**Objectives:** Addressing two issues relevant to the ~ 70 hotplate precipitation sensors sold by Yankee Environmental Systems (YES): 1) Two publications (Boudala et al. 2014; Zelasko et al. 2018) report bias in the YES-derived wind speed ($U_{\text{pro}}$), and thus error in determination of snow particle catch efficiency and in precipitation amount. Here, a calibrated hotplate wind speed ($U_{\text{cal}}$) is formulated via an energy budget analysis. 2) A new snow particle catch efficiency function is developed and tested. The new function is expressed in terms of the calibrated wind speed ($U_{\text{cal}}$).

- **Up and Down Surfaces (precip and wind speed)**
- **LW and SW Sensors**
- **Temperature**
- **Electronics**

Calibrated Hotplate Wind Speed –

$$U_{\text{cal}} = \frac{\mu}{D_h \rho} \left( \frac{Q_{dn} - A_h e_{h} \sigma T_h^4}{\alpha D_h K \cdot (T_h - T)} \right)^{1/\beta}$$

Measurements: $Q_{dn}$ and $T$

Constants: $\mu$, $D_h$, $A_h$, $e_{h}$, $\sigma$, $K$

Derived Calibration Coefficients: $\alpha$, $\beta$, $\gamma$, and $T_h$

Test of $E_{\text{new}}(U_{\text{cal}})$ on OWLeS snowfall events from Zelasko et al. (2018)

NOAH-II comparator is a wind-speed corrected weighing gauge

Reasonable agreement confirms method

Test of $E_{\text{new}}(U_{\text{cal}})$ on WYCEHG snowfall events from Zelasko (2017)

SNOTEL comparator is a weighing snow pillow

Discrepancy thought due to enhanced snow drift accumulation at easterly-exposed WYCEHG site