Scenarios to Solutions Workshop Summary
SCENARIOS, SERVICES, & SOCIETY RESEARCH COORDINATION NETWORK

Compiled by: Katie Theoharides, Kathy Fallon Lambert, and Pat Field

Hosted by the University of Maine
Organized by the S³ RCN Steering Committee and Harvard Forest
October 27-29, 2014

[Workshop Agenda and Presentation Links](#)

Next Steps

1. Workshop summary and network plan: Network coordinators will produce and distribute a workshop summary and updated network plan.

2. Working groups/workshop paper: Short-term Working Groups will convene conference calls to develop strategies and recommendations to the S³ RCN steering committee and to write and submit a journal paper based on the workshop.

3. Technical workshops: S³ RCN steering committee members will host technical workshops
- o Scenarios to Simulations – Mark Borsuk & colleagues, Dartmouth (February 2015)
- o Modeling ecosystem services – Taylor Ricketts & colleagues, UVM (TBD)

4. Scenario development: Interested collaborators will work with S³ RCN coordinators (Theoharides, Lambert and Field) to engage with implementers across the region to develop landscape scenarios. The engagement steps include:
- o Identify project practitioners/stakeholders
- o Conduct scoping interviews
- o Participate in partner meetings throughout the region to deploy scenario elicitation with smaller groups of implementers
- o Convene 2 regional workshops/meetings with influential practitioners/stakeholders to refine and polish scenarios

5. Current landscape trends: Jonathan Thompson, Matt Duvenek, Alexandra Thorn, and Spencer Meyer will continue to quantify current trends in land cover change, harvesting, and conservation and simulate continued current trends into the future. S³ RCN coordinators will help share results with the network.

6. Network coordination: Harvard Forest and the S³ RCN steering committee will continue Network Coordination and Development
- o I-pager to describe network for use by network participants and partners
- o Investigate sharing tools, update website including resources/papers, organize webinars
- o Recruit specific collaborators to fill gaps the in the network (e.g., economists, social scientists, developers, funders)

Partnership Needs & Opportunities
- Social scientists to help design stakeholder engagement approach and scenario elicitation
- Partners for engaging implementers & conducting scenarios in a box at existing meetings
- Agricultural land modeling
- Land for water and/or hydrology modeling
- Full climate benefits modeling of landscape change
- Birds – link w/ forest structure and composition
- Post-modeling economic & policy analysis
- Organizational partners to shape, develop, and distribute appropriate outreach materials

Scenarios to Solutions Workshop – Detailed Summary

WORKSHOP BACKGROUND

On October 27 to 29, 2014, the S3 RCN Steering Committee with leadership from the University of Maine and Harvard Forest brought together researchers and practitioners in the Scenarios to Solutions "best practice" training and workshop. The two-day workshop and one-day practitioner engagement training session convened the Scenarios, Services and Society Research Coordination Network's (S³ RCN) Steering Committee, collaborators, and invited speakers to learn from past experiences and create a shared plan for the S³ RCN that focuses on achieving both research insights and real-world impact.   The workshop was funded by the National Science Foundation under grant number DEB-1338809.

During the workshop participants learned about practitioner or "implementer" engagement preferences, explored lessons from past scenarios research projects, and discussed land-use challenges and opportunities in New England. Using facilitated discussions, panel presentations, and small group sessions participants focused on how participatory scenarios research can help explore New England's unique land-use challenges and advance land-use decisions that support human well-being, the sustainable flow of ecosystem services, and habitat for regional biodiversity in a time of climate change.

The objectives of the workshop were to:

- <u>NETWORK </u> – build relationships and forge a collaborative network among researchers and between researchers and practitioners in New England.

- <u>LEARN</u> – learn from each other about best practices and emerging directions in actionable science and participatory scenarios research; and build a shared understanding of the unique land-use challenges facing New England that can be addressed through the S³ RCN.

- <u>ACT</u> - develop an 18-month action plan for the S³ RCN and define the outcomes the group hopes to accomplish through our work.

WORKSHOP FINDINGS

The workshop included panel discussions on engaging implementers, designing scenarios research projects, and identifying key land-use challenges in New England. In addition to these panels, group discussions, small working group sessions, informal conversations, and the practitioner engagement training session resulted in significant insight for the project and participatory scenarios research more broadly. The findings from the workshop have been grouped into the following categories:

- major land-use challenges in New England
- best practices for engaging implementers
- best practices for conducting participatory scenarios research
- suggested products and impacts
- metrics of success

To reference specific panels and links to workshop presentations please see the workshop agenda and training program.

