Joshua Tree National Park is facing an environmental threat from an invasive weed, the Sahara Mustard. This non-native invader grows early in the season, using up resources before native plants germinate. With this strategy, the Sahara Mustard is able to aggressively spread, form dense stands and smother native plants.

With the threat of the Sahara Mustard permanently altering the fragile desert ecosystems within their boundaries, Joshua Tree National Parks needs to locate and eradicate these mustard weeds. Challenges are low resources and chemical treatment may harm native plants.

**Sahara Mustard Facts**
- Can self-pollinate
- Thrives in sandy, gravelly soil
- Prefers low elevations
- Seeds are tiny, red, sticky balls
- Spreads by adhering to unwary travelers: animals, humans, autos
- Most commonly found on roadsides

**Study Area**

**GIS Tools for Land Management and Invasive Weeds**

Violet Cullors • Rujin Ma, Ph.D.
MS GIS Program • University of Redlands

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**Problem**

**Solution**
- Locate areas in Joshua Tree that are highly suitable to the Sahara Mustard weed
- Predict spread rate from actual weed sites to identify the next potential infestation sites for assessment

**Geodatabase**
Stores Sahara Mustard weed data and GIS feature layers. Provides data support to analysis, querying, assessment, and GIS tools.

**Land Assessment Analysis**
Layers features to identify areas susceptible to weed invasion, i.e., hot spots.

**Predictive Spread Model**
Develop impedance layer from weed points, roads, and elevation layers. Input spread rate per year. Shown is a 250 meter spread rate for 1, 3, and 5 years.