

Assessing landscape capacity to regulate floods in selected watersheds across North Carolina and Virginia



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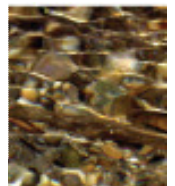
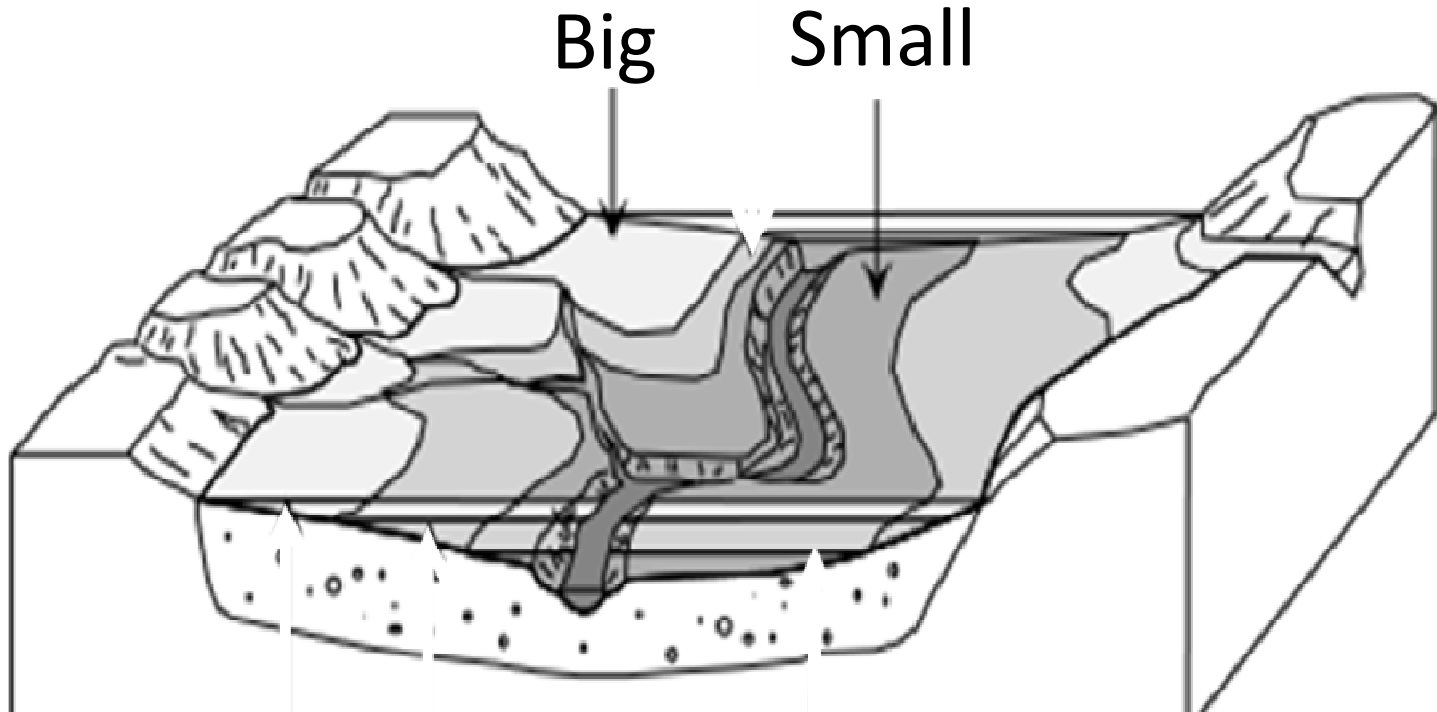
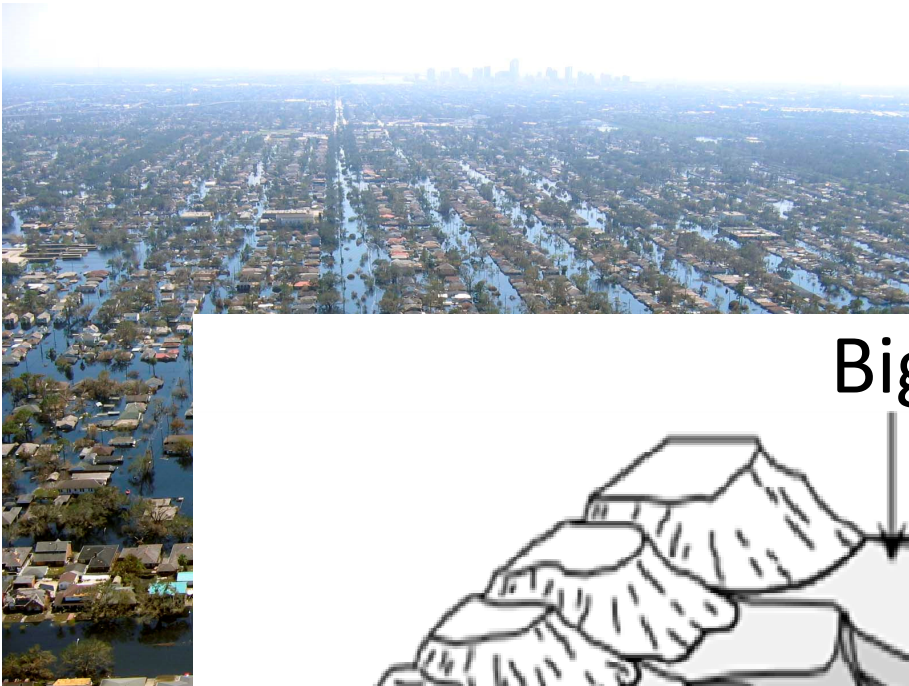
² U.S. Geological Survey, Virginia Cooperative Fish and Wildlife Research Unit, Virginia Tech

