Making restoration better
(Nothing in this presentation is true but its exactly how things are)
To err is human; to forgive, divine.

– Alexander Pope
How have I messed up?
How have I messed up?

- Making assumptions about what works
- Not accommodating uncomfortable truths
- Overlooking simple for fancy
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What drives success in dryland restoration?
What drives success in dryland restoration?

- Precipitation
- Plant material type
- Plant material amount
- Temperature
- Soil type
- Soil condition
- Current site management
- Historical management
- Flood events
- Fire
- Seed bank
- Extant vegetation type
- Extant vegetation amount
- Weeds
- Soil chemistry
- Soil compaction
- Follow up management
- and more.....
What drives success in dryland restoration?

Precipitation

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Plant material amount
Temperature
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Seed bank
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and more.....
What drives success in dryland restoration?

**Precipitation**

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Shackelford et al. 2021 NEE
What drives success in dryland restoration?

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Follow up management
and more.....

Shackelford et al. 2021 NEE
Goal: to identify how restoration approaches might modify pipeline revegetation outcomes
Hannah Farrell

Topsoil

Topsoil + seed

(A)
Hannah Farrell

Topsoil

Topsoil + seed

Livestock exclusion
How have I messed up?

- Making assumptions about what works
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Amy Gill

Agave palmeri (Palmer's agave)
Amy Gill

Agave palmeri (Palmer's agave)
Goal: to understand biotic and abiotic factors important for agave restoration
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- Shading
- Herbivore exclusion
- Weed control
Not accommodating uncomfortable truths.
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Arizona Department of Transportation (ADOT) Automobile Accident Data

Stars show high proportion of dust-related automobile accidents. Black, green, and blue stars show most dangerous hot spots.
• Restoration approaches for dust mitigation that only consider physics and chemistry usually fail.

• Need to integrate expertise across atmospheric physics, hydrology, soil physics, soil chemistry, soil microbiology, plant biology, and ecosystem ecology.
1. Existing soil microbial community
2. MICROP® cyanobacterial inoculant
3. EM-1® lactic acid/photosynthetic bacterial inoculant
4. AM120® mycorrhizal inoculant
Soil inoculation = complete failure
Overlooking simple for fancy?
Making restoration better

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