

Land Use in Regional Sustainability Transitions: Establishing a Network of Research and Practice to Support Governance in Linked Urban and Rural Systems of Massachusetts



PROJECT TEAM: Seth Tuler ((PI), Stephen McCauley (co-PI), Lisa Stoddard (co-PI), Oleg Pavlov (co-PI), Carrick Eggleston (co-PI), Sarah Strauss, Maddy Kroot, Erin Bryan, Richard Krueger

NSF Sustainable Regional Systems Research Networks Grantees Workshop, Washington DC, June 7-8, 2023

Integrated land use planning is important to achieve goals of sustainability and climate resilience

Massachusetts has ambitious goals for sustainability and climate resilience, including renewable energy and decarbonization, food security, housing security, economic security and vitality, equity and racial justice, functional and resilient ecosystems, and public health and community well-being. All have implications for land use and landscapes in urban and rural areas. Land is required for generation and transmission of energy. Open space plays a critical role in resilient ecosystems, public health, livable communities, and climate resilient infrastructure. Land is necessary for farming in both rural and urban communities. Land is needed to secure housing for all.



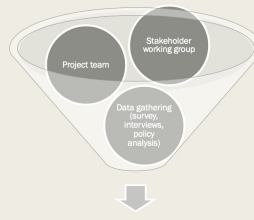
Clockwise from top right: land use in Massachusetts, showing Regional Planning Commission boundaries; Connecticut River view; advocacy sign; urban landscape in Boston.

Achieving multiple goals requires trade-offs among sectors, such as agriculture, energy, water management, forests, residential development, and climate resilience, in inter-connected urban and rural systems. What is gained and what is lost? Who benefits and who does not? Who decides these trade-offs and what are the equity and land justice implications? What are the unintended consequences of choices? Coordination of policies and plans at state, regional, and local scales is necessary for Massachusetts to meet the goals.



Sector-based reports from Massachusetts agencies and civil society organizations with implications for land-use.

Our goal is to create opportunities for discussion, identify information needs, and foster innovative approaches to integrated land use planning



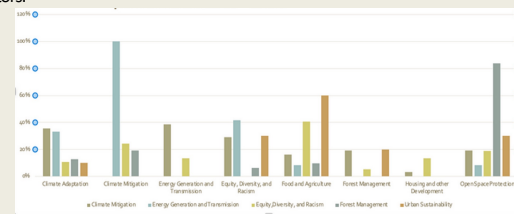
Propose structure for future work and identify potential pilot programs, research questions, and educational activities for a future proposal (NSF?)

PROJECT PARTNERS

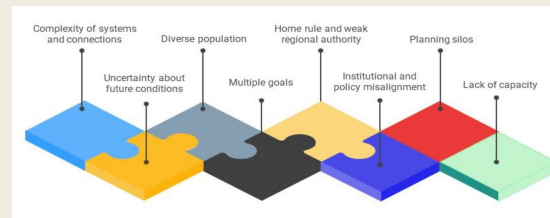
- American Farmland Trust
- Blackstone Watershed Collaborative
- Communities that Care Coalition
- Franklin Regional Council of Governments
- Gardening the Community
- Green Roots
- Hightstead Foundation
- MA Energy and Environmental Affairs
- MA Food System Collaborative
- Mass Audubon
- Mass in Motion Program
- Pioneer Valley Planning Commission
- Regional Conservation Partnership Network
- ReGreen Springfield
- Schumacher Center for New Economics
- Springfield Food Policy Council
- UMass Clean Energy Extension
- USDA Forest Service Northern Research Station

Activity: Characterizing land-use governance

To learn about the many civil society groups and government programs whose work touches on land use we gathered information via a survey. The information is being used to design tools for organizing information about civil society groups working in Massachusetts on issues that impact land-use planning and management and for describing networks and collaborations. We have also interviewed stakeholders to inquire more deeply about opportunities and challenges for planning within and across sectors.



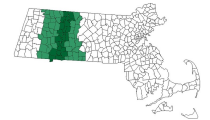
The extent to which civil society organizations work across sectors, based on survey responses (n=263).