The Virginia Water Conference

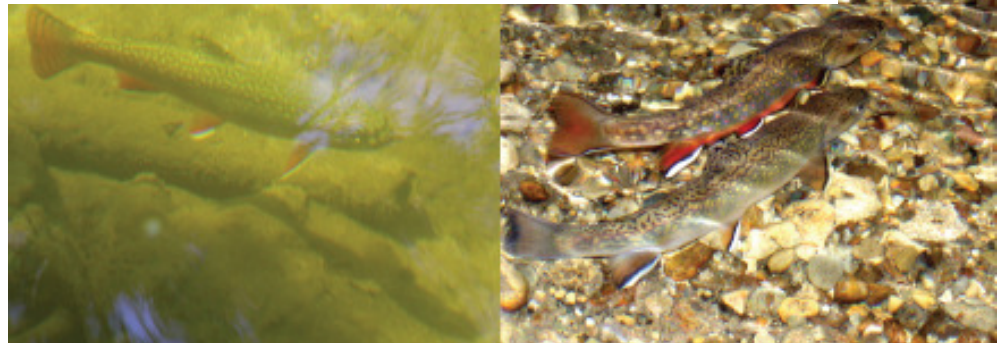
March 10, 2014

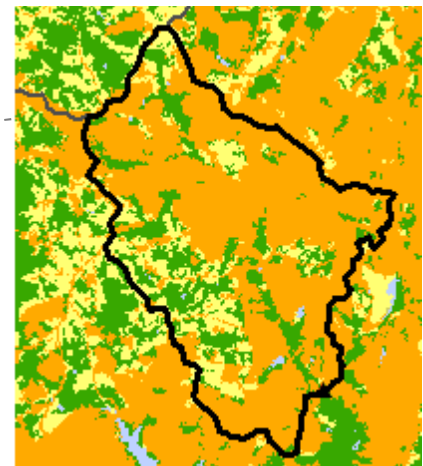
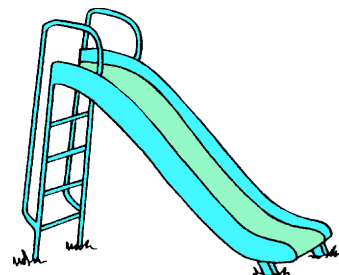
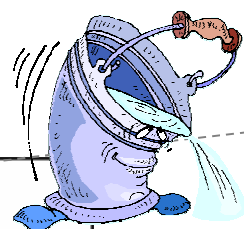
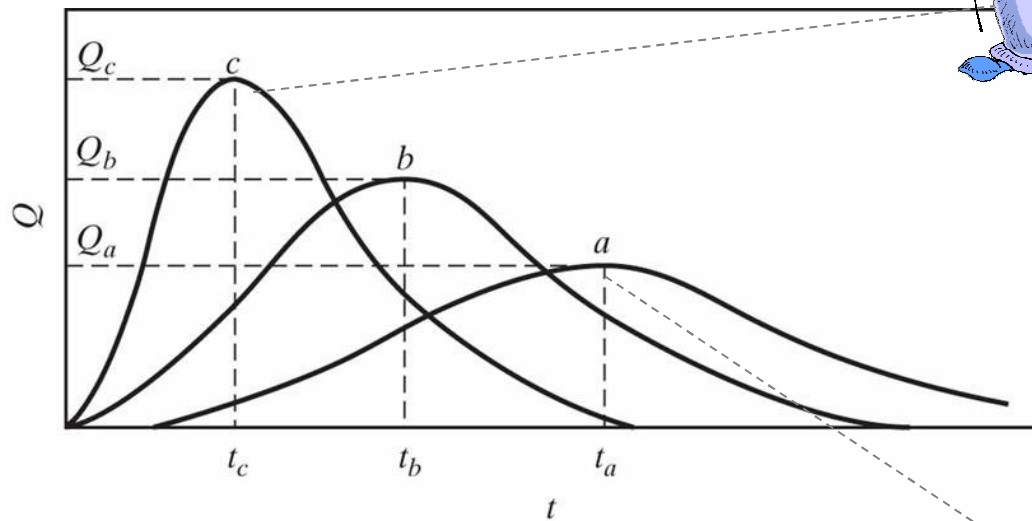
Richmond, VA

“Big” floods affect humans



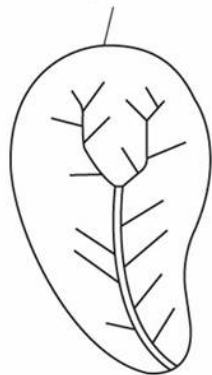
“Small” floods shape aquatic ecosystems





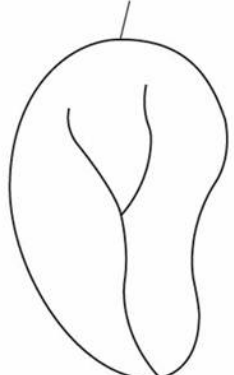
- Ocean
- Water
- Forests and Wetlands
- Developed
- Agriculture
- Barren

Fully developed

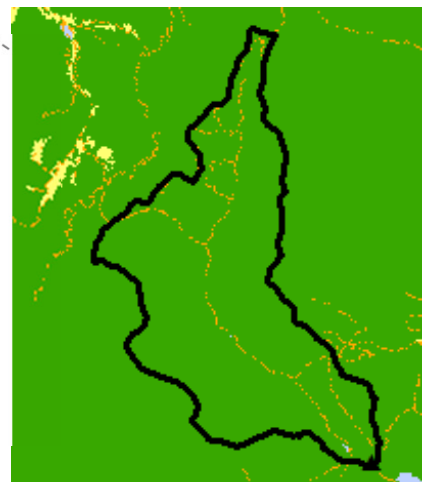
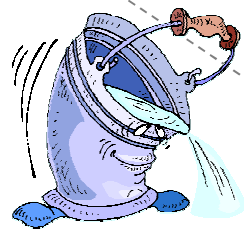


(c)

