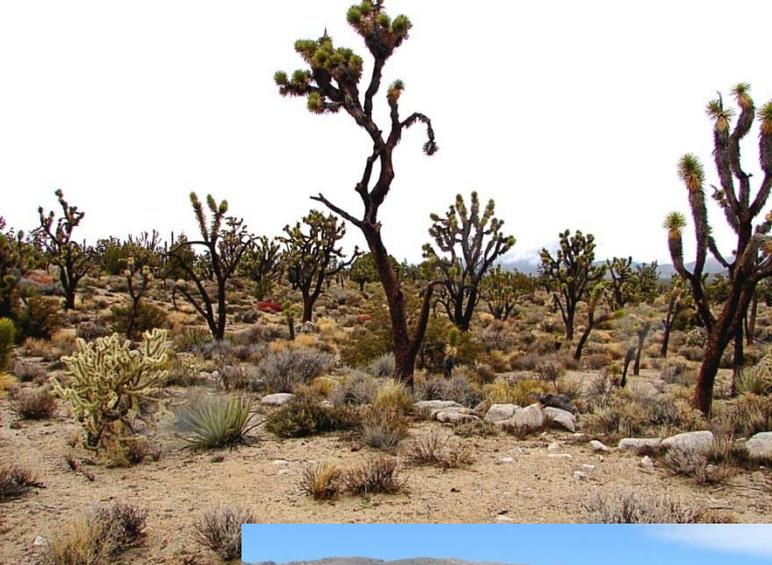




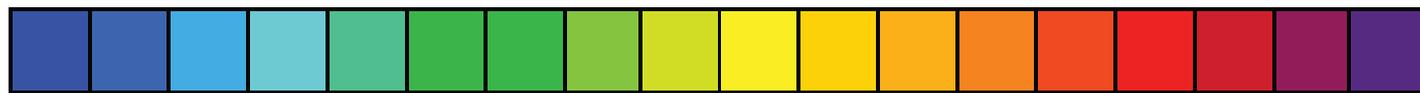
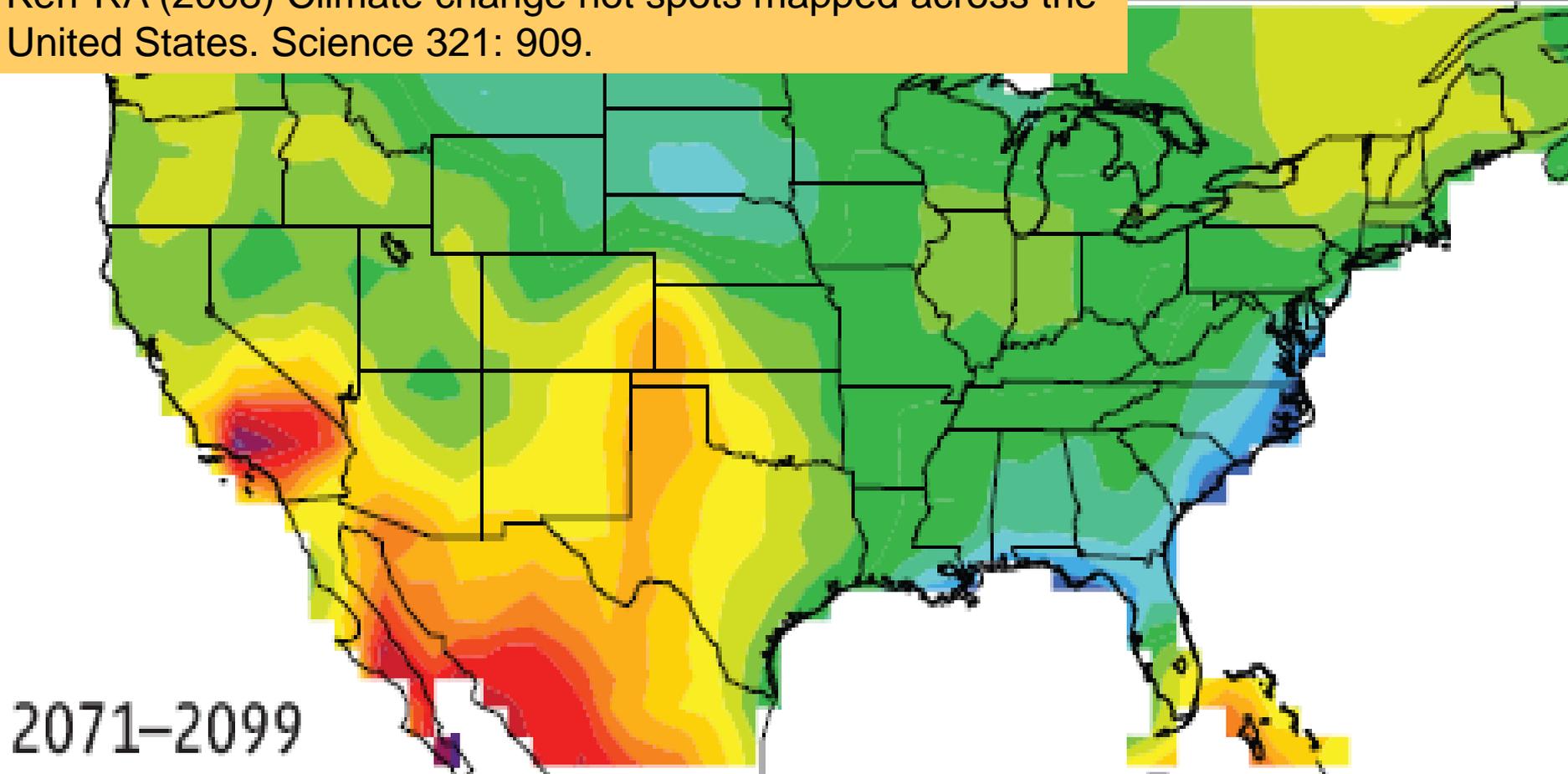
Climate Change and Restoration in the southern Mojave Desert

Cameron Barrows, PhD and Michelle L. Murphy
Center for Conservation Biology
cbarrows@ucr.edu





Kerr RA (2008) Climate change hot spots mapped across the United States. *Science* 321: 909.



2

3

4

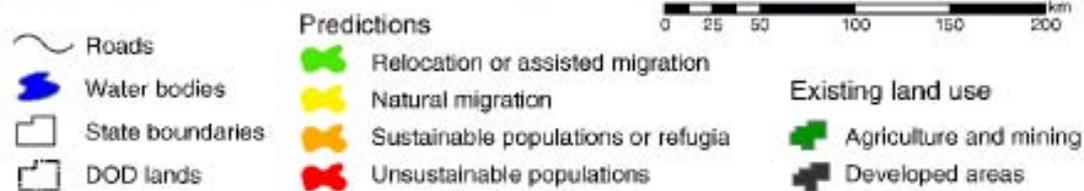
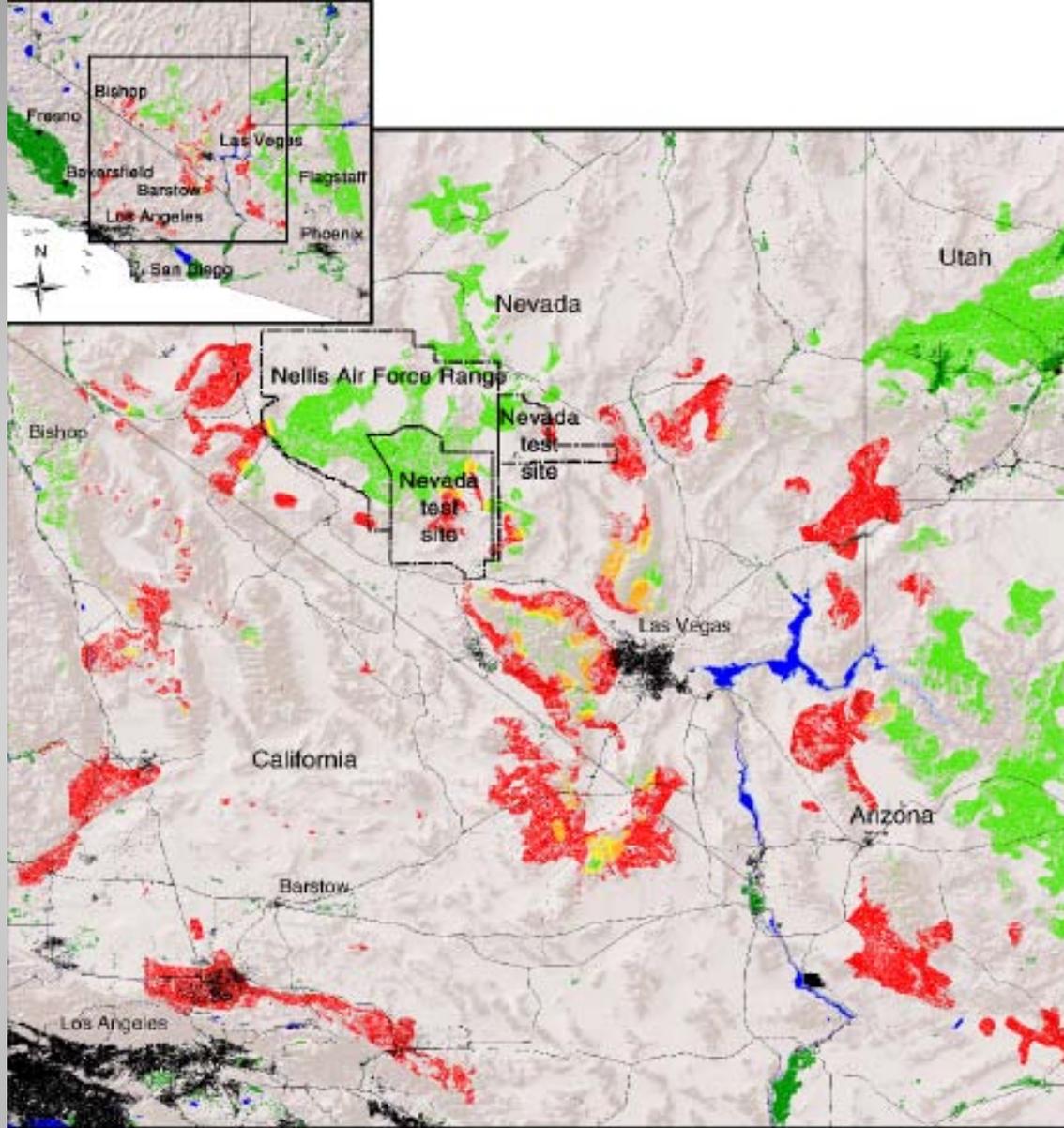
5

