

DESERT ECOLOGY CLASS – GRA LINKS TO ASOMBRO



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PIs

A diagram showing the relationship between PIs, a central course, and students. The central box is labeled 'Desert Ecology Short Course'. It is connected by lines to a box on the left labeled 'PIs' and a box on the right labeled 'STUDENTS'. The background is a photograph of a desert landscape with mountains and scrub vegetation.

Desert
Ecology
Short Course

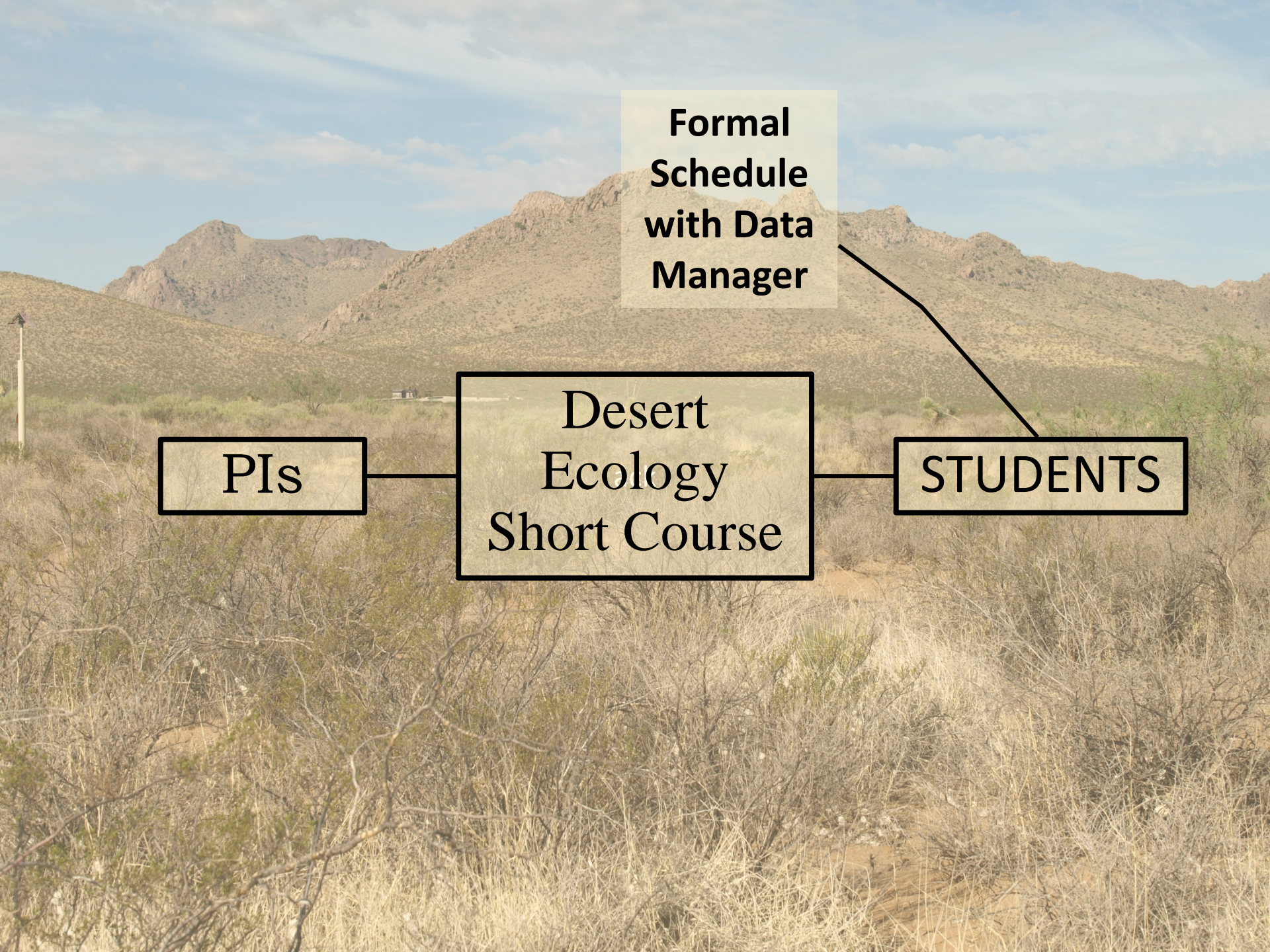
STUDENTS

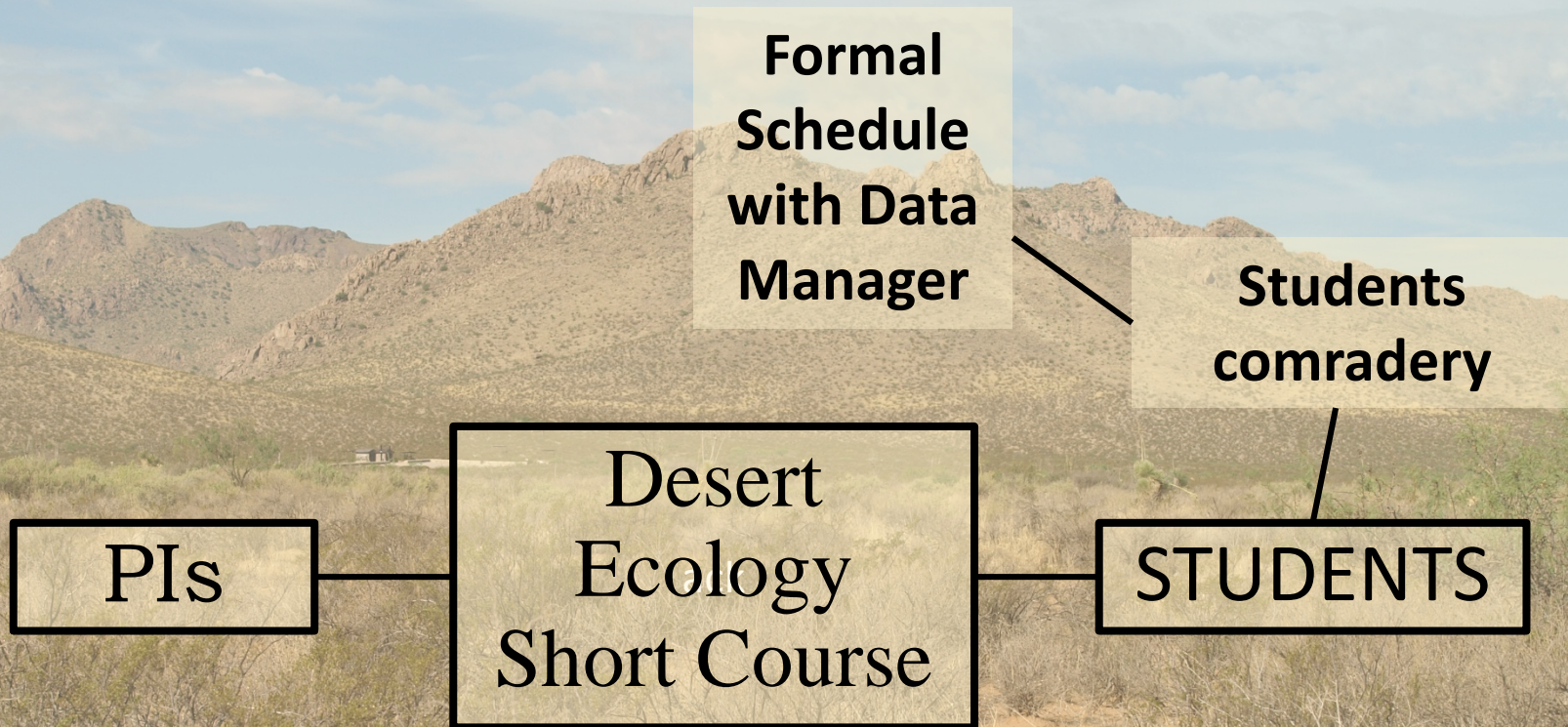
**Formal
Schedule
with Data
Manager**

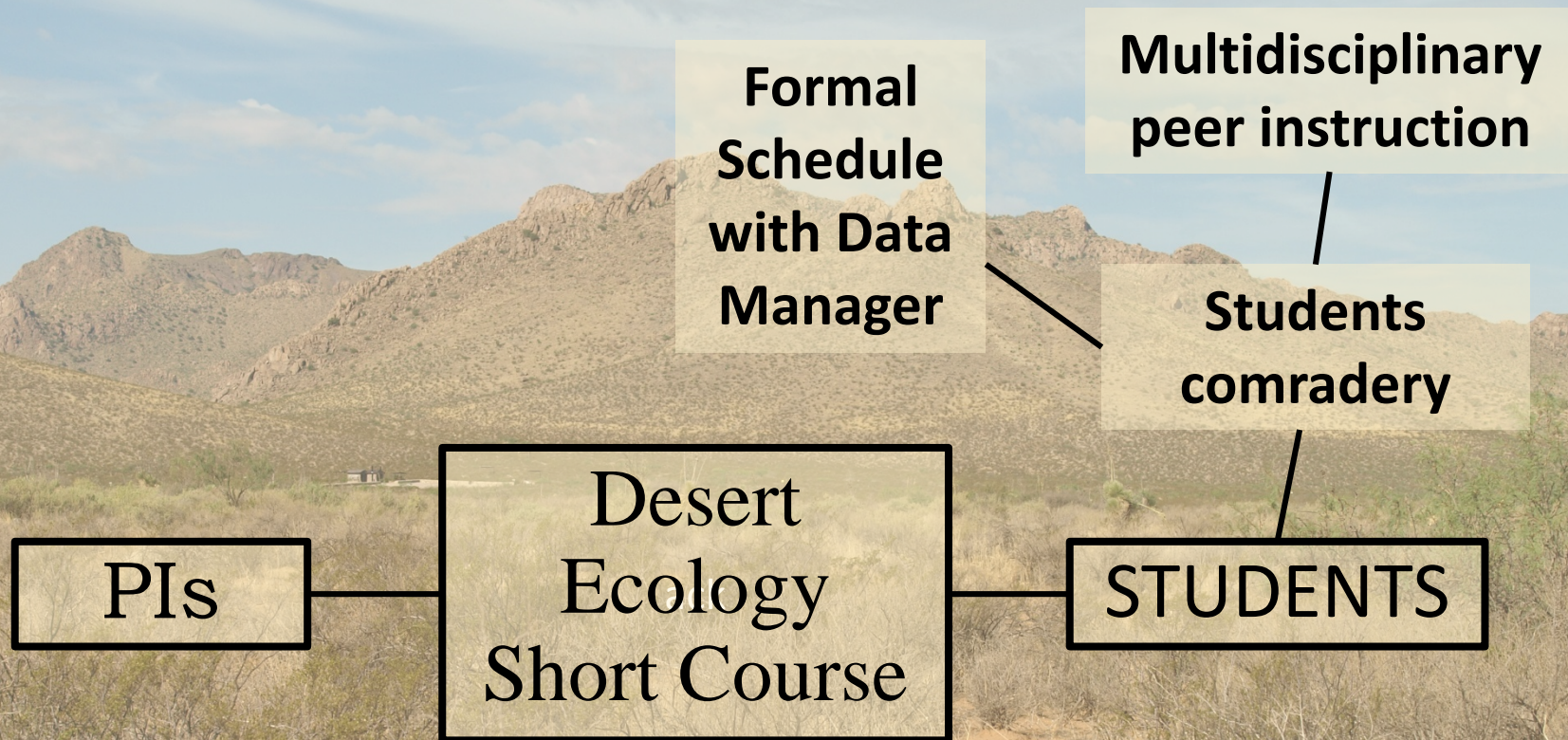
