

# Governance network modeling

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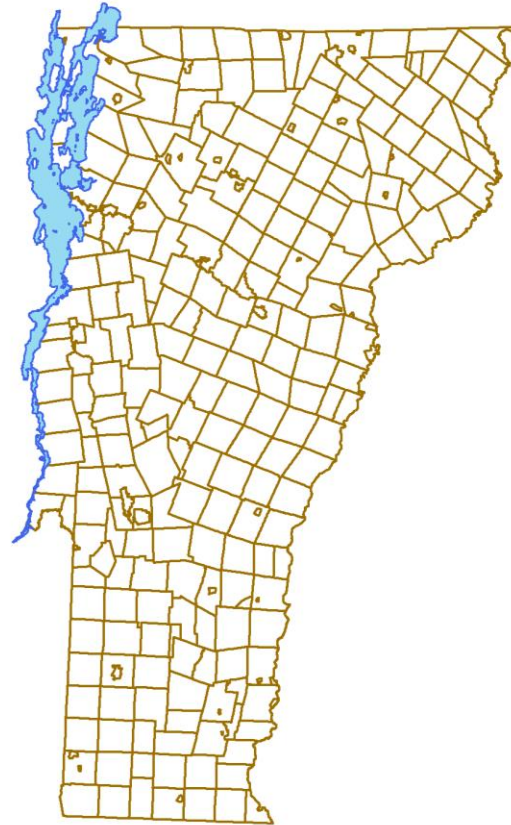
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# Governance modeling objectives

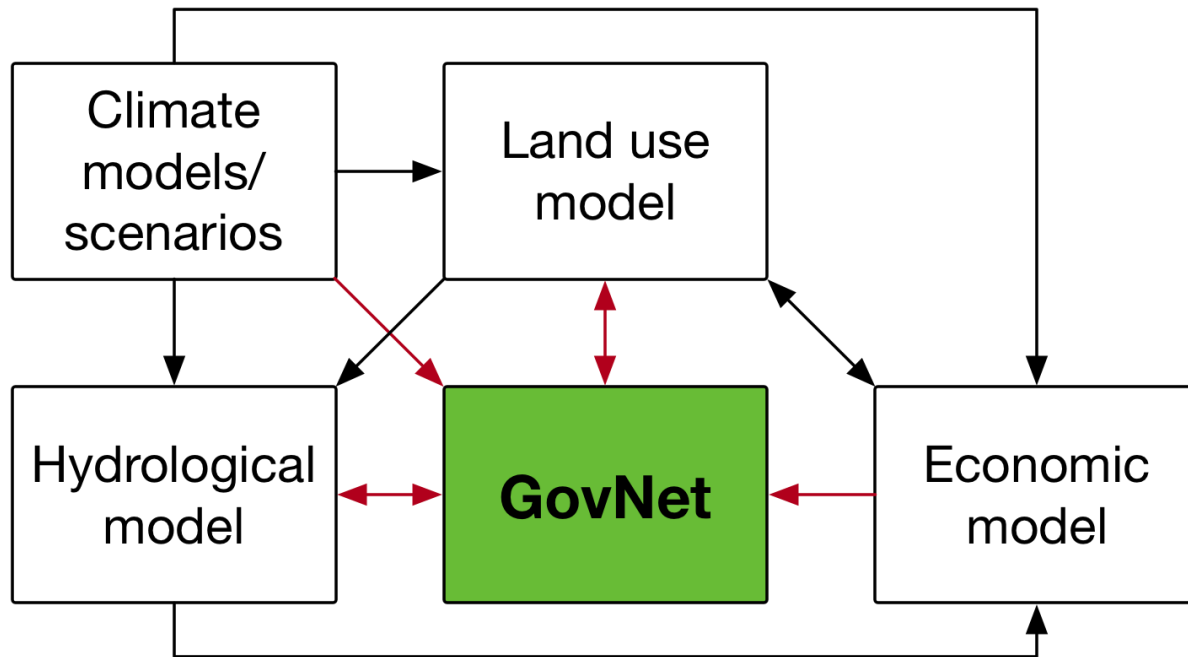
Determine how governance networks, institutional rules, macroeconomic indices, and resource allocations **respond to extreme events** and how this knowledge can be used to **design policies** that **enhance resilience** in the Basin

