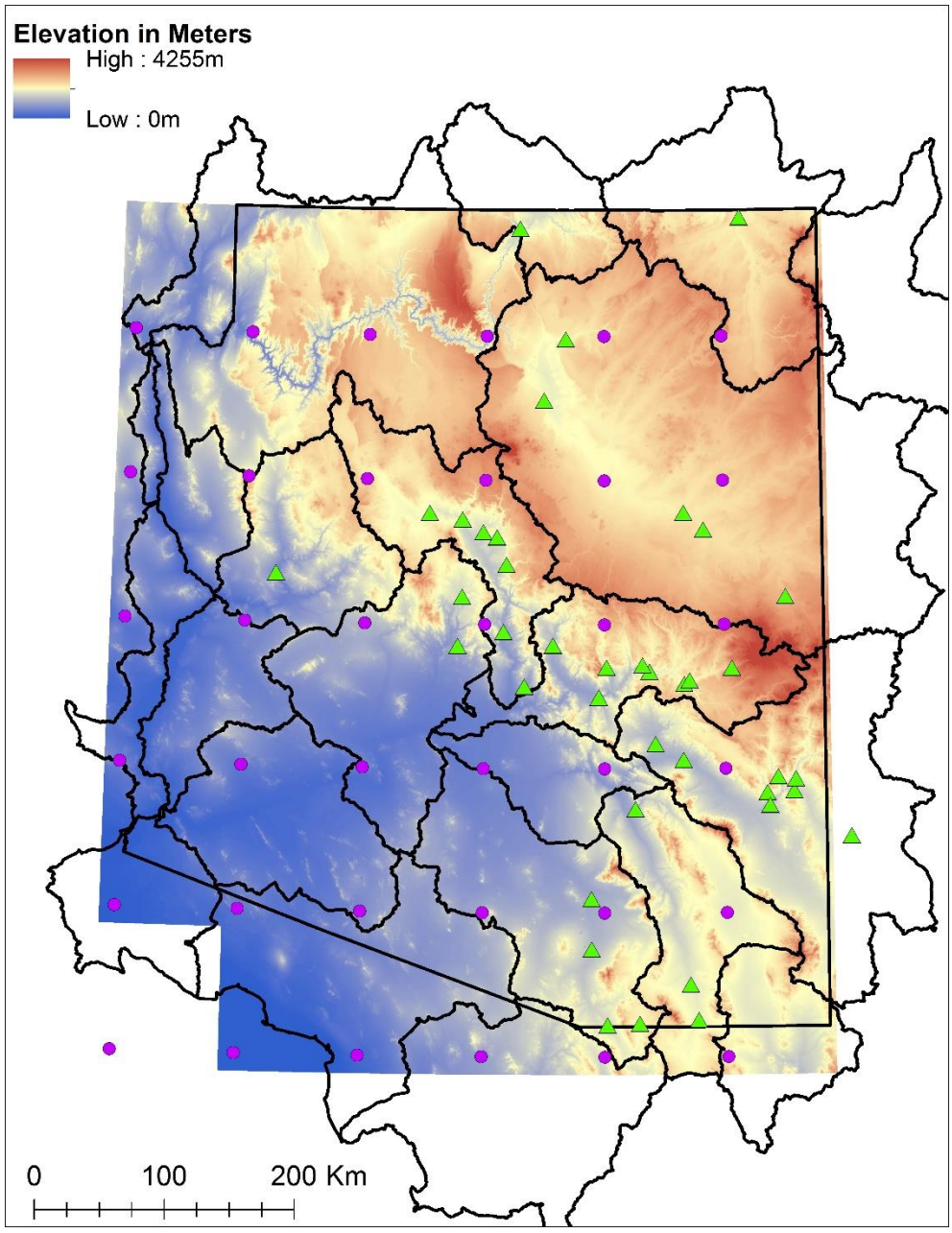

Figure 1: Map of Arizona showing major watershed boundaries, elevation, and the location of the flood peak gauging stations used in this study (green triangles).

Also shown are gridpoint locations of interpolated Integrated Water Vapor Transport (IVT) (purple circles) (see Section 3.2.2)

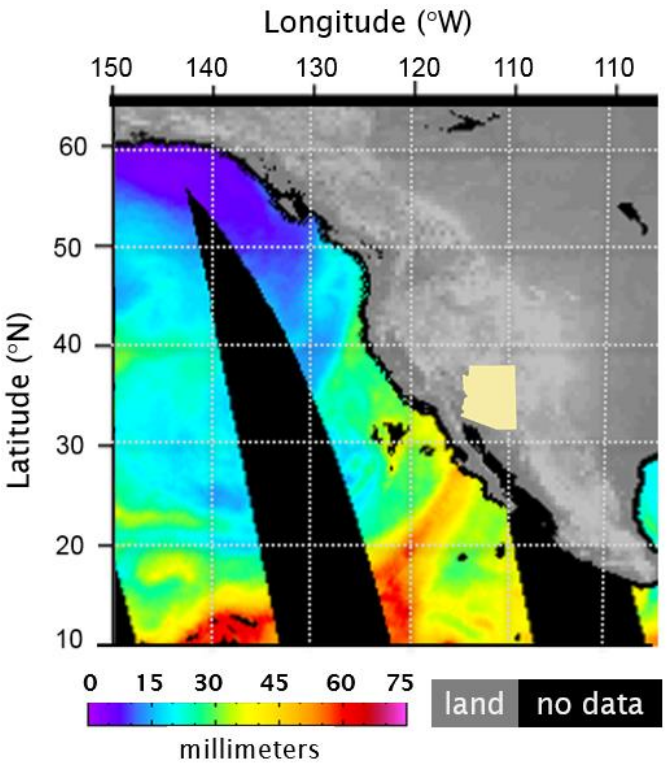

Figure 2: Satellite-derived Integrated Water Vapor (IWV) Composite Image

This 12-hour UTC PM composite shows column IWV (aka "Total Precipitable Water Vapor") on October 31, 1987. An inset map of Arizona is superimposed. In the image, a plume of concentrated water vapor can be seen with a south-southwesterly trajectory that is targeted to cross Baja and enter Arizona. This AR event was associated with 10 flood peaks in the Arizona Flood Project Database (see Appendix A).

