



Resilience Dialogues

Final Synthesis Report

Mt. Shasta, California

July 2017

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Resilience Dialogues Final Synthesis Report

Mt. Shasta, California, USA

Introduction

This report captures the key outcomes from the Mt. Shasta, California, Resilience Dialogues process, which took place between May 15 and May 26, 2017. The Resilience Dialogues partners with communities to explore their risks from climate variability and change. Using a professionally facilitated, online process to connect community leaders to a network of vetted national experts, the Resilience Dialogues helps them work together to understand risks and lay the groundwork for long-term resilience. The service connects communities with the most appropriate resources, whether from federal agencies, regional networks, or the private sector. The Resilience Dialogues builds on recent federal efforts, such as the Partnership for Resilience & Preparedness, the Climate Data Initiative, the Climate Resilience Toolkit, and the National Climate Assessment. It also leverages nonprofit programs, including the Thriving Earth Exchange and the Community and Regional Resilience Institute. This report captures the following outcomes from the Mt. Shasta Resilience Dialogues process:

- List of key questions that Mt. Shasta community leaders are seeking to answer regarding how to proceed with building climate resilience;
- Highlights of the exchanges between community leaders and subject matter experts (SMEs) from throughout the dialogue;
- Annotated list of tools and resources that could help community leaders answer their key questions;
- Dialogue participant list; and
- Next steps for the consideration of community leaders.

Community Context

The City of Mt. Shasta (population 3,394), located in Siskiyou County, California, is the largest of four communities (Mt. Shasta, McCloud, Weed and Dunsmuir; combined population of 10,000) located at the base of Mt. Shasta. This active volcano has a rich history in Native American culture and is considered one of the Seven Sacred Mountains of the World. As it attracts a large number of visitors, the city is home to a thriving economy supporting spiritual pursuits. The city has a tourism-based economy that is sensitive to climate impacts (e.g. skiing, hiking, mountain-biking, mushroom hunting, bird watching, dirt-biking, ATV-riding, RV camping). While its once-thriving timber industry is in decline, extractive resource consumption (timber and water) remains prevalent. Maintaining and improving natural recreation options is a growing focus in the community.

Surrounded by lakes, rivers, forests and mountains, Mt. Shasta is rich in natural capital. This natural capital provides outdoor recreation opportunities and aesthetics, and is a point of local pride and community identity. The community is invested in protecting the region's vast expanses of coniferous forest, as well as a large number of endangered and special status species that live within unique micro-climates in the region. The ecosystem services provided by these resources benefit the economic and environmental well-being of downstream and regional residents of California.

Mt. Shasta is located in a region that is considered a “Disadvantaged or Severely Disadvantaged Community” by the state, and the city government has limited staff and resources for implementing and monitoring resiliency initiatives. These limitations extend to state mandates concerning city services and infrastructure. Most efforts focus on providing basic services (e.g. clean water). Climate preparedness has historically been perceived as a luxury. However, there is great support in the community for environmental sustainability programs.

Key Assets

Key assets possessed by Mt. Shasta include:

- *Community buy-in.* There is a high degree of support in the local community for environmental conservation and sustainability initiatives. This interest could be leveraged to support climate resilience in Mt. Shasta via engagement, volunteerism, and support.
- *Natural capital.* Mt. Shasta is located in an area rich in forests, lakes, rivers, mountains and wildlife. Economic, recreational and aesthetic value placed on these resources could be a starting point for engagement and progress on wider resilience initiatives.
- *Sense of place.* As a small, rural community in a specialized environment, Mt. Shasta possesses a unique identity which could serve as a starting point for messaging and action. The value residents place in the quality and identity of their community could make them more willing to engage on resilience issues that they feel are directly relevant to their lives. Initiatives designed to preserve, protect and enhance the community - and thereby contribute to climate resilience – may have high participation rates due to this intrinsic quality.
- *Size.* Small communities tend to find it easier to communicate and collaborate across departments. A couple of highly motivated organizations and businesses working with the local government can often build community support in a small community more rapidly than in larger metropolitan areas.

