

# Designing participatory modeling & causal mapping projects: Tools and Approaches

Ellis Ballard, MSW/MPH

## Key concepts:

- *System Dynamics*: System dynamics is the use of qualitative maps and mathematical simulation models to visualize and to develop feedback explanations for system behavior
- *Sources of structural data*: Causal mapping and systems modeling requires both qualitative and quantitative data. Much of the data that informs practical maps and models is not found in empirical literature, but in the lived experience, perceptions, and expertise of people living and acting in complex systems under study.
- *Group Model Building*: A participatory process for using system dynamics modeling to engage those affected by policy change to:
  - o Define problems from a feedback perspective
  - o Formulate qualitative and quantitative models
  - o Analyze potential leverage of policy decisions & potential unintended consequences
  - o Make decisions about how best to act
- *Group model building processes are contextually driven*: Though tools are available for the planning and facilitation of participatory modeling processes, many decisions are informed by specific community or participant composition, the capabilities of research and modeling team members, and the specific purposes or uses of modeling proposed.
- *Design orientation to participatory modeling and causal mapping*: Contextual decisions require a design-based approach to planning and implementing participatory modeling and mapping projects, which can conflict with research timelines and documentation requirements.

## Overview of Tools & processes

- *Group Model Building Scripts*: Scripts are structured activities that perform a distinct function in participatory modeling or group model building workshops, such as variable elicitation, structure elicitation, model review, or prioritization. Scripts are sequenced and combined to support participatory processes to generate and refine causal maps and system dynamics models.
- *Core Modeling Team*: The Core Modeling Team is responsible for the design and convening group model building workshops. CMTs are groups of 3-6 people who collectively can speak to substantive, methodological, logistical, and community perspectives of a workshop design to ensure that the workshop is relevant, ethical, and effective.
- *Design Matrix*: A design matrix is a dialogue and decision tool to make workshop design criteria explicit, and to negotiate imperfect tradeoffs between workshop design choices.
- *Piloting*: Workshop piloting is an invaluable tool for developing preliminary structure, refining prompts and example materials, and building capabilities for facilitation among multi-disciplinary teams. Piloting can be conducted within a research team or core modeling team itself, or with potential community facilitators who will support the community-focused modeling process.



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## Learning resources mentioned in the presentation

- *Scriptapedia*: An open access resource of structured group model building “scripts” used for designing and facilitating group model building workshops: <https://en.wikibooks.org/wiki/Scriptapedia>
- *Social System Design Lab Methods Briefs*: Ongoing collection of short, practice-focused resources developed based on the tools and methods of the Social System Design Lab: <https://socialsystemdesignlab.wustl.edu/publications/methods-briefs/>
- *Training Opportunities in Summer 2022*
  - o System Dynamics Summer School: 5-8 July 2022 virtually: <https://systemdynamics.org/learning/summer-school/>
  - o Systems Science for Social Impact: 25-29 July, 2022 in St. Louis, MO, USA: <https://systemsscienceforsocialimpact.wustl.edu/>
  - o MSU Participatory Modeling Field School: 15-18 August 2022 in Detroit, MI, USA: <https://modeling.engage.msu.edu/>

## References & Readings

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