Relative Responsiveness



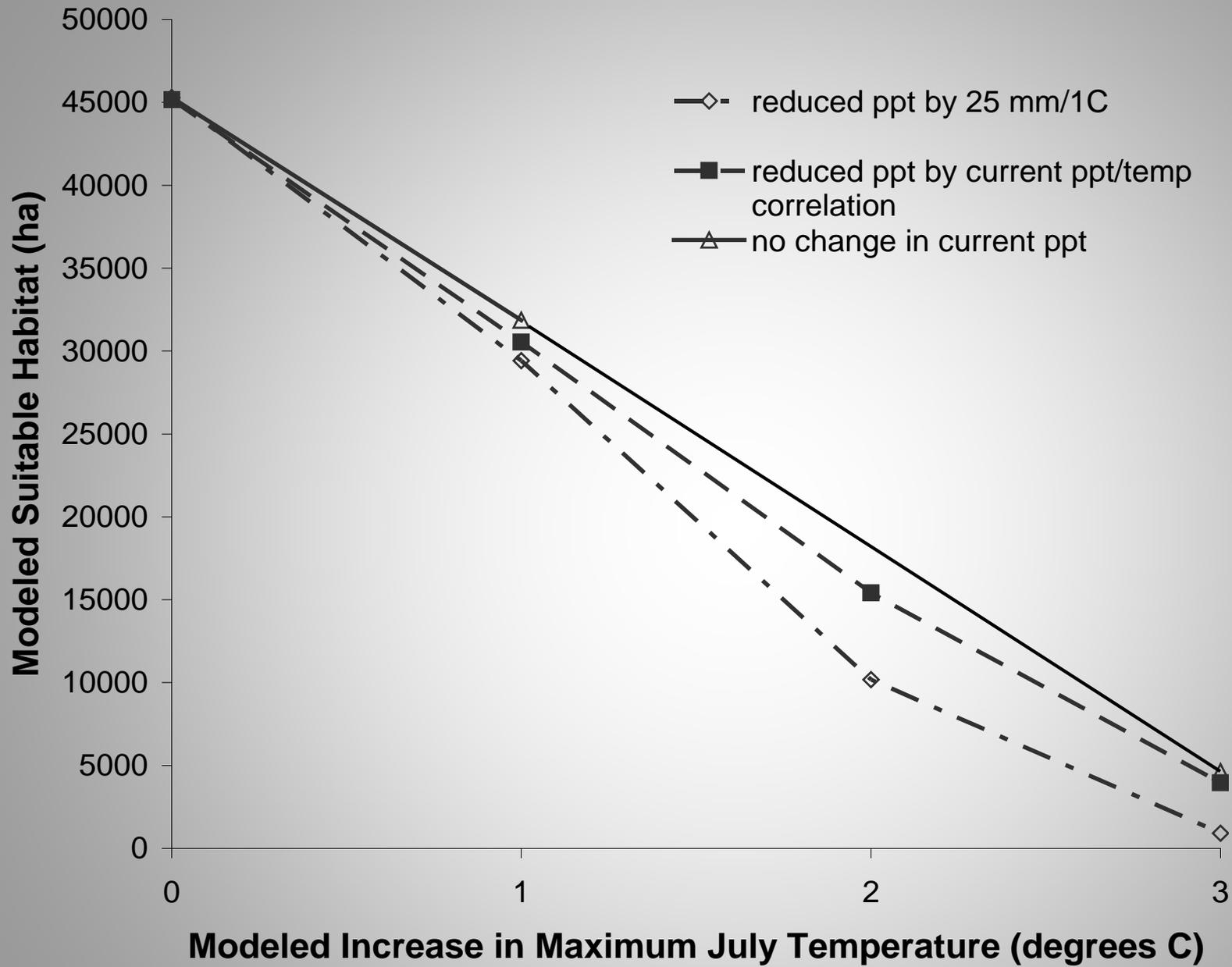
Image showing the condition of a Joshua tree woodland in Mojave County, Arizona

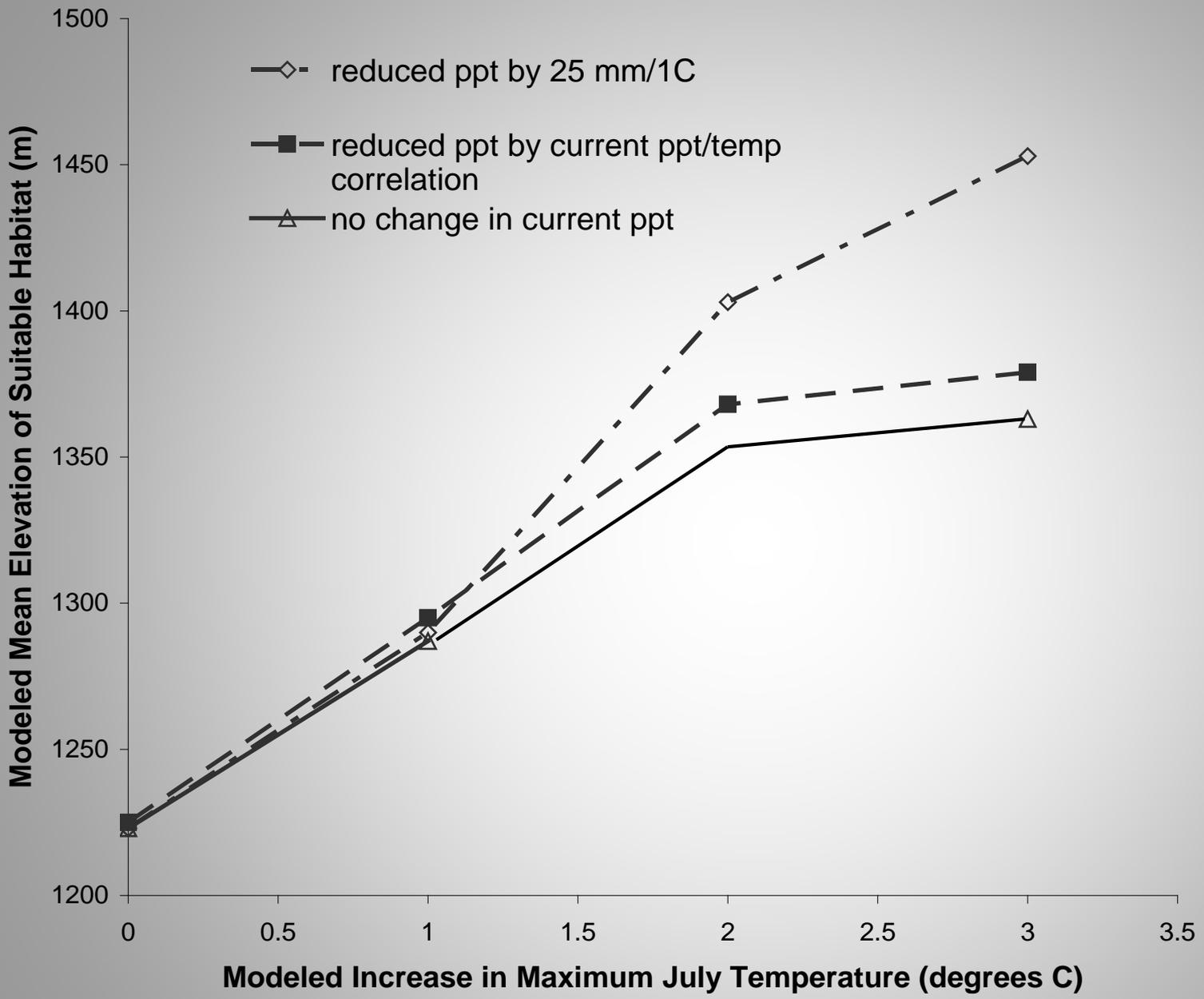
From: Cole, K.L. et al. 2011. Past and on-going shifts in Joshua tree distribution Support future modeled range contraction. *Ecological Applications* 21:137-149.