Framing Dialogue: List of Key Questions

The purpose of the following questions is to establish a foundation and general direction for Mt. Shasta’s climate adaptation and resilience building efforts following the conclusion of the community’s participation in the Resilience Dialogues. These questions were developed during the first week of the Community Dialogue, through a conversation about Mt. Shasta’s local context, priorities, and questions. The City of Mt. Shasta is primarily interested in strategies and best practices for integrating climate resilience into local plan updates. The community intends to implement these plans as soon as practicable through local initiatives and collaborations that invest in and advance resilient infrastructure and natural resources, and local hazard mitigation. The list presented reflects a number of refinements and additions derived from the exchange between community leaders and subject matter experts (SMEs) during the course of the dialogue.

General

- 1) Is there a rational sequence of potential resilience building actions that Mt. Shasta could pursue? What obstacles (physical and political) must be addressed before implementation of priorities can

happen?

- 2) What would be a substantive, priority project with multiple co-benefits that the city could tackle immediately to enhance resilience, unite multiple interest groups in the community, and build momentum for future efforts?

Enhancing Community Safety and Resilience: Infrastructure

- 3) What is the appropriate role of infrastructure and technology (versus policy) in enhancing resilience in Mt. Shasta? How can infrastructure and technology address known climate risks while enhancing sustainability and economic growth?
- 4) What are local projections for wildfire risk, temperature and precipitation changes? How can vulnerable infrastructure and services be made more resilient to these stresses?
- 5) What approaches (smart technologies, materials, etc.) should the city adopt to enhance the reliability and longevity of infrastructure investments? What state-of-the-art design standards should be considered?
- 6) What are representative or informative case studies of efforts to retrofit existing infrastructure and buildings with more resilient designs that the city can or should emulate?

Enhancing Community Safety and Resilience: Capacity

- 7) What state, federal and nongovernmental opportunities exist to provide additional capacity/manpower for city resilience programs and initiatives?
- 8) What approaches could Mt. Shasta adapt to streamline and bring efficiency to efforts to prepare for and manage the burden and uncertainty of rising temperatures, increased risk of wildfire, and precipitation extremes? What are methods, case studies and examples from similar towns that Mt. Shasta might consider?
- 9) What climate resilience initiatives could be adopted by the city within the context of “basic services” (e.g. wildfire risk prevention)? Which options are most attainable?
- 10) What are best practices for/ examples of successful integration of climate adaptation into hazard mitigation, general plans and local ordinances?
- 11) What mechanisms, support or incentives can the city/region offer to private land owners to increase conservation practices and easements? Are there frameworks for public input and forums to support private landowners and document strategies that work?

Enhancing Community Safety and Resilience: Financing

- 12) What frameworks for financing resilience investments have been applied in similar communities?
- 13) What funding sources (internal or external) could Mt. Shasta leverage for climate adaptation activities?

Engagement and Collaboration

- 14) What are effective strategies for engaging the private sector in resilience building?
- 15) Where are opportunities to connect or collaborate with universities for data collection and local climate resilience studies? How can Mt. Shasta pull in trusted scientific expertise and resources?
- 16) How can regional collaboration be leveraged to build regional resilience? Are there ways to engage with surrounding communities to enhance resilience without specifically referencing climate change?

- 17) What are good strategies for communicating the economic benefit and community protections that come with climate resilience (e.g., public safety, mitigating fire hazard and local self-determination)? Are there numbers that can be referenced?
- 18) Given the strong Native American cultural heritage and spirituality associated with the region, what might be opportunities for the city to collaborate with Native American organizations to preserve that character while enhancing environmental stewardship through that lens? Where are opportunities for Mt. Shasta to invite the perspective of tribes in the region?
- 19) Among which interest groups must trust and collaboration be built? How could the community approach identifying synergies between them?

Ecosystem Services Valuation

- 20) What methods or models should Mt. Shasta consider to pursue ecosystem services valuation as a mechanism to enhance protection of natural resources (primarily water) and maintain ecosystem function?
- 21) Who are the trusted experts on developing ecosystem service metrics?
- 22) Are there examples of ecosystem services valuation being done successfully in communities like Mt. Shasta?

Dialogue Highlights and Resources

Addressing climate change and enhancing climate resilience is a large and complex task that will manifest with a variety of actions to address impacts across multiple sectors. Prioritizing and developing focal points for action is essential, and can provide a roadmap for the pursuit of actionable goals that foster stakeholder collaboration. It is important to identify top priorities and break them down into small doable steps.