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MAJOR LAND-USE CHALLENGES IN NEW ENGLAND

Land-use challenges and opportunities in New England that were highlighted in the workshop include:

- *competing demands for water, energy, food and fiber production*
- *changing patterns of land ownership and land-use regimes*
- *population growth and suburban/ex-urban sprawl*
- *lack of sufficient community/local land-use planning that integrates conservation, working lands, and development interests*
- *habitat degradation and the loss of biodiversity*
- *access to clean water*
- *coastal and inland flooding events,*
- *forest pests and pathogens,*
- *climate change, sea level rise and human response to climate change including inland migration*
- *resistance to agricultural and wood production*
- *climate adaptation planning in small communities*
- *implementing forest carbon offsets to achieve greater climate and conservation outcomes*
- *Participants also strongly expressed a need for more economic valuation studies and the development of greater incentives and economic rewards to landowners for conservation and stewardship efforts.*

Significant opportunities exist to achieve complementary goals within the same landscapes, to tap into local food and wood markets, to protect habitat in a network of conservation lands with some existing connectivity, to harness natural resources like abundant water, and to help guide the intergenerational transfer of working forest and farmland.

Panelists:
Jonathan Thompson, Harvard Forest, Harvard University
David Foster, Harvard Forest, Harvard University
Cris Coffin, American Farmland Trust
Martha Sheils, New England Environmental Finance Center
Mark Berry, Schoodic Institute
Michele Johnson, U.S. Forest Service

Key Insights
Much of New England has been reforested over the last 150 years, but forest cover is now declining in all six states. Across the region it has been well documented that the forested landscape has returned, in quantity though not necessarily quality, to conditions similar to those in pre-colonial times (J. Thompson). On the one hand, this is a remarkable success story of returning habitat and wildlife populations, a long-term regional commitment to conservation, and economic trends and development markets. On the other hand, with increasing suburbanization, changing land ownership, and climate change, there is a need to consider how multiple demands on forests and other undeveloped lands will be supported into the future. Furthermore, northern regions continue to struggle economically, and the success of conservation is in part painfully coupled with declining economic conditions in the region.

There is the potential for unprecedented and unpredictable change: Climate change, in combination with other elements of global environmental change, and the human response to these changes will result in unprecedented and often unpredictable changes. Human land use changes in response to climate change could have a greater impact on the New England landscape than climate change itself (J. Thompson). Changes may include:

- Increased development resulting human population shifts inland; population shifts to New England due to resource scarcity or less hospitable climate in other regions
- Increased biomass harvesting in response to shifts toward more renewable local energy sources
- Uncertainty in other human land management response to climate change(e.g. replacing certain tree species, responding to pests and pathogens, delivering carbon offsets, siting renewable energy)Decreased habitat quality due to pests and pathogens and changes in climate
- Changing patterns of species diversity and mismatches between species and habitat or lands conserved to protect certain resources or species and their ideal climate

Building a case for conservation in New England: Conservation in New England is in many ways a huge success story and public and political sentiment may reflect the question of "when is this going to be enough for conservationists?" Carbon continues to be sequestered in our forests, air and water are cleaner, wildlife is thriving, forest harvest is well below growth, and climate change is expected to be less severe in New England than in other parts of the country. However there are significant challenges ahead and we need to be articulate about expressing these challenges, highlighting tradeoffs, and informing choices and actions that can bring the region towards a more sustainable path forward (J.Thompson).

Identifying landscapes and implementing land-use practices to achieve multiple purposes (e.g., as food, wood, and habitat) and address competing pressures is an increasingly important strategy and will help to build and strengthen relationships with new and existing partners.

- Many land-use goals can be complementary if they are planned and implemented correctly – for example agricultural land can support biodiversity, but both goals must be explicitly addressed and planned for (C. Coffin).
- To optimize delivery of positive outcomes land uses should be targeted and mapped (e.g. mapping prime soils in areas with existing agricultural resources) (C. Coffin)

Without timely regional and local planning and visioning, development may use up all of the existing open space. Martha's Vineyard provides an example of the importance of land use planning for communities. Prior to massive development in the 1980's and 1990's, the island planned where conservation lands should be and steered development away from these areas, which resulted in 1016 avoided houses on an ecologically sensitive island ecosystem (D. Foster). Existing regional planning and visioning efforts include Wildlands and Woodlands, A New England Food Vision, and Changes in the Land.