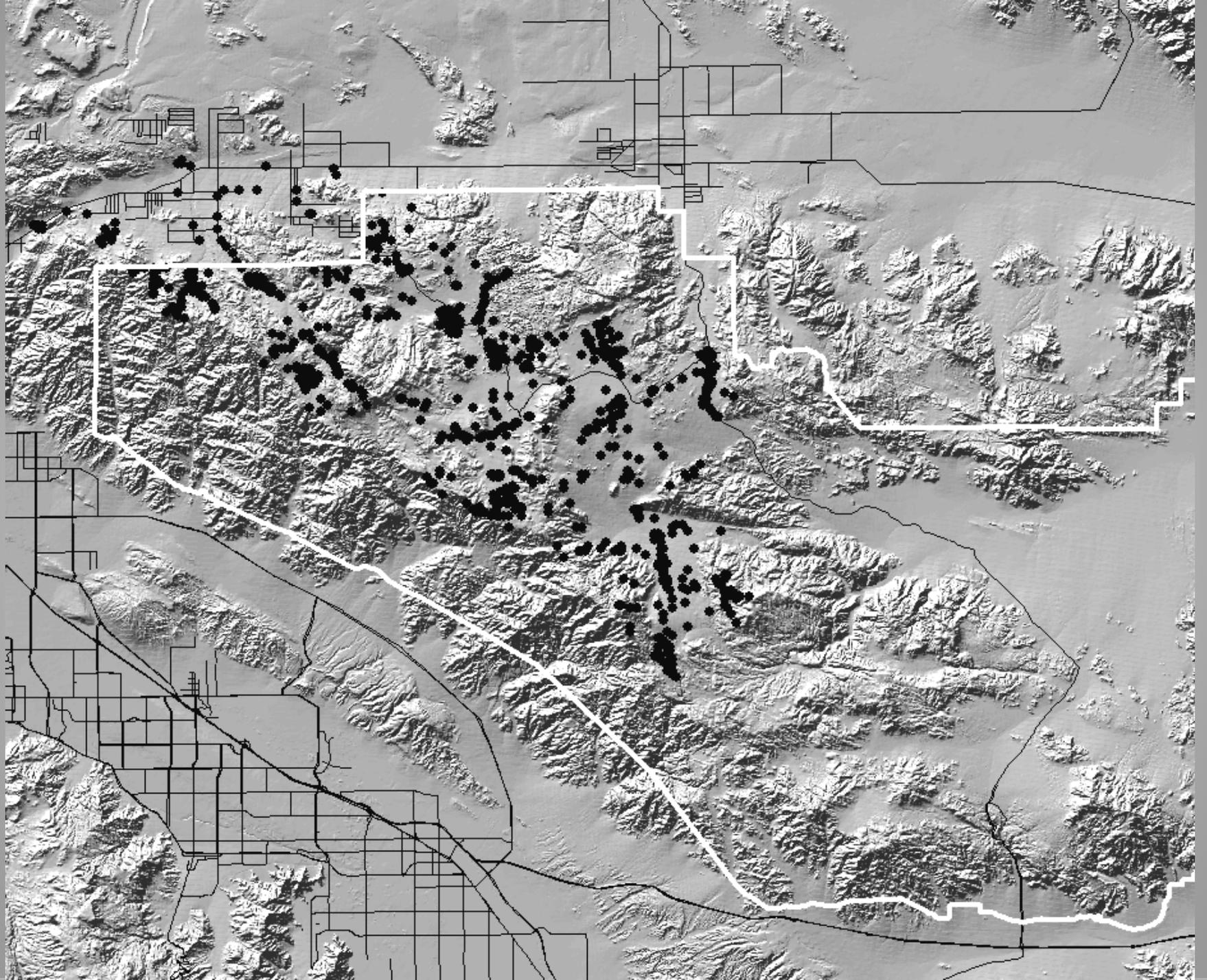


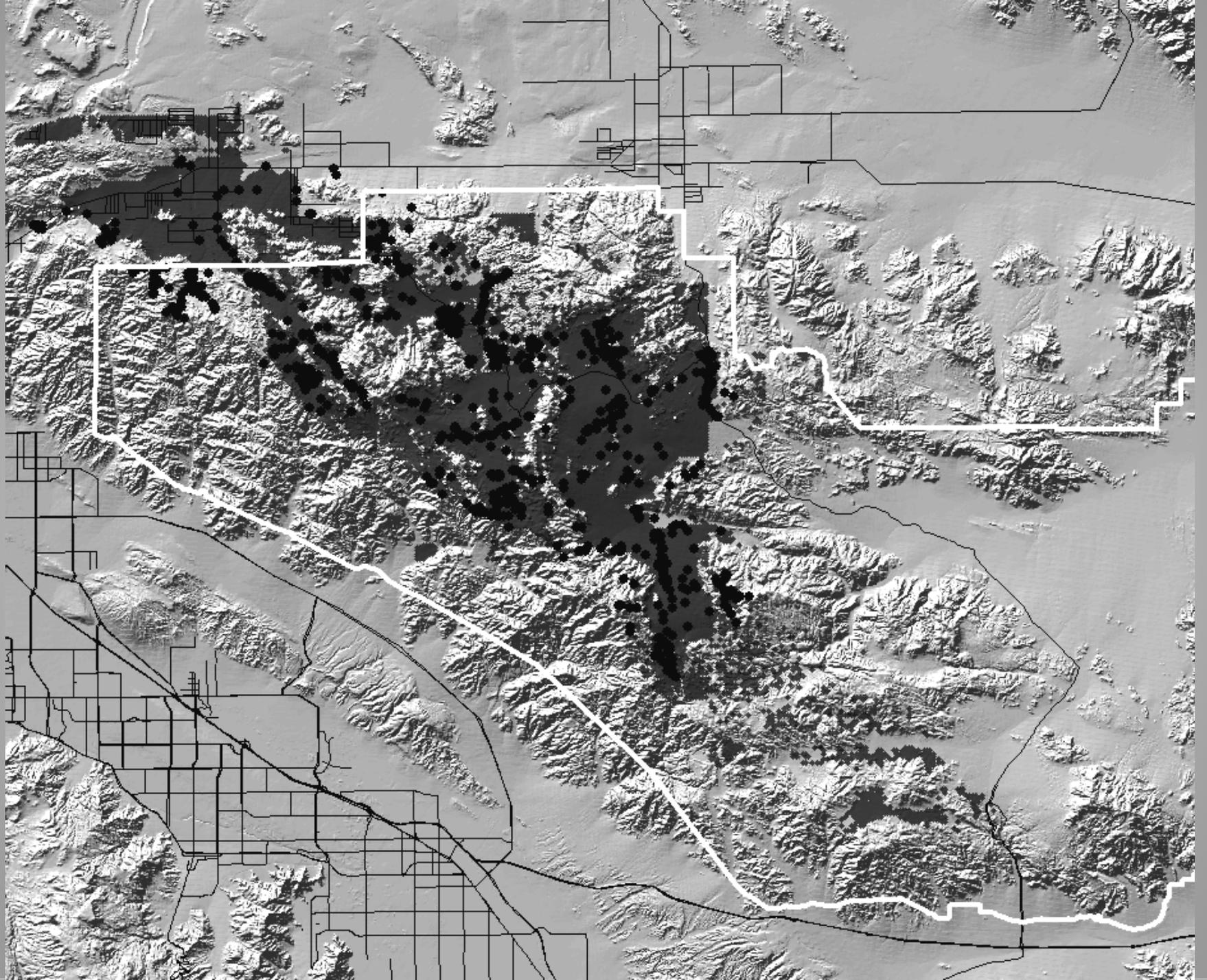


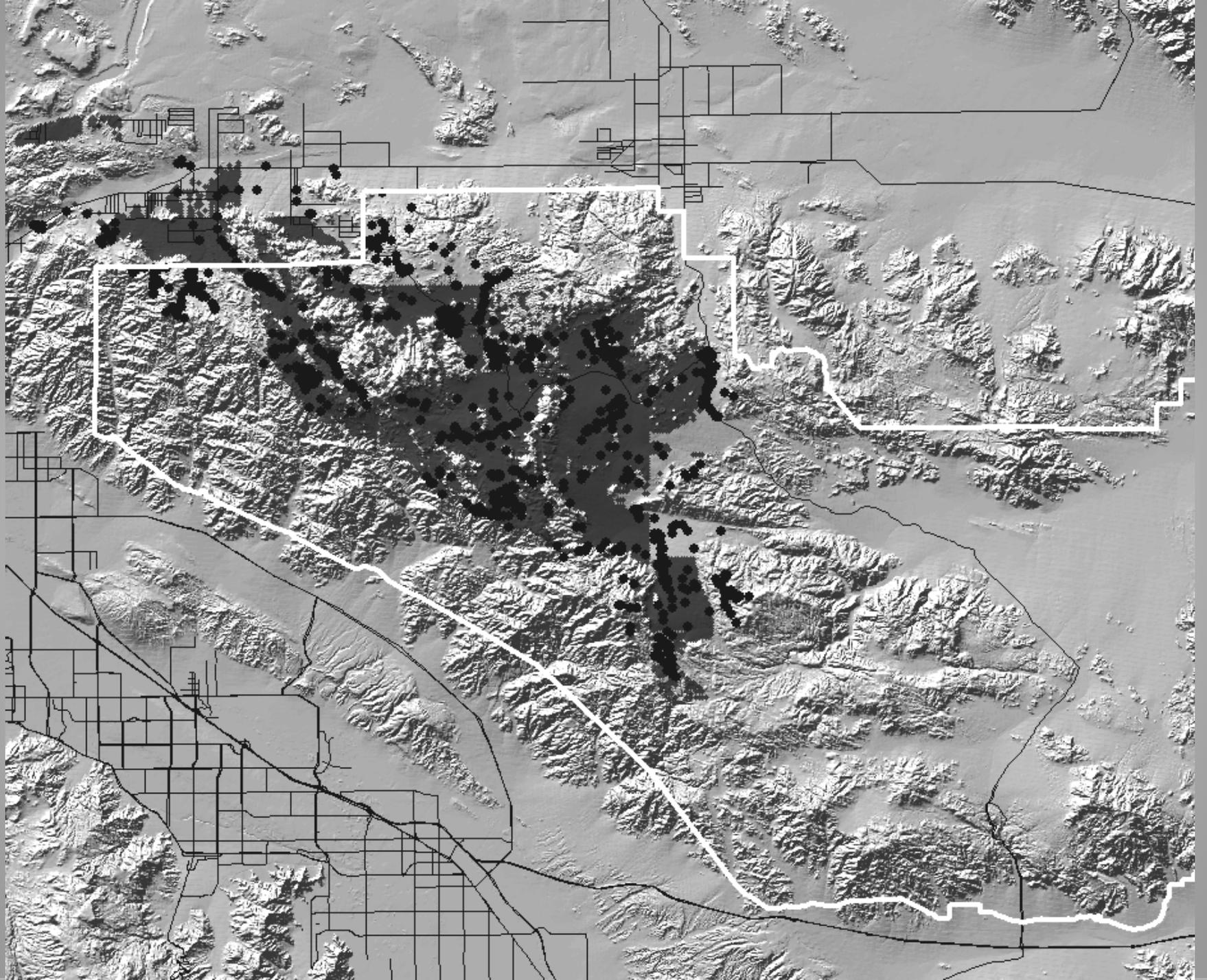




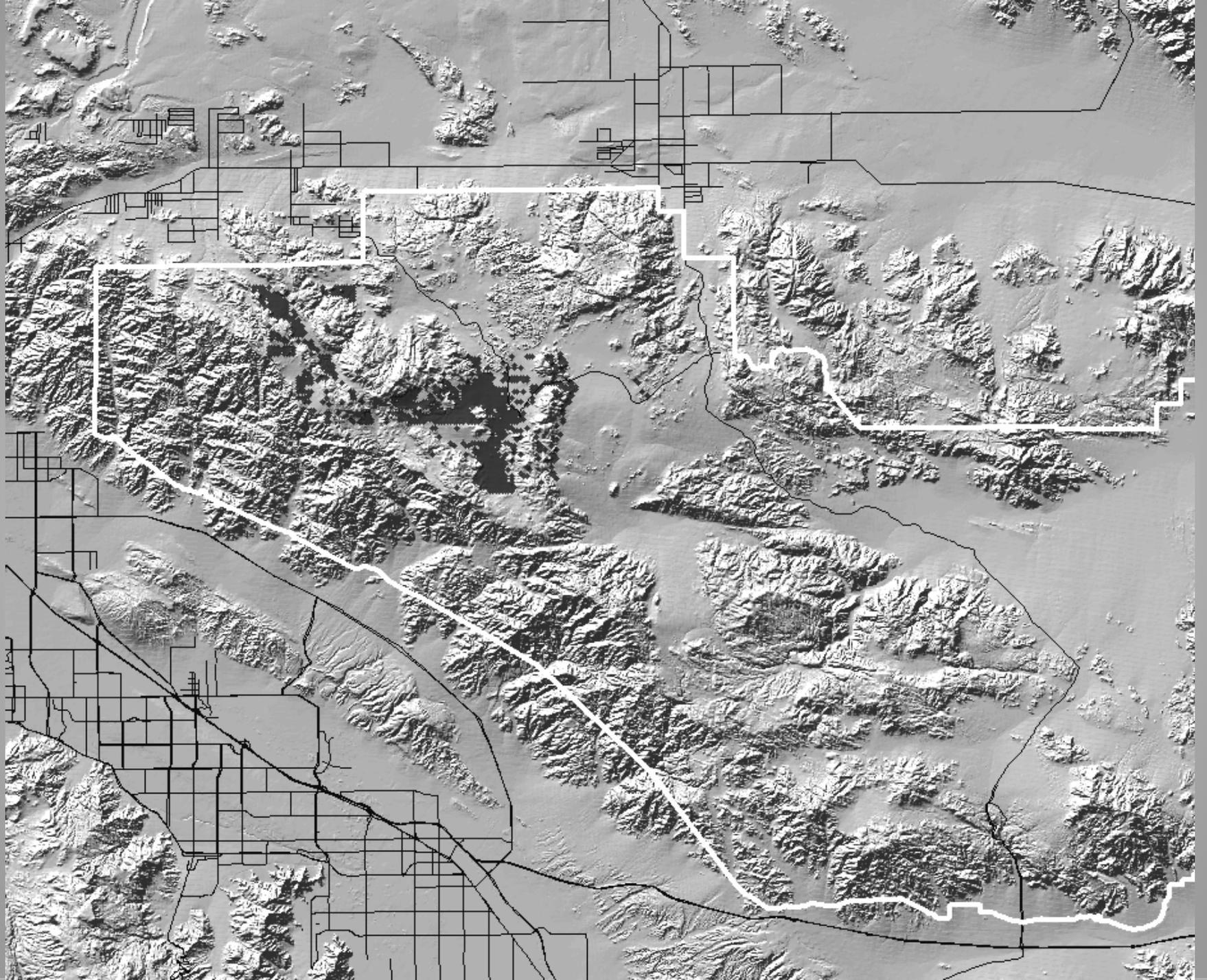




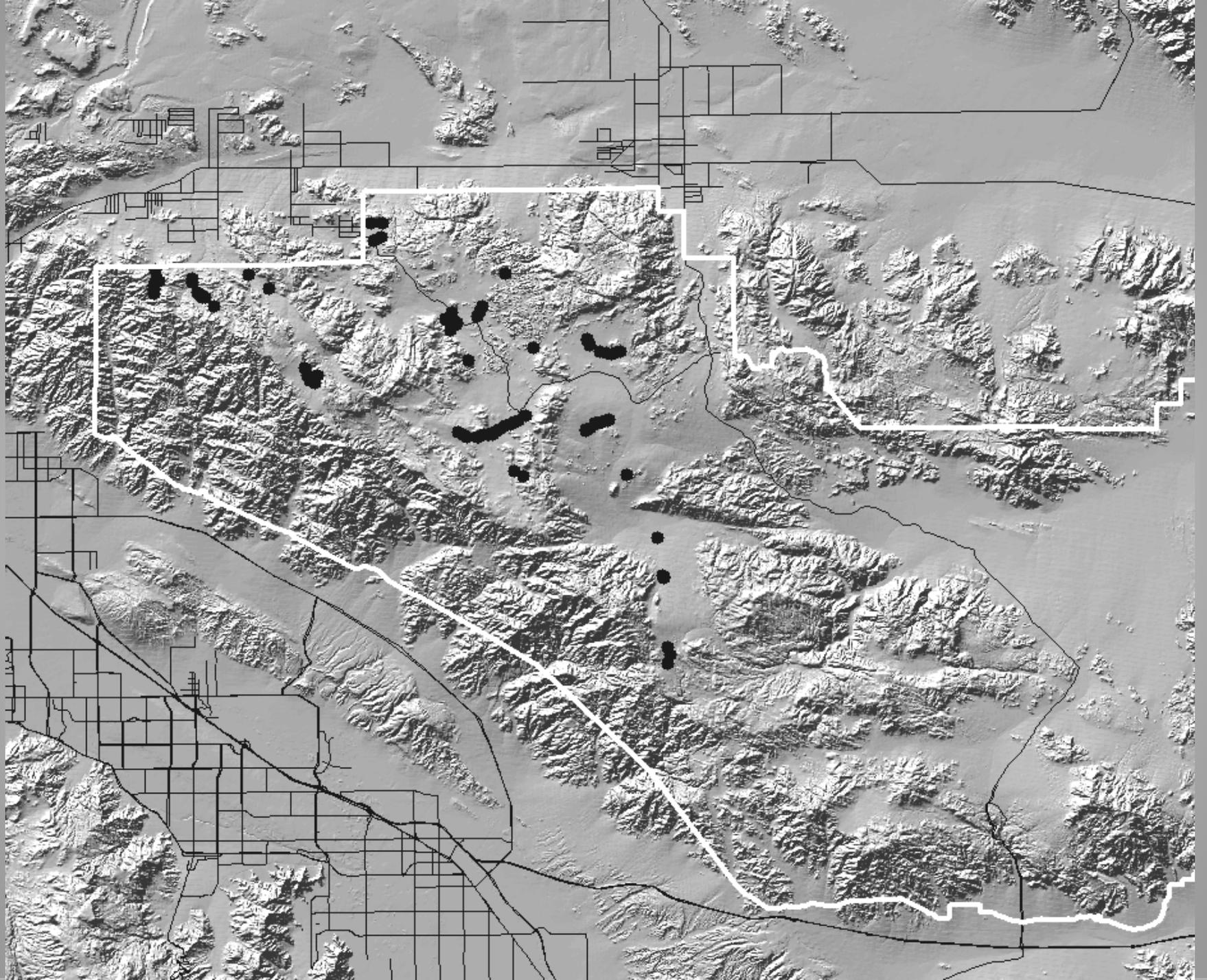


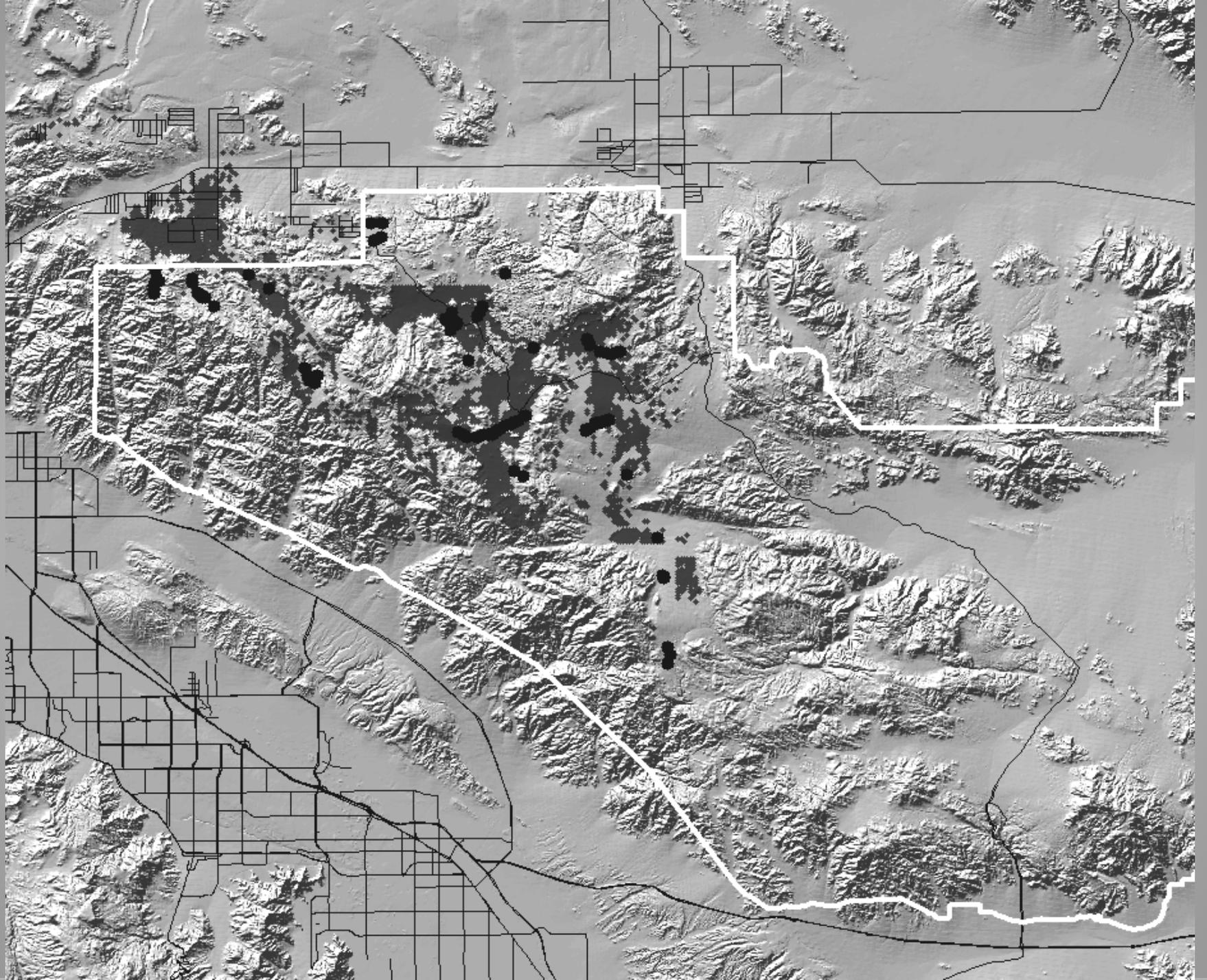


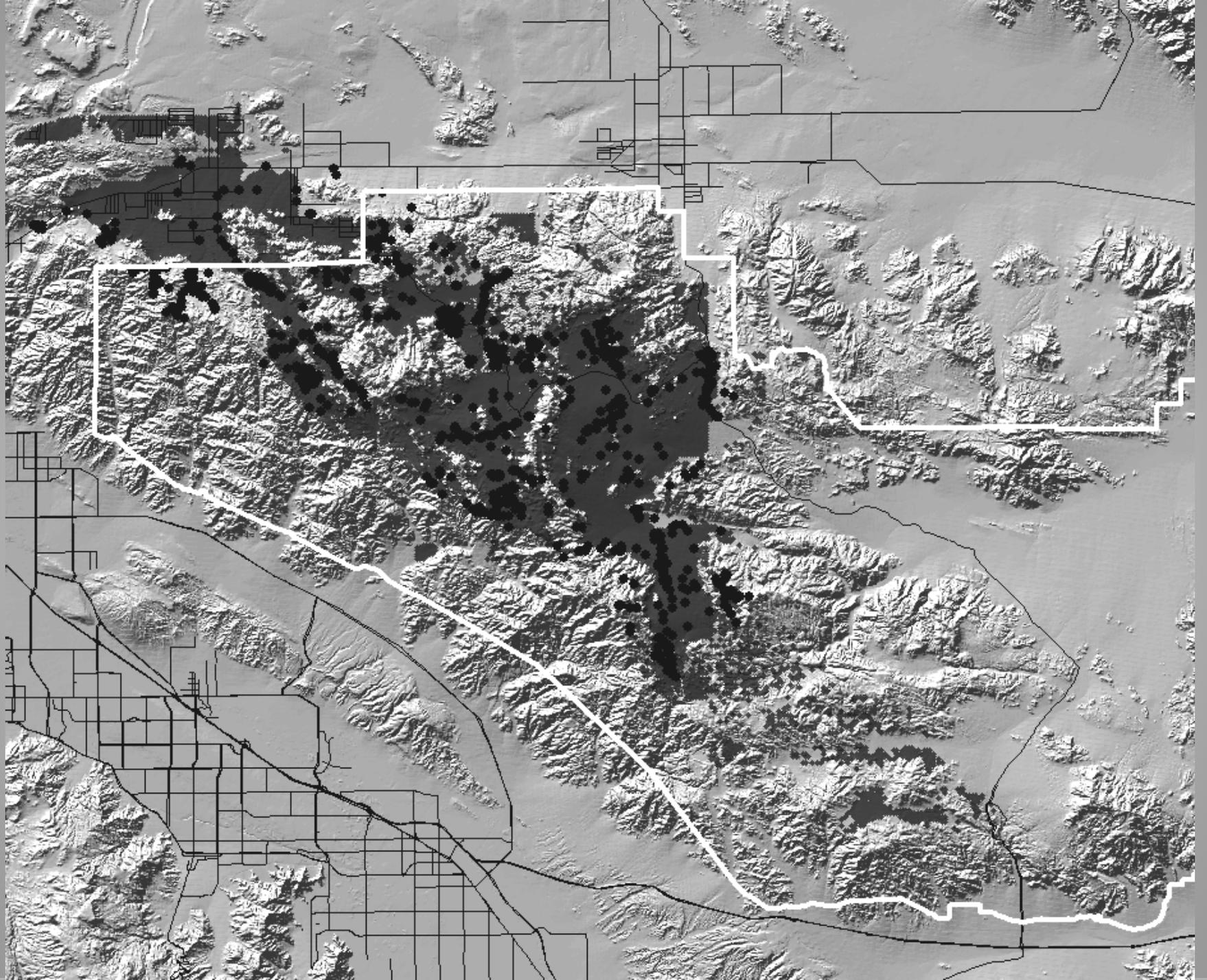


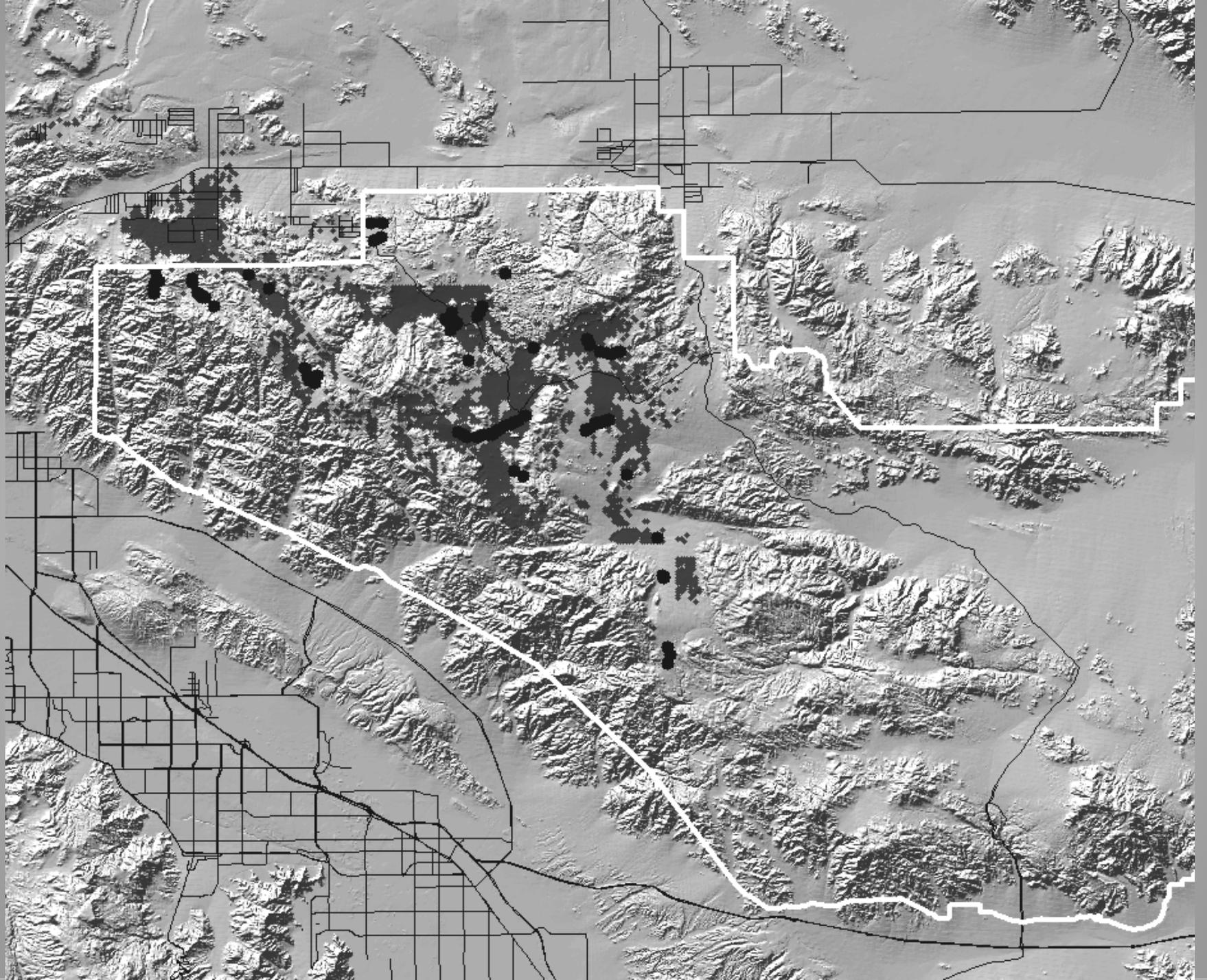


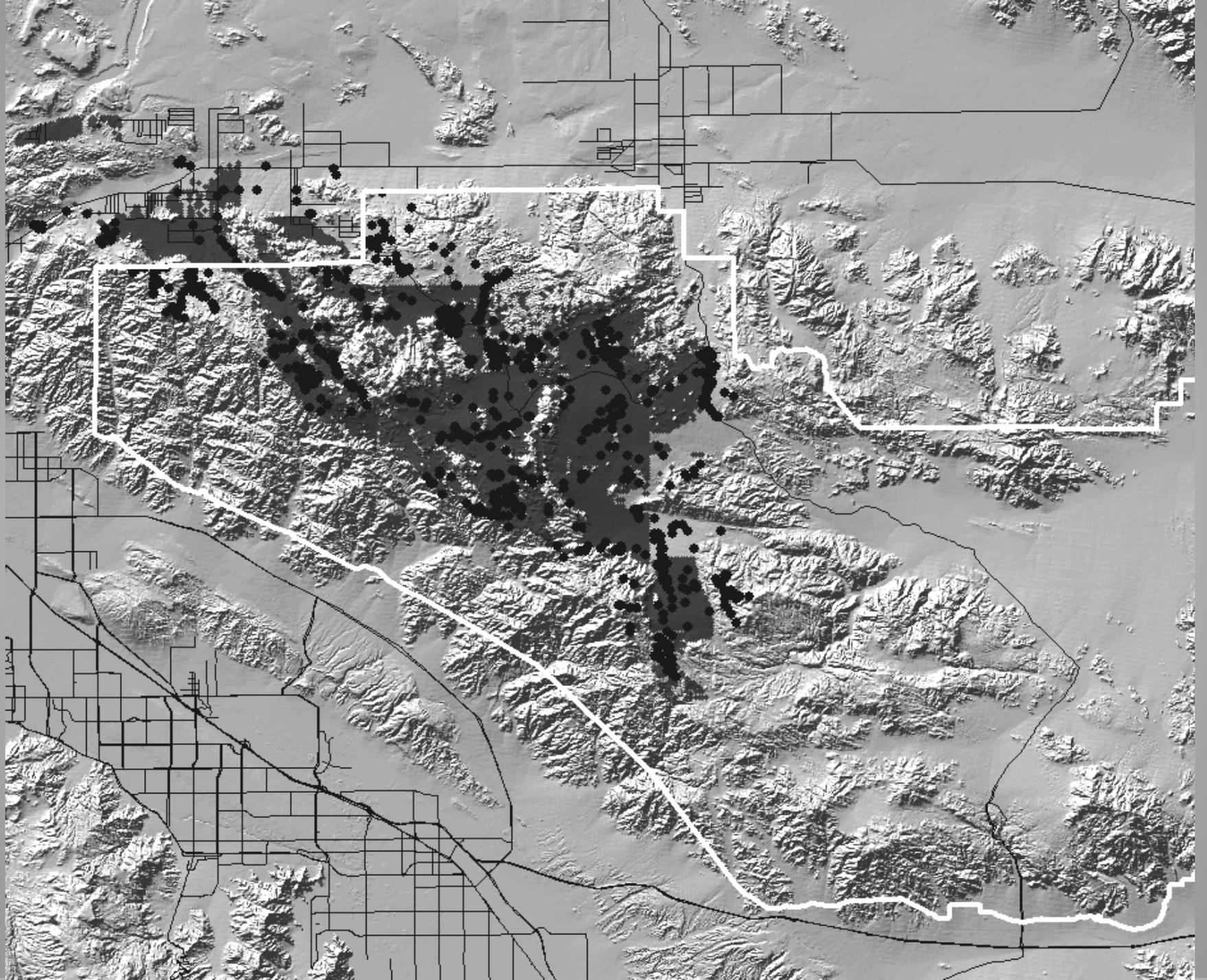