Natural



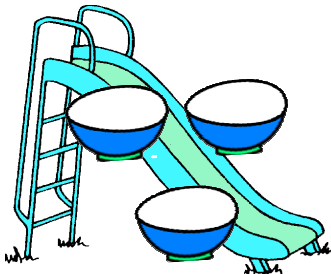
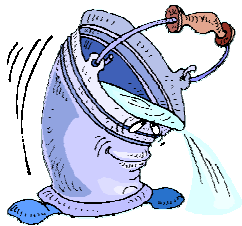
(a)



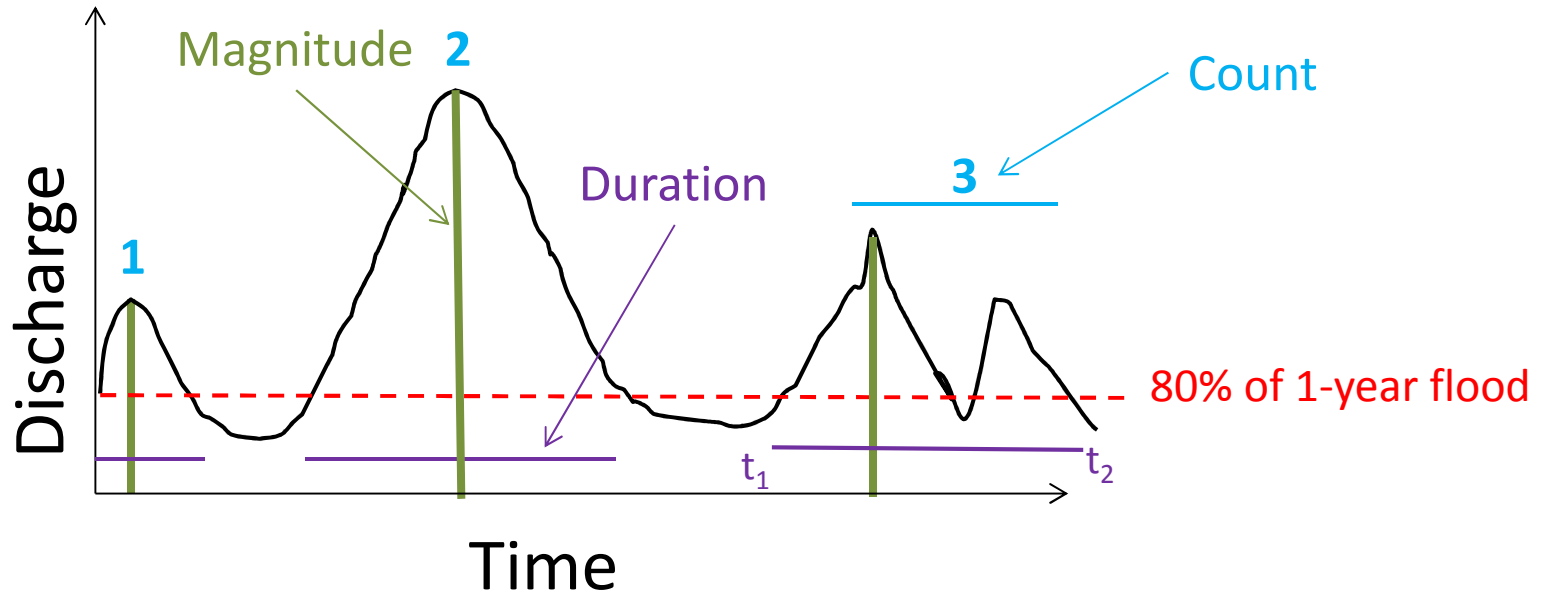
Push flows downstream



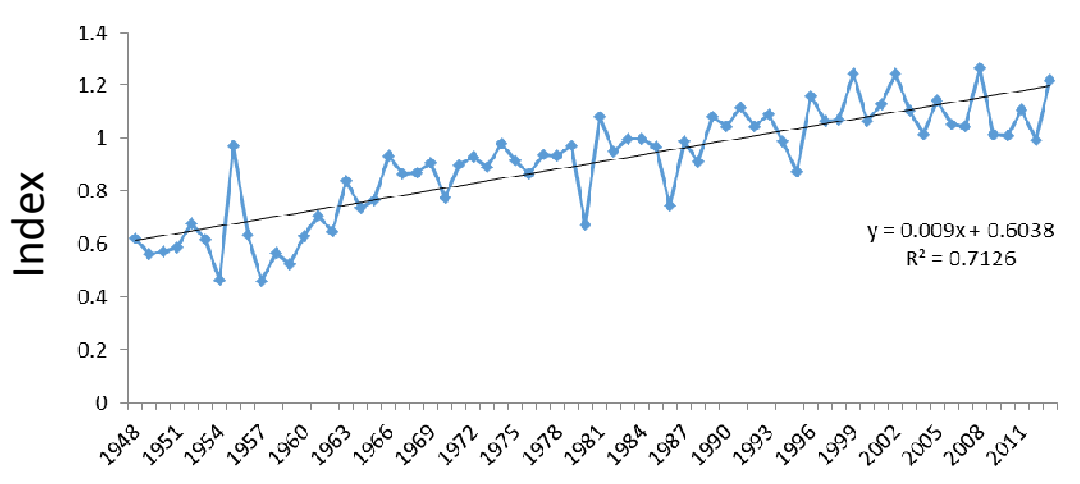
Hold water in place

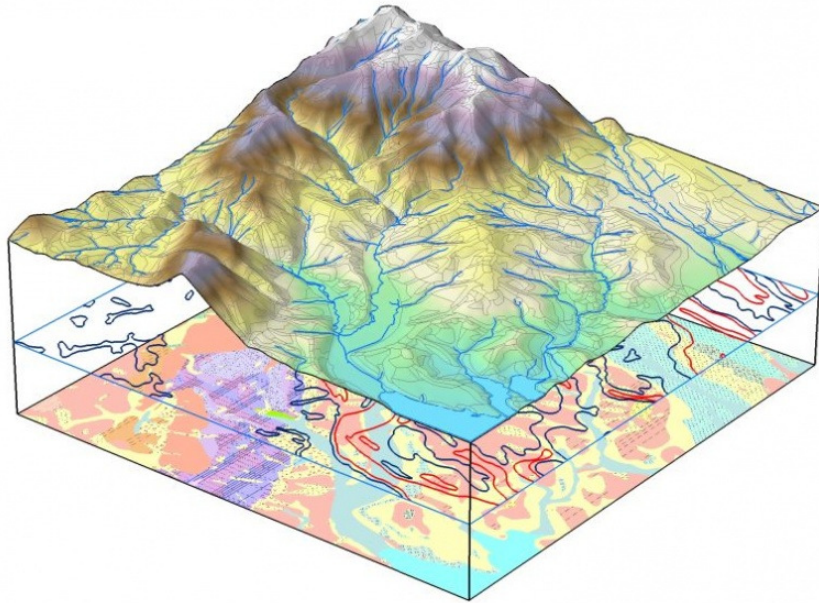


This study



Flashiness Index





Objectives

- 1) Understand the effect of landscape structure on flooding over space and time
- 2) Assess the utility of flood metrics (magnitude, duration, count and flashiness)

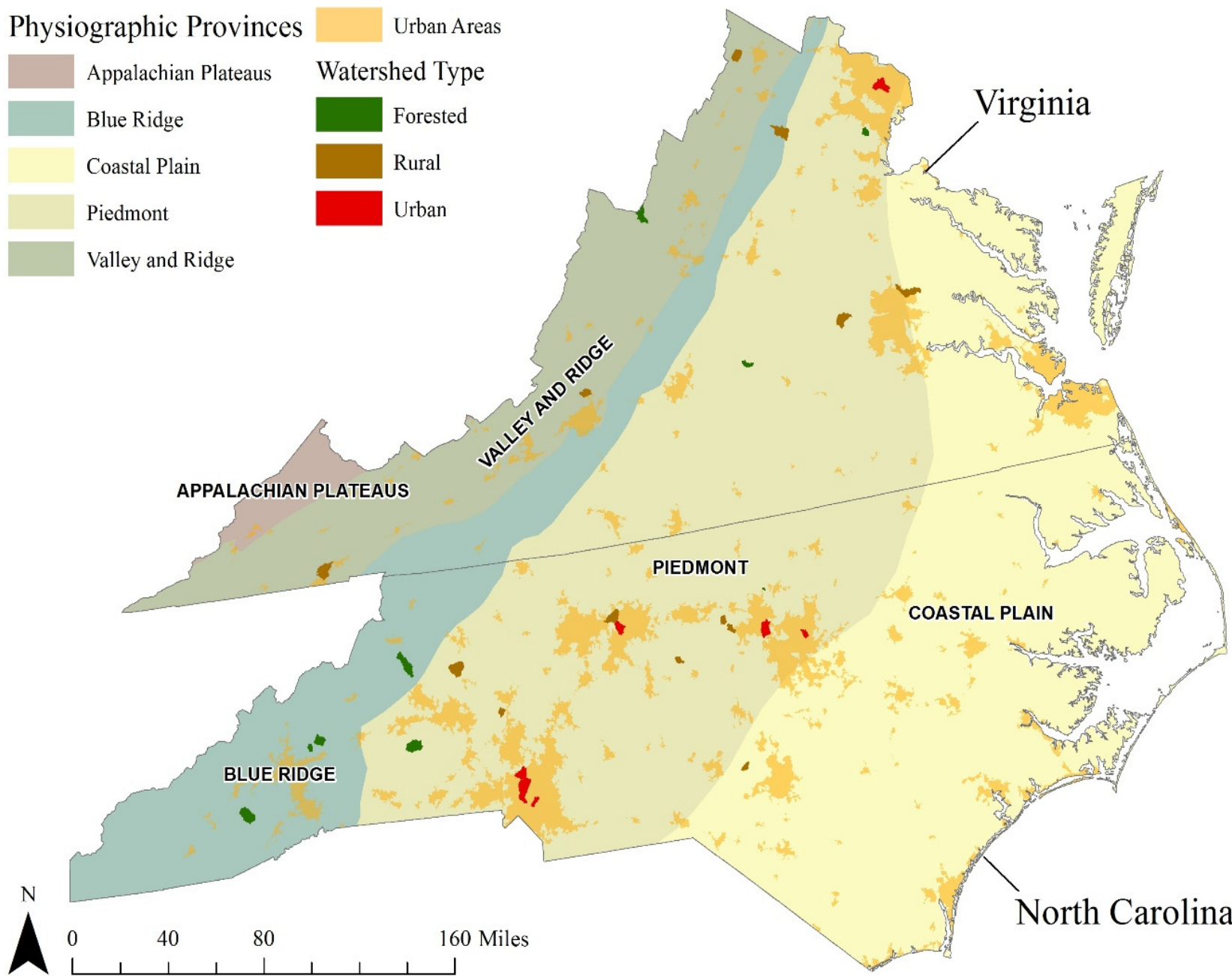
Physiographic Provinces

- Appalachian Plateaus
- Blue Ridge
- Coastal Plain
- Piedmont
- Valley and Ridge

