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### Role-Play Simulations and System Dynamics for Sustainability Solutions around Dams in New England

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# **Re-Imagining the Decision-Making**

# Landscape by Acting and Modeling

# the Future of Dams

**Role-Play Simulations and System Dynamics for Sustainability Solutions around Dams in New England** 

# FIGURES



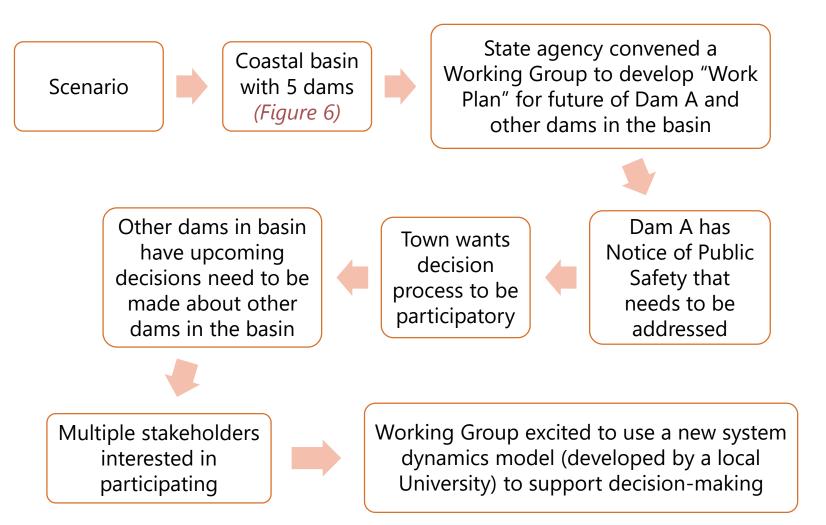
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## **1. INTRODUCTION**

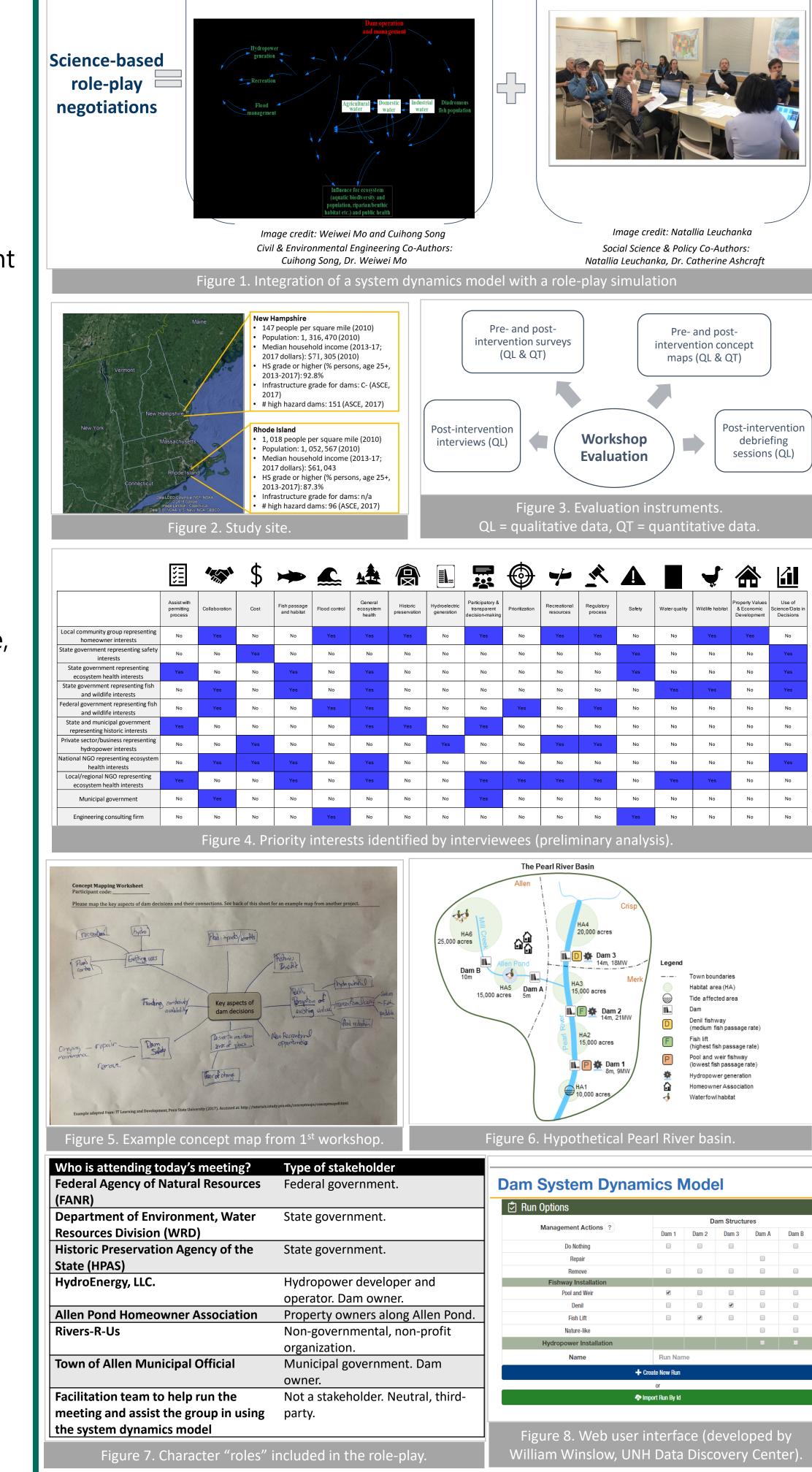
- Over 14,000 dams in New England management decisions are complex and contentious
- Traditional "hard-bargaining" approaches to water negotiations have limited capacity to address complex sustainability issues
- Consensus building and other collaborative decision-making approaches can help communities find sustainable and innovative solutions to aging dams
- We design and test a new approach that integrates role-play negotiation simulations with system dynamics modeling (Figure 1)