New England has rich hydrological resources, including rivers, estuaries, and coastal habitat and that will present both a challenge and opportunity as the climate changes (M. Sheils).

- New England is particularly vulnerable to storm surge and both coastal and inland flooding (e.g. Hurricane Irene)

- Many coastal marshes and estuaries serve natural infrastructure functions that should be maintained for both economic and environmental and social reasons (Maine's "sense of place")
- There should be efforts to increase the use of natural infrastructure to protect critical ecosystem services, rather than gray infrastructure. Efforts to quantify and communicate the values of natural infrastructure are needed on a larger scale throughout the region.

Quantifying natural resource benefits and communicating these benefits is essential in order to impact policy solutions and decision-making (M. Sheils, C. Coffin).

- For example, American Farmland Trust struggles to understand the benefits of a well-managed acre of farmland and is always asked to quantify how much better an acre of well-managed farmland is than an acre of development (C. Coffin).
- A good model comes from The Nature Conservancy's work in Maine examining the avoided costs resulting from protecting open space as water protection land for clean drinking water, flood attenuation, and built versus natural infrastructure. This work has resulted in a local bond measure and there is a need to do this for water and other ecosystem services in other areas and to understand how this type of approach is most useful to policy-makers and practitioners (M. Sheils).

If the science is not relevant to people it's not relevant at all: There is a strong need to make this work relevant to people by ensuring that conservation clearly benefits people in ways they value (M. Johnson). Ideas to think about:

- How to evaluate scenarios in terms of human well-being?
- Landscape conservation as a driver of economic growth and a source of well-being
- Restoring and protecting urban nature is important too, not always in terms of getting the biggest bang for the conservation buck but because it helps *communicate* the importance of this work, makes it tangible for many residents, and connects to large voting constituencies who can make or break political activities and priorities.
- How to take advantage of unexpected opportunities for working lands in the context of mill and population declines?
- How to communicate this work with citizens, landowners, businesses, etc? Not just the usual circles.

The potential for carbon offsets from New England forests presents an opportunity and a challenge that will continue to impact land-use in the future. Forest carbon offsets already improve the feasibility of large scale forest conservation and could substantially change current forestry practices for investment owners. Incentives for carbon offsets may provide opportunities to increase corridors and connectivity between conserved lands and subsidize adaptation investments such as watershed restoring (M. Berry).

Opportunities exist to address land use challenges through the development of policy and management strategies (Land-Use Challenges Break-Out Group). Challenges and opportunities in this area include:

- Siting development to encourage smart growth
- Developing stronger incentives for protection and management of open space, forests, agricultural land and multi-benefit landscapes
- Integrating/blending open space, forests, and agriculture
- Using agriculture to enhance conservation and biodiversity values
- Enhancing easements and direct land acquisition

- Paying for ecosystem services, including carbon sequestration, to increase conservation incentives and economic reward to landowners
- Promoting recreation economies

<u>Information needs that the S^3 RCN or partners might help address:</u>

- Quantify benefits of land conservation for natural resource protection (e.g. avoided costs for water protection and flood attenuation in more locations) and working lands
- Map the spatial distribution of lands that are important for critical ecosystem services and threats under different futures
- Quantify the avoided cost and other economic benefits of the function of forests and other undeveloped lands and how that would change under different futures
- Work to understand climate change driven land-use regime shifts and its potential consequences
- Help policy-makers and practitioners prepare for a whole suite of unprecedented land use challenges
- Understand how to sustain and manage working lands to provide benefits for natural resources, deliver ecosystem services beyond their specified use, and create valuable habitat
- Understand the consequences of climate change and land use change for biodiversity in New England (perhaps starting with birds)
- Rethink farmland protection strategies – what is most important to protect especially in a time of climate change? How to increase resiliency of farms to climate change?
- Develop adaptation strategies for communities, biodiversity, natural systems, working lands and think about how adaptive management fits into the picture. When is it necessary to observe, fight, or facilitate a change?
- What is the potential impact: positive and negative of converting prime agricultural soils currently in forest to agriculture (exploring different future scenarios of land-use)?
- How do management strategies, particularly those aimed at carbon sequestration affect forest resilience to climate change?
- On state or sub-state basis –where are specific opportunities to expand land access? And where do those opportunities overlap with other resource objectives?
- How will the future look and what will the trade-offs be based on different choices we make.
- How can we most effectively communicate these land choices challenges and the impacts of our choices with citizens, landowners, and other audiences?