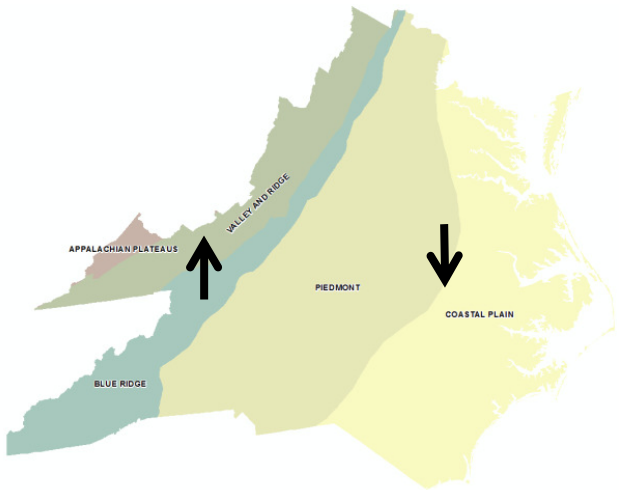
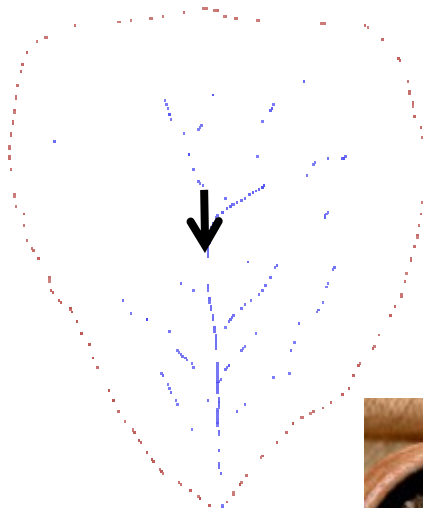
Urban Areas