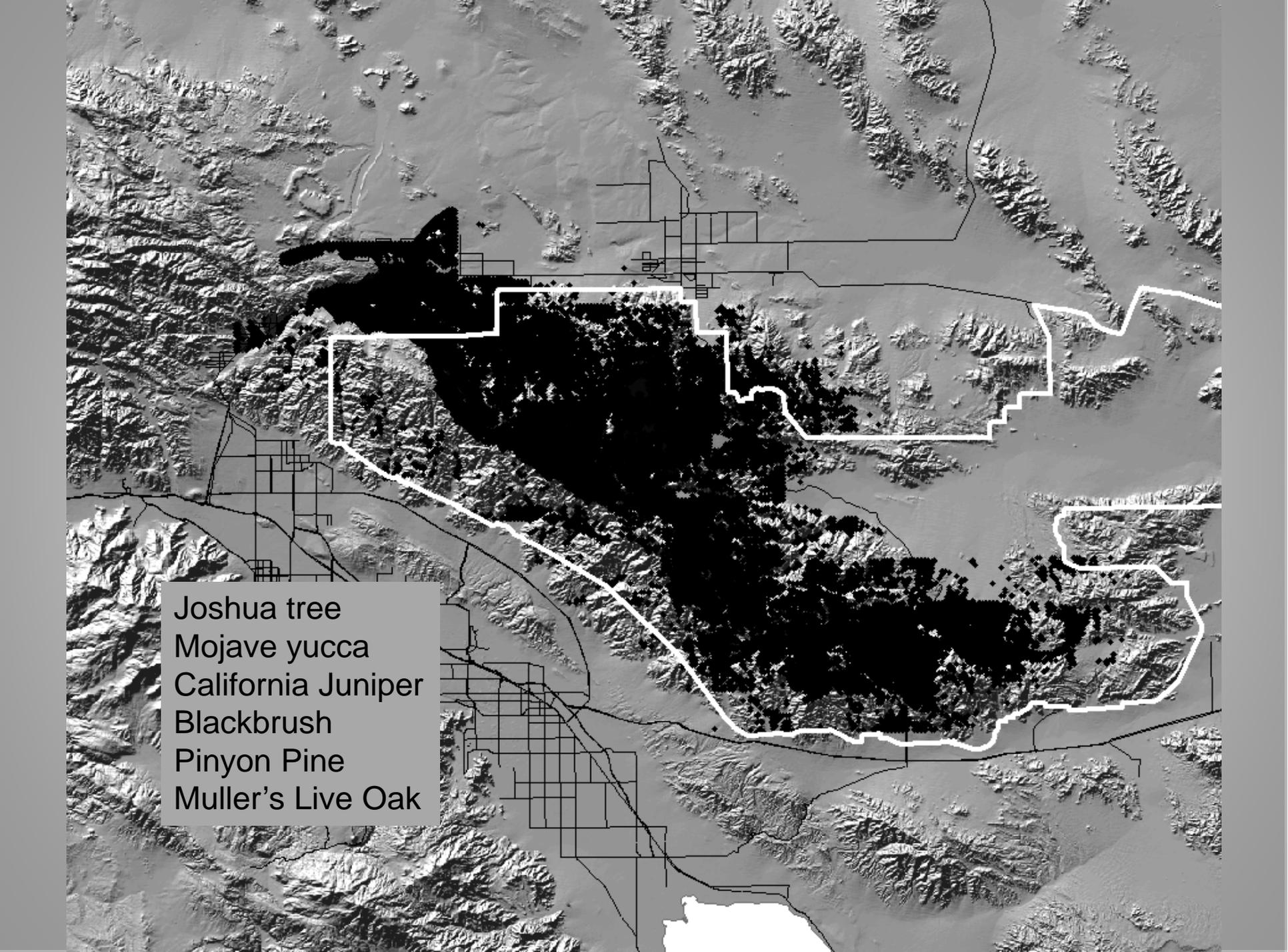




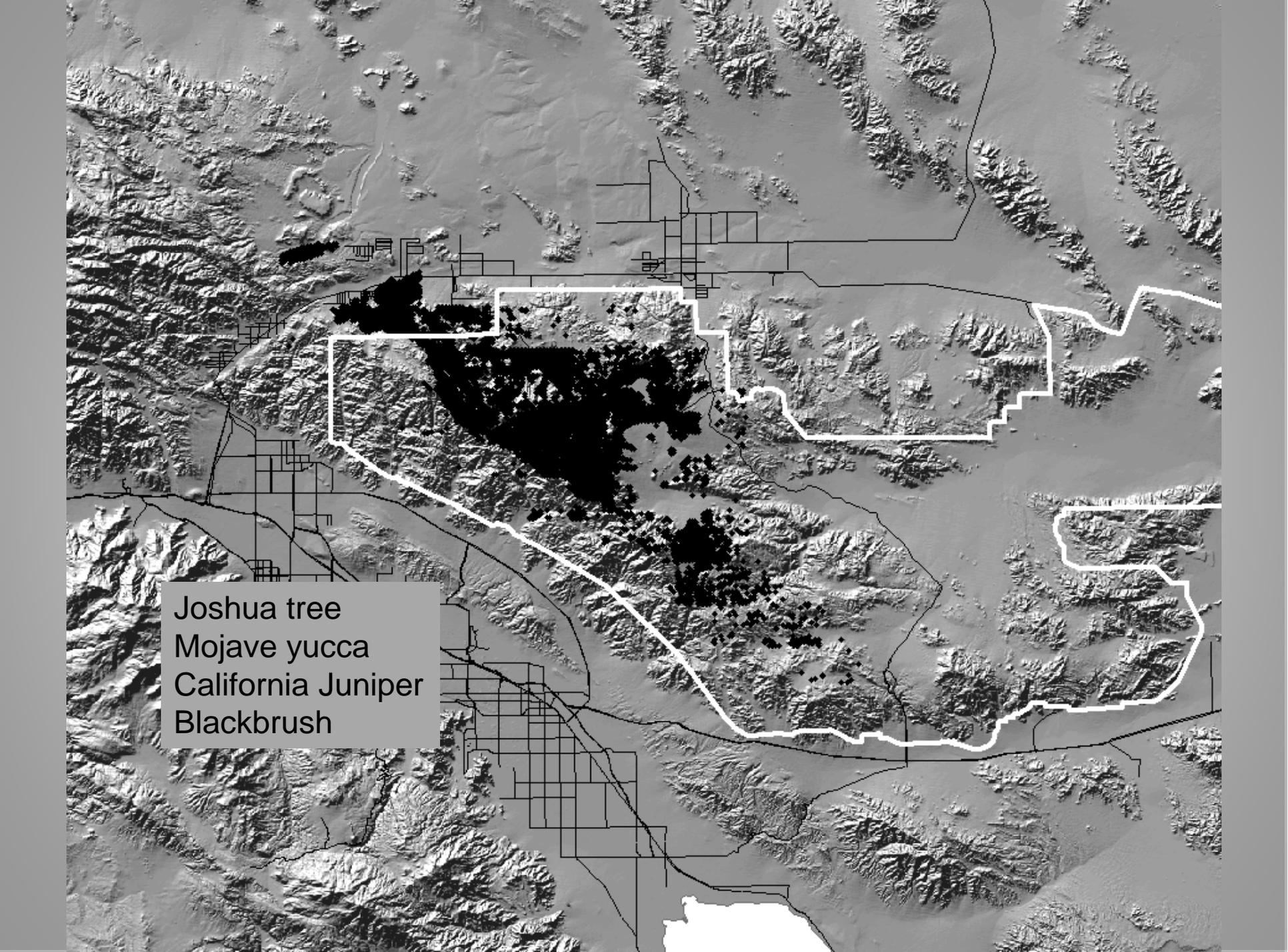








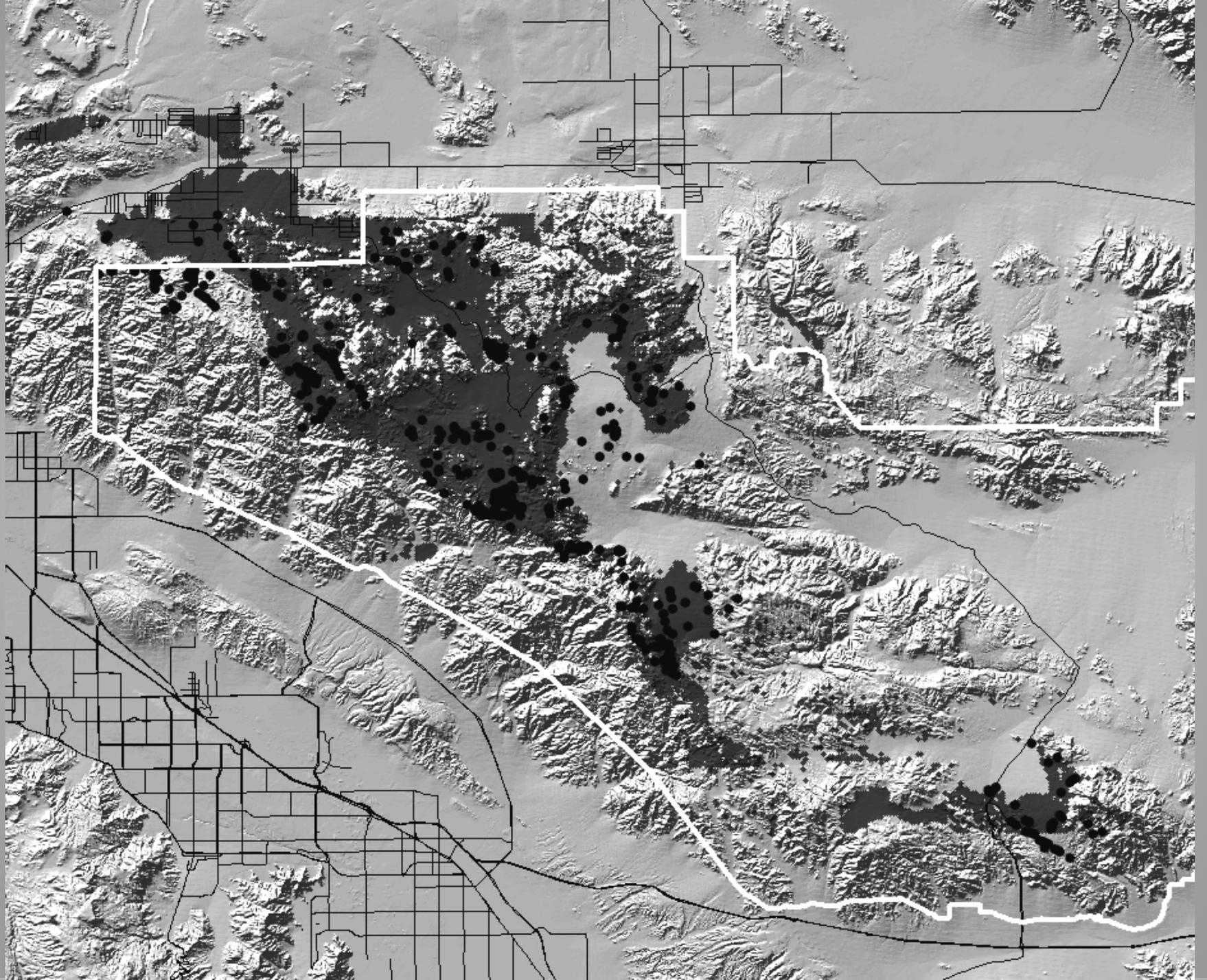
Joshua tree
Mojave yucca
California Juniper
Blackbrush
Pinyon Pine
Muller's Live Oak

A grayscale topographic map of a desert region, likely in the Mojave Desert. The map shows terrain elevation with contour lines