# Plant succession and native plant species reestablishment along the newly exposed shoreline of Lake Mead

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# Outline

- Background
- Methods
- Results
- Experimental Revegetation
- Conclusion
- Management

# Background & Objective

♦ The receding level at Lake Mead has exposed land resulting in:

1. Changes in desert soil properties
2. Primary succession
3. Invasive species problems
4. Barren land

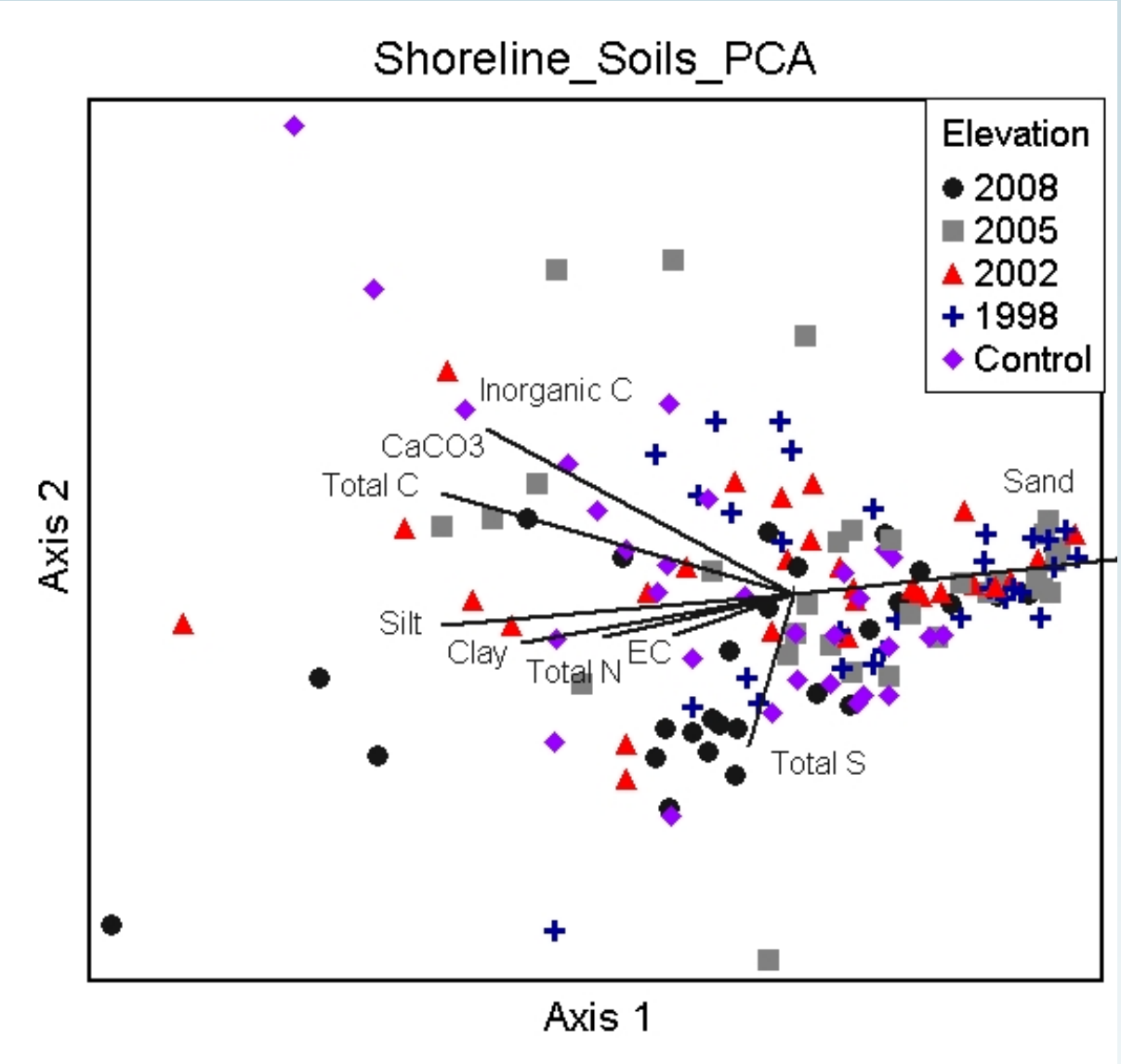
♦ Objective: To assess how drawdown in the lake has been effecting vegetative succession and soil properties.