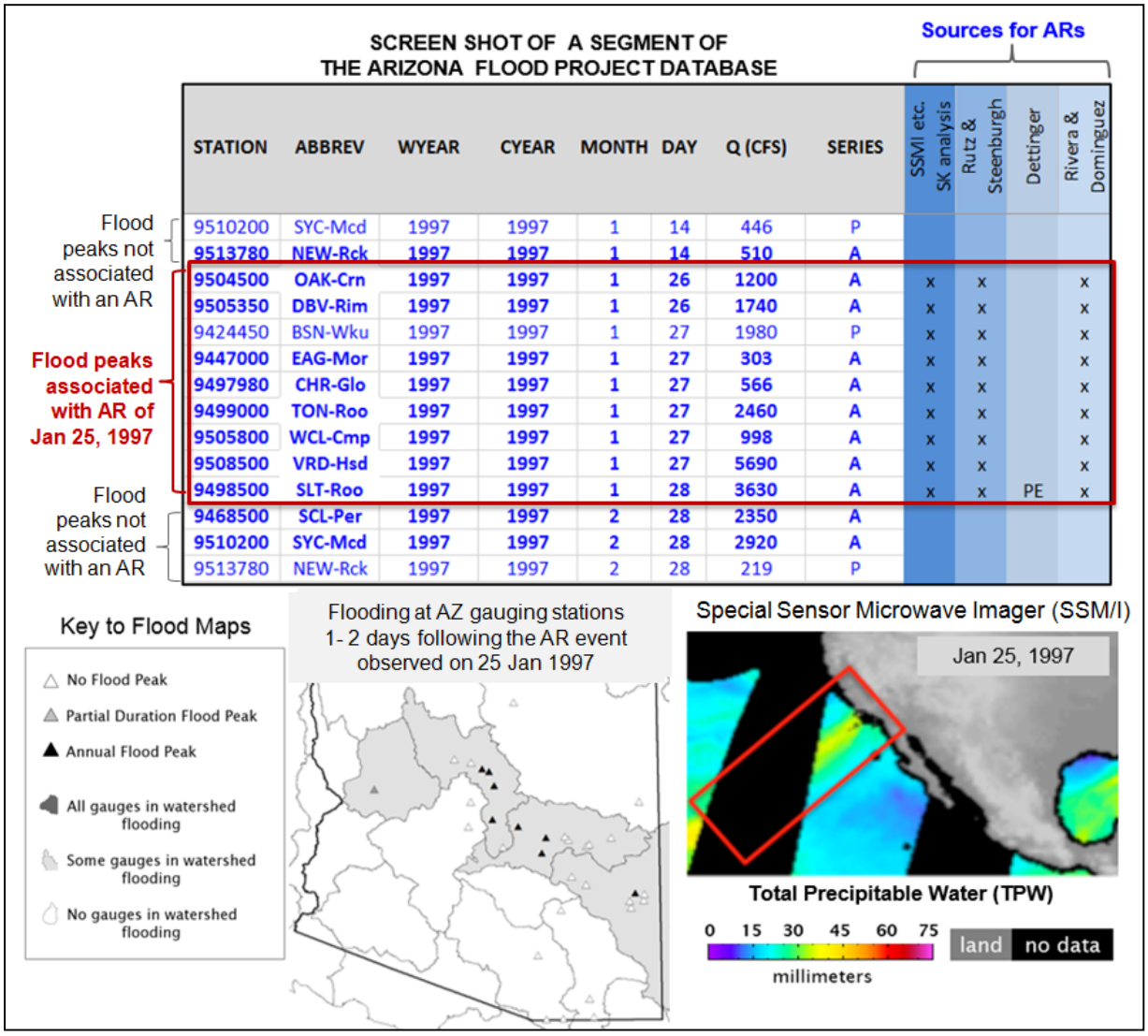

Figure 3. Illustration of the procedure used to identify Arizona flood peaks associated with atmospheric rivers originating in the eastern North Pacific Ocean.

The AR seen in SSM/I imagery on Jan 25, 1997 (red box) was also noted in each of the other AR published sources investigated for the January 26-28 flood peaks.

