

# Perspectives on Multiple Modeling for Management

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STAC Multiple Modeling Panel

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# EPA/CBPO Perspective

## - Cautious Interest -

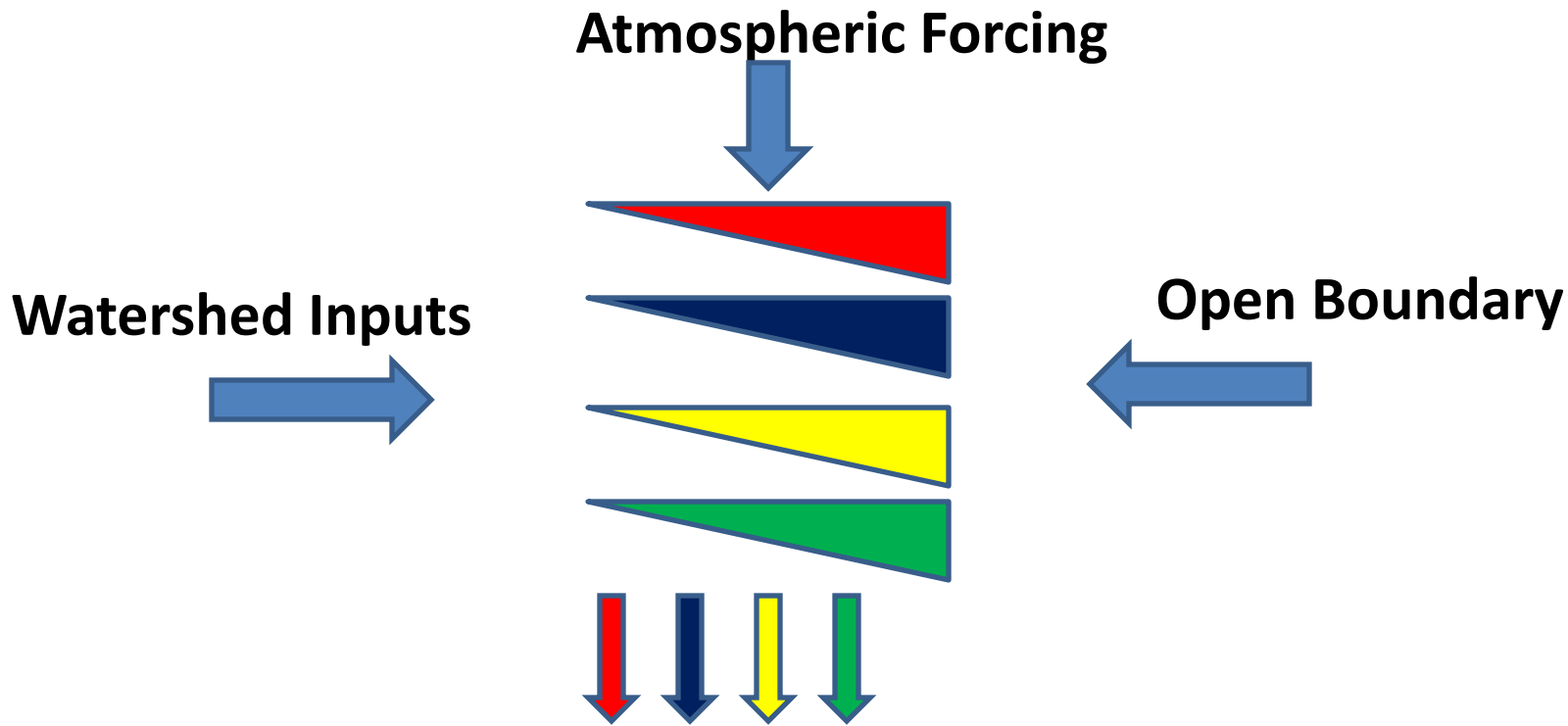
- Benefits
  - Greater involvement of the scientific community
  - Greater confidence in model outputs
  - Increases pace of scientific advancement
- Challenges
  - Time and Money for development
  - How can it work in a regulatory framework?
  - What are the operational Challenges

# EPA/CBPO M3 Strategy

## - Slow and Steady Progress -

- Possible Pilot Study in Shallow Water
- Active Participation in the M3.1 and M3.2 workshops
- Active Participation in the Modeling Laboratory Action Team
- Consideration of M3 in future development plans