# Methods

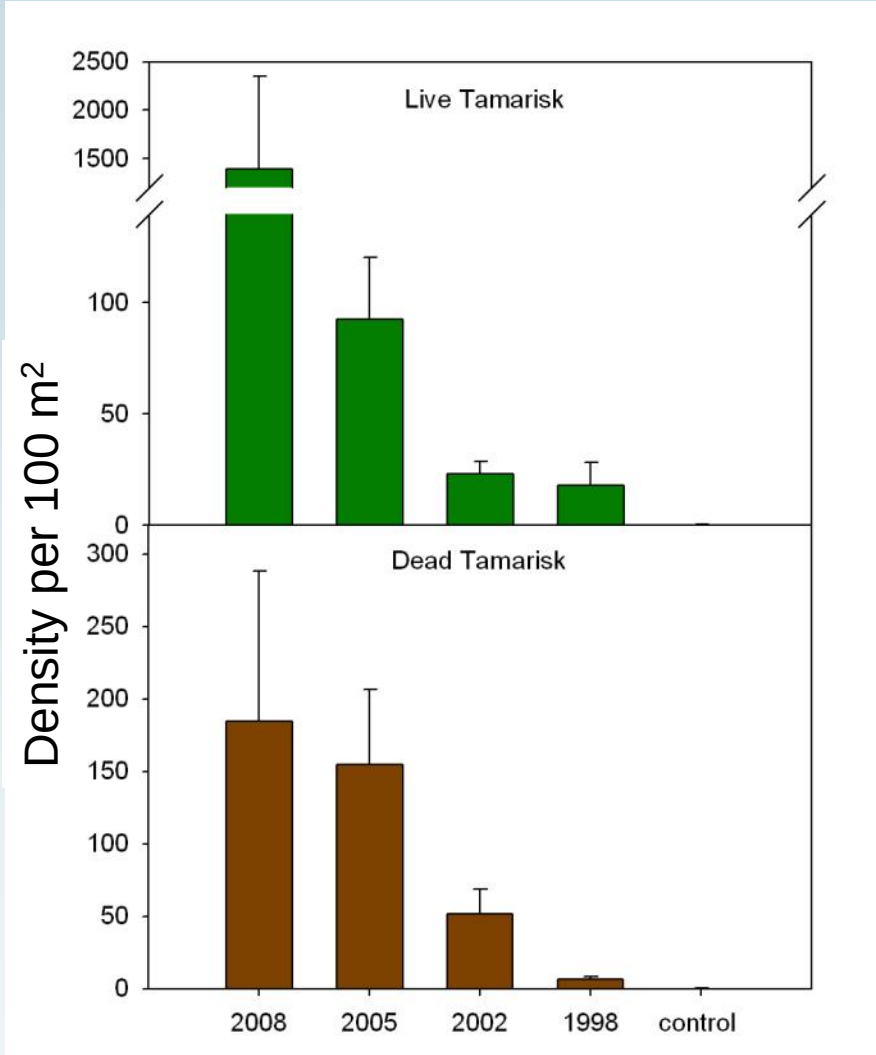
- Ten transects were established at Boulder Beach, Stewart's Point, and Overton
- Five plots sampled from transect representative of five elevations
- Plant species data Collected
- Tamarisk counted
- Soil samples collected

