Four important results from the Southern Sierra CZO:

1. **Closing the water budget at multiple scales.** At the headwater-catchment scale our estimates of evapotranspiration (ET) using a water-balance approach¹ are in good agreement with flux-tower measurements². Similarly, our estimate of the water balance across the entire Upper Kings River basin also matches observations.³ This level of confidence provides a foundation for in-depth process research.

2. **Year-round growing season at mid elevation.** We had expected the mid-montane forest to shut down both in winter due to cold and in late summer due to drought stress. But the forest largely avoids these limitations through deep rooting and cold tolerance, explaining high productivity and biomass in the mid-montane belt⁴.

3. **High rates of evapotranspiration at mid-elevation.** Along an elevation gradient, the lower-elevation site exhibited less ET due to greater water stress; the higher-elevation site exhibited less ET due to greater cold stress.²⁴⁵ This confirms the inverse drought and energy limitation conceptual model, with implications for effects of warming on ET.³

4. **Importance of water storage below the mapped soil.** Deep rooting and soil development⁵ are important for sustaining high rates of net primary productivity.¹⁶ At our main instrumented headwater catchment, we found that over one-third of the ET came from depths below 1 m.

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³ Goulden, M.L. and Bales, R.C., Vulnerability of montane runoff to increased Evapotranspiration with upslope vegetation redistribution. In preparation.