Key focus areas identified¹ that present the greatest opportunity or need to make progress on climate adaptation and resilience in Mt. Shasta include:

- Plan Updates.
 - Mt. Shasta is in the process of updating their Hazard Mitigation Plan to meet FEMA standards. The community is also due to update stormwater and drainage plans, and indicated a desire to integrate resilience throughout the city's General plan.
- Green Space and Green Infrastructure.
- Community Education and Engagement.
- Natural Resources (Forests and Water)

These key focus areas are discussed in the following sections. They highlight key points and information shared during the course of the Mt. Shasta Resilience Dialogues process.

¹ Although it was not explored in detail as part of the Resilience Dialogues process, the inclusion of alternative energy planning was identified as an additional focus area. The presence of Wholesale Solar, Inc. represents an opportunity for the city to engage proactively in this space. Look for funding mechanisms and opportunities to build a relationship with this company to help the city lower greenhouse gas emissions and promote the local green industry.

Community Needs and Potential Climate Impacts

- Community leaders in Mt. Shasta are striving to make climate resilience a lens through which City practices and policies are developed and evaluated. To support this effort, they need to know where to find appropriate data, information and training to facilitate efficient and appropriate actions and expenditures. High-impact, low-cost opportunities are critical to enhance local resilience without stressing limited city capacity and resources.
- To the extent possible, climate resilience should be integrated within existing initiatives focused on providing basic community services. Given limited city staff and resources, approaching resilience from a community-scale systems approach will be essential for turning interest into action.
- A key vulnerability is the potential for interruptions to Interstate-5, the primary road by which the community is accessed.
- Long-term residents of the community have observed fairly drastic short-term weather changes, but cyclical patterns of heavy vs. little precipitation on a decadal scale, with more extremes in recent years and a general warming trend.
- Climate extremes (e.g. flooding, drought, wildfire, extreme weather) may affect the local economy via interruptions to outdoor recreation and natural resource extraction.
- Enhanced fire risk is likely to affect tourism revenue and long-term capital investments like housing and business development. This risk may coincide with changes in vegetation, and may be enhanced or mitigated by the presence of different plant communities (e.g. drought-tolerant vegetation).
- More frequent and extreme flooding and runoff events due to rapid snowmelt, glacial melt or heavy rainfall is increasingly likely, and can impact transportation and cause extensive damage to local infrastructure. Repair costs and downtime could be extensive. The cumulative impacts of nuisance flooding from these events could be significant.

Planning for Resilience

Integrating climate change into city plans (e.g. General Plan, Hazard Mitigation Plan) is an easy, low-to-no cost opportunity for Mt. Shasta to set the stage for achieving longer-term resilience objectives. As the city updates relevant plans, resilience should be made an integral part of meeting stated objectives. For example, in approaching the City's 2020 Vision the community could: examine the stated goals; reflect on what might be done differently in light of specific climate impacts; then alter or change action priorities based on this analysis. Success is most likely when resilience planning is linked directly to on-the-ground actions that are responses to specific threats (e.g. fire-adapted plants or drought mitigation).

When updating these plans to incorporate resilience, consider looking at combinations of events and associated vulnerabilities (e.g. a drought followed by a flood, followed by a heat wave). Plan for hazards with potential magnitudes beyond the usual and pursue actions which increase the overall responsiveness of the community to change.

A key need and goal identified by community leaders is to expand the scope of resilience thinking in the city to include zoning, development, technology and infrastructure management, including improvements, alternative energy programs, and green space dedication and development. Implementation of these initiatives may come at a high price, but planning now will set the stage for

future action. The city is well positioned to move forward with such initiatives in terms of will and timing.

SME Suggestions:

- The Capital Improvement Plan (CIP) represents a low-cost opportunity to begin mainstreaming climate thinking into city government operations. Consider creating an evaluation process to judge which projects make it into the CIP and associate budget, and which don't. One or more criteria can be climate-related, e.g. "Does this project reduce key greenhouse gas emissions?" or "Does it reduce a key vulnerability (wildfire risk, heat, flooding, etc.)?"
- Include climate-related or climate-focused stakeholders included in the planning process.
- Openly and actively discuss climate change during public discussions (to the extent it is appropriate and done in a contextually relevant way).
- Including regional climate-related entities in the planning process to help lay the foundation for regional coordination.
- Facilitate co-leadership in plan development between emergency managers and planners.
- Create a plan to integrate new climate information, as it is developed, into plan and strategies.
- Include a discussion of how climate change could affect each hazard in the community.
- Consider climate change as a stand-alone hazard.
- Factor climate change into probability calculations for future hazards.
- Consider structures and assets likely to be vulnerable in future years (e.g. not just those within a static 100-year floodplain).
- Design goals and strategies with future climate change in mind (not just historical occurrences of disasters).
- Integrate strategies that are specifically designed to be viable in a climate-altered future.
- Include climate change-related criteria in the evaluation of proposed strategies (e.g., greenhouse gas reduction potential and adaptation value).