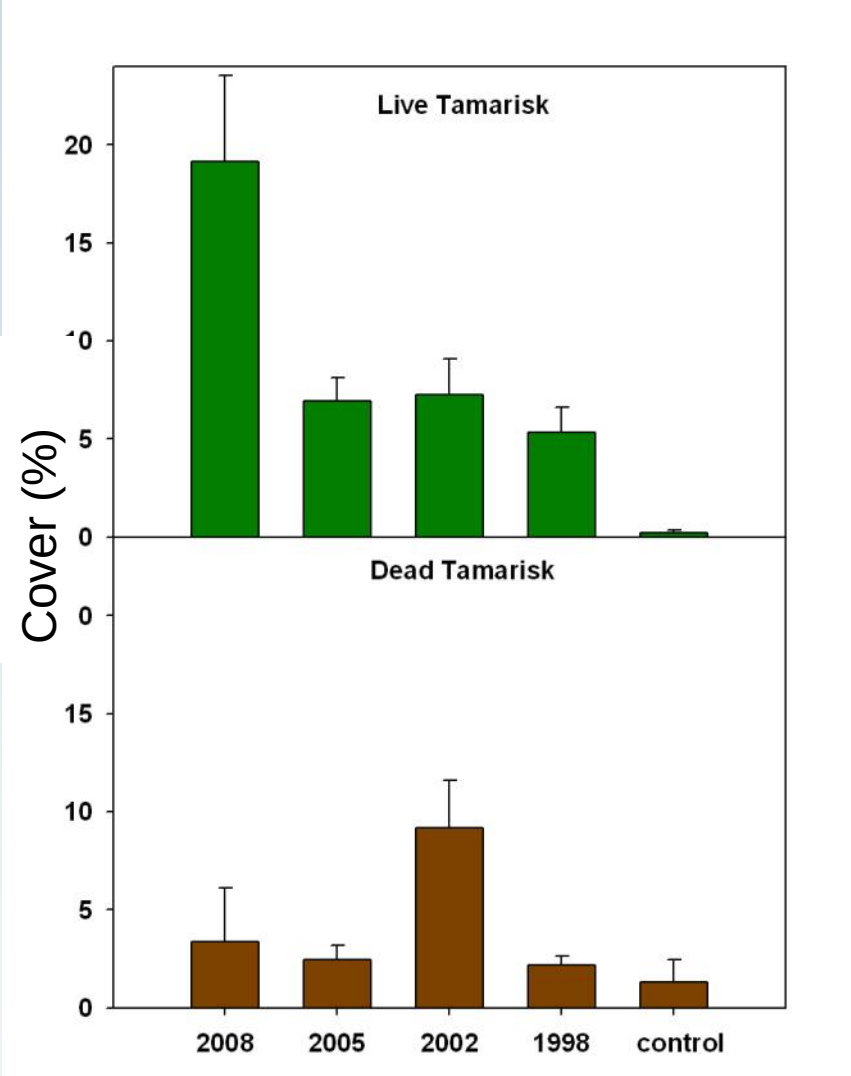
# Soil Properties

- Boulder Beach and Overton had similar sandy texture
- No pattern shown by year



# Tamarisk Populations

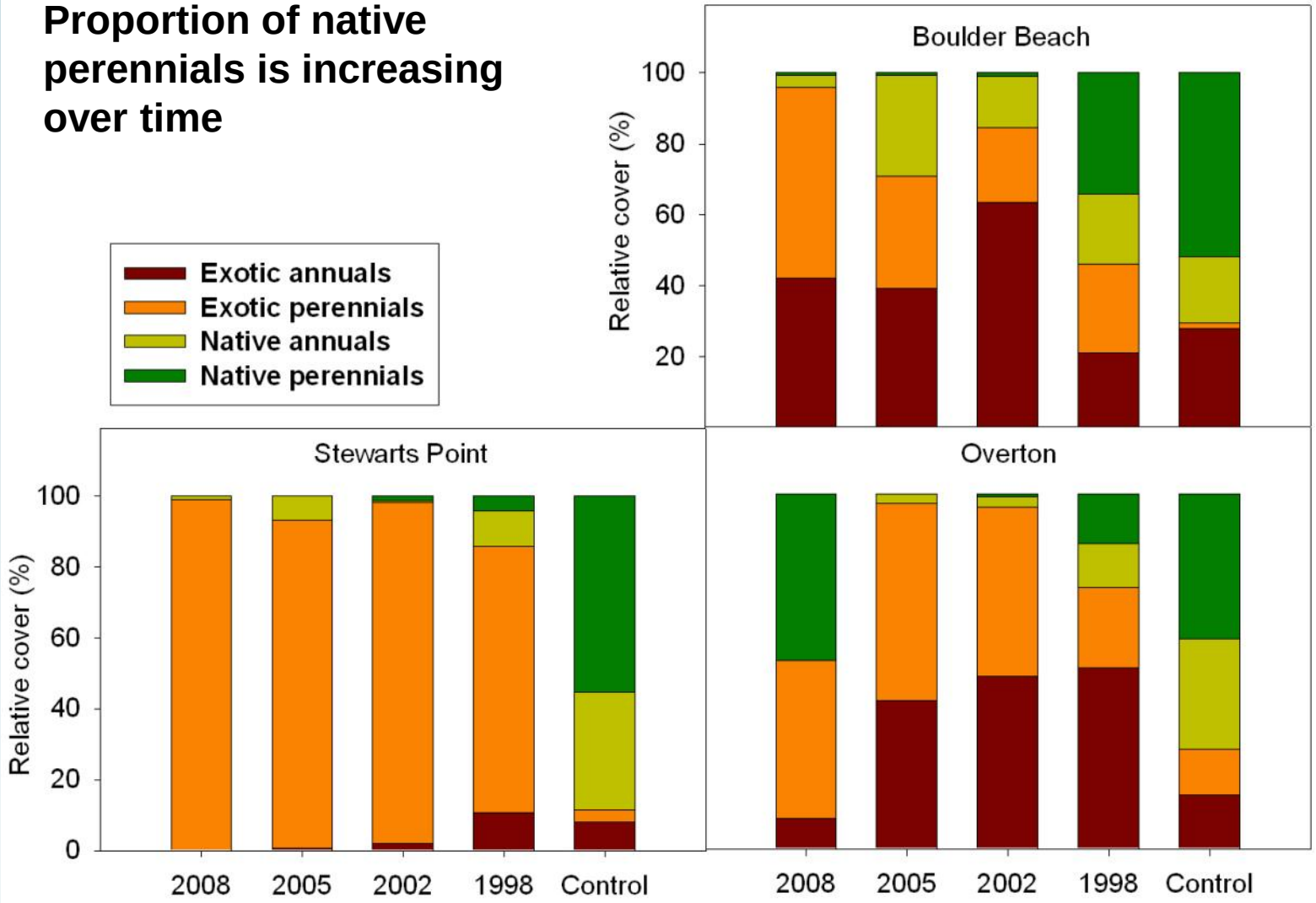


# Tamarisk Progression Pictures

# Relative Percent Cover

**Proportion of native perennials is increasing over time**



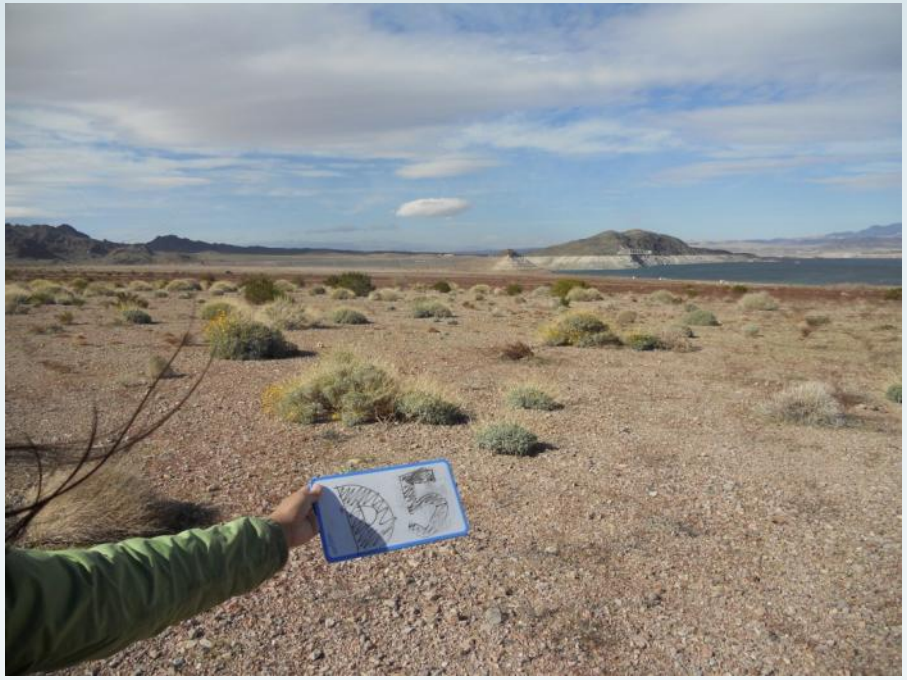
# Perennial Species Comparison

**Control Plots**

- ***Larrea tridentata***
- ***Ambrosia dumosa***
- ***Psorothamnus fremontii***
- ***Encelia farinosa***

**1998 Plots**

- ***Encelia farinosa***
- ***Stephanomeria pauciflora***
- ***Hymenoclea salsola***
- ***Bebbia juncea***



# Annual Species Comparison

**Control Plots**

- ***Schismus arabicus***
- ***Plantago ovata***
- ***Pectocarya  platycarpa***
- ***Bromus rubens***

**1998 Plots**

- ***Schismus arabicus***
- ***Bromus rubens***
- ***Pectocarya platycarpa***
- ***Erodium cicutarium***

# Experimental Outplanting

- ***Larrea tridentata*** **(creostoe bush)**

- ***Hymenoclea salsola*** **(cheese bush)**

- ***Ambrosia dumosa*** **(white bursage)**

- ***Encelia farinosa*** **(brittle bush)**