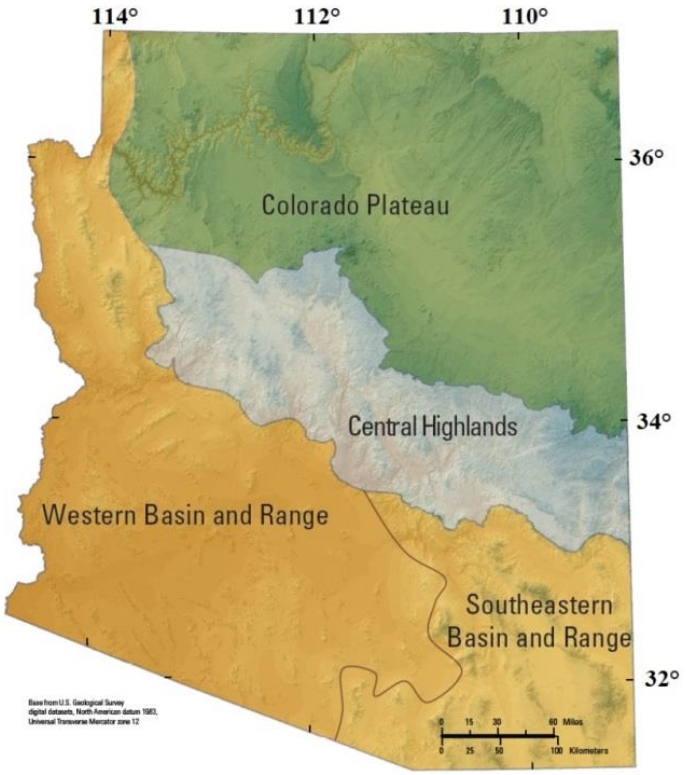

Figure 4. Generalized Physiography of Arizona. Flat Colorado Plateau to the North, complex topography in Central Highlands (Mogollon Rim) and Basin and Range to the South

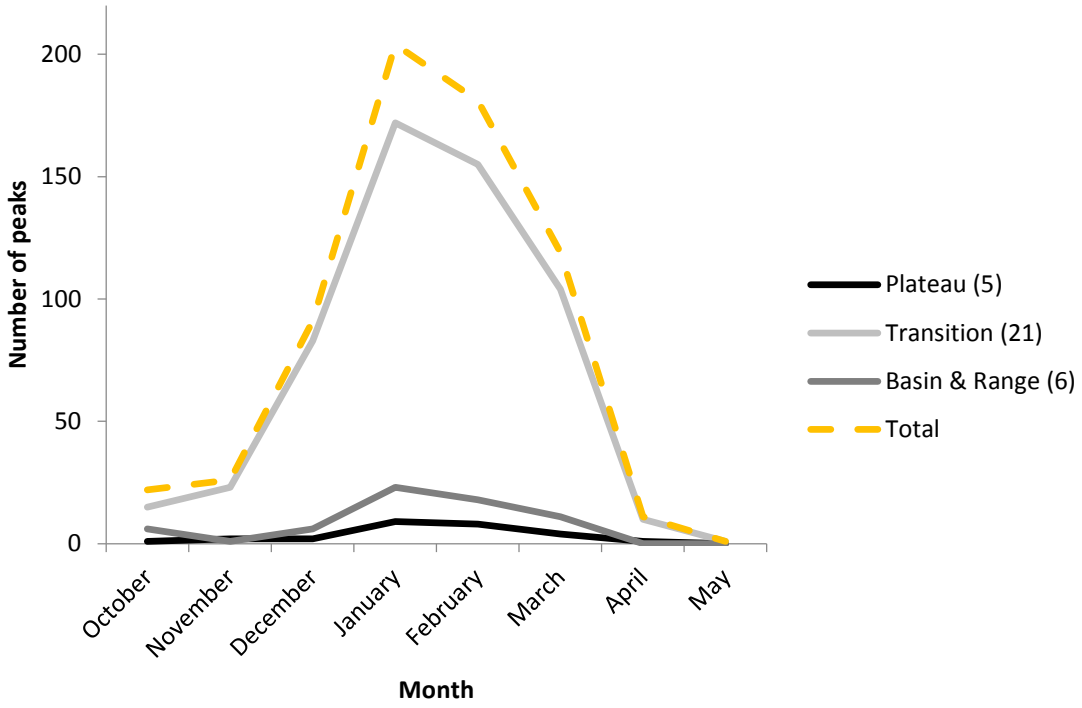

Figure 5. Monthly distribution of AR-related peaks in Arizona grouped by physiographic region for the cool season months during the WY 1988-2011 study period.