PIs

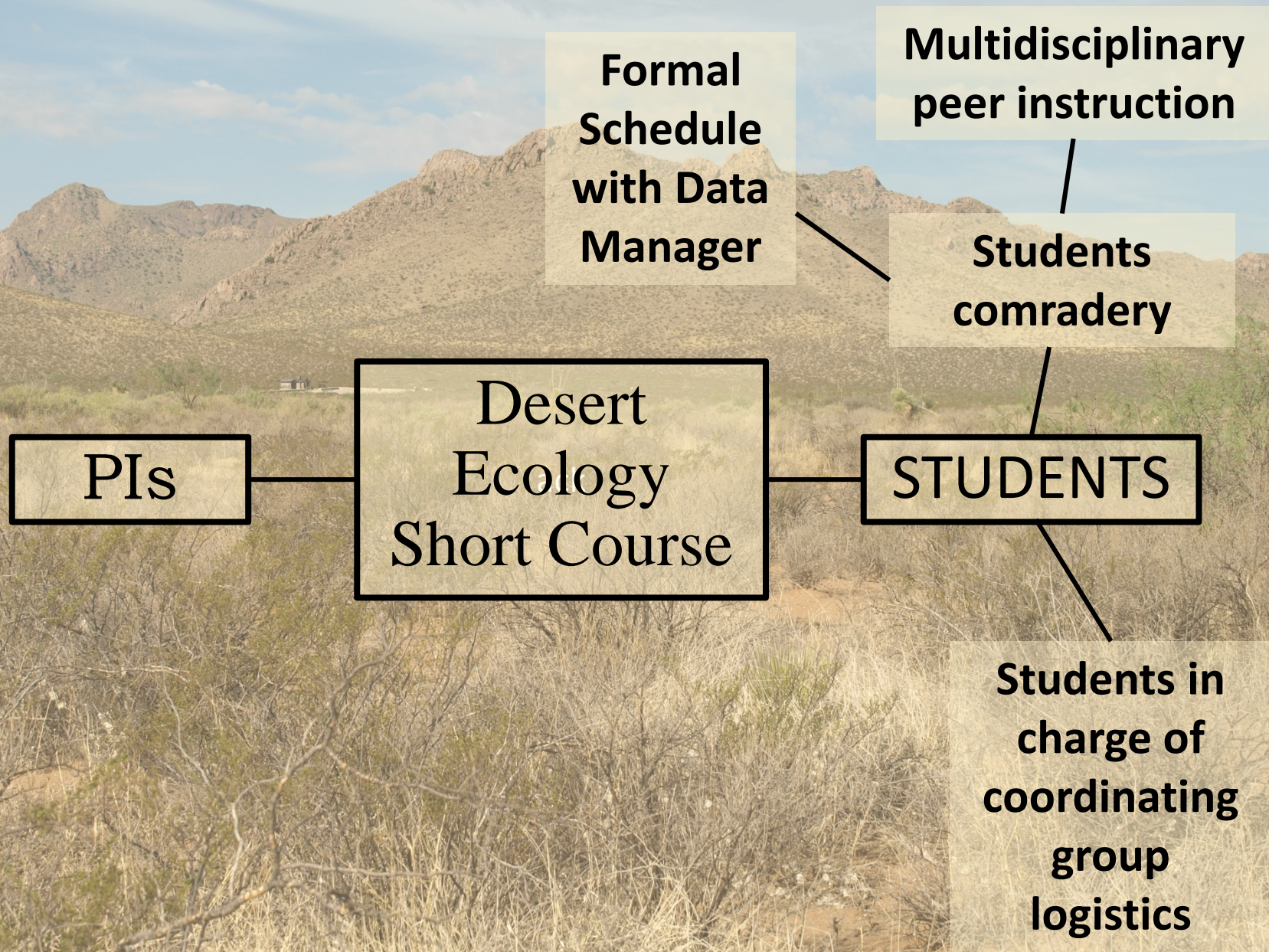
**Desert
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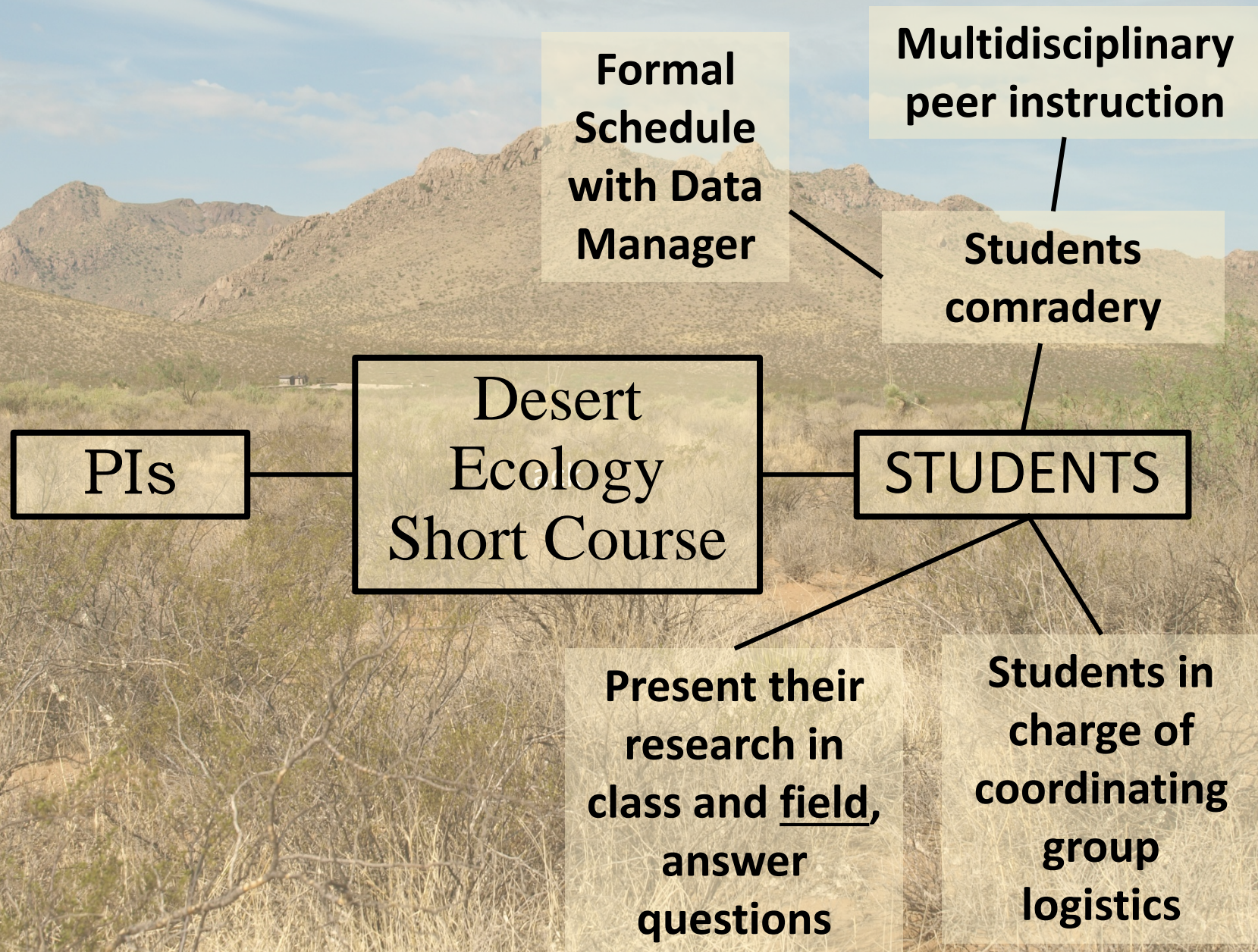
STUDENTS

