

MetroMan preliminary Pepsi2 results

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MetroMan run setup & generic params

- **Metropolis Manning algorithm**

- Imposes mass conservation across reaches subject to continuity equation ($dA/dt = dQ/dt$)

- **Update from Durand 2016 AGU poster:**

- Stage-discharge parameterization:

$$\tilde{n} = n_0 * \left(\frac{H}{\bar{H}}\right)^{x1}$$

- Hydraulic depth parameterization:

$$\tilde{n} = n_0 * \left(\frac{A}{W}\right)^{x1}$$

- **Run setup:**

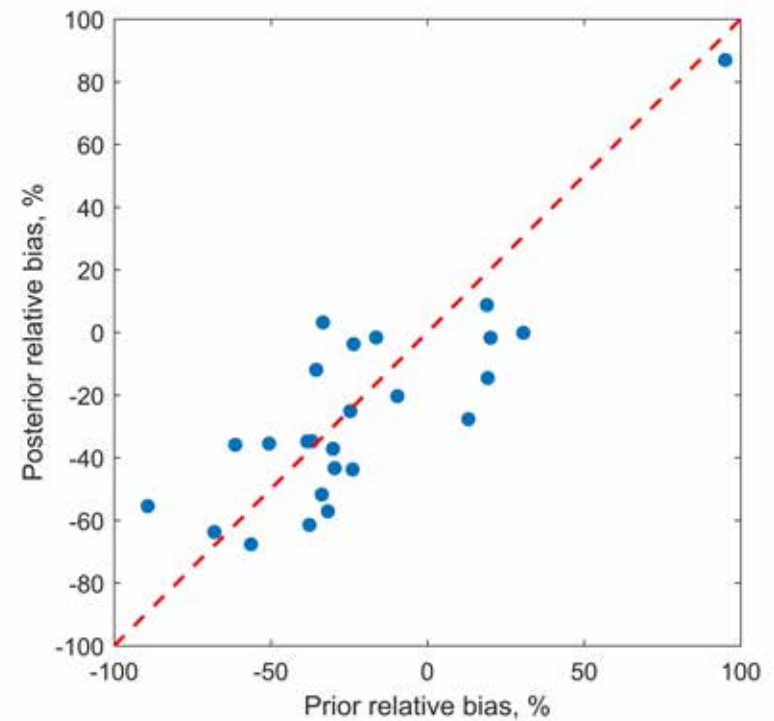
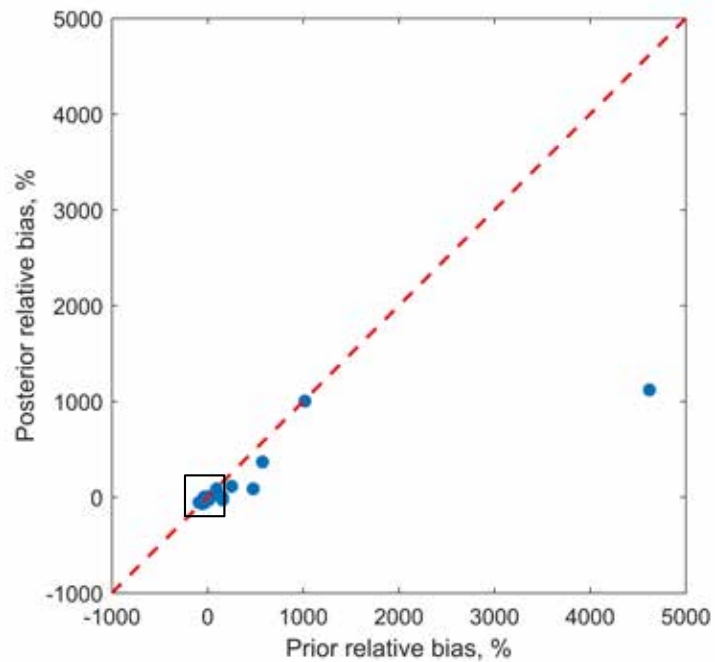
- Prior covariance on discharge estimate = **50%**
- Prior standard deviation on slope: **0.1 cm/km**
- Prior standard deviation on height: **5 cm**
- Prior standard deviation on width: **5 m**
- Chain length: **10,000** (2,000 sample burn-in)
- Inversion window: **20 obs; height variability; small dH/dt; avoid out of bank flow**