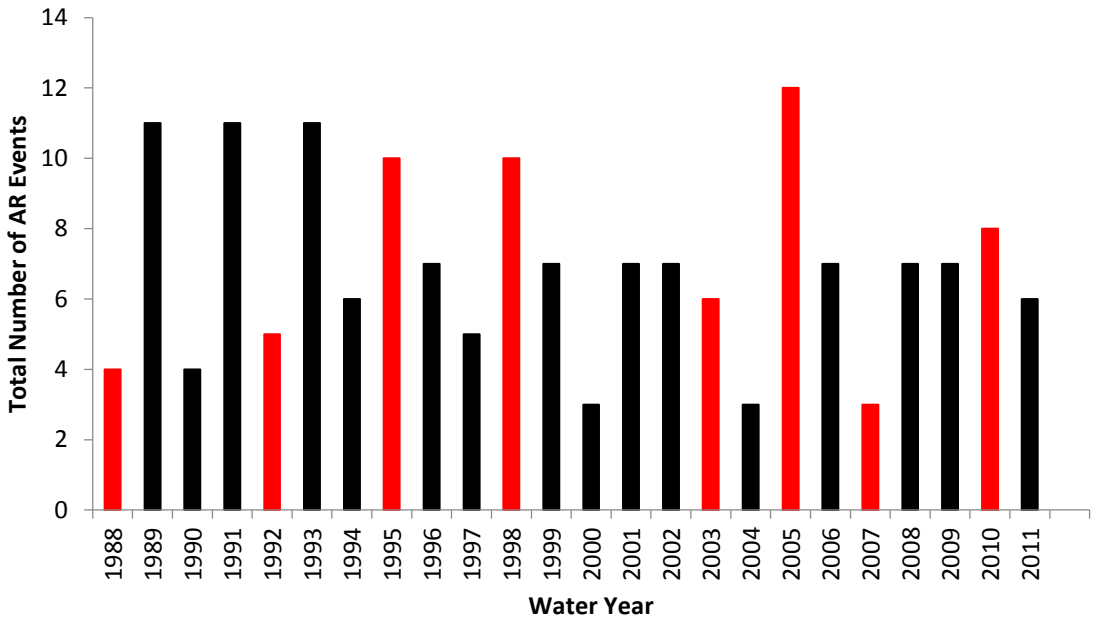

Figure 6. Yearly distribution of the total AR events observed during WYs 1988 – 2011. Red bars indicate an El Niño year.

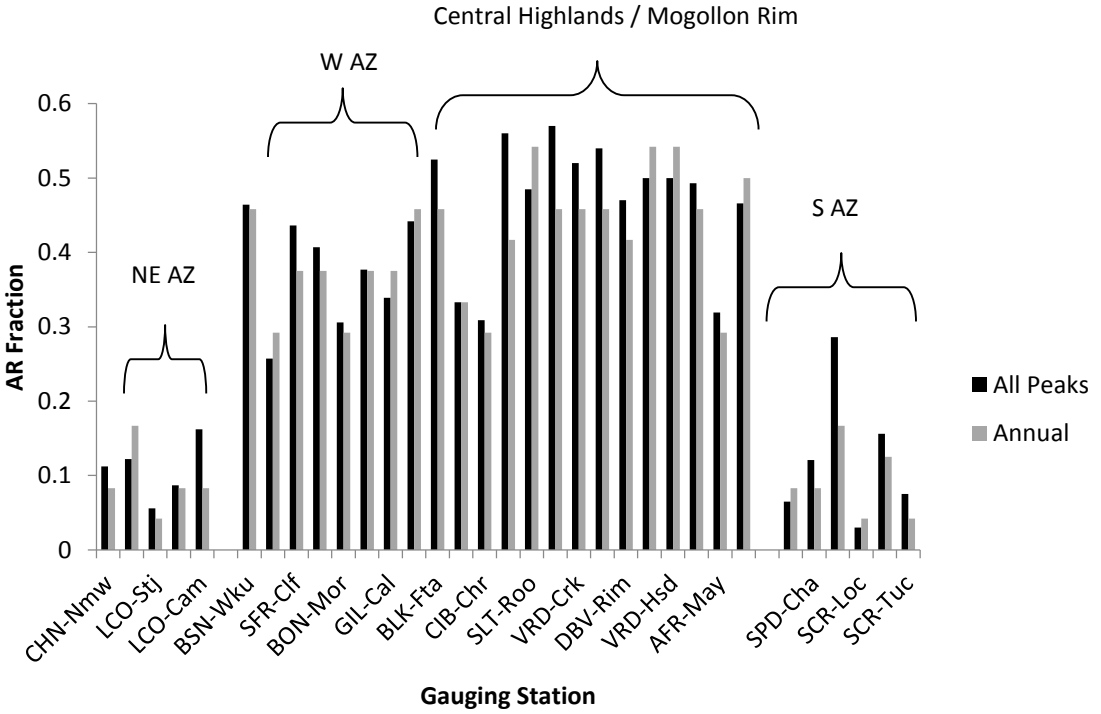

Figure 7. AR fractions at selected gauging stations by watershed during WYs 1988 – 2011

