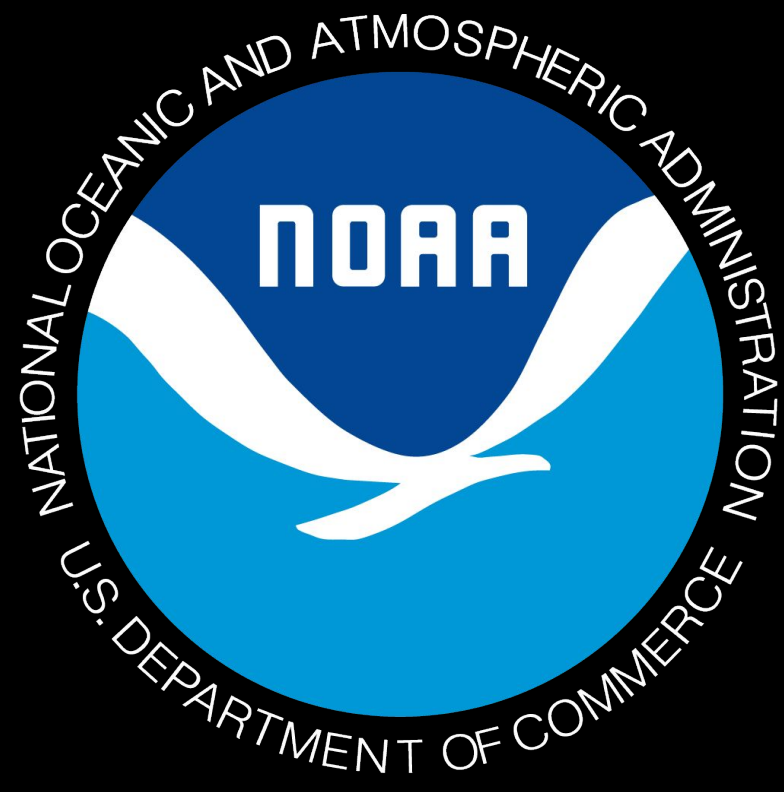


# Methods for Evaluating Arbitrary Hydrologic Models and Process Modules in the Next Generation Water Resources Modeling Framework



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## Problem

How do you rate the relative value of simulations originating from varying model mosaics?

## Procedure

- Two different formulation mosaics, comprised of the CFE and TOPMODEL formulations, were generated by randomly selecting what formulation should be used in which location and generating arbitrary model parameters for each
- For every location:
  - Take the sum of each metric multiplied by its magnitude, with the inputs of each metric being thresholded observations and simulations
  - Take the weighted mean of the sums of those thresholded metrics
- Take the weighted mean of each of the weighted averages from step 2.
- The preferred mosaic is determined by the mosaic with the greater weighted mean from step 3

## Criteria

The primary metrics considered are **Probability of Detection** with a **magnitude** of **7**, **False Alarm Ratio** with a **magnitude** of **7**, the **Heidke Skill Score** with a **magnitude** of **3**, and the **Accuracy** with a **magnitude** of **3**. **Areas** within the hydrofabric were **weighted** based on **contributing area**. Thresholds considered are **Action** with a **weight** of **4** and **Minor** with a **weight** of **5**. Weights and magnitudes are distributed based the level of interest within this particular study.

## An Evaluation Infrastructure Enabling Evidence-Based Selection of Heterogeneous Hydrologic Models has been Created

|      | Mosaic One | Mosaic Two |
|------|------------|------------|
| 2008 | 7.3        | 8.9        |
| 2011 | 7.39       | 11.15      |
| 2015 | 7.4        | 11.22      |
| Mean | 7.36       | 10.42      |

**Mosaic Two resulted in higher weighted metrics than Mosaic One, indicating better model performance based on these criteria**