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BEST PRACTICES FOR ENGAGING IMPLEMENTERS

Successfully engaging implementers in scenarios research requires careful consideration of the scale and context of the research and the desired impacts on the ground, the motivation and potential for fatigue among implementers in the region, and the most effective process for bringing the right mix of people together.

Implementers prefer to be engaged in participatory research as early as possible in the process, preferably in the grant writing and project development phase of the research to help define the problem. In that way, the project will engage implementers not only in passive ways but as partners who have the opportunity to build their own capacity through the project. Implementers and researchers should ask the questions and steer the direction of the research together; researchers may consider acting as service providers in addition to academic scholars.

<u>Panelists</u>
<u>Joe Short</u>, Northern Forests Center

Liz Hertz, Maine Department of Agriculture, Forestry and Conservation
Erika Rowland, Wildlife Conservation Society
Alex Giffen, Consultant

Key Insights

Early Involvement is Important: Workshop speakers and participants and the practitioner engagement trainers all stressed that implementers need to be involved early in the process to help identify key questions to answer that will lead to meaningful impacts or change within the targeted system. Researchers should then provide the muscle to get the questions answered. In addition, the value of researchers themselves to come to the project as implementers and to bring their expertise to bear when identifying questions was also raised (L. Hertz, J. Short, L. Silka).

- Scientists often do not get the question right if they plan their research without implementers involved in the early phases. Researchers should ask implementers what they care about and what information or answers would help them to solve a problem they care about.
- Involve implementers in
    - Proposal writing → build the capacity of non-academic participants. More PIs should be non-academics.
    - Research design & review of results
    - Executing studies
    - Data collection, where appropriate
    - Helping to disseminate and share findings
    - Implementers view researchers as not the implementers and feel they often don't know what implementers really need to get work done
- Dissemination of research is also an issue – results needs to be communicated to implementers in a way that is useful for them (e.g. not peer-reviewed literature) and not just as email blasts of a single designed fact-sheet or policy white-paper.

Terminology Matters: We need to find the right terminology to convey a relationship of mutual respect among participants in our work – practitioner or practitioner may not be the best word to use to describe implementers. Moreover, most people wear more than one hat and researchers voiced the fact that many of them play implementer roles outside their academic roles. It is also important to be clear about the terminology used when communicating with different audiences (e.g., land-use versus land cover brought up as a source of confusion for non-researchers) (J. Short).

Scale and Location Matter: Defining and reconciling the scale and geographic location of research and its intended audience is important (E. Rowland, L. Hertz, J. Short).

- Determine the unit of change you want to impact and deliver appropriate information at that level
- Make sure to identify the intended audiences, what kind of information do they need, how can we help?
- Transferring research results from somewhere else is difficult (e.g. work in Massachusetts transferred to Maine) – it can lack credibility with local practitioners, that is, "it's from away."
- Be in it for long haul – which usually is more than one grant period – so implementers and communities feel a long-term commitment, not a one-off "thanks very much."
- If research is at regional scale there is a need to develop local-scale "touch-points" for engagement and downscaled products and findings

<u>Relationships Matter:</u> Trust is the key to successful partnerships and you can help gain trust by asking people what matters to them and really listening (L. Hertz, A. Giffen, [E. Rowland](#), [J. Short](#), L. Silka).

- Utilize existing relationships and those of people involved early in the process to help bring the right group together
- Identify and involve key decision makers
- Have enthusiastic partner on the ground to help carry forward work
- Really listen to implementers. Ask them what they are interested in and what "solutions," they need. Show them you are listening and value what they bring throughout the process.
- Respect everyone's time and use it well by understanding the motivations and incentives of each partner.

