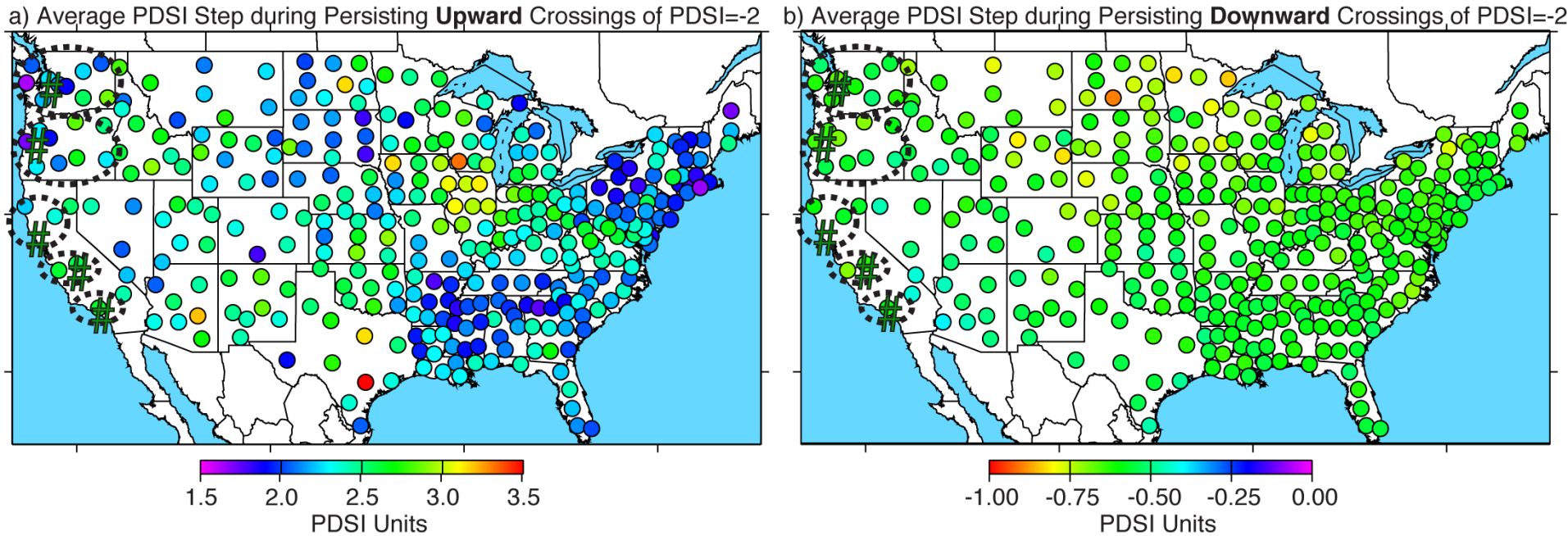
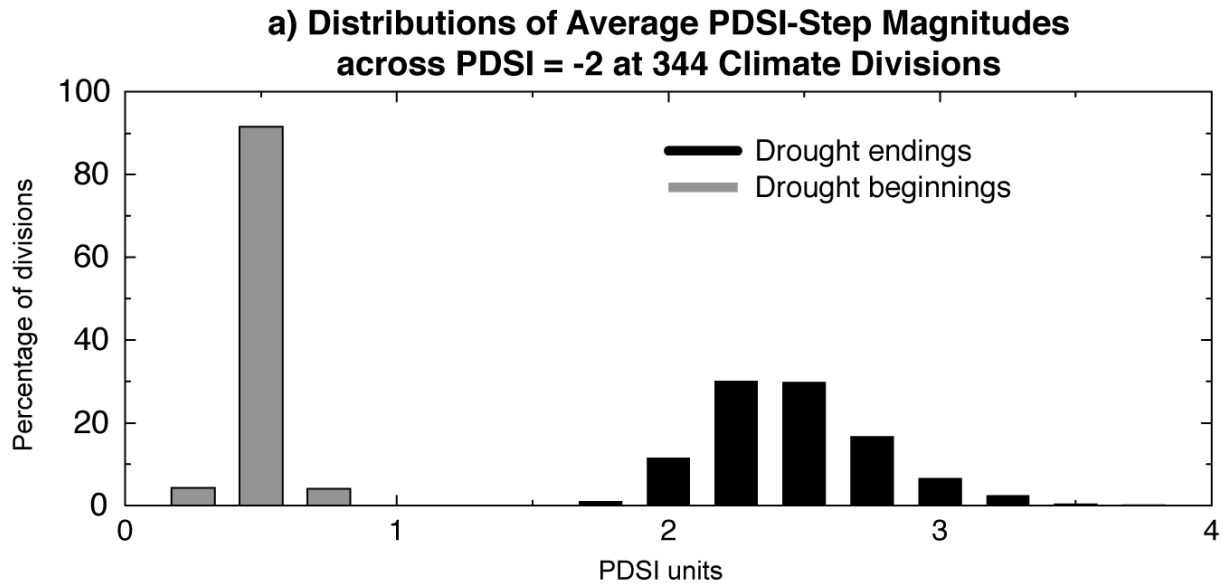