1. Model how network structure affects resource distribution and **response** to extreme events
2. Model how priorities and policies propagate through a governance network and **change** the set of **possible outcomes**
3. Model **novel** policy (dis)incentives (e.g., common pool management, credits) and their **effects**

# Overlapping & conflicting spatial units



# GovNet: an agent-based model of network governance

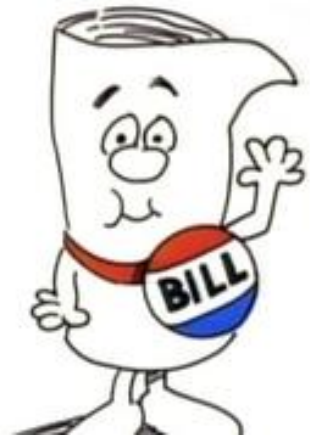


- Connects policy, incentives, and outcomes in a spatially-explicit framework
- **GovNet** models:
  - Multi-scale, multiplex governance networks in the Lake Champlain Basin
  - Interactions among governance actors (the agents)
  - Flow of information, resources, and rules
  - Diffusion of ideas and innovation
- Prototype in place, building out application using Missisquoi CWAC

# Adaptive management & GovNet components

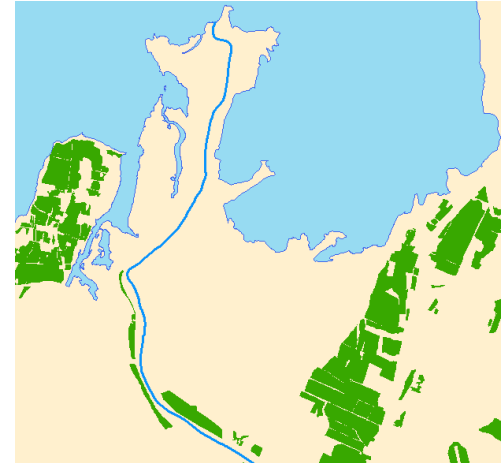
decision-  
making  
process

**Rule**



**Objective**

**Target area**



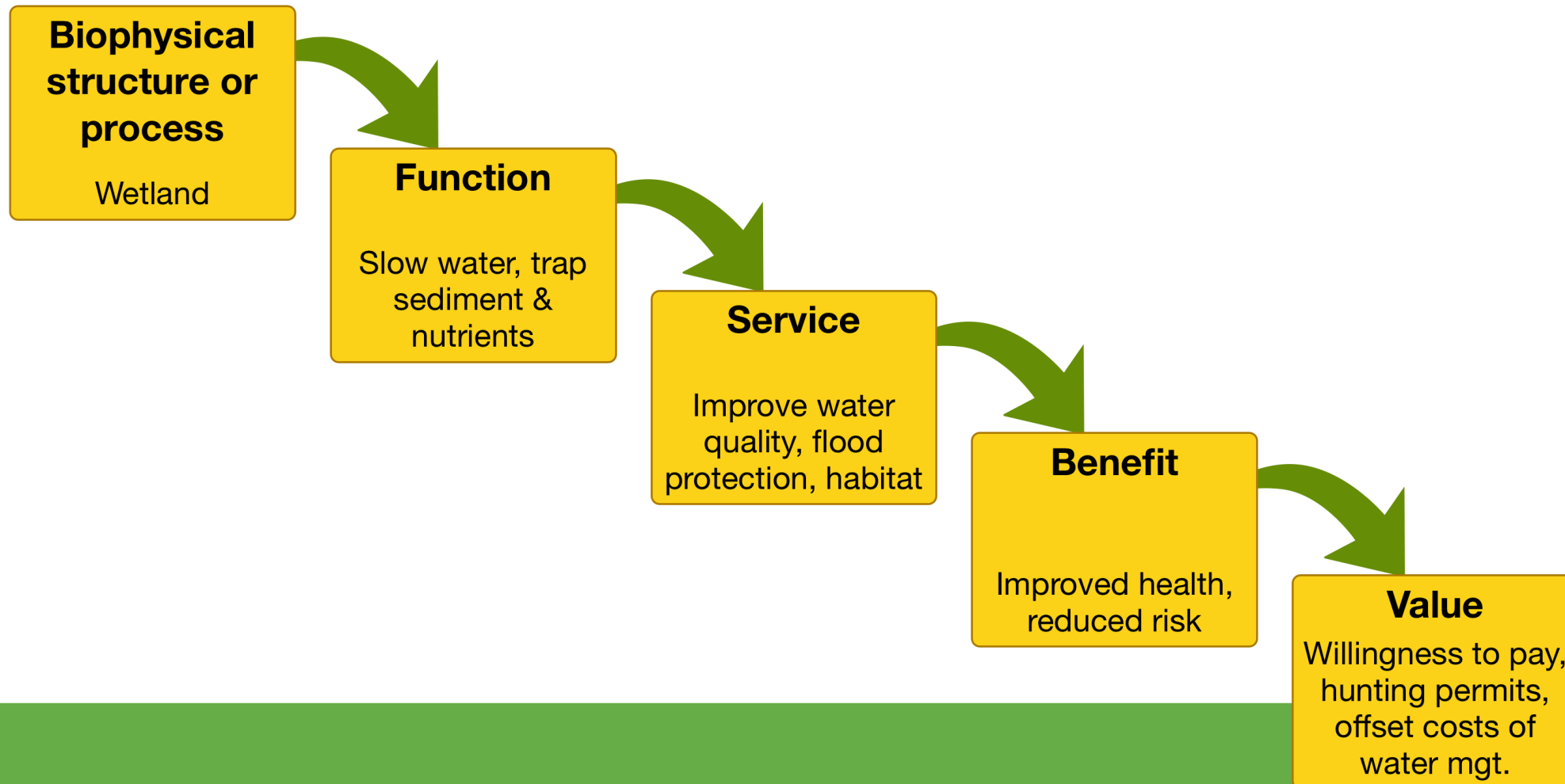
**Vehicle** (e.g., rule, loan, tax)