Watershed Type

- Forested
- Rural
- Urban

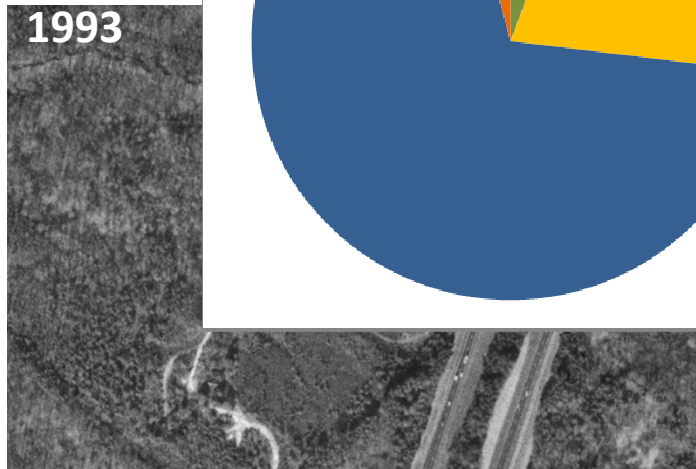
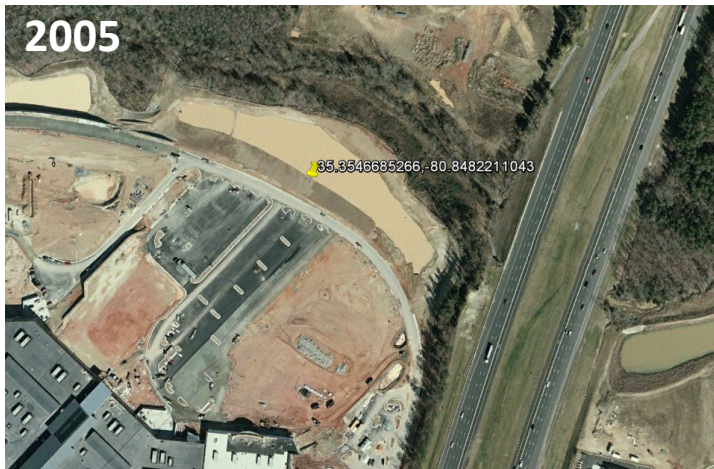
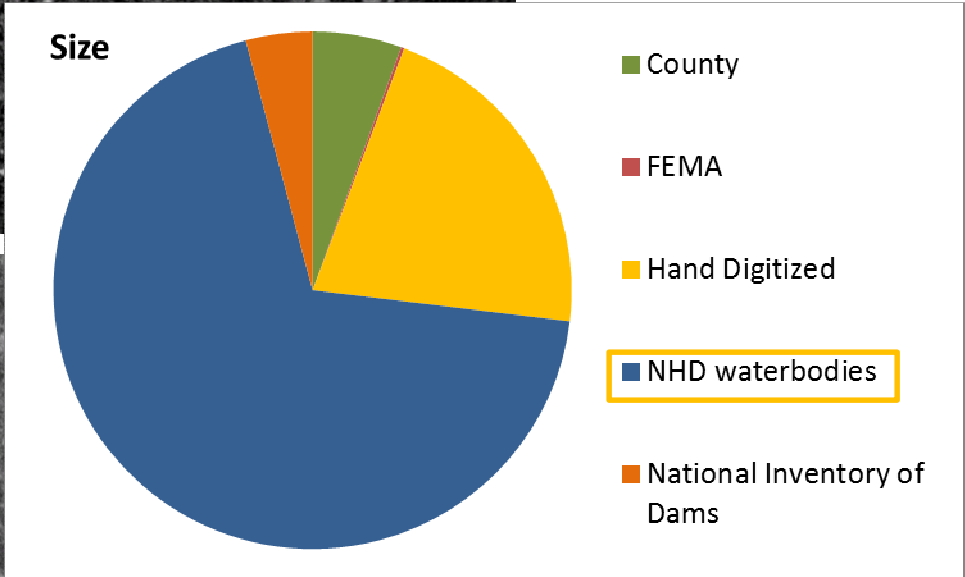
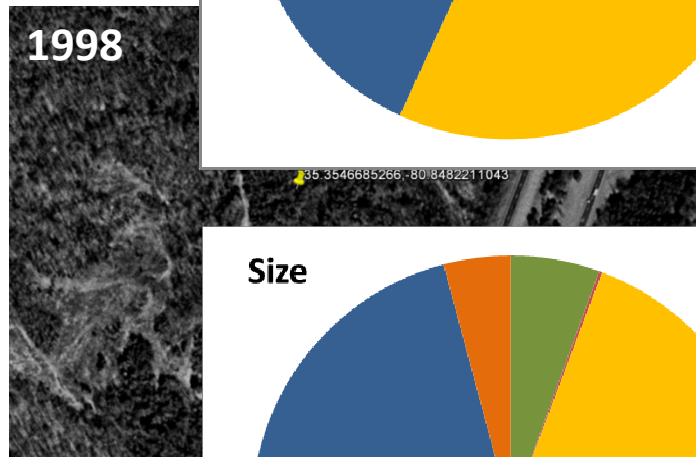
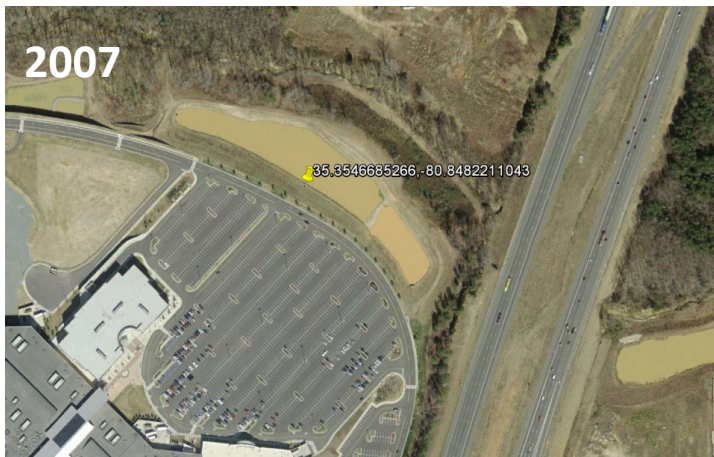
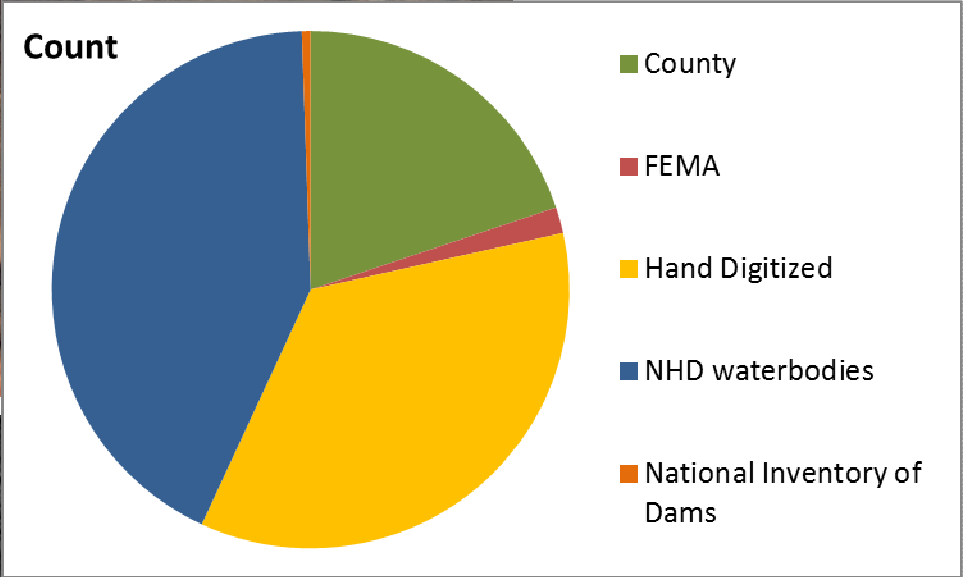