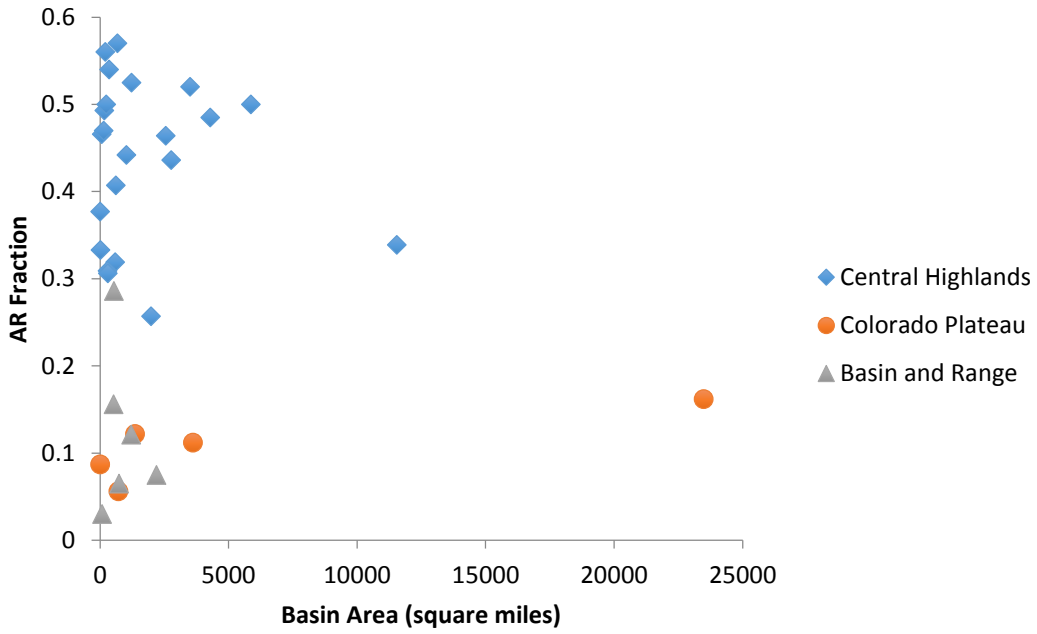

Figure 8. Drainage basin area and AR fraction

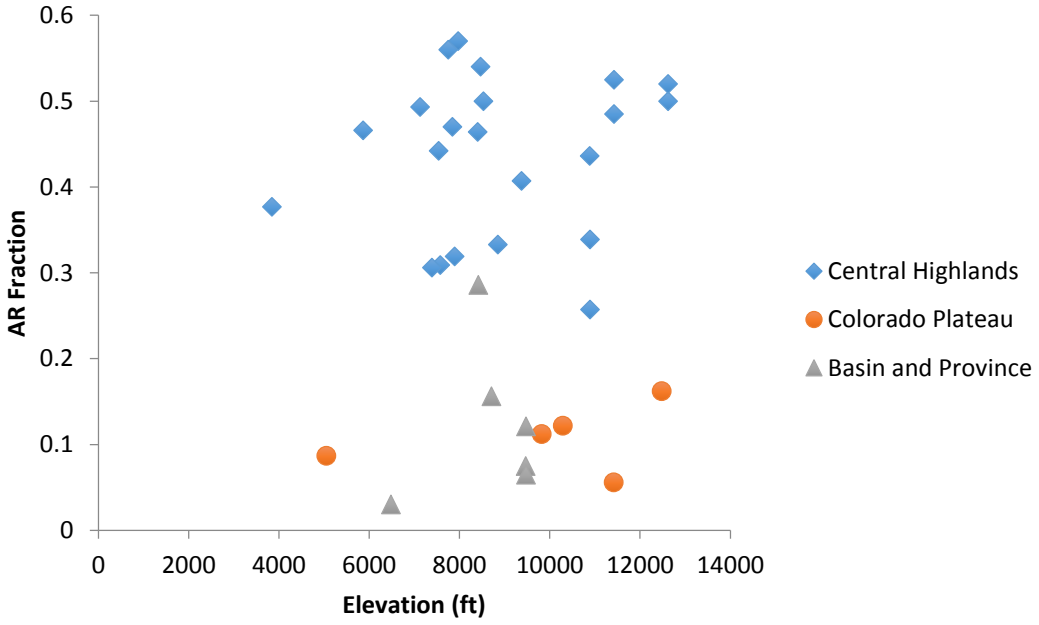

Figure 9. Maximum elevation and AR fraction

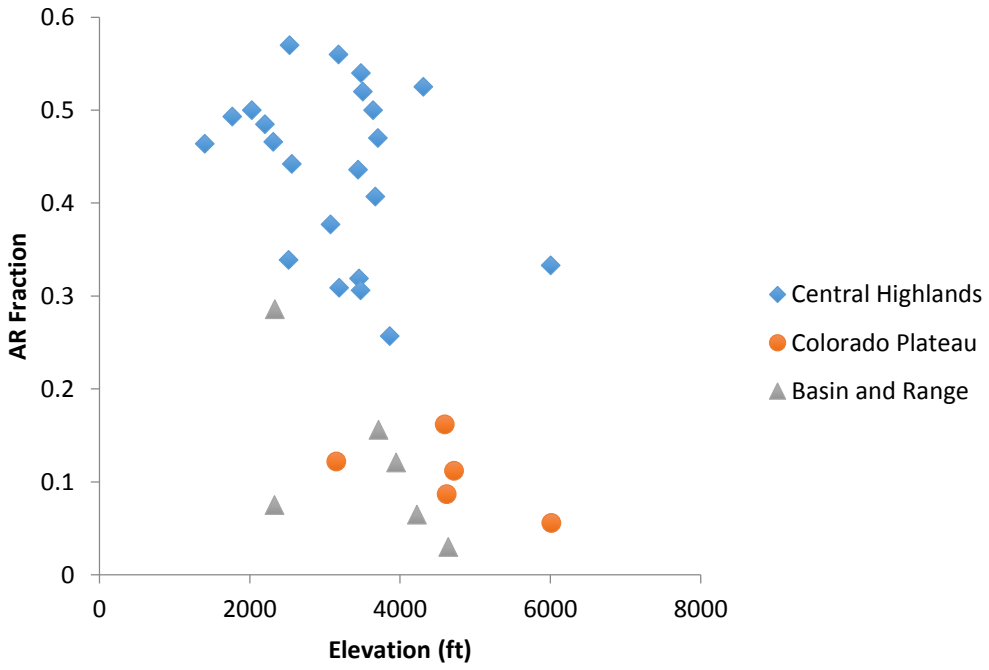