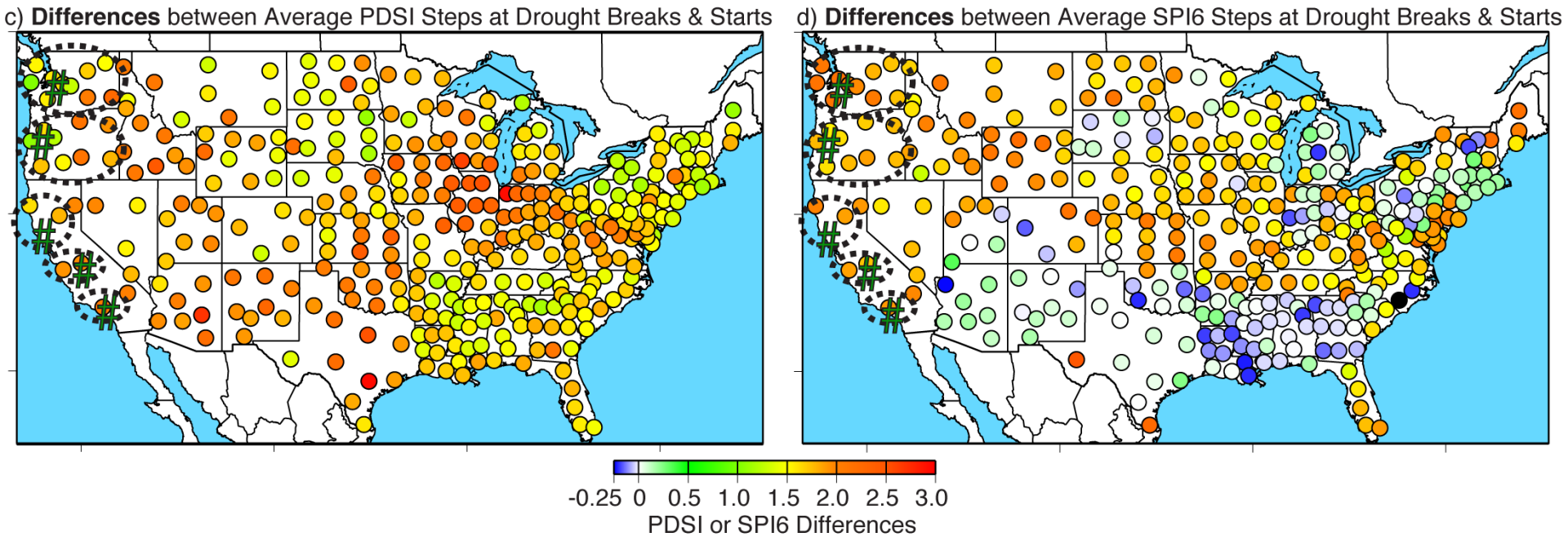
Atmospheric Rivers as Drought Busters on the U.S. West Coast