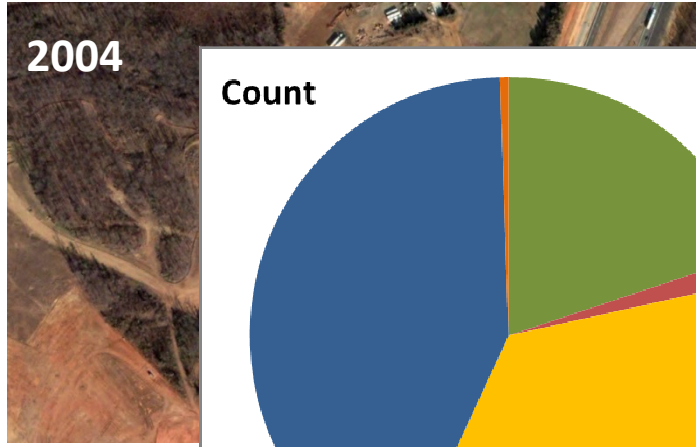
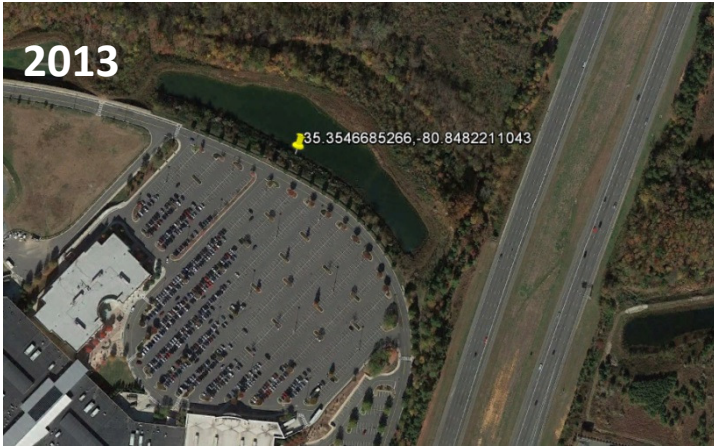


Natural...



Human...

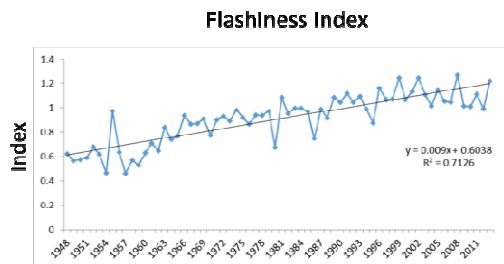
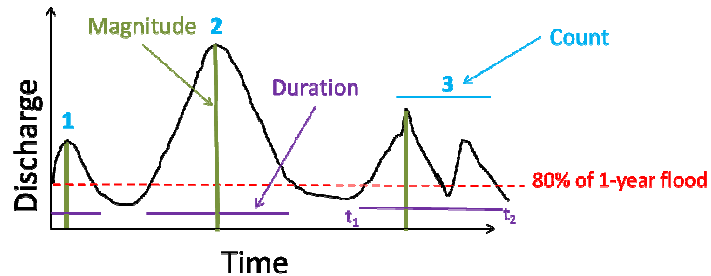




What type of model is driving the variability seen in floods?