## **3. HYPOTHETICAL ROLE-PLAY SCENARIO**



### 2. METHODS

- Study site: New Hampshire & Rhode Island (*Figure 2*)
- Conduct literature review of participatory modeling & role-plays
- Conduct and analyze 36 stakeholder interviews to develop a Stakeholder Assessment (SA) to identify stakeholders, issues and interests (*Figure 4*), and decision context
- Use SA, literature review, and expert knowledge to design role-play scenario instruments:
  - Confidential "role/character" instructions
  - General "shared context" instructions
- Use existing data, literature review, and expert knowledge to design system dynamics model and make it publicly available via a web user interface
- Conduct 2 workshops in each state 6.
  - 1<sup>st</sup> set of workshops: gather feedback from stakeholders on model, user interface, and role-play; stakeholders play their actual role (January 2019)
  - 2<sup>nd</sup> set of workshops: apply stakeholder feedback to improve model, userinterface, and role-play; stakeholders play roles different from their real-life roles (May 2019)
  - Evaluation: surveys, concept maps (*Figure 5*), interviews, debriefing sessions,



- Group negotiates 3 decisions:
  - *Decision 1*: Which dams should be included in the "Work Plan" and what alternatives should be considered for those dams?
  - *Decision 2*: Who leads implementation of the alternatives proposed in the "Work Plan"?
  - *Decision 3*: Who pays to implement alternatives in the "Work Plan"?
- 7 roles (plus a facilitator) based on actual stakeholder types (*Figure 7*)

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feedback sheets (Figure 3)

## **4. RESULTS**

- 1<sup>st</sup> set of workshops completed Jan. 2019
- Total # participants from first set of workshops: 39 (14 in RI and 25 in NH)
- Participant feedback (*Figure 9*) from 1<sup>st</sup> set of workshops were used to improve model, web interface (*Figure 8*), and role-play
- Total of 42 pre-intervention surveys and 37 pre-intervention concept maps (*Figure 5*)
- Analysis to follow completion of 2<sup>nd</sup> set of workshops

# **5. NEXT STEPS**

- Complete second set of workshops in NH and RI (late May 2019)
- Conduct post-workshop interviews

NH

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• Analyze surveys, concept maps, interviews, and debriefings for normative, relational, and cognitive learning

Say "Hi" to us!

@NatLeuchanka

Make role-play and model package available as "off-the-shelf" tool for anyone to access

"Bringing together the players in such an exercise can inform players and non-players (interested citizens) and broaden their views. In [town], such an activity would have been useful at one of our early information gatherings... Even the use of averaged data would work in this situation. Using computers could quickly show trade-offs and the relative importance of specific factors." – NH Workshop #1 Participant & Municipal Elected Official

Figure 9. Quote from workshop participant.



Scan this QR code to access the "Future of Dams" project website 🗲 • • • • • • • • • • • • Or visit this link: https://www.newenglandsustainabilityconsortium.org/dams

Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

Poster template inspired by Mike Morrison.

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