Sonora Field Campaign 2008

A presentation by: Laura Alvarez, Kimberly Bandy, James Craft, Luis Mendez, and Agustin Morua
Overview

• Isotopic Partitioning of Evapotranspiration
• Daily Soil Moisture and Temperature
• Soil Pit Analysis
• Installation of Regional Rain Stations
• Eddy Covariance Tower Installation
• Cultural Experience
Isotopic Partitioning and Scintillometry
Isotopic Partitioning of Evapotranspiration

- **Purpose:** The purpose of this project was to determine the amount of water vapor that was coming from soil evaporation and the amount of water vapor that was being transpired by plants.
• **Location:** Rayon Tower in Sonora, Mexico

• **Setup**

• **What was collected:**
  - vapor samples at 4 heights (9m, 4.5m, 2.3m, and 0.1m),
  - soils samples
  - stem samples and leaf samples (for four tree species: Palo Verde, Ocotillo, Mesquite, and Acacia), and leaf samples

• **Duration:** Two days a week for three weeks
Scintillometry

- **Purpose:** The purpose of this project was to measure a single sensible heat flux measurement for an area on the scale of 1-3 km for comparison to calculated fluxes using satellite imagery.
• **Location:** Near Rayon Tower in Sonora, Mexico

• **Setup**
  - Two Scintec scintillometers (1 receiver with CPU and 1 transmitter per transect)
  - 3 transects setup overlooking different vegetation types

• **What was measured:** sensible heat flux

• **Duration:** Two weeks of campaign
Soil Moisture and Temperature
Rayon Tower Location
Latitude: 29.7410044 N
Longitude: 110.5366073 W

Measurements Days: 15
Date: July 3rd-July 18th / 2008
SOIL MOISTURE PROBE
(THETA PROBE)
SOIL THERMOMETER

Three depths

- 1 cm
- 5 cm
- 10 cm
Soil Pits
Soil Pit Analysis

• 5 Soil Pits in Sierra Los Locos

• 4 Soil Pits near Rayon Tower
Soil Pit 20

• On top of terrace in Sierra Los Locos
• 3 Horizons
• Depth of 65 cm
Soil Pit 22

- Hill slope on terrace in SLL
- 5 Horizons
- Depth of 100 cm
Soil Pit 26

- Hillslope of dissected alluvial fan
- Depth of 2 meters
Cultural Experience
Language Sharing
The Tower Crew
Moonshine
San Carlos
On the Streets of Rayon
The Monsoon is Here
A Hard Day’s Work
Rain Gauge Installation
ANOTHER DAY IN PARADISE!
TOWER Installation
Tower Location

- Sierra Los Locos
- Oak savanna ecosystem
- Elevation ~ 1300 m
Criteria of site selection

- Homogeneous vegetation cover
- Dominant wind direction over region
- Tower height 12 m
Set up of new tower

- Base installation
- Concrete base and anchors
Set up of new tower
Set up of new tower
Set up of new tower

......Nobody’s perfect
Soil heat flux plates

- 2 cm below the soil surface
- Different location
Soil moisture sensors

- Different depths: 2, 10, 15 and 30 cm.
- 2 cm depth for soil heat flux correction
Sonic anemometer

- Installed 9 m high
Net radiometer and pyranometer
Relative humidity and air temperature sensor
Electric power

- Two 65 watts solar panels
Datalogger

• Model CR5000
Los Locos tower
• 4 days to complete the installation
• 2 days in “Los Cuates” ranch
• 1 smashed finger
• 1 injured back

• 1 Person who quit the campaign
• 1 serious dehydrated person
• 1 dislocated shoulder
• 12 Ramon noodles soups
• 12 Tuna cans
• 12 salmon cans
• And one close encounter of the third kind…..