Resources:

- [California Adaptation Planning Guide](#) (Local and Regional Actions and Projects, California Natural Resources Agency)
- [Climate Adaptation Gap Assessment](#) (from [Model Forest Policy Program](#)). Engagement starts by completing a survey, then working with the Program to identify where opportunities exist to easily integrate climate change into city planning. Missy Stults is working with a small town in Michigan which is considering using the resource and can provide more detail.
- [Smart Growth Fixes for Climate Adaptation and Resilience](#) (Environmental Protection Agency Office of Sustainable Communities) presents overall and hazard-specific strategies for incorporating resilience into land use and building codes based on strategies that require modest adjustment, major modifications and wholesale change. Consider when thinking through the types of actions that are feasible in the near- and longer-term.

- [Quick Starts in Small and Rural Communities](#) (BC Climate Action Toolkit, Canada) is a toolkit with specific sections dedicated to issues like transportation and land use. It has a heavy focus on mitigation, but many strategies are adaptation-relevant.
- The [Arkstorm](#) scenario simulation is a useful planning response and recovery actions for extreme events.
- Plan-specific Resources:
 - Hazard Mitigation Plan
 - [Integrating Climate Change into Hazard Mitigation Planning: Opportunities, Constraints, and Real-World Examples](#) (Missy Stults): Analysis looking at the different ways a handful of municipalities integrated climate change into hazards planning - from including a generic description of how hazards might change (i.e., become more frequent, more intense, and have shorter return intervals) all the way to analyzing the changes to frequency and intensity for each hazard because of climate change and, as such, selecting actions for inclusion in the local hazard mitigation plan that are climate-smart.
 - [Opportunities for embedding climate change into hazard plans](#) (Missy Stults): A table identifying opportunities to integrate climate change into material required by FEMA in each element of a hazard mitigation plan.
 - [City of Baltimore Hazard Mitigation Plan](#): A joint hazard mitigation and climate adaptation plan that was developed in close consultation with FEMA. It is considered one of the most comprehensive attempts to marry the two.
 - [Draft guidelines](#) from Office of Planning and Research for implementation
 - Contact staff at Office of Emergency Services ([Victoria La Mar-Haas](#)) to discuss guidance for local hazard mitigation plans
 - [Draft General Plan Guidelines for Safety Element](#) (California SB379) calls on local jurisdictions to integrate climate adaptation into local hazard mitigation plans and safety elements.
 - Examples: San Diego and Monterey County Local Hazard Mitigation Plan updates incorporate climate.
 - General Plan
 - Examples of integration of climate change throughout General Plan elements can be found in Sonoma, San Luis Obispo, Alameda County, Yolo County and Sacramento County.

Potential Next Steps:

Hold a workshop or training session to bring all city staff and decision makers up-to-speed and on the same page for thinking about climate change impacts and resilience for development and implementation of updated city plans. Resources to consider:

- Guidance on workshops and outreach are included in the [California Adaptation Planning Guide](#) (referenced above).

- Thriving Earth Exchange held a [workshop in Boulder, CO](#) to help city staff develop a better understanding of climate impacts and broaden thinking about where climate risks and opportunities lie. Contact Melissa Goodwin (Thriving Earth Exchange) for more information.
- *Future Shocks and City Resilience* was a game played in Tempe, AZ which brought together leaders of city departments and challenged them to adopt systems thinking in their operations to enhance local resilience and sustainability. Contact Lauren Keeler (Arizona State University) or Braden Kay (Sustainability Manager, Tempe, AZ) for more information.
 - [Paper](#) (Currently undergoing peer review) summarizing the game and its results.
 - [Executive summary](#) of the partnership on sustainability and resilience between Arizona State University and the City of Tempe. This could be a useful model for a similar collaboration between Mt. Shasta and a local university.
- [Adapting to Climate Change: Managing Federal Lands in a Changing Environment Webinar Series](#) (Southern Oregon Forest Restoration Collaborative) is a natural resources-focused resource which may be valuable.

