Recharge: Corroboration of Model Results

Chloride Mass Balance (CMB)

- As precipitation encounters the soil surface and percolates downward, water lost to evaporation and transpiration concentrates conservative solutes.
- If the initial Cl concentration, precipitation, and final concentration are found, we can solve for what has been lost to ET.
- Assumes steady flux of chloride through root zone, no geologic contribution to chloride mass, conservation of chloride anion, and no recirculation of chloride.

$$DP = P\frac{[Cl^-_{eff\ ppt}]}{[Cl^-_{gw}]}$$

where DP is groundwater recharge [L], P is precipitation [L], $Cl^-_{eff\ ppt}$ is effective chloride concentration of precipitation [ML^{-3}], and Cl^-_{gw} is groundwater chloride concentration [M/L^{-3}].

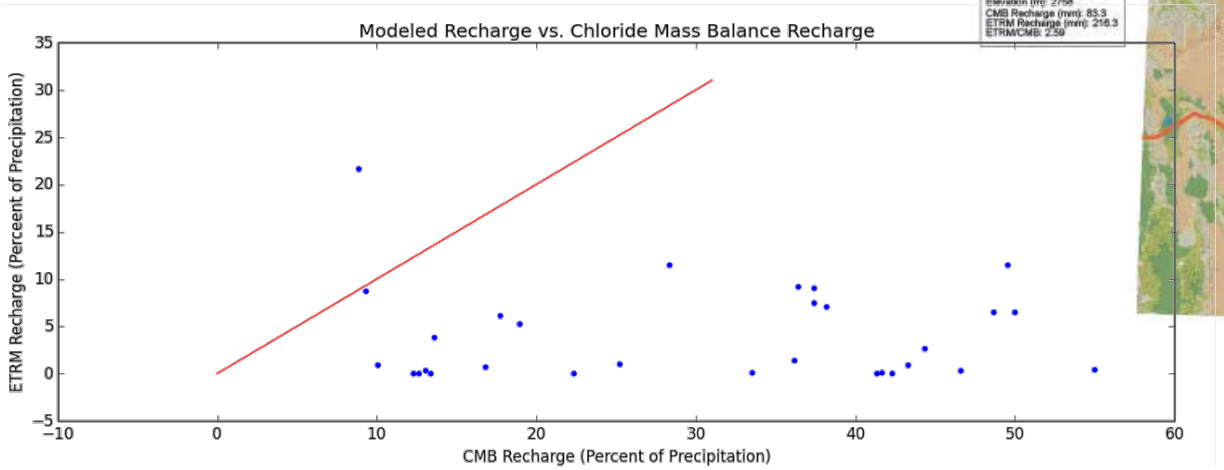


Figure 1. Comparison of modeled recharge and estimated recharge based on chloride mass balance in mountainous areas.