<u>Motivation and Fatigue Matter:</u> Identify solutions for motivating implementers to participate in your research and avoid geographic regions or groups of practitioners who have been over-utilized in other projects (P. Field, L. Hertz, [E. Rowland](#), [J. Short](#), L. Silka)

- Complete an inventory of researchers, implementers/practitioners, etc., to understand where people are already working together and where there may be interest, need, or fatigue
- Partner with and build collaborations around existing initiatives and collaborate with workshop participants to use platforms that already exist to the greatest extent possible
- Develop tiered practitioners groups and allow people to get on and off the bus at different times
    - o Different objectives for different groups
    - o Different scales allow different practitioners to participate at different points in the process
    - o Different practitioners have different strengths and interests
- Must have local applicability as well as regional outputs
- There must be a clear benefit to participating: only good if there is a tangible product
- You often have to pay for time and travel expenses to get full participation
- Identify intermediate products that might be useful to practitioners now to motivate more engagement during and not just at the end of projects
- Develop innovative ways to engage remotely – webinars, google groups, etc
- "Fish or cut-bait:" at some point, from an implementer's perspective, there have to be enough results to lead to implementable action on the ground. More info does not necessarily result in better decisions (L. Hertz)
- Need to avoid overpromising and manage expectations, without turning practitioners away – there is a gap between the questions and needs implementers have and the challenges of model optimization and outputs.

<u>Don't overlook certain sectors (A. Giffen, S. Meyer):</u> Businesses, developers, bankers, insurance brokers, realtors, etc. are often overlooked in this type of work and should be represented as appropriate. These groups will often bring a unique perspective and are clearly necessary to engage if we want to make real change.

<u>Luck Matters too!</u> Many of our speakers described the role luck and serendipity had in their successful projects. Good timing, knowing the right people, and lucky coincidences can help bring a project to the stage where it begins to have meaningful on-the-ground impact ([E. Rowland](#), L. Silka).

<u>For the S³ RCN:</u>

- Develop an Engagement Strategy with our engagement processes working group
- Define and map our practitioners

- Goals for engagement: Development of scenarios, communication of project to others, learning about use of scenarios, understanding consequences of different land-use decisions, use of scenarios for future projects, working with us to translate results into action
- Questions/Needs
  - Need to conduct market research on what kind of information brings implementers to the table and on motivation to show up
  - Increase social science in project to achieve better results

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BEST PRACTICES: SCENARIO DEVELOPMENT FOR RESEARCH

Given the large uncertainties regarding future climate and landscape conditions, scenarios offer a useful tool for exploring alternative futures for New England and provide strategic agility and adaptive capacity to practitioners working to plan for uncertainty. Existing computer models can be used to simulate how the landscape will change in the future under each scenario and to estimate potential consequences for benefits people value.

Scenario development should be a transparent process that involves the appropriate level of complexity and scientific knowledge, but also takes implementer fatigue and buy-in into account and engages these partners throughout the process. In the simulation stage, a baseline is critical and assumptions should be tested with practitioners/implementers. Again, the simulation process should be as transparent as possible to achieve legitimacy with implementers and the public. During analysis, tools such as fragility analyses may be used to look for "tipping points," within the system.

It is also important to report findings in a meaningful way to implementers with specific impacts in mind. Throughout scenario development and simulation, efforts should be made to convey the legitimacy of the process with implementers to lead to shared power and to increase the likelihood of collective action and resulting policy impacts.

Panelists
Holly Hartman, Carpe Diem West Academy
Anne Kapuscinski, Dartmouth College
Spencer Meyer, Yale University
Eric White, Oregon State University

Key Insights

Scenario Development:

Scenario narratives are an important first step in scenario development. Narratives can provide strategic agility (A. Kapuscinski) to focus research questions, to gain insight for ongoing processes, to evaluate existing plans and actions, to understand tradeoffs, and to develop innovative new policies, plans and strategies that foster adaptive capacity (H. Hartmann, A. Kapuscinski).

- They can be simple and cost effective
- Their integrative focus on unknowns and knowns is empowering
- Flexible, affordable and adaptable structure allows unknowns to unfold
- Build capacity in systemic thinking & strategic agility
- Use insights from citizen leaders to focus research
- Identify policies & practices that foster *adaptability* to multiple futures

How to develop alternative scenarios with practitioners was a key part of our workshop discussion and presentations from panel 2. Researchers should guide the scenario development process based on the science and the current state of knowledge and provide the necessary capacity while bring transparent. Practitioners should be involved throughout scenario development and should understand the process; dedicated staffing is needed for practitioner engagement and outreach. Below are important items both for researchers and for managing practitioner input into models (Scenario Development Breakout Group).

