

Atmospheric drivers of glacial changes in Southwestern rainfall seasonality

TRIPTI BHATTACHARYA¹

¹Department of Geosciences, University of Arizona,
tripti@email.arizona.edu

The North American Monsoon (NAM) is an iconic feature of Southwest climate, providing the majority of annual rainfall in many regions of northwest Mexico and Arizona. Monsoon rainfall is critical to regional terrestrial ecosystems, but the NAM remains one of the least understood monsoon systems. Here, I reconstruct the late Pleistocene evolution of the NAM from isotopic analyses of leaf waxes deposited in Gulf of California sediment cores. Proxy/model comparisons suggest that glacial reductions in summertime rainfall are a result of ice-sheet induced changes in the subtropical jet that 'ventilate' the monsoon by mixing cold, dry air into the NAM region. Syntheses of terrestrial vegetation records also show a strong dependence of plant community composition on rainfall seasonality. This work points to an important role for midlatitude atmospheric circulation in regulating regional subtropical precipitation, with cascading influences for terrestrial ecosystems.