and a network of roads. A prominent white boundary outlines a specific area, and within this boundary, a large area is shaded in black. A legend box in the lower-left corner lists four plant species: Joshua tree, Mojave yucca, California Juniper, and Blackbrush.

Joshua tree
Mojave yucca
California Juniper
Blackbrush



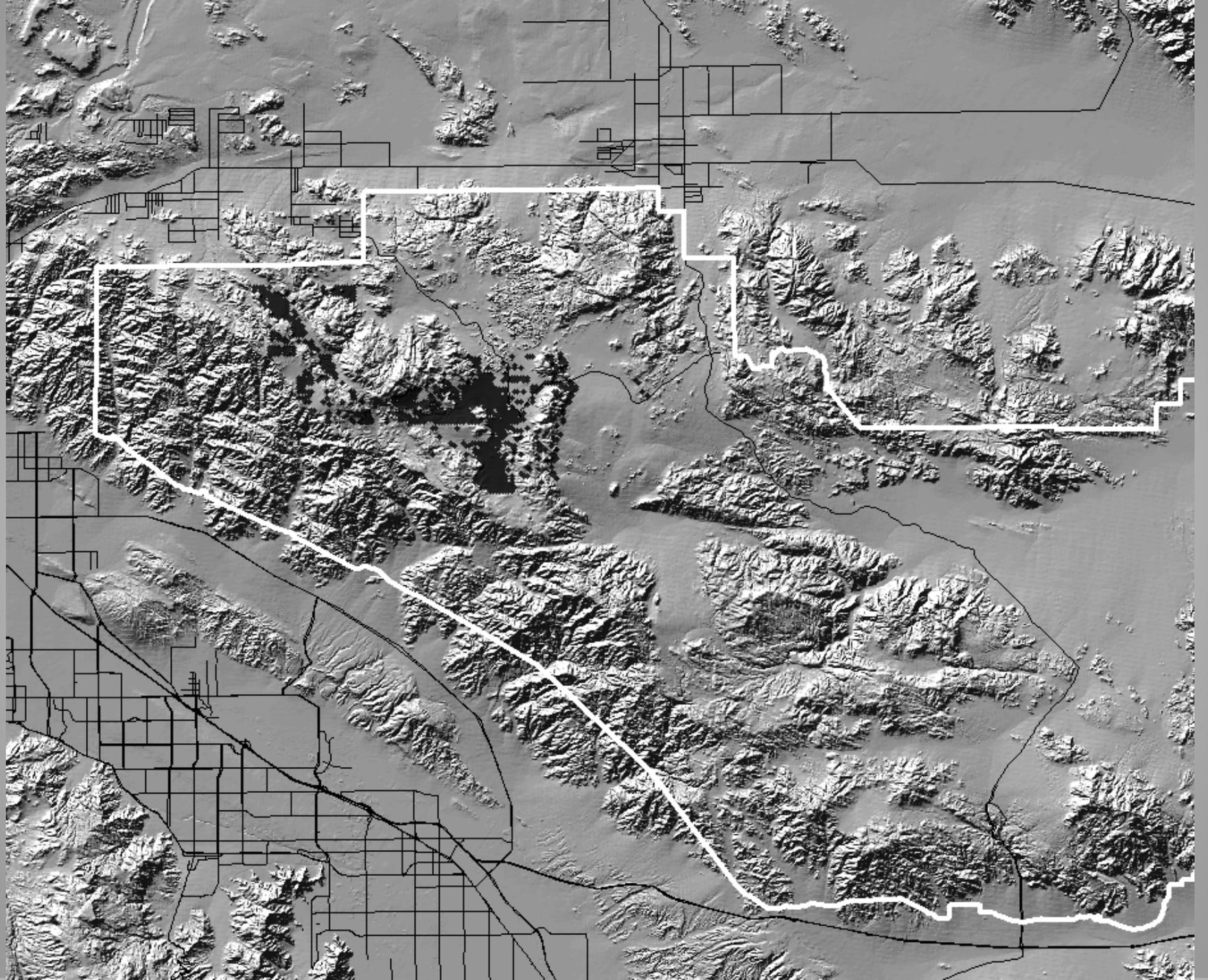












Outcomes and Summary

- Scale is very important for ground-based information. Incorporating site-specific local conditions and adaptations into models is critical for these tools to be useful to resource managers
- Joshua trees are VERY sensitive to climate change – primarily to summer temperatures but also to changes in precipitation
- The ultimate persistence of Joshua trees, as well as other Mojave Desert species will be dependent not only on the degree to which climate shifts, but also on the interaction of climate, invasive species, and fire. Successful resource management, whether for restoration or for the protection of extant populations will need to incorporate each of these impacts.

Funding from the Desert Southwest Cooperative Ecosystems Studies Unit and Joshua Tree National Park

and help from

Andrea Compton and Josh Hoines (JTNP logistics)

Matt Davis and Robert Johnson (GIS)

**Michele Felix, Heather Hulton, Kathleen Fleming, Brian Wilk
and Citizen Scientists from**

**College of the Desert, James Madison University and the Desert Institute at Joshua Tree
(GPS location data)**