- Process Design
    - Select appropriate complexity of development process
    - Researchers should understand the current state of knowledge
    - Two options for modeling, offer different outcomes
        - Narrative to model
        - Model to narrative
    - Have the right amount of team capacity
    - Be transparent about engagement and input for scenario development
    - Encourage and make space for science input to be at table as narratives are developed
    - Use existing information and efforts
    - Respect heterogeneity
        - Important for regional studies
- Scenario elicitation with practitioners
    - Practitioners should be involved throughout the process, from before scenario development, right through the simulation and analysis stages, but the potential for fatigue must also be considered (S. Meyer)
    - Need dedicated staff team to help organize practitioners (E. White)
    - Approaches to scenario elicitation vary but focus on asking key questions and identifying factors for participants to consider (e.g., in Minnesota 2050 participants were asked the focal question "How are we interaction with the landscape and natural resources in 2050 and how is the environment affecting our quality of life." Participants were instructed to consider Natural, Social, Political, Cultural, and Technological elements (A. Kapuscinski)
    - Discuss and negotiate limits of model
    - Other ways to use info that can't be captured in the model – non-modeling
    - Consider practitioner fatigue/input tradeoff and determine how you will stay true to the practitioner scenarios in narratives and when modeling
    - Scenarios are often consolidated by researchers (sometimes with practitioner input), using a variety of clustering techniques and then presented to practitioners to explore the consequences or "inhabit (A. Kapuscinski)" the future scenario. Practitioners should understand the scenarios and potential qualitative consequences of the scenario even before the outcomes are modeled.

Scenario Simulation: Modeling future landscape changes corresponding to the different narrative scenarios can be challenging both from a modeling perspective and in communication to practitioners. This is the part of the process where there is danger for losing practitioner engagement or buy-in. Researchers cannot always model the key elements or outputs that practitioners may care most about and outcomes from the modeling can be different than stakeholders and scientists expect. Communicating the right level of detail (possibly to different tiers of practitioner or practitioner groups) is critical (Breakout group 2).

- Developing a baseline is critical
- Ask, is this the right model? Is it relevant? Credible?
- Robustness to alternative assumptions within a scenario
- To build legitimacy with practitioners:
  - Provide simple explanation of model
  - Ask practitioners, what assumptions to check
  - Complete on the fly alterations w/ practitioners
  - Embedding researchers right in communities as go-betweens and translators in both directions can be valuable
  - Some practitioners may want more information than the group as a whole is willing to digest. These people should be invited to explore and learn as much as possible at times separate from the larger group.
  - Legitimacy in the process leads to shared power and collective action (A. Kapuscinski)
- Meaningful/face validity of unit of change (pixel/parcel/patch) and patterns

Scenario Analysis: Interpreting outputs from the simulation and presenting results to practitioners in a meaningful way is an important part of scenario development. It is important, though potentially challenging, to explain the stochasticity in the modeling results to practitioners. Several aspects of analysis were discussed (Breakout group 2):

- Transparency of stochasticity to practitioners
- Modeling and analysis requires dedicated technicians
- Fragility test (find tipping points) – practitioners need to know major changes or flex points, not necessarily marginal, discrete ones
- Present output in meaningful ways to practitioners with opportunity for feedback and real-time adjustments
- Definitive model verification needs to be completed by project personnel (researchers)
- Presentation of model results can stimulate discussion around landscape-level thinking
- and drivers of change (E. White)
- Important to report non-meaningful differences in scenarios due either to results not changing OR to the inability to model the impacts – sometimes the model does not show what researchers or stakeholders expect and it is important to discuss and explore these results

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PRODUCTS AND IMPACTS

Participatory scenarios research results can be distilled into products to inform and motivate policy, planning, and decision-making, to coalesce groups around a shared vision, and to communicate the tradeoffs of different choices in an accessible way.

To have the greatest impact, specifically defined products must be targeted towards key audiences and designed with their needs in mind. Effective dissemination of products is also a challenge – taking the time to cultivate and develop "early adopters" who can share products and serve as case studies can be a good strategy to increase product use (Products and Impacts Breakout Group).

Key Insights

Products should be designed for a targeted audience and to help address specific goals (e.g. reduced conflict in land-use planning, more strategic conservation purchases, etc). Products should be accessible and should not try to avoid requiring users to adopt new technology without compelling

reason. It is important to note that this can sometimes be in conflict with the broadly exploratory nature of scenario research. While many types of products exist, thought should be given to what is known about the effectiveness of different communication products and their impact on target audiences. Finally, it is important to dedicate funding for product development and dissemination and to garner appropriate expertise for this aspect of the project.