Figure 10. Outlet elevation and AR fraction

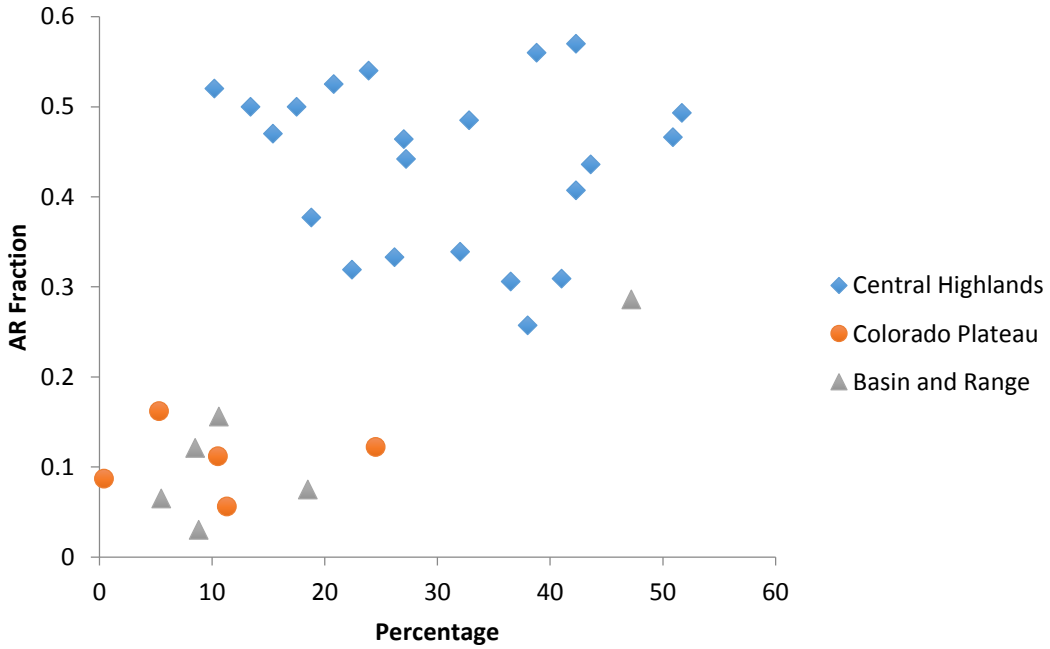

Figure 11. Percentage of slope > 30 and AR fraction

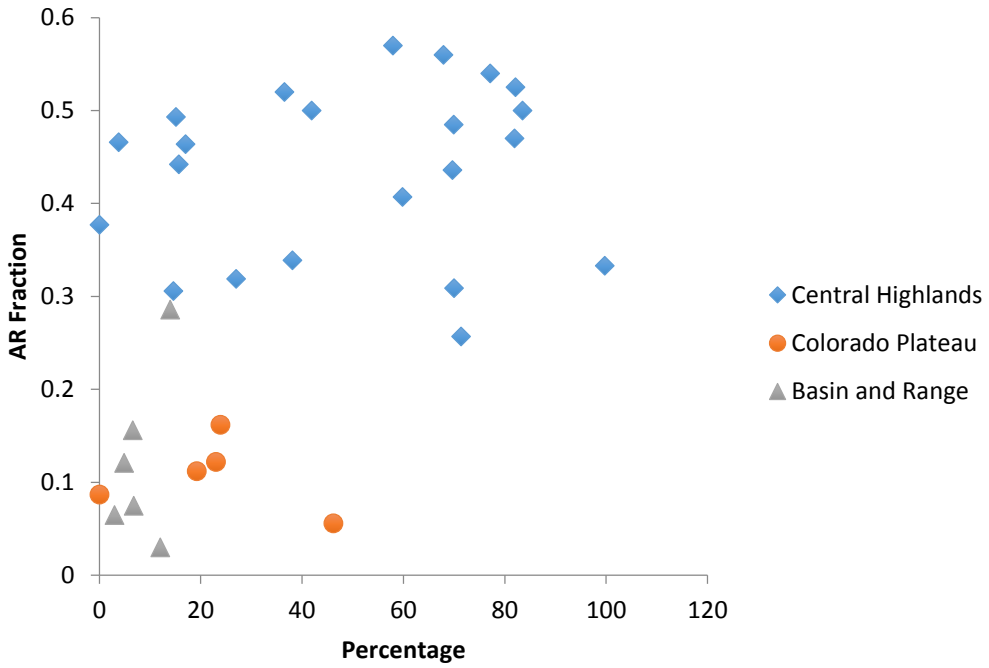

Figure 12. Percentage of forest cover and AR fraction.