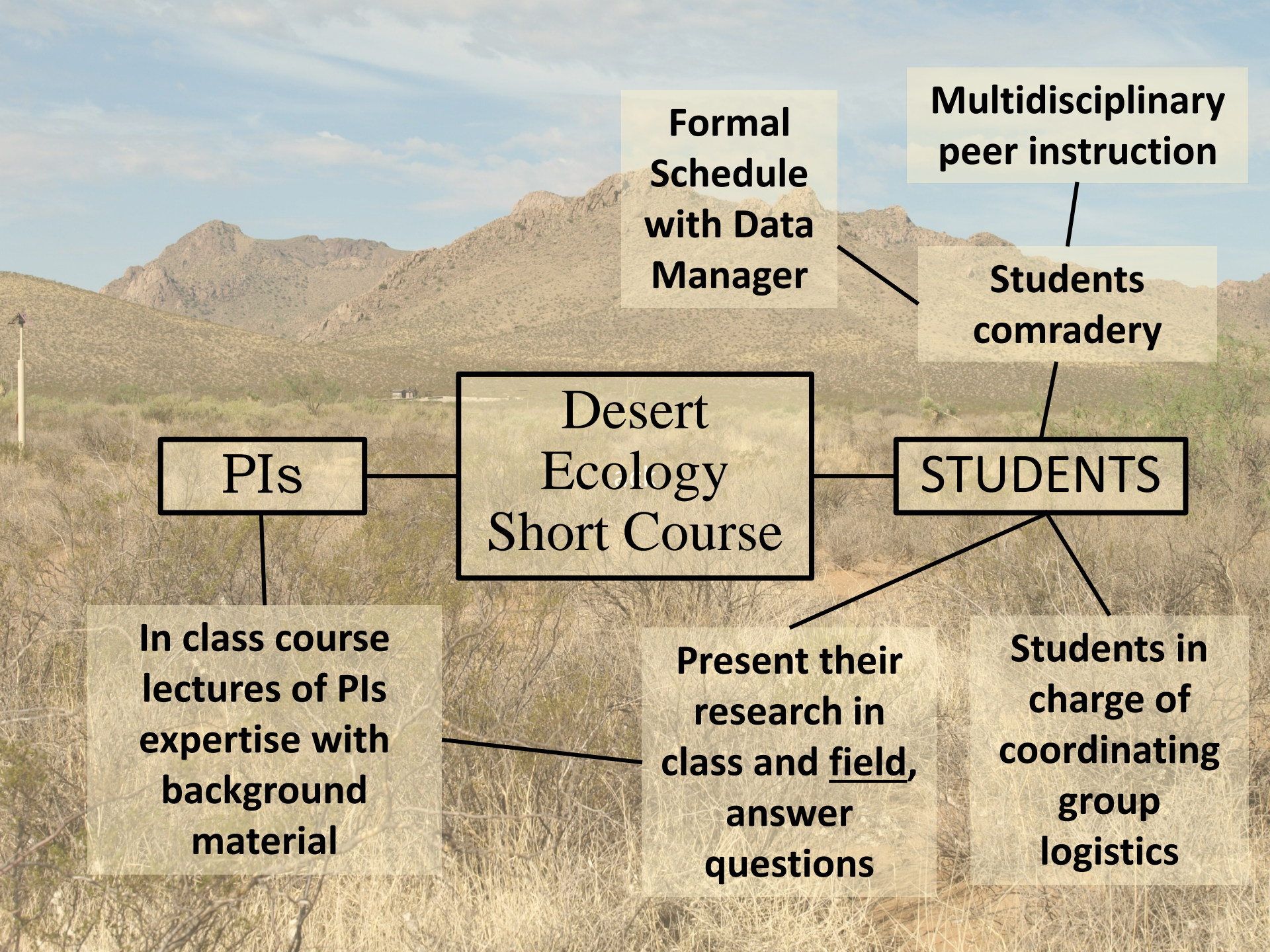












**Desert
Ecology
Short Course**

PIs

**In class course
lectures of PIs
expertise with
background
material**

**Formal
Schedule
with Data
Manager**

**Multidisciplinary
peer instruction**

**Students
comradery**

STUDENTS

**Present their
research in
class and field,
answer
questions**

**Students in
charge of
coordinating
group
logistics**

**In field discussion
of questions,
hypotheses,
methods,
results →
new questions**

**Formal
Schedule
with Data
Manager**

**Multidisciplinary
peer instruction**

**Students
comradery**

PIs

**Desert
Ecology
Short Course**

STUDENTS

**In class course
lectures of PIs
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**Present their
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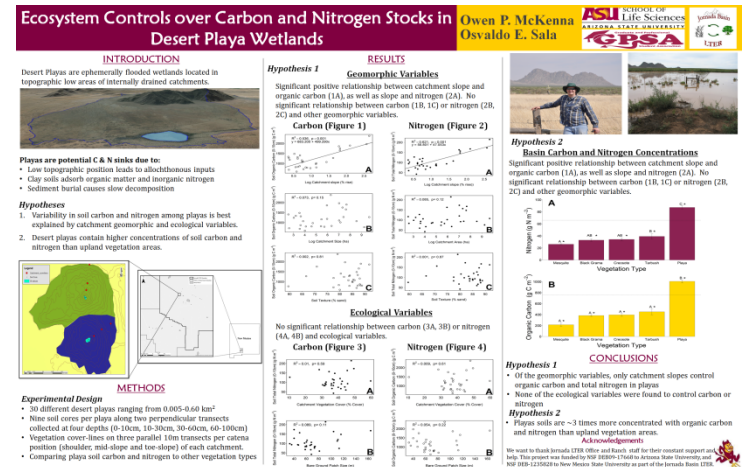
**Students in
charge of
coordinating
group
logistics**

Jornada Grad Fellowship

- Summer funding for research and stipend
- Desert Short course
- Annual Symposia
- Conference

Presentations

- LTER ASM
- AGU
- ESA



Asembro Projects

2013-field activity

Soil Texture Feel Test

Activity Overview

Students collect soil samples and classify soil texture using a soil texture feel test key.