# Conclusions

- Tamarisk population density is shown to decline since time submerged
- Soil communities do not show any clear patterns through time
- Plant species composition is  showing patterns of increasing natives species through time

# Management

- Fluctuating lake levels will make revegatation efforts more difficult
- Focus on revegetation of early successional species instead of late successional species
- Selective tamarisk removal

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# Take Home Points

- Total species richness increase was site specific
- Perennial species richness increasing but not yet meeting control
- Native plant colonization greatest on oldest surfaces
- Tamarisk declined with increased surface age

# Take Home Points

- No strong difference in soil properties among surfaces
- *Arctomecon californica* observed near 13 year old formerly submerged plots
- EC correlated with salt concentration was highest at young sites except for Stewarts Point

# Take Home Points

- Soil texture did not differ among surfaces; either submersion did not alter texture, or that the net effect of submersion and exposure resulted in no change
- Variation among sites suggests parent materials have more influence on soil than submersion

# Four Principles

- Observed early colonization of both annual and perennial species concurs with the general principle that both plant groups are represented in both early and late-successional desert communities

# Four Principles

- Many of the colonizing perennial species (cheesebush, sweetbush, and wirelettuce) also inhabit washes in non-anthropogenically disturbed ecosystems. Washes are periodically disturbed, and species inhabiting them colonize a variety of other disturbed environments, including the Lake Mead shoreline

# Four Principles

- *Ambrosia dumosa* (bursage or burrobush) was both an early colonizer and an inhabitant of the never-submerged community, consistent with the principle that deserts contain “versatile” species found throughout the successional sequence.

# Four Principles

- Exclusive late-successional species such as *Larrea tridentata* (creosote) remained sparse after 13 years of surface exposure, consistent with the principle that establishment of late successional communities requires long periods of time.

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