

# 2017 Montana Floodplain Resource Seminar: Lecture 9 Course Wrap-Up

Eli Gruber, PE

Christian Warren, PE, CFM



Identify *Hazards*, Interpret *Risks*, Integrate *Mitigation*

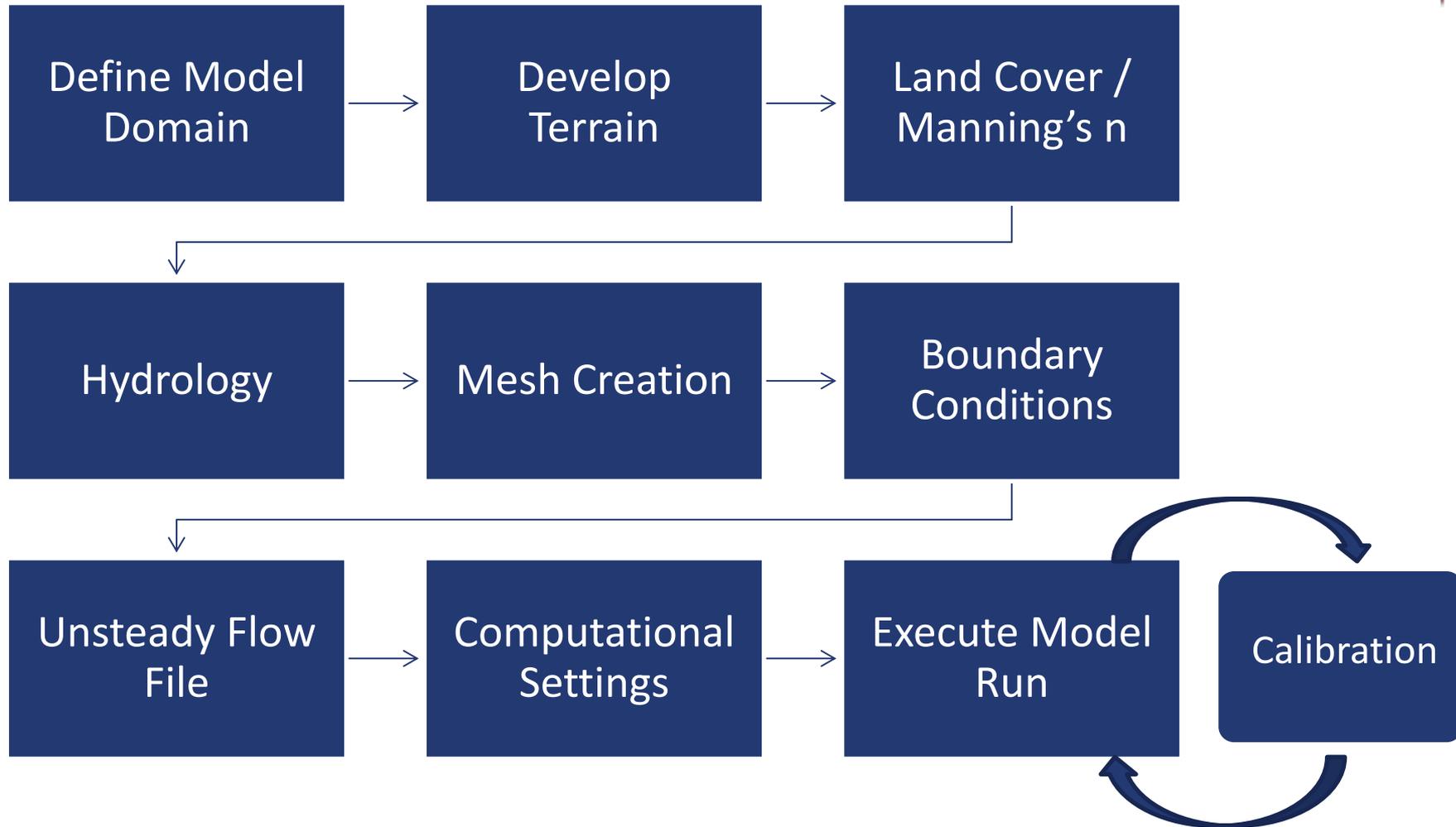


# Lecture 9 Overview

- Review key course material
- Question session
- Course Wrap-up



# Modeling Process

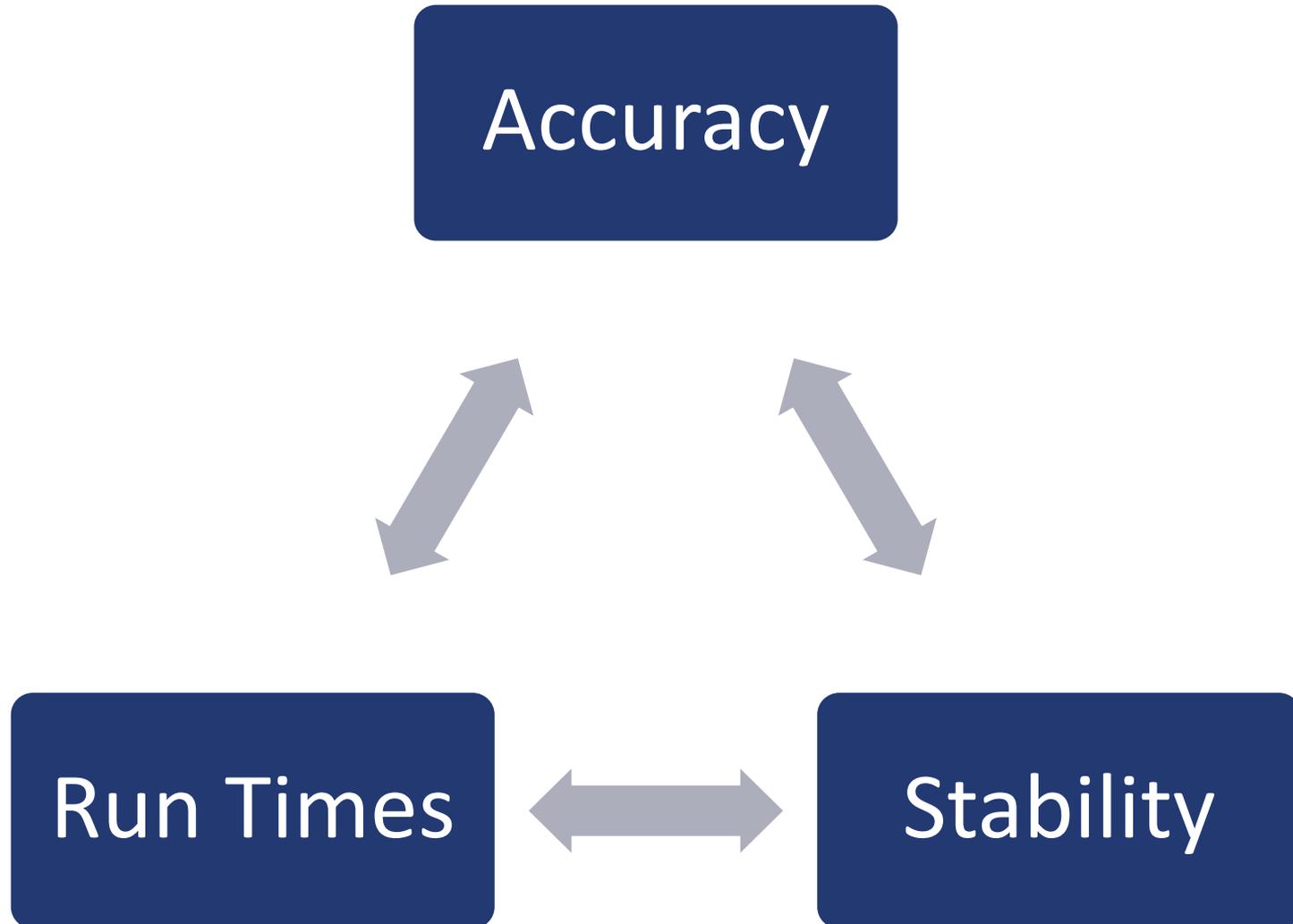


# Key Takeaways

- Breaklines will determine the model accuracy
- Must have high resolution LiDAR
- Subgrid bathymetry representation
- Exercise caution with Diffusion Wave Option
- Significant uncertainty in data
  - Calibration and sensitivity analysis



# Computational Considerations



# HEC-RAS 5.0 Considerations



- Advantages:
  - Includes subgrid bathymetry
  - 1D/2D options
  - Diffusion Wave/Full Momentum
  - User friendly
  - Widely used and accepted
  - Free!
- Limitations:
  - Bridge crossings
  - No close conduit options
  - Leakage across flow impediments
  - Results rendering issues
  - Error identification
  - Rain-on-Grid losses (infiltration)

# Resources

- HEC-RAS User's Manual
- <http://hecrasmodel.blogspot.com/>
- FEMA Standards
- Training courses



# Questions



Photo from FEMA

