

A brief overview of precipitation variability at the SNWR during the summer monsoon

Matt Petrie, University of New Mexico, 2012



Photo: Amaris Swann, 2008

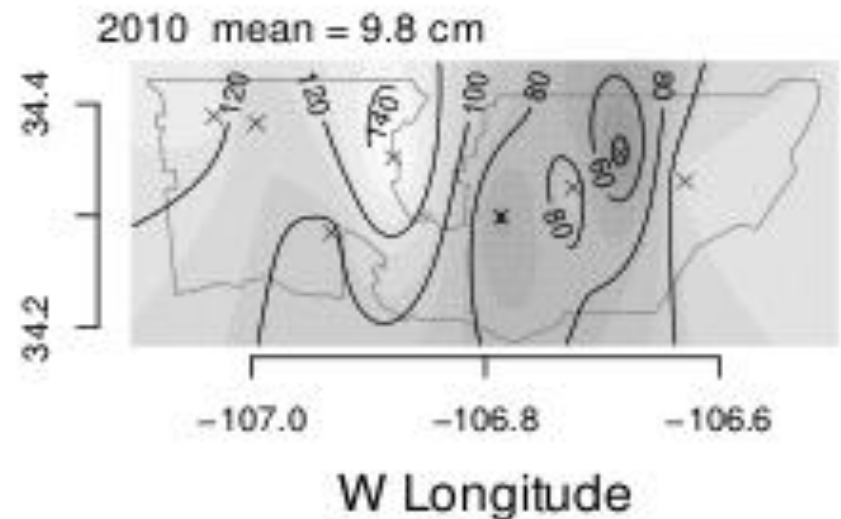
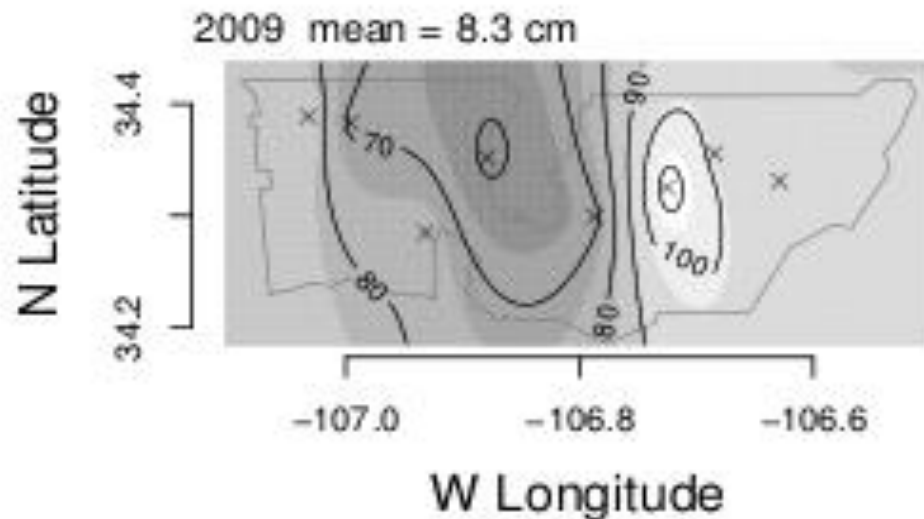
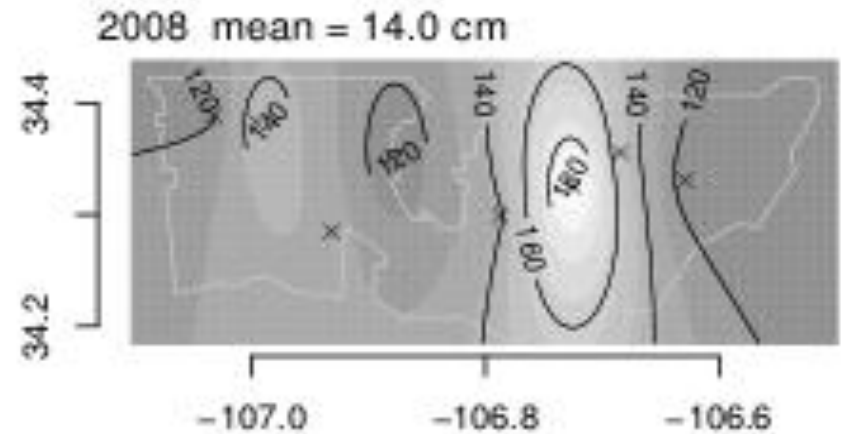
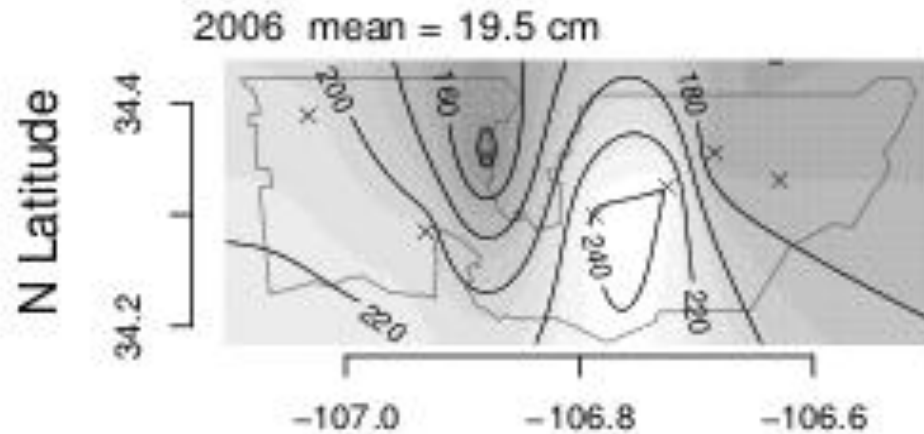
Overview

- Paper in review, regional P during the summer monsoon (DOY 181-273) from 1910-2010 and local P during the summer monsoon at the SNWR from 2006-2010.
- Primary question is has monsoon P changed regionally from 1910-2010?
- Secondary questions focus on P statistics and annual variability across spatial scales.
- Only analyzed grassland sites.

A few facts

- Change to the properties of regional monsoon P from 1910-2010, but no change mean P.
- Mean P is 14.4 cm from 2006-2010 at SNWR, but stations rarely experience this (high variance at $< 5 \text{ km}^2$).
- From 2006-2010, the smallest 60% of days with P have an insignificant effect on total P.
- The largest quartile of actual events account for around 80% of total P; driving variables are geographic extent and magnitude of events (i.e. large convective thunderstorms).

Spatial kriging of monsoon P, linear variogram model in 8 directions, R-project gstat package



Year	# Events	Site \bar{P} [mm]	σ_P^2 [mm]
2006	70	195.4	22.9
2008	53	139.6	26.4
2009	66	82.9	31.3
2010	64	98.0	32.8

- The number of events does not correlate to total P.
- Variance is higher in dry years.
- Does deposition exhibit similar characteristics?
How much variability exists?

A few thoughts

- The SNWR is huge in area, especially when compared to other sites in this project.
- Dominant P forcings are winter P (as spring snowmelt) and summer monsoon P. These exhibit statistical properties that may contrast mesic and temperate sites. I have done some modeling of winter snowfall for upland sites at the SNWR, if this is useful.
- Climate change projections for the region are unclear in terms of P. Lower winter P is often suggested, but I am not sure how accurate this is for the SNWR.

I hope this info helped! Thank!