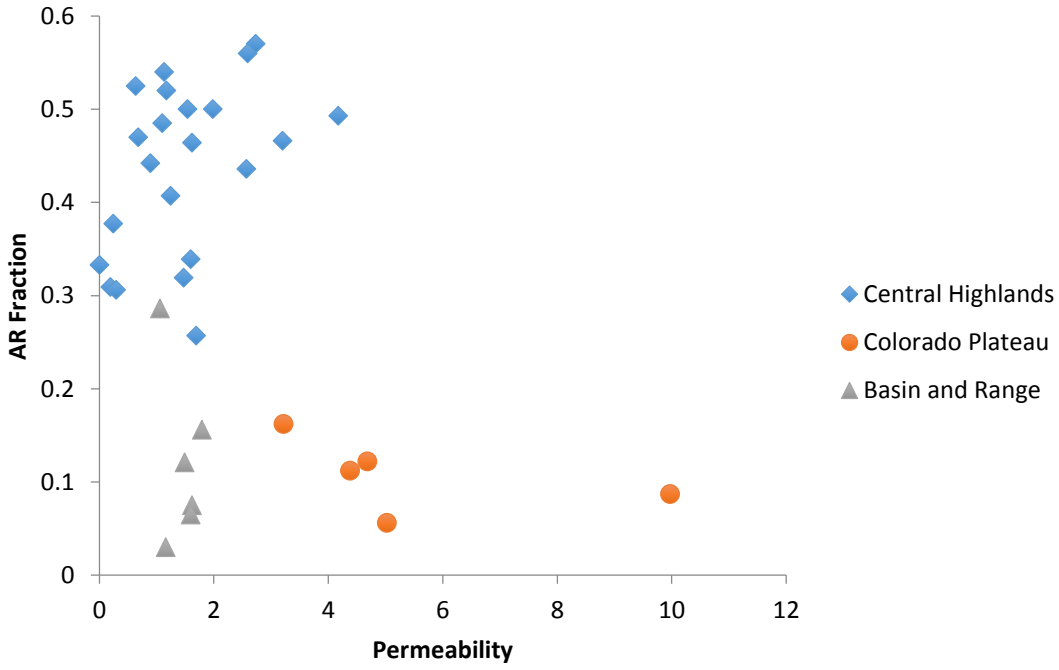

Figure 13. Soil permeability and AR fraction.