Community Engagement & Communication

Planning for resilience creates a prime opportunity to educate and engage with the public about the potential for changing conditions, and the actions proposed. Local support could be enhanced if the city can demonstrate that residents' interests are in mind, and that the city is preparing for events based on the best available science and projections. A community social network analysis to map network allies, community stakeholders, and involved parties, along with their respective interests can spark messaging and engagement ideas and serve as a baseline for the social, human and political elements at play in Mt. Shasta. Articulating agreements and divergent issues among stakeholders can help identify trusted voices and unlikely common ties. Meanwhile, building trust between these groups may make it easier to tackle difficult issues. While this trust exists in Mt. Shasta, the need for productive communication to drive this conversation can't be overemphasized.

The large amount of energy in the community for sustainability natural resources conservation is a significant asset for Mt. Shasta. However, community leaders indicated that Mt. Shasta is not traditionally a community of activists. Look for opportunities to implement actions that explicitly engage and leverage the actions of homeowners and citizens (e.g. citizen committees, neighborhood awards, citizen monitoring of high-risk areas, drone use).

A useful way to open and ground a conversation is to invite participants to describe lived experiences. This can help develop a baseline for understanding and visualizing how climate has changed locally and promote responsiveness to conversations about how it could change in the future – and facilitate the development of a common language of resilience. Framing conversations around public safety, hazard mitigation and local self-determination can help bring people to the table.

SME Suggestions:

- Simulations and games can be useful for engaging broader communities on climate risks and response. Goals for such activities include generating new ways of thinking about risk and responses, bringing together a diverse mix of sectors and interests, making climate risks tangible and directly linked to public service/environmental/infrastructure issues, and paving the way for

new partnerships and collaborations. Examples:

- Future Shocks and City Resilience (Tempe, AZ; See section above)
- [Game of Floods](#) (Marin County, CA) is an interactive game that communities can play to address flooding and explore what kinds of strategies a fictional city can use to prepare.
- Consider opportunities to bring together local champions, apply their talents, and enhance the city's capacity to assess and implement programs. For example, Whitefish, Montana, launched a [volunteer Climate Action Plan Committee](#) to serve as an advisory group to the city on their energy and water consumption work.
- Keep discussion focused on local impacts to maximize engagement.
- Link climate engagement to concrete impacts and make it project-based. Get a diverse group of people in the room and manage the dialogue, linking it to actions and things already on people's plates.
- If you rely on data for evidence, good data visualization is critical. Show trends for concrete resources (stream gauges, snowpack, wildfire) and let the discussion emerge naturally around how to best manage those impacts.
- Frame resilience in broader terms beyond climate impacts to develop interventions. For example, ask "What happens if our fire season becomes 12 months in length? Or "What is the worst flood we could get in the next 50 years based on indicators?"
- Start with things people care about (health, safety, jobs, etc.) and relate climate change to these priorities. To frame issues in this way, identify:
 - Priority economic sectors (e.g., tourism, recreation)
 - The inputs and conditions needed for success in the sector (e.g., snow for skiing and snowboarding; road access to hiking, mountain biking, mushroom hunting areas; effective natural resource management)
 - The non-climate (e.g., under-valuing of natural resources) and climate stressors (e.g., changing snowfall patterns, floods) that currently adversely affect these inputs and conditions.

Resource:

- The [Sierra Climate Adaptation and Mitigation Partnership \(CAMP\)](#) is one of five regional climate change collaboratives in California. Their website features funding opportunities specifically focused on [environmental education](#).

Collaborations

Tied to community engagement and communication is the establishment and cultivation of strong collaborations among regional stakeholders. To build this network, establish small successes with existing partners and build upon them to generate word of mouth and further action, engaging and incorporating additional allies in the process.

