

Soil and Biogeochemistry

The Soil and Biogeochemistry component of the SageSTEP study has several goals

- ✓ Test on a large scale the feasibility of utilizing a new soil core device for data collection.
- ✓ Collaborate with fellow researchers to identify abiotic factors that influence vegetation distribution and site recovery following management treatments.
- ✓ Complete whole ecosystem carbon and nitrogen budgets for semi-arid systems and land management treatments.
- ✓ Help fellow researchers identify drivers of infiltration, runoff, and sedimentation processes.
- ✓ Help fellow researchers to identify factors restricting ant populations that are important dispersers of seed.

The sampling array consists of three levels in order to address these issues

- ✓ Soil cores taken at each site help to identify existing conditions, and abiotic variation between sites.
- ✓ Surface soil samples taken at each site will allow for immediate assessment of changes in soil C and N following treatments.
- ✓ PRS™ resin probes deployed on 9 woodland sites and 4 sage/cheat sites allow for measurement of temporal and treatment induced changes in nutrient availability.

To date we have observed that:

- ✓ Soils within the Great Basin are highly variable in regards to parent material, depth to bedrock, nutrient availability, and texture making broad generalizations difficult.
- ✓ Woodland expansion has little influence on current levels of soil organic carbon and total nitrogen. However, Pinyon-juniper woodlands may have increased root biomass as a result of woodland expansion.
- ✓ Exotic grass invasion also has little influence on current levels of soil organic carbon and nitrogen. However exotic grass invasions may also increase root biomass.
- ✓ Burning, cutting, masticating in woodlands increased available nitrogen and phosphorus to some extent. Burning resulted in the highest increases and masticating resulted in the lowest increases. Burning also increased available manganese. Cutting and masticating increased available potassium.
- ✓ Only burning and possibly mowing increased nitrogen availability on sage/cheat sites. Burning also increased soil manganese. All treatments (burning, mowing, and tebuthiuron) resulted in increased potassium availability.

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