Overall algorithm performance

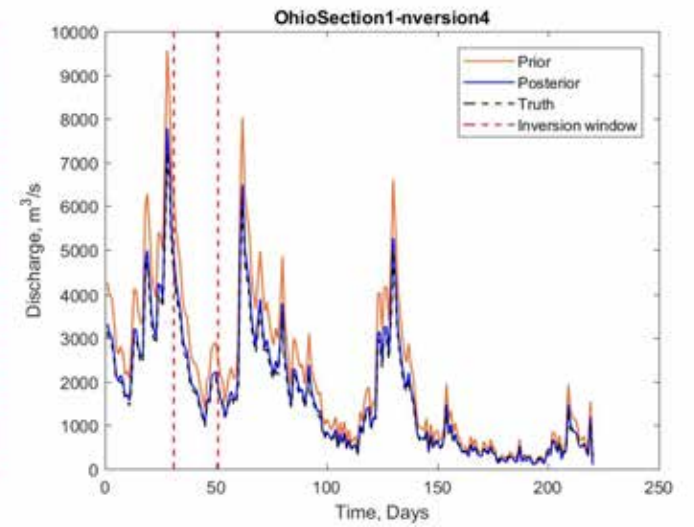
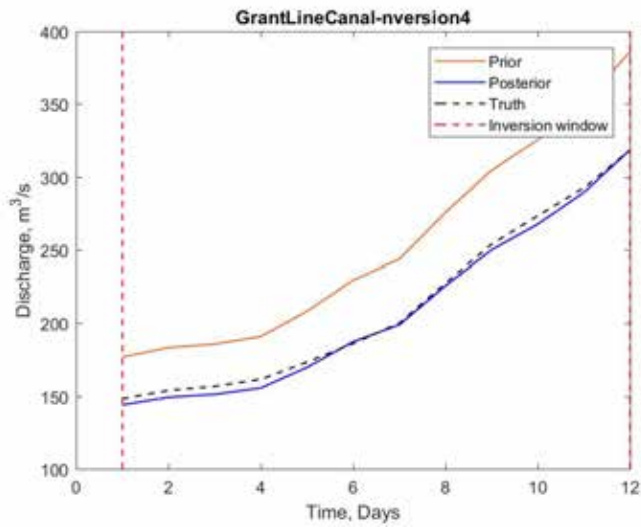
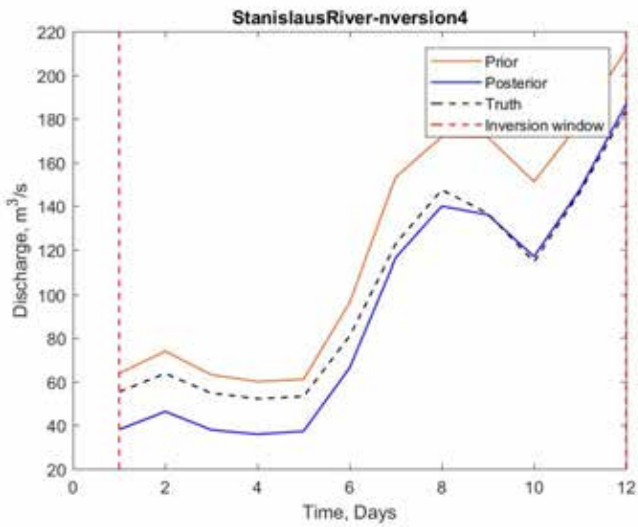
n version	Stage-discharge	Hydraulic depth
Median nRMSE (all rivers)	44%	37%
# of Rivers w/ nRMSE < 0.45	16 (50%)	20 (63%)
# of Rivers w/ posterior nRMSE < prior nRMSE	19 (59%)	21 (66%)
Median NSE (all rivers)	0.55	0.66

Prior & Posterior Errors - relative bias

7 cases where prior relative bias > 100%
4 cases where posterior relative bias > 100%



'Great' cases ($nRMSE < 0.15$)



'Tough' cases ($0.9 < nRMSE < 1$)