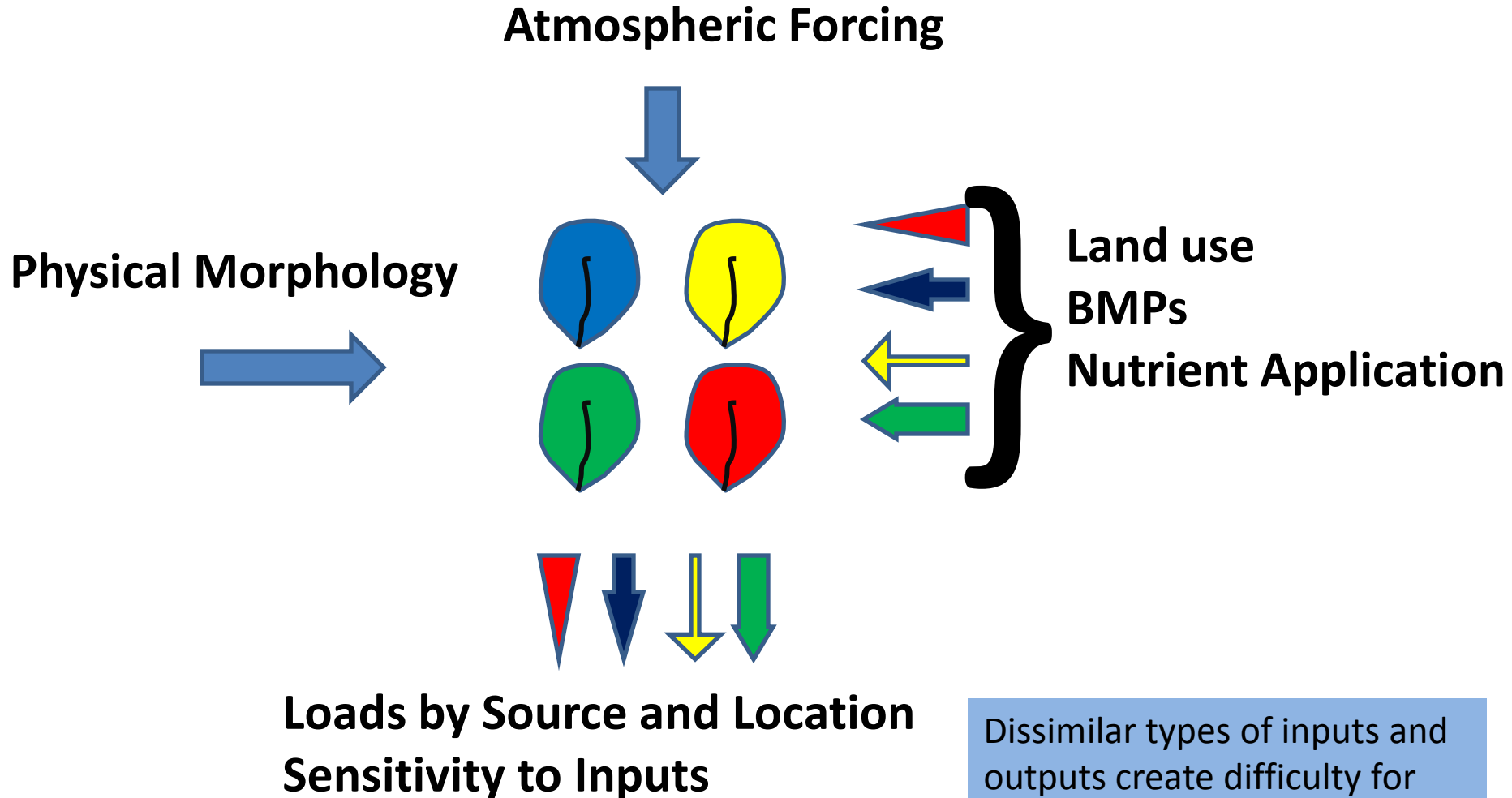
# Multiple Models of an Estuary



**Dissolved Oxygen**

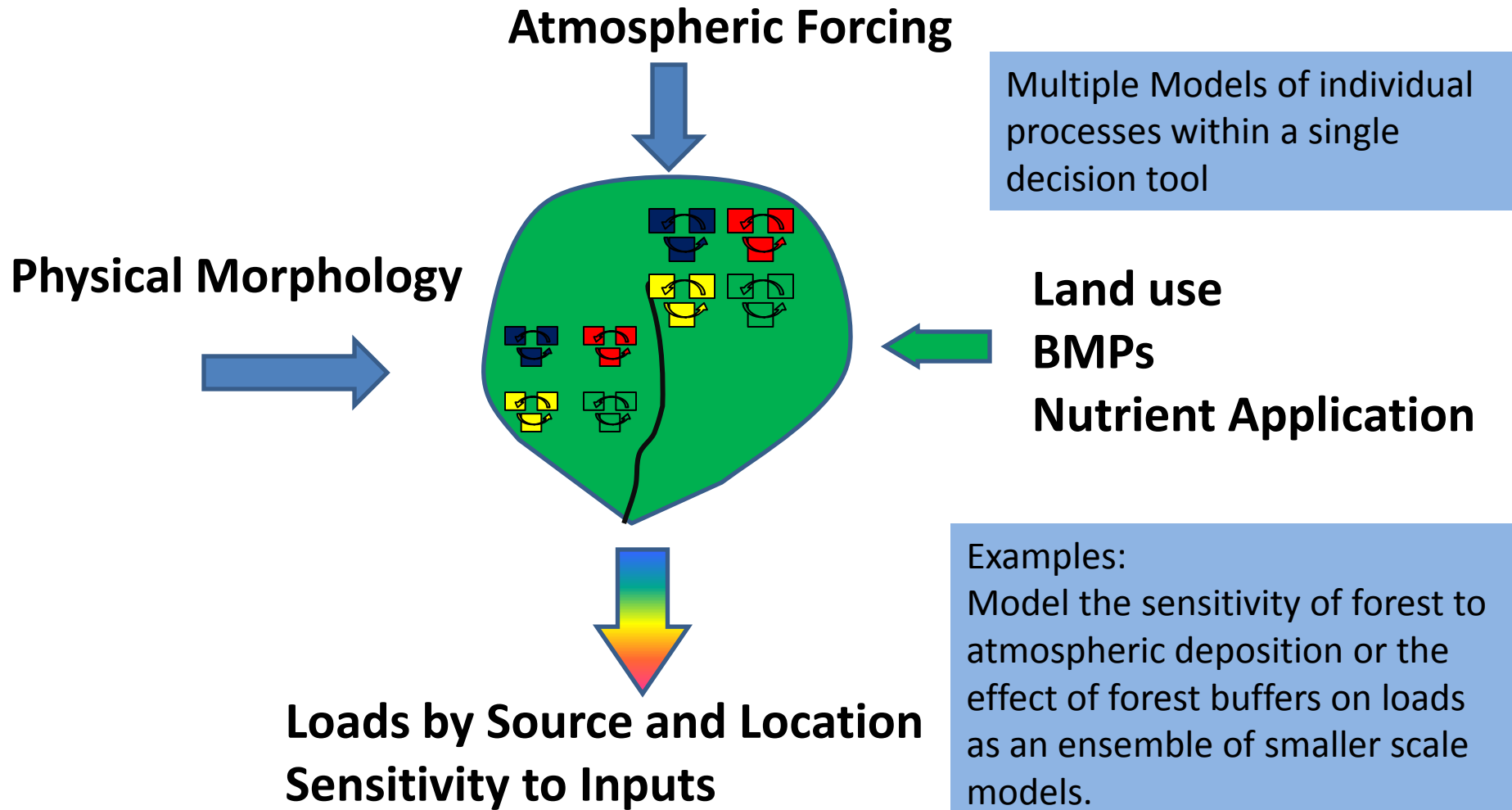
Similar types of inputs and outputs create an opportunity for 'classic' ensemble modeling

# Multiple Models of a Watershed



Dissimilar types of inputs and outputs create difficulty for 'classic' ensemble modeling

# Multiple Models of a Watershed



# Some Discussion Points

- Science Questions
  - What are the different ways to use M3?
    - Averaging
    - Support of a regulatory model
    - Nesting
  - What are the scientific benefits?
    - Confidence, characterization of uncertainty, identification of outlier predictions
- Management Questions
  - What are some case studies of successes and failures?
  - What benefits and challenges would there be for the Chesapeake TMDL or TMDLs in general?
    - Regulatory decision making
    - Legal
    - Practical and operational
    - Communications