SME Suggestions:

- The National Forest Service has a large presence in Mt. Shasta. They have a number of highly educated employees that live and work in and around the City. The service tends to stay in its own silo from the City, but some efforts to alleviate that have occurred in the last year. There is currently little to no data sharing between the two entities.
- Common collaborators include: Regional Watershed groups, CalFire, National Forest Service, Governor’s Office of Planning and Research, Siskiyou Land Trust, California Office of Emergency services, Federal Emergency Management Agency, Chamber of Commerce, Siskiyou County Economic Development Council, and Regional Water Quality Board.
- The Regional Integrated Sciences and Assessments (RISAs) program supports research teams that help expand and build the nation’s capacity to prepare for and adapt to climate variability and change. See the [California-Nevada Climate Applications Program](#).
- Higher education institutions
 - Look to planning schools and policy programs (e.g. California State University, Chico or University of California, Davis).
 - Derek Kauneckis (Ohio University) could partner with Mt. Shasta for a Fall Climate Resiliency course to research further what other small communities are doing in this space.

Potential Next Step:

- Identify and engage with trusted collaborators.

Infrastructure and Financing

Community leaders identified green space and green infrastructure as key opportunities to make progress on climate adaptation and resilience planning. Notably, city stormwater and drainage plans are due for updates near-term, and the city intends to include shovel-ready projects to integrate natural drainage and stormwater retention into the cityscape.

SME Suggestions:

- Project return on investment (ROI) and community buy-in can be higher for new development when it addresses risk mitigation, sustainability and economic growth. SMEs advised considering infrastructure development with multiple co-benefits. For example, investments in urban greening, cool paving and cool roofs can limit heat and provide aesthetic value. Especially viable projects may address both risk reduction and economic benefits directly (e.g. jobs) or indirectly (e.g. lower wildfire fighting costs and avoided losses). Examples:
 - Placer County, California, opened a [woody biomass plant](#) which reduced fire risk, lessened dependence on fossil fuels, and created jobs.

- Grand Rapids, Michigan, requires that any work or upgrades to roads must integrate green infrastructure for stormwater management.
- When exploring infrastructure investments in Mt. Shasta, ask whether:
 - Considering the city's natural capital and the nature-based resilience strategies that are available, what is the role of infrastructure and technology?
 - Do planned investments address identified climate risks and community needs? Do they leverage (and sustain) the existing natural capital?
- Peer-to-peer learning opportunities can help support, inspire and connect to innovative strategies and opportunities.
- Engaging with the private sector to finance and develop projects can enhance the reach of resilience activities.

Resources:

- [National Complete Streets Coalition](#) (Smart Growth America) provides technical assistance and resources
- The [Sierra Climate Adaptation and Mitigation Partnership \(CAMP\)](#) is one of five regional climate change collaboratives in California. Their website features a variety of [funding opportunities](#).
 - CAMP is situated within the [Sierra Business Council](#) and may have relevant insights for engaging the private sector.
- [Funding Assistance Options](#) (California State Water Resources Control Board) helps identify relevant state funding sources by project phase and project type.
- The [U.S. Climate Resilience Toolkit](#) has a [section on potential funding resources](#).

Potential Next Steps:

- Consider attending regional or national professional events when possible to learn about small-scale community activities.
 - [American Planning Association California Chapter](#)
 - [Strong Towns](#) is a media organization which seeks to help cities, towns and neighborhoods become financially strong and resilient.
 - [National Adaptation Forum](#)

Resilience Opportunities in Natural Resources

To advance resilience priorities in natural resources, build upon linkages that connect economic dependencies to the most apparent direct and indirect threats (e.g. fire and flood risks):

Wildfire and Forest Management

A significant resilience gap in Mt. Shasta and the surrounding areas is a lack of synergy in fire management techniques among various landowners. Advancing climate-resilient forest management and wildfire mitigation strategies was identified as a priority by community leaders which could support

regional coalition-building around natural resources and public safety.

There is a high level of political will from private landowners and foresters to preserve natural resources and manage forests and land with a long-term frame of mind. Sustainable conservation strategies are being applied on their properties, but challenges persist in funding, expertise and permitting for the sustained management of natural resources by private land holders. Needs include examples of successful private sustainable land management, collecting and documenting strategies that work, and frameworks for public input and private landowner forums.

Actions taken to reduce wildfire risks are often climate adaptive in drier forests.

SME Suggestions:

- In addition to reducing the likelihood that fire will reach buildings, focus efforts on having them survive fire passage (e.g. through building materials and design, and regulating the proximity of adjacent buildings). Such policies could be incorporated into city zoning and requirements during remodels.
 - For example, Chula Vista, CA set zoning requirements to address fire risk from materials and siting.
- Draw on traditional ecological knowledge concerning past forest structure and species mixes, as well as key understory components that will also support wildlife and wild pollinators.
- Reducing stand densities can help reduce crown fire risks, risks to homes and infrastructure, risk of insect and disease outbreak, and increase drought tolerance.
- Some form of commercial removal may be necessary to facilitate continuous wildfire hazard reduction. Look for opportunities to leverage this activity in a sustainable way.
- Initially, prioritize identifying and working with those who are already predisposed toward conservation activities, i.e. those enjoying co-benefits from standing forest (birding, hunters, timber harvesting, visual/sound buffers).