Slides by Mike Dettinger (USGS)



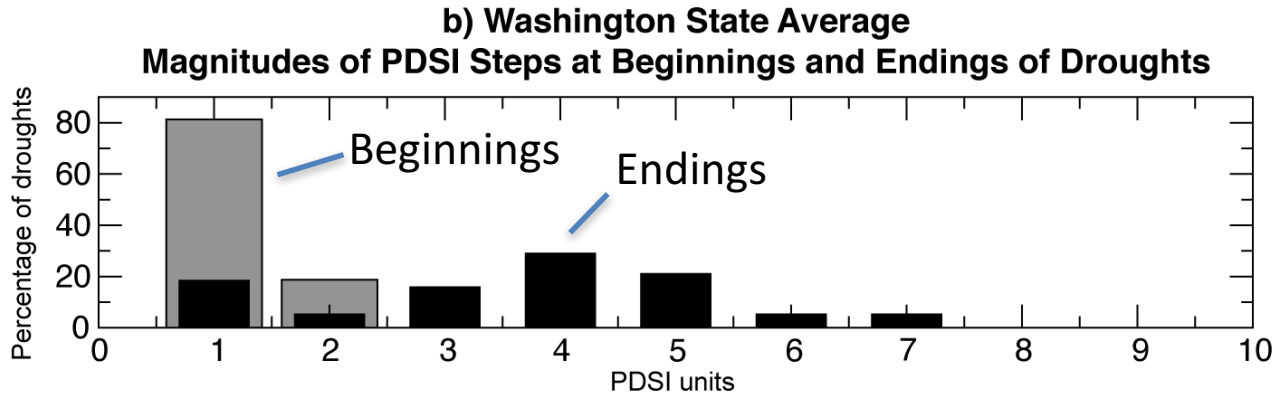


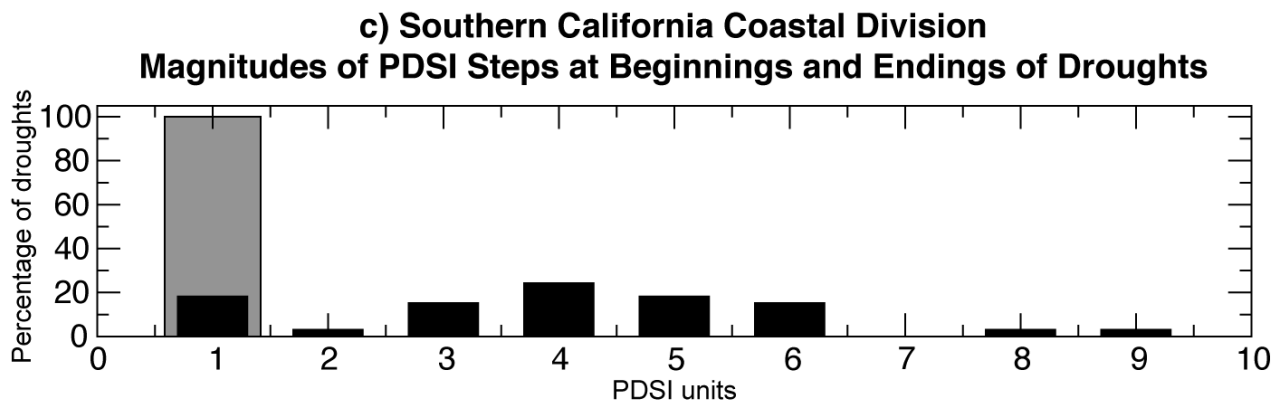
The average month that ends historical droughts (as measured by PDSI changes) involves a much larger, more sudden moistening than the month that begins one, NATIONWIDE.