- Scenarios themselves are products and can be useful to communities and organizations or agencies who are working on visioning and planning exercises.
  - One example comes from the Minnesota 2050 project. In this project, participants in a state workshop were asked to examine recommendations from a statewide conservation plan, inhabit the scenarios developed through the project, and then to discuss their insights into how the landscape was changing. They were then asked the question, "If you are living in this scenario in 2050, what do you wish, that back in 2010, people had done for our natural resources (A. Kapuscinski)?"
- Producing suitability maps or showing areas important for producing critical ecosystem services that are served up online and available as GIS downloads for different land-use (e.g. forestry, development, conservation, water quality protection) may be a useful tool for planners, land trusts, developers, etc., and may help communities to steer away from land-use conflict, as in the Maine Futures project.
- "Decision Theatre" can be used to examine alternative futures with practitioners via a sophisticated, technology driven, participatory lab/theater. Decision makers spin a dial to look at alternative futures. It requires simulations to be completed ahead of time and can be quite expensive to run.
- Gaming applications are a user-friendly product that may help practitioners understand the complexity of land-use decisions and land cover patterns. They are well-suited to target a younger generation and the competition involved can spur participation. An example would be looking at a sample watershed to test complexity in a constrained and manageable scale.
- The quantification of environmental benefits, such as farmland or water resource protection benefits, can be an important communication product to provide to organizations who work with landowners or help guide land-use (e.g. NGOs, land trusts). Additionally, quantifying the trade-off in cost between natural vs. human infrastructure can really help to understand the ramifications of land-use decisions and build the case for conservation (M. Sheils, C. Coffin).
- Developing visual and easily accessible depictions of the consequences or benefits from different alternatives futures (e.g., through looking at changes in ecosystem services or indicators of human health and well-being) may help to communicate the impact of land-use decisions. It will be important to use indicators here that are audience appropriate (e.g., ecosystem services may need significant explanation/alternative terminology in certain settings).
- Throughout the process, researchers should identify opportunities to develop intermediate products that can be released to practitioners/implementers as soon as possible to maintain interest and relevance. The timeline of a research project is often not fast enough to help inform on-the-ground decision-making (J. Short).

Product dissemination is a challenge and usually cannot be successfully completed with grant funding or by researchers alone. Effective outreach to develop successful case studies of early adopters in different sectors who have used the product and achieved results through its use can be effective both for increasing usage and for grant reporting and new funding opportunities. Cultivating partners to help in these efforts is critical, especially when working across scales (e.g., project designed for local community use and researchers do not have time/personal connections to engage with this group). More regional conservation or planning organizations may be able to learn how to use a tool and deliver it very effectively to their constituents, like local communities or land trusts.

S³ RCN Products and Impacts: The desired impacts for our RCN include developing a network to build a shared vision and communicating our results in order to inform and motivate policy, influence state and regional plans, guide conservation priorities, and strengthen the case for conservation research and funding in our region.

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METRICS

Measuring success requires assessing project outputs (e.g. # of practitioner meetings), outcomes (e.g. Town planning board references Scenarios in meeting), and impacts (e.g., Planning board changes zoning rules based on scenarios). Outputs are often the easiest metric to measure, but measuring impacts leads to greater understanding of causality and the resulting change. An example of a major assessment for a project like the S³ RCN would be a survey across all sectors represented by practitioner group (e.g. land trusts, realtors, foresters) to ask about specific outputs, outcomes, and impacts questions.

Key Insights

<u>Kinds of Success:</u> There are many kinds of success that can result from scenarios research and much of this depends on the goals of the project. Success can include new partnerships and processes for working together, research outcomes such as journal articles and modeling insights, measures of engagement with practitioners through meetings and webinars, and significant changes like new planning rules implemented or new policies created. It's important to note the metrics for implementers or practitioners may be quite different than those for researchers ([Metrics Break-Out Group).](#)   Specific kinds of success include:

- Researchers working with decision makers
- Processes for working together and collaborating created
- Policy change/management impact
- Longevity of the partnership
- Research outcomes
    - Journal publications
    - Citations
    - Leverage ratio of new grant funding
- Thinking "Differently" (both researchers and partners); changing minds about how a problem or solution is perceived (or allowing a problem to emerge that wasn't known before).
- Positive practitioner response to the effort in terms of satisfaction, willingness to participate again, etc.
- Increasing # of orgs and practitioners involved in project for greater awareness and hopefully impact
- Numbers of webinars, meetings, etc. held
- Value-add for practitioners (did they use the product?)
- Changes in land-use policy or planning at state or local levels
- Improved conservation priorities/strategic plan for land trusts or other small conservation orgs.