Resources:

- A [cohesive forest strategy](#) that ties to the National Fire Plan was recently finalized by the [Southwest Oregon Forest Restoration Collaborative](#) as an effort to develop fire plans that engage various stakeholders, provide grants and develop priorities. This could serve as a model for a similar undertaking in the Mt. Shasta region, and represents an opportunity to collaborate with the Forest Service. For more information, contact Kerry Metlen or Darren Borgias (The Nature Conservancy).
- Ashland, Oregon, has a fully forested watershed and has worked with local groups to educate the public about the risk of wildfire. Collaborations from this effort have led to federal funding for treatment, as well as greater public support. Consider reaching out to colleagues in this community for insights on their process.
- [Era of Megafires Presentation](#) (Forest Service Pacific Northwest Research Station) is a publicity and educational tool which can be effective for starting a local discussion.

- The [Illinois Valley Timber Assessment](#) can help inform forest planning, generate recommendations to land managers, strengthen public support for forest restoration, and improve project efficiency and effectiveness. This analysis was funded by an Oregon Energy Trust to sustain a local mill. (Terry Fairbanks can answer questions.)
- [Pacific Forest Trust](#) works on sustainable forest management practices with private companies.
- [Lomakatsi Restoration Project](#) develops and implements forest and watershed restoration projects in northern California. One current project is focused on treating plantations in the Cascade Siskiyou Monument. Contact them for a conversation about how agencies partner with NGOs and educational institutions to generate capacity for building local ecological and restoration workforces.
- [EQIP](#) (Natural Resources Conservation Service) helps fund small forest owner efforts to plan and implement sustainable conservation practices. The program is aimed at nonindustrial private forestlands and provides funding for both planning and implementing conservation practices, including reducing fire risks.
- Case Study: Wildfire mitigation actions taken by Flagstaff, Arizona
- [Data Basin](#) is a resource for how changing climate might affect local forests. Note: The website is dense, but regular webinars are provided on how to navigate and use the site. Relevant projects include:
 - AdaptWest - A Climate Adaptation Conservation Planning Database for Western North America (the Watershed Climate Data Explorer)
 - California Water Planning Information Exchange
 - Conservation Biology Institute Climate Center
- [Natural Resources Canada](#) has the most comprehensive site for information on the effect of climate change on individual species
- College of the Siskiyous work-study program
- Incentive/grant programs include EQIP (see above), CalFire, California Office of Emergency Services, and FEMA
- USDA Natural Resources Conservation Service helps small private landowners manage forest resources
- The Nature Conservancy is a great partner for private conservation efforts.
- [Comprehensive Fuels Treatment Practices Guide for Mixed Conifer Forests: California, Central and Southern Rockies, and the Southwest](#): covers the Sierra Nevadas, but the Southern Cascades are likely very similar.
- [Synthesis of Knowledge from Woody Biomass Removal Case Studies](#): See section on the Pacific West Region (page 9)
- CalFire and the Forest Service can be a resource for keeping residents informed during prescribed burning operations.

Potential Next Steps:

- Connect and collaborate with other towns in Siskiyou County to coordinate fire prevention activities. Aim to develop some consensus around what that means in terms of types of treatments and priority areas, and incorporate actions by individual homeowners in a larger plan.
- Collaborate with local groups to educate the public about wildfire risk and facilitate honest conversations, presentations, field trips with strategic stakeholders and the public.
- Promote public acceptance of the actions needed to address wildfire risk. Include discussion of and preparation for impacts from smoke from prescribed burns.
- Consider undertaking a forest asset inventory to highlight areas most worth conserving for smarter resource allocation and to identify the most appropriate policy instruments. To undertake a less funding-intensive survey, pull in local knowledge via a one-day workshop to identify 1) critical natural resources, 2) those you don't want to lose, and 3) those that would hurt to lose - but you could live without.
 - Common policy instruments include forest conservation tax benefits (especially in the Eastern/Midwestern states), conservation easements and voluntary deed restrictions.
- The establishment of a "wood bank" or "forest fuels to firewood" project was identified as a project which could be accomplished with existing city capacity. Co-benefits could include job creation, meeting local needs for firewood, and minimizing wildfire risk.