This strong tendency is not just a function of using PDSI to measure drought; the same "rule" also applies if, e.g., we measure droughts with standardized precipitation indices in most places, except in the Southeast.

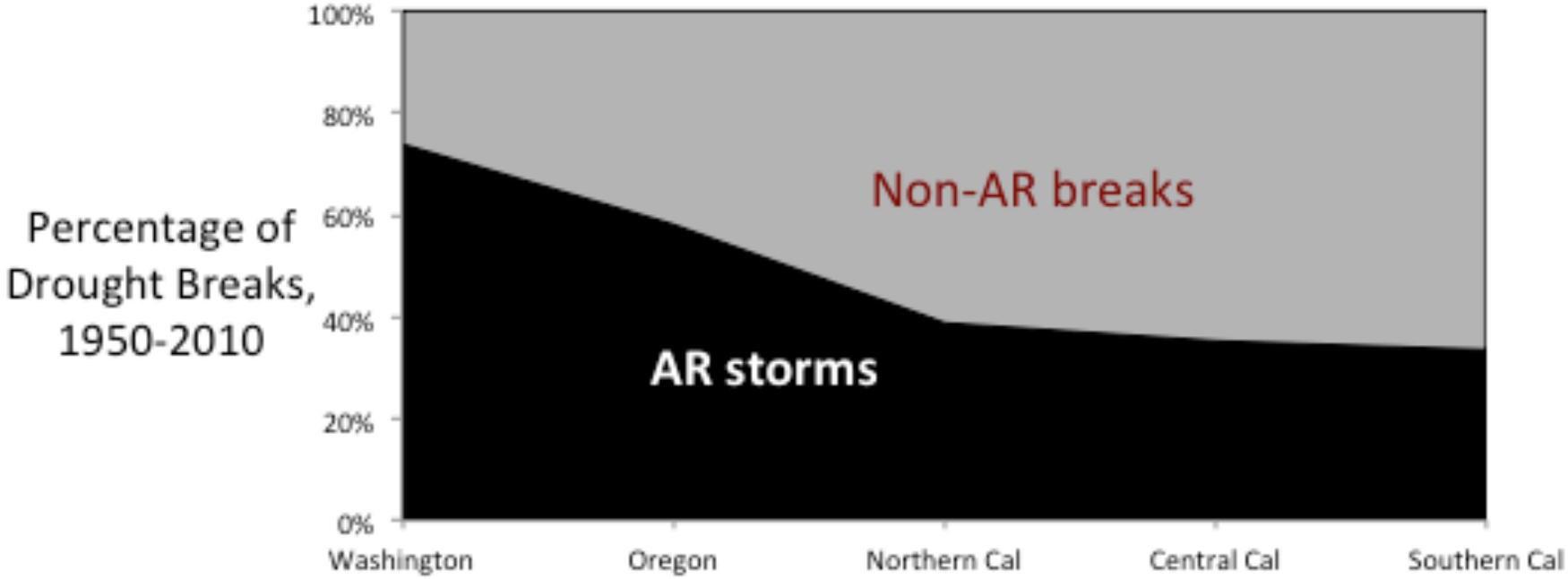
Thus far and wide, on average, historical droughts end in very wet episodes, rather than gradually. Historical drought on the other hand tend to begin gradually.





That was "on average"…but this also applies to the vast majority of droughts on the West Coast (at least).

E.g., this figure shows the distributions of ALL drought endings in WA and SoCal, and demonstrates that a very large majority of droughts end with large PDSI steps and virtually all drought beginnings are gradual. (Details are in the paper.)



Finally, here is the prototypical "ARs as drought busters" figure.

A significant fraction (but not all) of historical droughts end abruptly with one or two ARs (this is all my paper showed in this regard)…however, this finding describes the full range of droughts, and thus many more modest droughts than record breaking ones.

We saw this year that a truly record-breaking drought in California takes a LOT of ARs to break!