<u>Measurements</u> vary across spatial and temporal scales and by the measure they are seeking to quantify (e.g. output, outcome, or impact). Output is the easiest level to measure, while untangling the impact can be more difficult and requires a longer time period between action taken and evaluation and correlate/causality complex and often impossible to measure. Examples of measurements and metrics include ([Metrics Break-Out Group](#)):

- Surveys of practitioners and partners
- Google search citations

- Textual analysis
- Public outreach to ask about outcomes and usability
- Practitioner desired outcomes [bounded process] achieved
- Perceptions of sustainability of change that has been initiated
- Researcher comfort with practitioners and participatory research
- Change in researcher methods
- New research initiatives with the same practitioners
- Number of new policies introduced or plans that made use of information

OVERALL APPROACH AND OUTCOMES FOR THE S³ RCN

Based on the insights gained at the workshop and continuing efforts to shape and define the project, the RCN participants outlined the following approach and outcomes for this work.

S3 RCN Objectives:

1. Forge a collaborative regional network of researchers and practitioners/implementers to understand major land use challenges facing New England in time of climate change;

2. Synthesize and catalyze research about the consequences of alternative land use futures by co-developing & sharing scenario narratives and simulations; and

3. Apply insights to near-term policy, planning, conservation and land management

Approach:

We will create a network with researchers and practitioners to draw on existing expertise and engage diverse implementers to develop:

1. Scenarios of land cover and land use change (development, harvesting, conservation)
2. Simulate how the landscape will change in the future under each of these scenarios together with climate change
3. Quantify the consequences for human well-being, timber flows, carbon mitigation, land for water protection/natural infrastructure, habitat and biodiversity;
4. And apply results to:

   - **Economic incentives for landowners** -- economic analysis of viability of different mechanisms to pay landowners for non-market values to "keep forests as forests" and "let forests rest" under these scenarios, to achieve policy advances to complete demonstration projects
   - **State policy** – complete analysis of the extent to which climate mitigation and adaptation goals are supported or not, outline implications for state planning and policy, target actions in climate action plans, amount and use of bond funding, and influence zoning regulations
   - **Local decision making** – thinking through the benefits of different approaches to balancing of development and non-development, completing demonstration project with leaders at town and RCP level, working with land trusts and conservation partners to identify conservation priorities

Our project will strive to help steer land-use toward a sustainable and resilient trajectory by creating:

- **A shared landscape vision** for New England and a process for diverse interests across the region to engage in understanding and managing trade-offs in the face of climate change and a finite land-base with competing demands for natural resources and ecosystem services.

- **A shift in thinking** that results in citizens, leaders, and policy-makers thinking of nature as infrastructure that supports people in a way that can be measured and used to inform decision-making instead of as separate from people and local economies. As researchers, our view of "working lands" and landowners will shift from one of harming the land to partners in securing critical goods and services we all depend on.

- **Decision support and new approaches** to state and federal policy, state and sub-regional planning, and the priorities and strategic planning actions of local towns and conservation organizations that will help guide decisions based on an enhanced understanding of tradeoffs and consequences.

Project Timeline

Year 1

- Steering committee coordination
- Hiring of team (Theoharides, CBI)
- Organize and host kick-off workshop – Scenarios to Solutions
- Build expanded network

Year 2

- Stakeholder engagement/scenario development
- Current trends LU/LC modeling complete
- Scenario LU/LC modeling underway
- 1 training workshop and 2 stakeholder workshops

Year 3

- All LU/LC modeling complete
- "Consequences" modeling underway

Short-term Working Groups will develop products and strategies

Practitioner Engagement: *Emily Bateson, Keri Bryan, Gillian Galford, Pat Field, Rich Howarth, Kathy Fallon Lambert, Spencer Meyer, Joe Short, Katie Theoharides, Jonathan Thompson, Alexandra Thorn, Cameron Wake, Liz Hertz, Sarah Garlick, David Lutz*

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