Objectives

- Students will:
 - Manipulate and feel soil to classify soils by texture using a key
 - Consider the relationship between soil particle size, plant growth and water

Subjects Covered

Science

Grades

1 through 12

Activity Time

1 hour

Season

Any

Materials

Soil samples, spring tines of water, paper towels, Key to Soil Texture by Fay

State Standards

Adapted to California by Love The Rain

Background

Soil is made up of three particle sizes—sand, silt and clay. Sand is the largest particle (0.05 to 2 mm diameter), silt is intermediate (0.002 to 0.002 mm) and clay is the smallest (less than 0.002 mm). Soils have different textures depending on the proportions of sand, silt, or clay particles in the soil. A soil texture is graded into fourteen texture classes such as sand, sandy loam, silty clay loam, loam, sandy clay, etc. Sandy soil is any mix with over 90% sand; sandy loam is 70% sand, 15% silt, and 15% clay; silty clay soil is 50% clay, 20% silt and 20% sand; heavy clay is any mix with over 60% clay.

The texture of the soil influences the moisture-holding capacity of soil, the drainage rate, and the soil's ability to hold nutrients. Coarse, sandy soils drain water quickly and are poor distributors of nutrients. Plants must be able to tolerate drought conditions in most sandy soils, in clay soils water drains slowly as a result, soil remains wet for long periods, and often over development is hindered. Plants growing in clay must be able to tolerate long periods of excessive moisture with less oxygen conditions or to endure dry, hard soil. The medium texture of silt-based particles creates a spongy soil that is well drained and holds nutrients. It is ideal for most plant growth. Consequently, different soils support different plant species or communities. Determining the soil texture of your recreation plot is one of the informational tools for assessing which community type the soil will sustain.

Soils can be classified into texture classes by the way they feel and respond to handling. Sand feels gritty and the grains do not stick together when squeezed. Silty loam feels flour like when dry and forms a small ribbon when wet. Pulverized dry clay feels smooth, aggregates and sticks are very hard and difficult to break by hand. After the heavy clay or very smooth and satin like when rubbed and forms a long, flexible ribbon.

Activity Description

Collect soil samples from the field and use the soil texture feel test key to classify them.

Extensions

- Soil texture varies from the surface to each foot and will help you assess the degree quality in the field plot/community where "Soil Profile Investigation"

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2014- classroom modules

Weather vs. Climate

Background:

NASA's take on weather vs. climate

http://www.nasa.gov/mision_pages/nasa-nasa/climate/climate_weather.html#U-PHF_k7cY

Good article about a real world scenario of climate vs. weather

<http://earthobservatory.nasa.gov/ROTD/view.php?id=43371>

The Greenhouse effect

General concepts: Earth's Energy Budget, Atmospheric Chemistry, Global Carbon Cycle, Anthropogenic CO₂ production

I. Earth's Energy Budget Basics:

A. Wavelengths of energy produced by a body depend on the temperature of that body (Figure 1)

- i. Shortwave radiation- produced by high energy (temperature) bodies
1. Example: The sun (Temp: 6000°C, wavelengths: 0.3-4 μ m)
- ii. Longwave radiation- produced by low energy bodies

B. Energy transfer

- i. Radiation is emitted by a source and absorbed or reflected by another body (Figure 2, which is a Segway, because it is a greenhouse AND leaves F as it is the greenhouse effect)

III. What is a greenhouse? (Figure 3)

- A. Make sure they know what a greenhouse is, and explain how it works so that they make that connection between the greenhouse effect and what is happening in a greenhouse
- i. How does a greenhouse work? (Figure 4/5)

 1. Incoming shortwave radiation from the sun shines through a glass greenhouse
 2. Shortwave solar radiation is absorbed by the floor of the greenhouse (red) and

What do greenhouses have to do with Earth's Energy budget?


Figure6

Figure7

http://www.esd.sac.nasa.gov/docs/2006/2006_04_26main_greenhouse_06.pdf

<http://www.teachmeanearth.com/teachmean/06main/earthgreenhouseeffect.pdf>


2015-reference guide




Playa Criter Guide

Asombro Institute for Science Education

Eulimnadia texana- Texas clam shrimp



Front view



Side view

Kingdom:	Animalia
Phylum:	Arthropoda
Subphylum:	Crustacea
Class:	Branchiopoda
Order:	Spinicaudata
Family:	Limnadiidae
Genus:	<i>Eulimnadia</i>
Species:	<i>E. texana</i>

Quick Facts:

- *What does it eat?* –They eat algae, bacteria, protozoa, and detritus
- *What eats it?* – Amphibians like spadefoot toads and woodhouse's toads
- *Fun Fact-* Individuals can be hermaphrodites and fertilize their own eggs!