Challenges to integrated regional land-use planning, based on interviews with stakeholders.

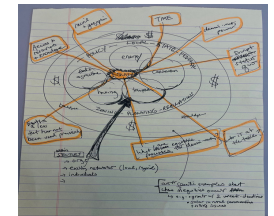
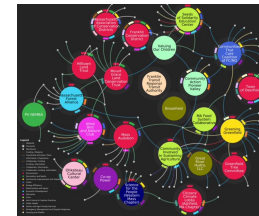
Pilot Activity: Initiating an integrated land-use dialogue in the Connecticut River Valley

Many organizations and networks have been working within the CT River Valley region to address challenges of sustainability, equity and justice, and climate resilience. A challenge remains to more effectively integrate these efforts across issue areas, sectors, geography, and policy.



We are initiating collaborative space for stakeholders to:

- Identify needs that might inform policy recommendations with land use, equity, and climate at the center,
- Forge new alliances and relationships,
- Develop concrete ideas for programs and policy recommendations



Left: Network of civil society groups whose work addresses land use in Franklin County, MA. Right: Working concept and structure of the dialogue.

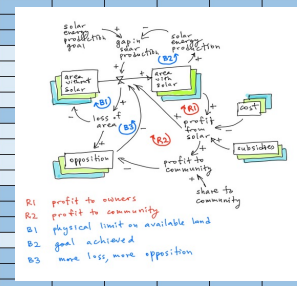
Pilot Activity: Exploring land-use requirements to achieve solar energy deployment goals

To achieve MA decarbonization goals will require 15-20 GW of installed ground- or roof-mounted solar photovoltaics. Ground-mounted solar development accounts for approx. 1/4 of land development in MA. It is also leading to widespread conflicts over land-use.

With stakeholder input we are designing a tool for stakeholders to explore:

- Scenarios of how much of the anticipated solar capacity can be gained from different types of land – such as forests, farms, landfills, brownfields, parking lots, and roof tops.
- Equity implications of developing solar capacity in different regions of the state.

Land use type	Land use subtypes	Area of land use type in MA (acres)	Anticipated change in area of land use type from 2020 to 2050 (acres)	Land available for solar (acres)	Area connected to both solar-to-grid and solar-to-heat (acres)	Additional area to allocate for solar (acres)	Capacity generated (MW)	% land type used for solar	Area remaining (acres)	% land area remaining in land use type
Forest/Ag/Highway	Timberland in MA	533,517	-	-	-	-	-	-	-	-
	Timberland	20,445	-1,130	-	-	-	-	-	-	-
	Highway corridor	-	-	-	-	-	-	-	-	-
Farmland	Timberland at risk	1,800,000	-280,000	-	-	-	-	-	-	-
	Farmland	-	-	-	-	-	-	-	-	-
	Non-agricultural	1,113,161	-	-	-	-	-	-	-	-
Landfill	Timberland at risk	20,244	-	-	-	-	-	-	-	-
	Landfill	-	-	-	-	-	-	-	-	-
	Non-agricultural	533,517	-	-	-	-	-	-	-	-
Wasteland	Timberland at risk	90,000	-	-	-	-	-	-	-	-
	Wasteland	-	-	-	-	-	-	-	-	-
	Non-agricultural	11,130	-	-	-	-	-	-	-	-
Recreational/OpenSpace/Landbank	Timberland at risk	800,000	-1,000	-	-	-	-	-	-	-
	Recreational/OpenSpace/Landbank	-	-	-	-	-	-	-	-	-
	Non-agricultural	10,200	-	-	-	-	-	-	-	-
Impervious/Urban	Timberland at risk	148,274	-10,274	-	-	-	-	-	-	-
	Impervious/Urban	-	-	-	-	-	-	-	-	-
	Non-agricultural	475,000	111,000	-	-	-	-	-	-	-
Other	Timberland at risk	70,000	-	-	-	-	-	-	-	-
	Other	-	-	-	-	-	-	-	-	-



Rear: Worksheet for defining scenarios; Inset: Working sketch of causal loop diagram of land-use options for achieving desired solar capacity.