

Observations (e.g. wind speed, PBL heights)
 $O(s, t)$

Single observed variable
 $O(s_i, t_j)$

N modeled variables
 $M_{0-N}(s_i, t_j)$

Model ensemble (with N members)
 $M_{0-N}(s, t)$

Histogram of the ranks K over $N+1$ bins
 $K(s, t)$

Rank of the observation $O(s_i, t_j)$ among the N
modeled values $M_{0-N}(s_i, t_j)$
 $K(s_i, t_j)$

Flatness of the rank histogram for the ensemble
 $M_{0-N}(s, t)$ using $O(s, t)$
 $S(M, O)$

Random selection of N members among 45 by
Monte Carlo approach (GA/SA)

Ensemble $M(s, t)$ with score $S(M, O)$
closest to 1 is selected
to represent the transport uncertainties

Dimensions: $s =$ space, $t =$ time

$i =$ site location, $j =$ observation time