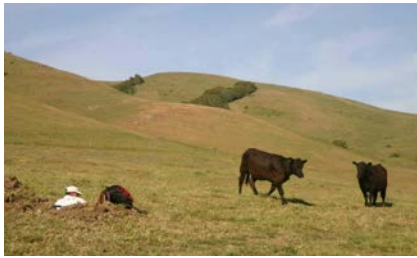


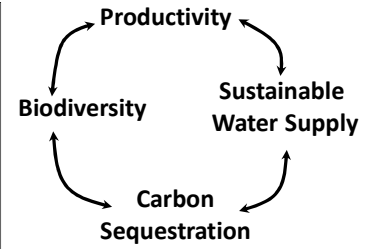
### Managing Soils as a Foundation to Support Ecosystem Services



Toby O'Geen

Soil Resource Specialist in Cooperative Extension  
Dept. Land, Air and Water Resources, UC Davis

### Managing for Multiple Outcomes

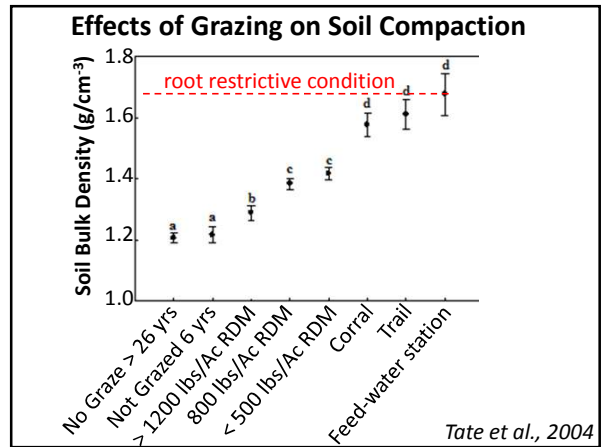


How do we manage soils for multiple outcomes?

#### Impacts of Improper Grazing on Soil

Soil Properties Impacted	Process
↑ Bulk density	↑ Compaction
↓ Aggregate stability	↓ Infiltration
↓ Soil organic carbon	↑ Runoff
↓ Soil biodiversity	↑ Erosion
↓ Plant available water	
↓ Total water storage	
↓ Vegetative cover	