Response Variables

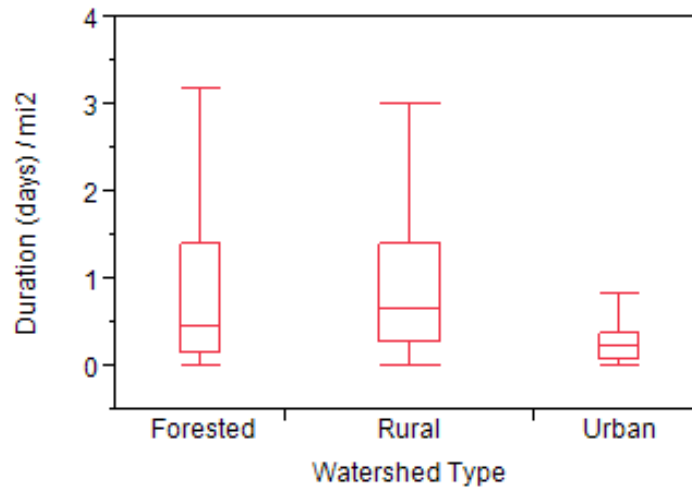
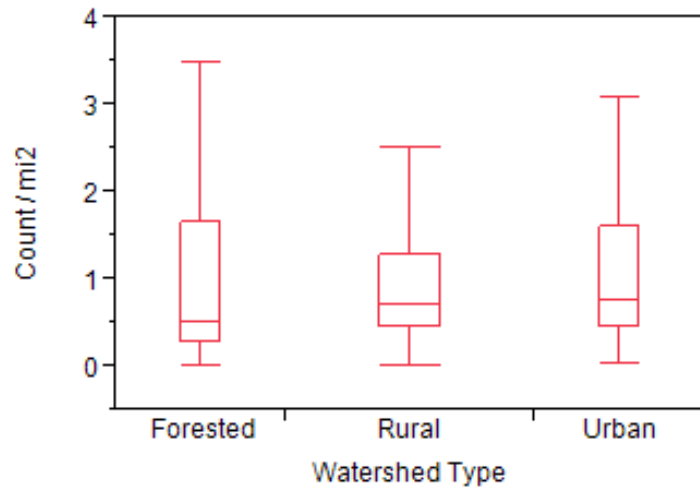
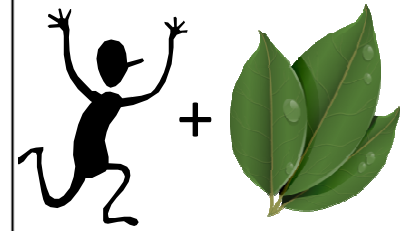
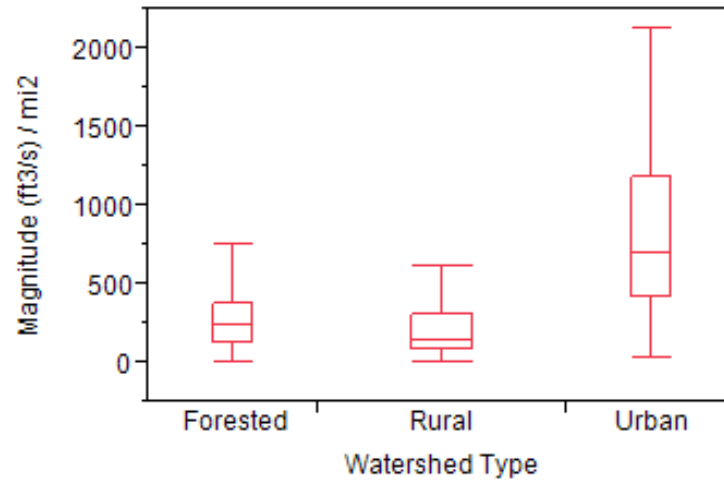
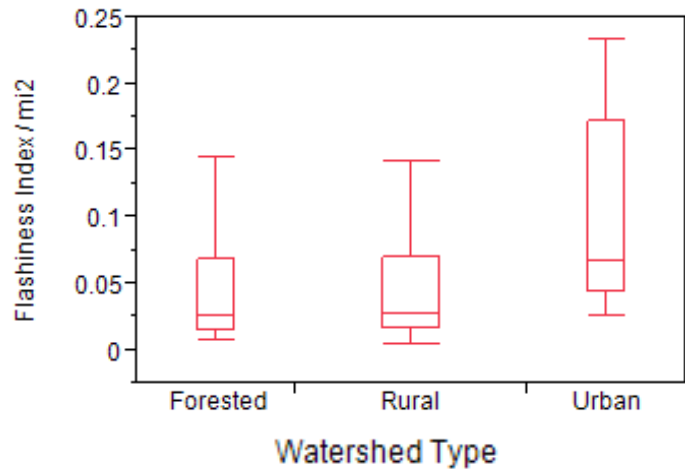
- Magnitude
- Count
- Duration
- Flashiness Index



