Influence of temporal variation in the vertical distribution of soil moisture on the surface energy budget: Implications for semiarid land-atmosphere interactions.

Zulia M. Sánchez-Mejía (zuliamsm@email.arizona.edu) and Shirley A. (Kurc) Papuga
School of Natural Resources and Environment, The University of Arizona.

1. Introduction
- Semiarid ecosystems are typically characterized as patchy, with different percentage of cover, they are also pulse-dependant and respond to precipitation regimes.
- Precipitation is variable in time and intensity, within and between years. Small pulses wet the surface soil layer, while a deeper wetting front is observed under large pulses conditions.
- Energy, water & carbon fluxes, are especially driven by soil moisture (θ) in aridlands.

Objective: Identify the influence of temporal variation in the vertical distribution of θ on the surface radiation budget.

2. Hypotheses
- Soil moisture probability distribution functions (pdfs) will vary with depth and cover, especially at shallow depths.
- Vertical distribution of soil moisture during wet periods will increase Albedo, been opposite in dry periods.
- Seasonal variation in albedo is weak in contrast with wet or dry periods.

3. Study Site & Approach
Santa Rita Experimental Ranch

4. Hydrology at Creosote Site
Rainfall pattern
θ profiles
Are they changes in the θ pdfs among cover?

5. What happens with depletion of θ?

6. Energy Components

7. Looking for trends in depth.....

8. Conclusions
- Soil moisture depletion is different from the surface into deeper layers.
- Under 17 cm moisture depletion has to be analyzed beyond 2 weeks.
- Percentage cover have important implications in moisture distribution.
- Soil moisture and albedo have been explained by linear regression, however more has to be analyzed with other components of energy.

Future Work
- Through linear regression we can observe the influence of soil moisture on albedo, however there is more to be done while considering available energy and evaporative fraction, and more components of the energy budget.
- Use the One-Dimensional Planetary Boundary Layer Model

Reference

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