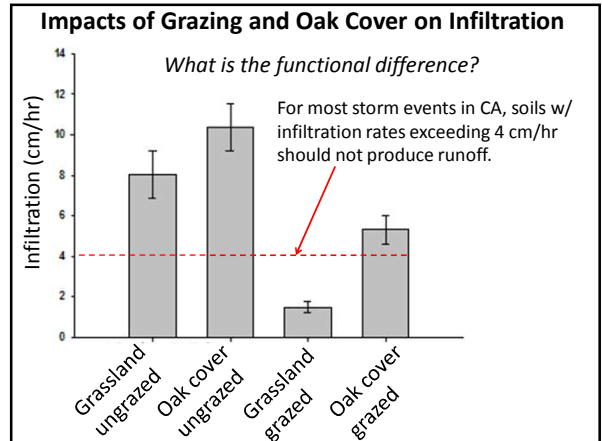
Photo by K.W. Tate

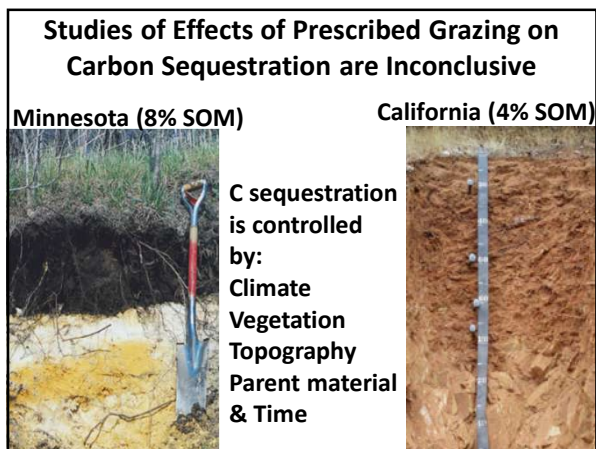
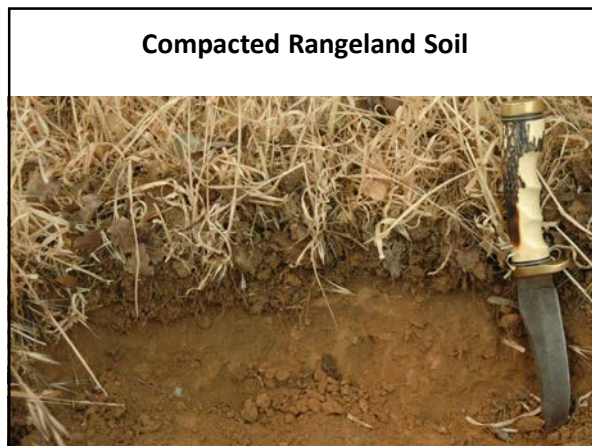


#### Soil Properties Dictate Resilience to Disturbance

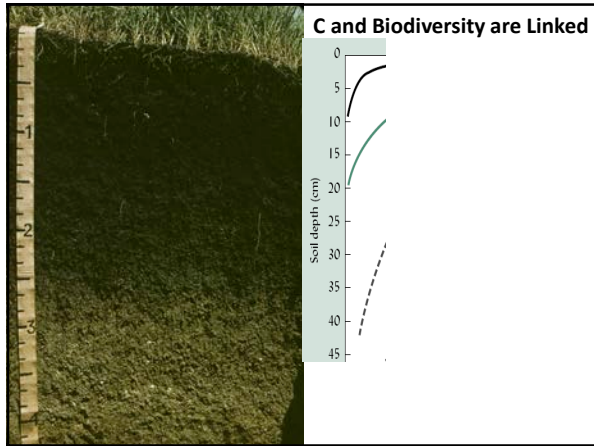
Textural Class	Root & H <sub>2</sub> O restrictive threshold Bulk density (g/cm <sup>3</sup> )
Sand & loamy sand	1.80
Sandy Loam	1.75
Loam & sandy clay loam	1.70
Clay loam	1.65
Sandy clay	1.60
Silt loam	1.55
Silty clay loam	1.45
Clay	1.40

NRCS Soil Quality Institute









### Tools to Get to Know Your Soils

<http://casoilresource.lawr.ucdavis.edu/soilsurvey>

California Soil Resource Lab

Home Links Online Soil Survey People Projects Software Site Map

SoilWeb: An Online Soil Survey Browser

Our online soil survey can be used to access NRCS 1:24,000 scale detailed soil survey data (SSURGO) in many parts of the lower 48 states. Unless this data is not yet available, 1:250,000 scale generalized soil data (GSSURGO) can be accessed instead (CA, NV only). An interactive map interface allows for panning and zooming, with highways, streets, and aerial photos for added navigation (Figure 1). Soil polygons become visible near a scale of 1:250,000. Alternatively, a GPS point, CA ZIP code, or a street address can be used to access an in-situ location. General usage notes and information on how our online soil survey work can be found [here](#). Instructions on how to use our online soil survey can be found [here](#). Technical details on SoilWeb can be found in this publication. Please note that we are currently transitioning to a new server, and planning to launch our final copy of the database, SSURGO, and GSSURGO databases updated in the coming months.

Select an interface for SoilWeb:

- An iPhone App for real time, location-based soil queries (iPhone) (SSURGO, GSSURGO, SSURGO, GSSURGO, SSURGO, GSSURGO)
- Native App for Android (Android)
- Google Earth interface (Google Earth)
- A web-only interface for SSURGO

### Google Maps Interface

Enter location here

List of map units in view field. Click on MU of interest

### Browse Soil Survey Data:

Soil organic matter  
Plant available water  
Erosivity  
Permeability

### SoilWeb: Get to Know Your Soils in the Field with Smartphone Apps

### Cropland

Soil surveys of rangelands should be interpreted carefully

### Rangeland

Rangeland soil map units are generalized and depict multiple soils within a delineation