Explanatory Variables

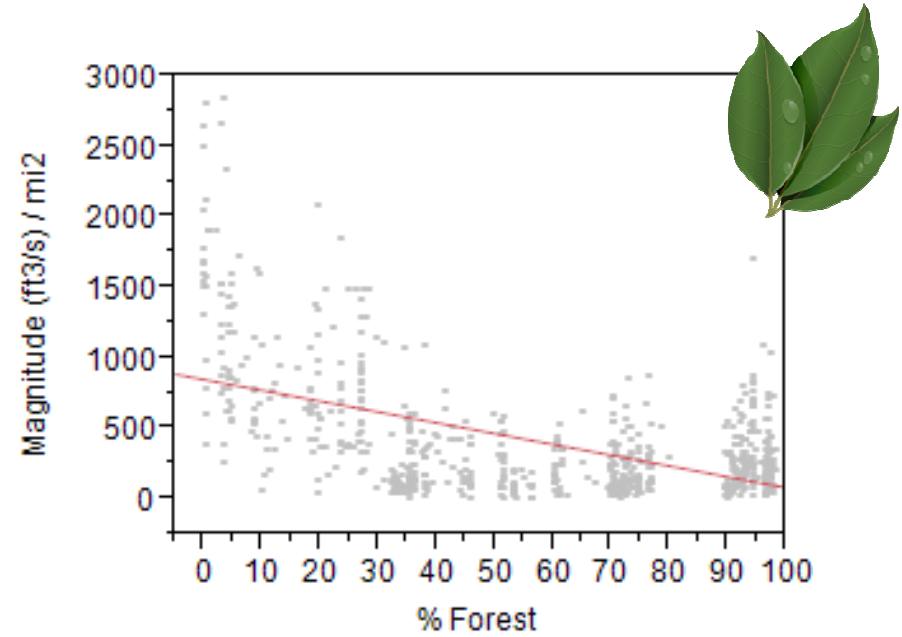
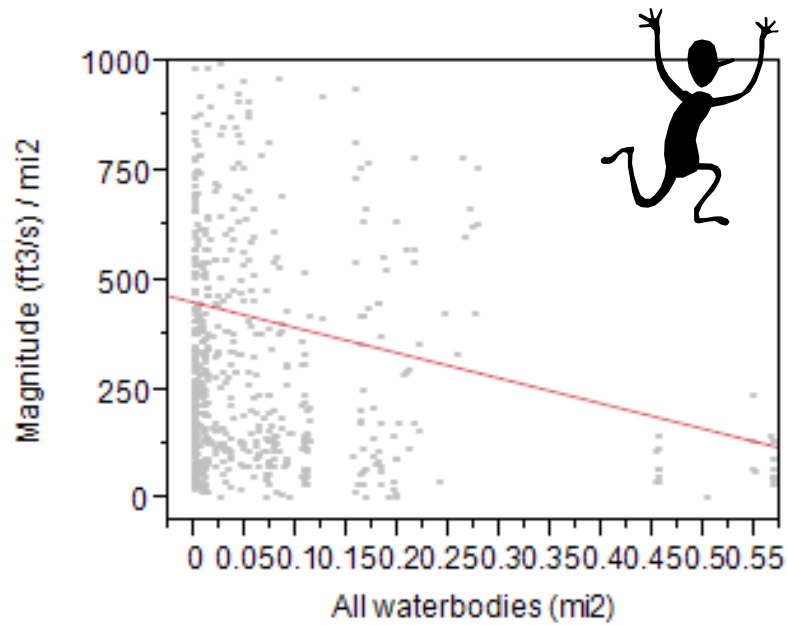
- Natural
- Human
- Natural & Human





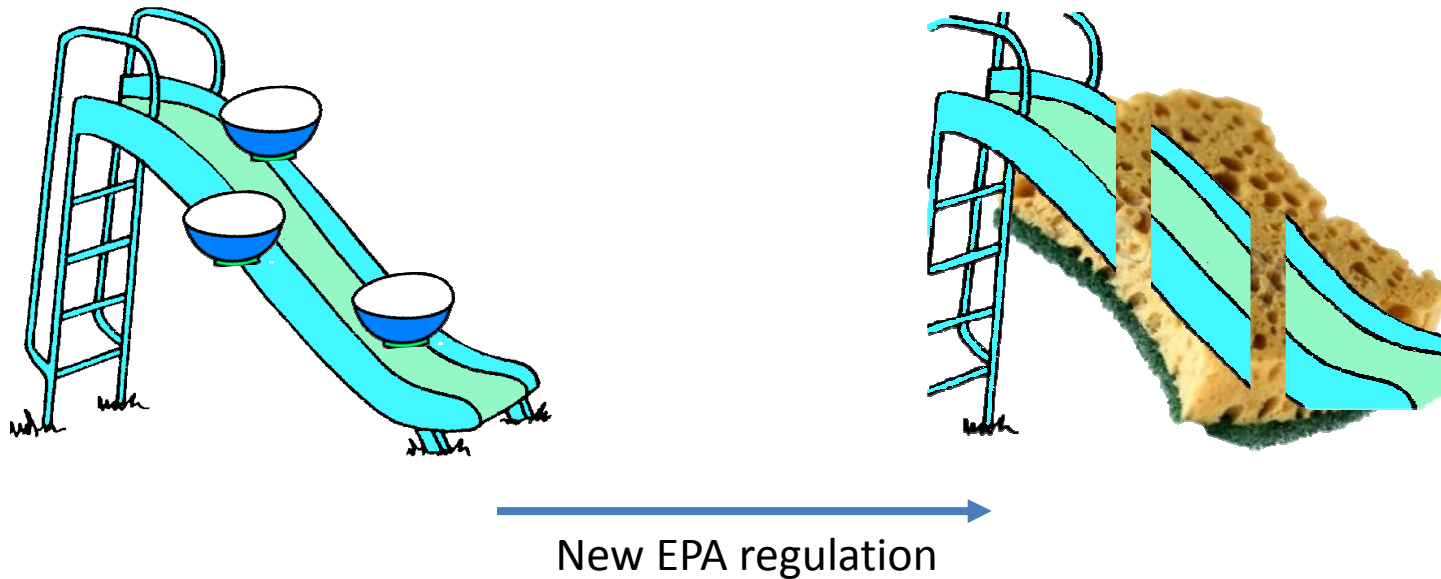
Findings

- M, D, C have decreased
- FI has increased
- Mainly to rainfall
- But other features are important



So what...

- 1) Both natural and human features affect flood characteristics
- 2) Measuring multiple characteristics of floods helps us understand the causes and management of floods
- 3) Availability of data on man-made structures limits our ability to understand the effectiveness of flood management



Thank you

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