**Delivery system**

outcome

**Evaluation and learning**

# Ecosystem service cascade and feedbacks



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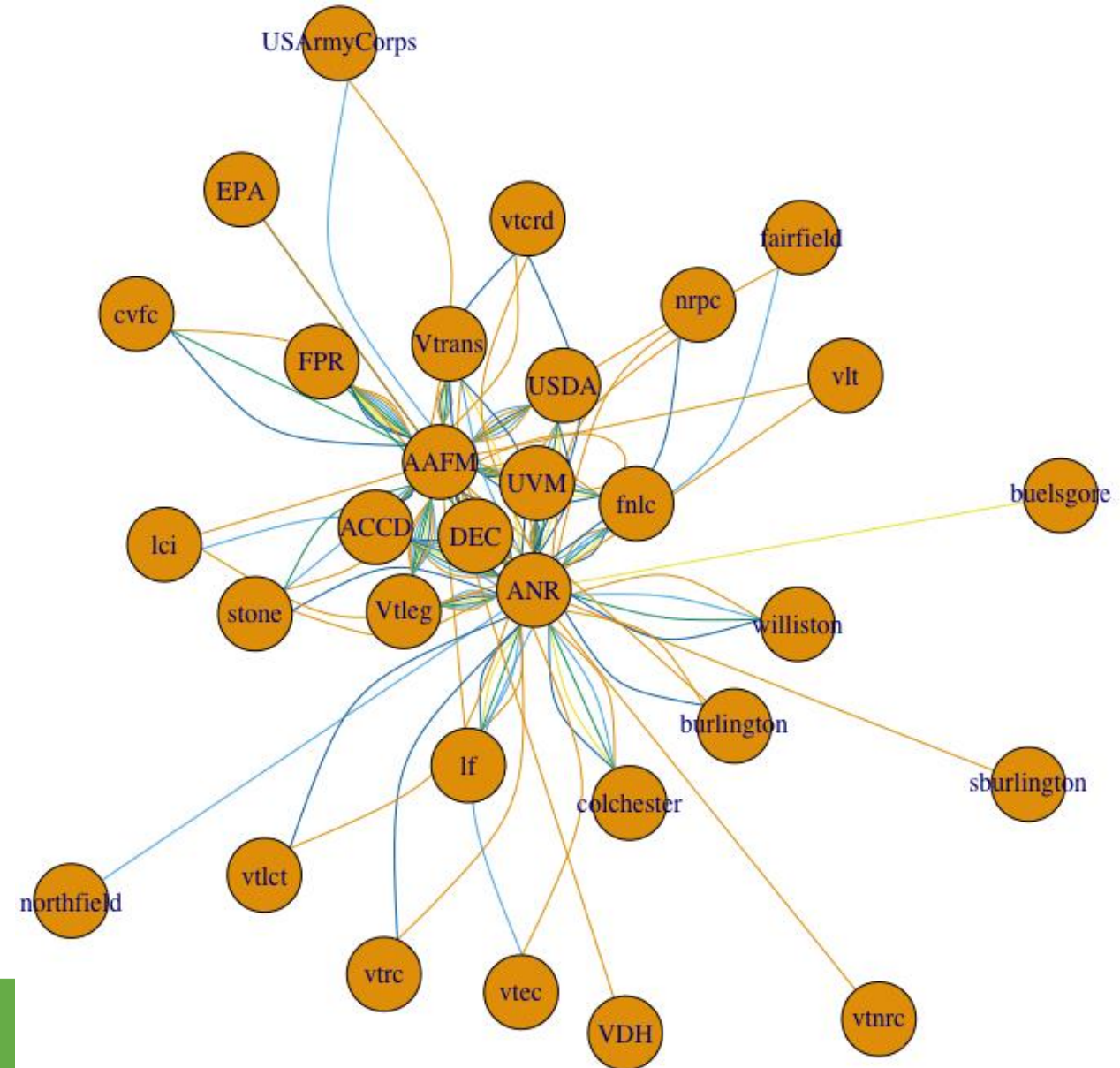
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# Research questions

- How do network structure & institutional rules affect the ability of the system to plan for, and cope with, extreme events?
- What is the optimal configuration of the governance network, policies, rules, and resource allocation for improving LCB water quality and resilience?
- How does the governance/management process respond to environmental change that may be uncertain, slow, or smaller than expected?

# Data collection activities

- Institutional network data (2 surveys)
- Municipal survey (decision-making, funding, capacity)
- 2 FOIA requests to USDA
- 6 focus groups (starting in January)
- Text mining of public records (Summer 2018)





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# Challenges and needs

- Data, data, data, data, data
- Need visibility into the decision-making & evaluation processes
  - What is the “universe” of possible programs, policies, and tools under evaluation?
  - How are expectations formed? Evaluated?
  - What types of ecosystem services are valued & prioritized? What are the influences on project prioritization?
  - (how) does the governance process internalize spatial and temporal lags that attenuate the effects of policy change?
- What governance scenarios is the PTAC interested in?

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**Thank you**

# GovNet framework

## GovNet

### Spatial subsystem

Geographic space

GEOMASON

Network space



### Governance subsystem

- production of policy tools, programs
- connects institutional structure to actions & feedbacks
- supports institutional modeling at various scales

### Behavioral subsystem

- goals, objectives, mandates
- expectation formation
- agent-agent & agent-environment interactions
- cognition