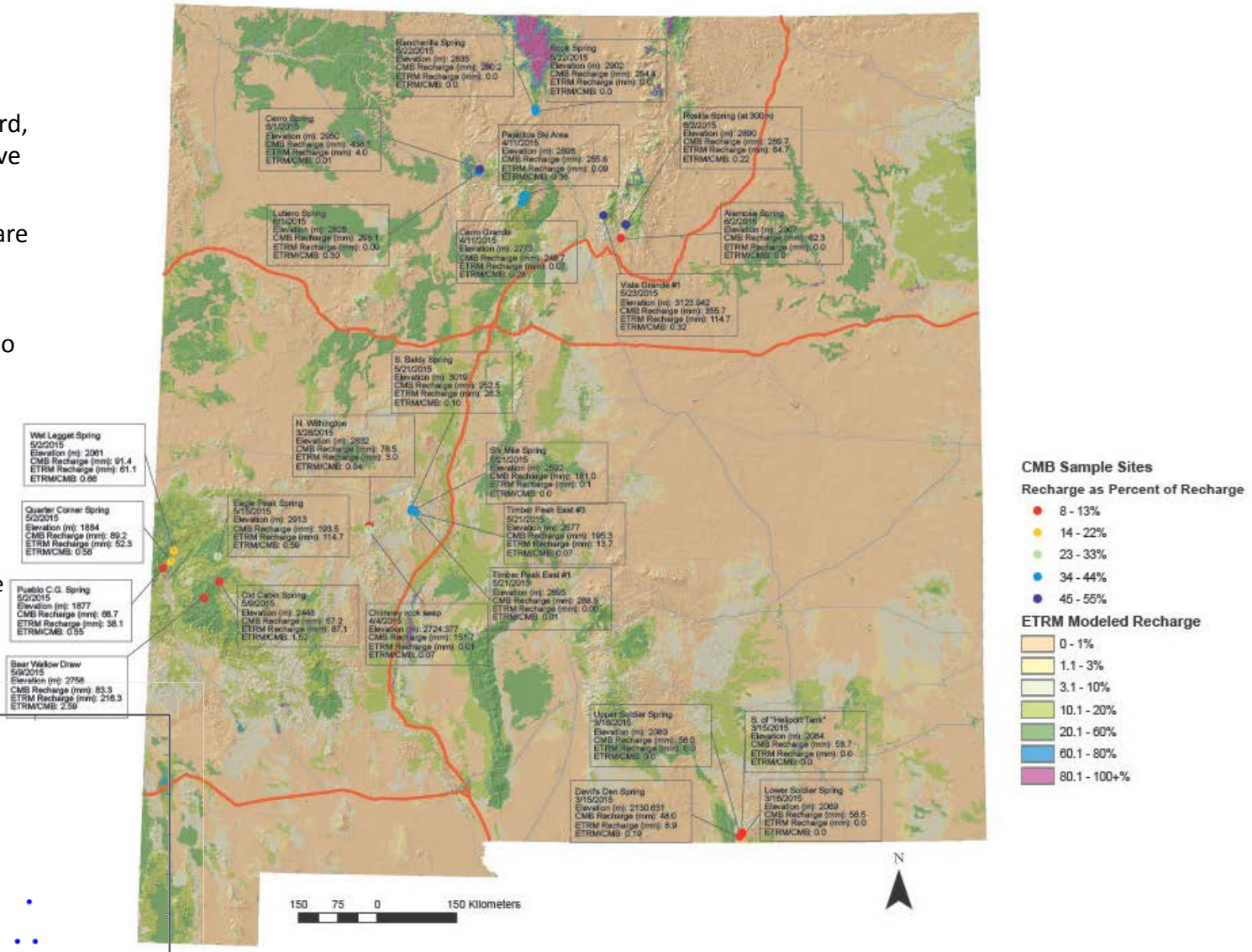
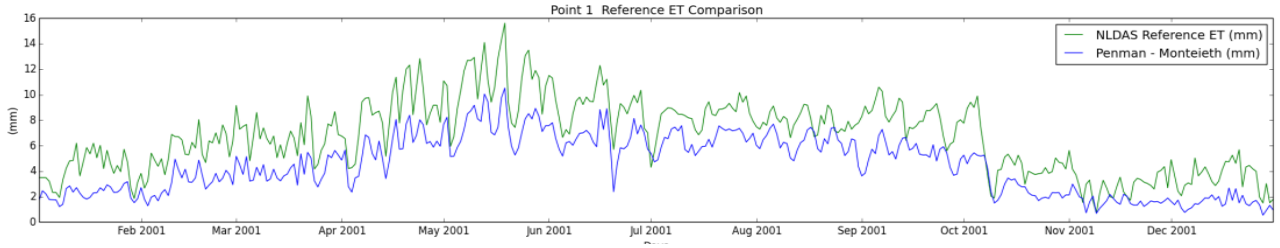
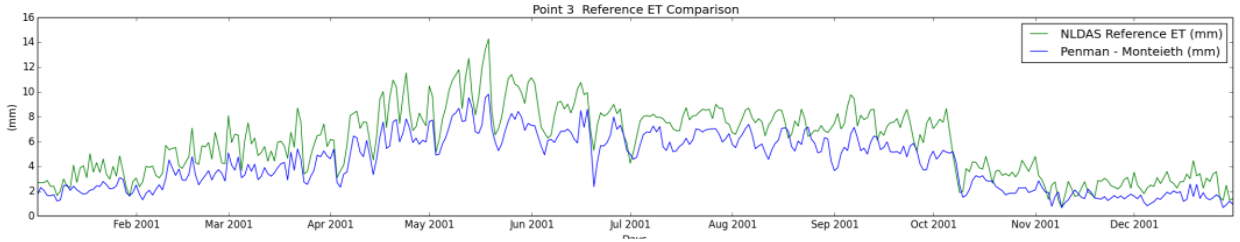


Figure 2. Comparison of modeled recharge and point measurements made in the field around the state of New Mexico. Points represent CMB estimates based on spring samples. Continuous coverage represents results from preliminary ETRM results.

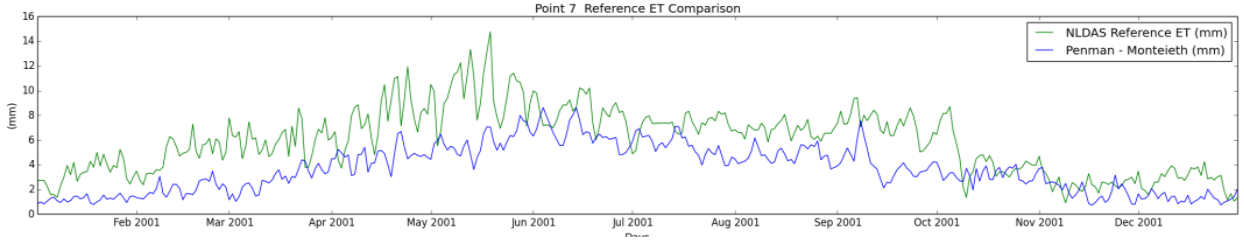
Comparison of New Penman-Monteith Data with NLDAS Reference ET at Test Points



Elevation = 1670 m $\overline{refET} = 6.76$ mm $\overline{refET} = 4.48$ mm



Elevation = 2130 m $\overline{refET} = 5.95$ mm $\overline{refET} = 4.33$ mm



Elevation = 2740 m $\overline{refET} = 5.94$ mm $\overline{refET} = 3.66$ mm