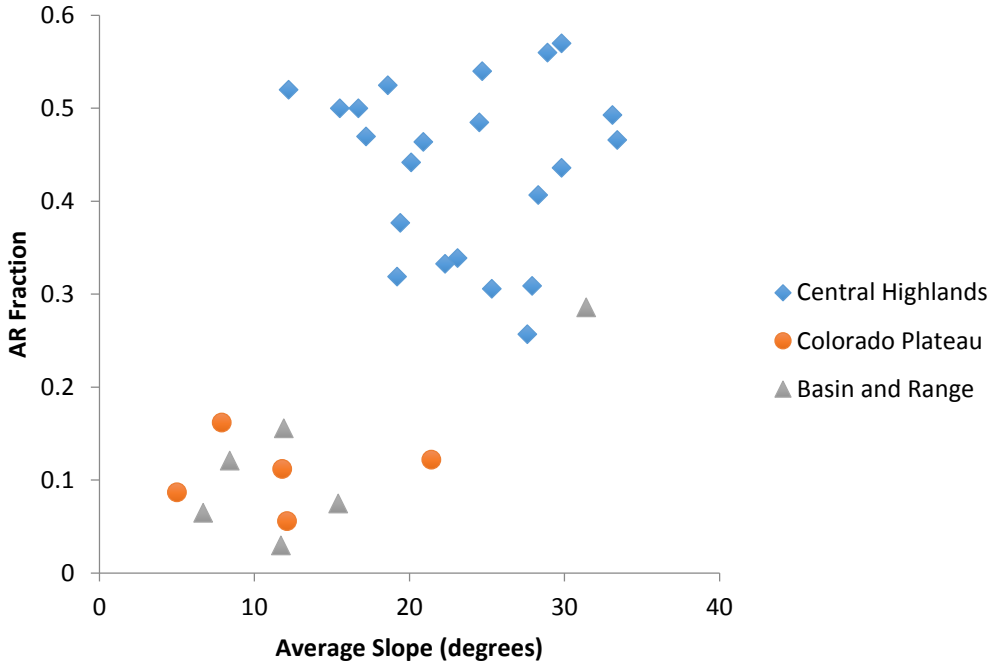

Figure 14. Mean basin slope and AR fraction

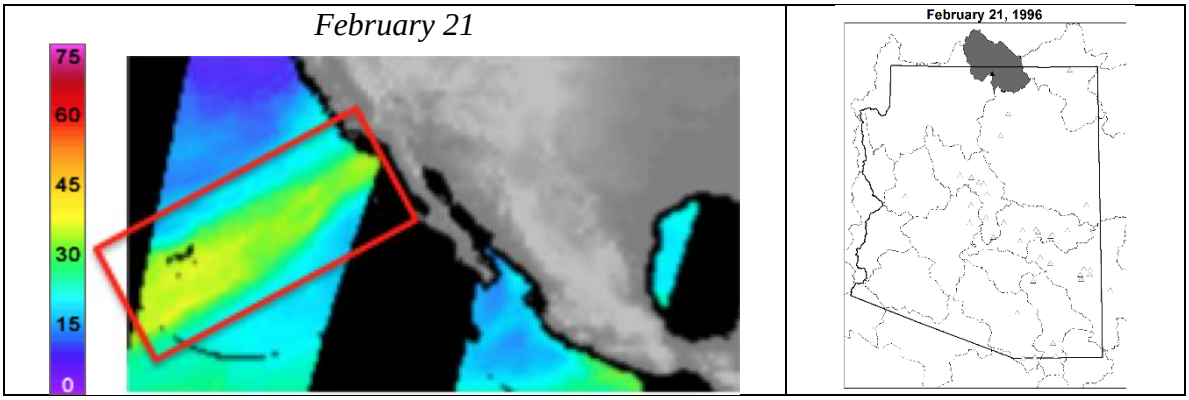

Figure 15. SSM/I and watershed map for the 21 February 1996 event

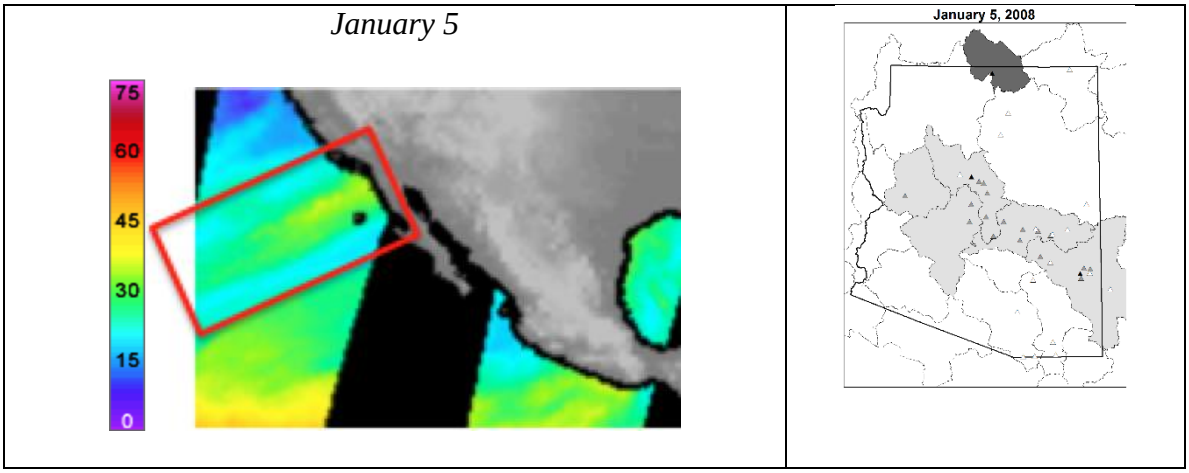

Figure 16. SSM/I and watershed map for the 5 January 2008 event

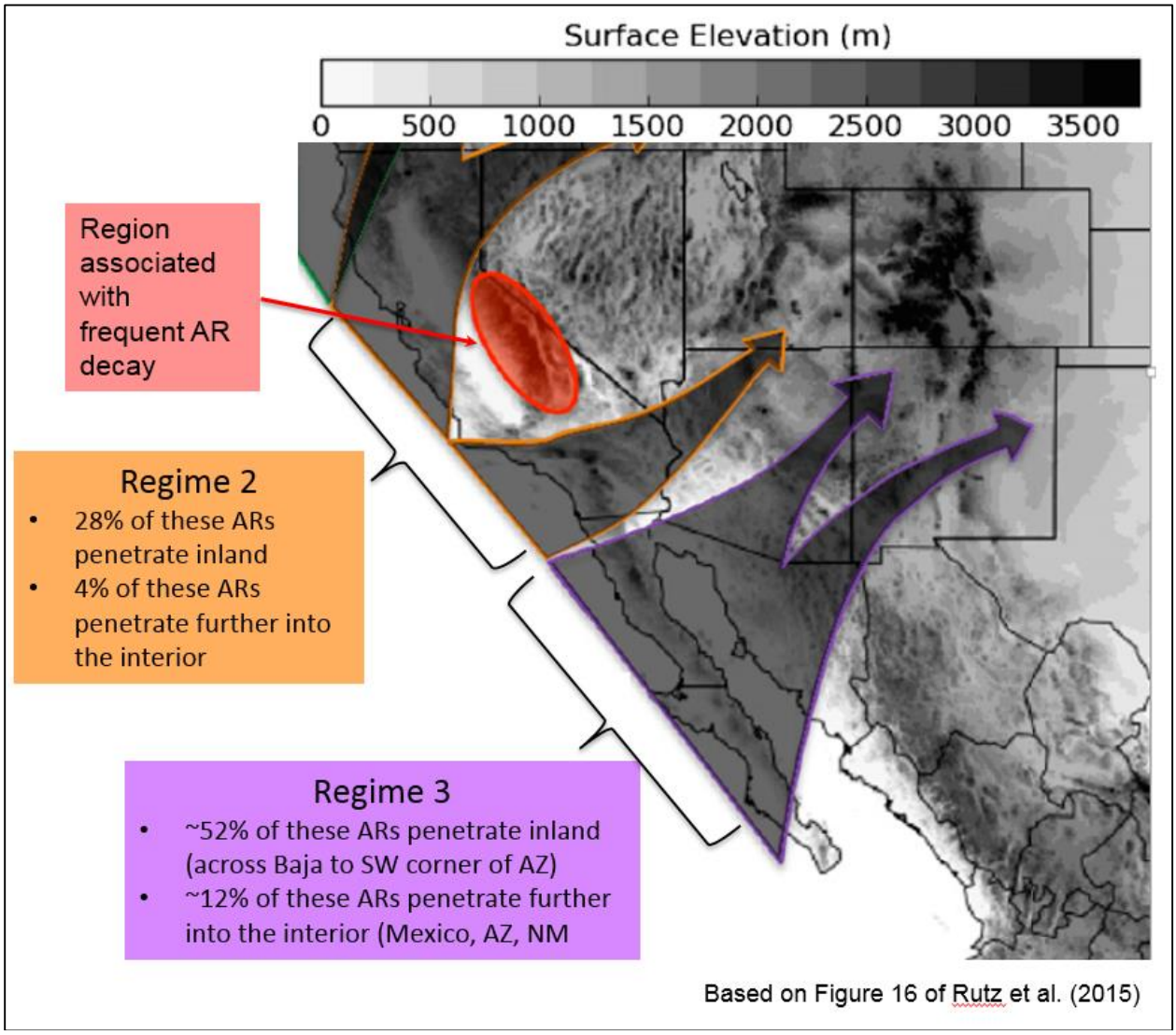

Figure 17. Schematic showing the primary pathways for the penetration of AR-related trajectories into the interior of western North America. Regime 3 and the southern branch of Regime 2 are the most likely pathways for ARs entering Arizona.
(modified version of Figure 16 in Rutz et al. 2015).