Water Resources

Community leaders described Mt. Shasta as a “land of plenty” in terms of water resources. A critical need however, is to enhance knowledge and appreciation for the need to actively conserve and protect water resources in the community.

SME Suggestions:

- Success generated by household involvement will be limited unless companies investing in local water resources are brought to the table to collaborate on efforts. A multi-stakeholder conversation about what water resilience looks like in Mt. Shasta (economically, aesthetically, ethically, ecosystem-centric) will be a valuable start to this conversation.
- Opportunities for community education and engagement regarding water conservation may include:
 - Including water saving tips on people's water bills;
 - Having a rating on the water bill that tells people how much water they use compared to their neighbors;
 - Hosting a neighborhood competition where those who reduce water consumption the most in a sustained way are rewarded (e.g. community ceremony or yard sign);
 - Launching a reality TV/radio show with a local television or radio station to showcase competition to reduce water (or energy) use. See "[Energy Smackdown](#)" in Medford, MA;

- Challenging a sister city to a water conservation competition;
- Competing in the [National League of Cities Water Conservation challenge](#);
- Having a city-wide sign on pledge listing 10-12 things for each resident to do over the course of a year. (E.g. water conservation, home insulation, etc.) Each month, organize a campaign that focuses on one of those 10-12 things. Provide pledge stickers to showcase participation. Missy Stults can provide sample pledges.
- A community-climate science engagement workshop with scientists studying regional hydrological systems may be useful for identifying opportunities to advance this issue.
- Consider enlisting a volunteer(s) to collect freely available data and analyze it to discover trends in snowpack and precipitation. Target at least 30 years of data to meaningfully capture and mitigate interannual variability. Looking at the trends and the pattern of departure from an average can show how these elements are changing over time. Such trends help understand not only what is happening to snowpack and surface water availability but why they are changing.

Resources:

- For further reading on what works best in reporting vs. messaging, consider:
 - [“Promoting conservation by managing residential outdoor watering evidence from the Truckee Meadows area in Northern Nevada”](#) describes what works best in reporting vs. messaging.
 - The use of simulations is an excellent way to bring attention to an issue, though they require funding. Applicable models include [ArkStorm](#), [Drought Tournaments](#), and [Alternative Futures](#).
- [Sno-tel](#) network provides snowpack data. While it doesn't have a station in Mt. Shasta, stations nearby in southern Oregon may suffice.
- [WestMap](#) has data for precipitation, minimum temperature, maximum temperature and average temperature by county. Use data for Siskiyou County instead of the hydrological unit (Upper Sacramento Basin).
- Staff at the [Desert Research Institute](#) (DRI), part of the Western Regional Climate Center can be a resource for understanding climate observations.
- Derek Kauneckis (Ohio University) and/or [Thriving Earth Exchange](#) could support development/implementation of community-science engagement workshops or programing.

Potential Next Steps:

- Confirm and assess city knowledge of local hydrological and meteorological projections over relevant timescales; engage with partners or volunteers to fill any gaps in knowledge.
- Consult with appropriate stakeholders to explore and develop a public engagement activity or program to meet water education and conservation goals.

- Look for and pursue opportunities to highlight and raise awareness of water conservation in city/utility information and products.

Payment for Ecosystem Services (PES)

There was some interest in exploring PES as a way to reframe Mt. Shasta’s ecological assets and engage new sectors to advance a conversation about demonstrating the value of Mt. Shasta’s natural resources. Currently, they are viewed largely as exportable commodities. While it is a developing science, PES offers a model for adding explicit economic value to environmental public goods. PES can be useful for framing the relative value of prevention vs. post-event response. Note, however, that it is important to not fully "monetize" the environment, but to retain valuation of intrinsic value.

SME Suggestions:

- Exploring climate linkages can help identify what should get valued using PES in order to justify certain interventions and adaptation actions.
- PES be used for everything from watershed services, carbon markets, to public health benefits depending on the service of interest. The most successful valuation schemes, effectively “bundle” benefits to get the highest value for the services they want to protect (i.e., water quality, biodiversity richness, flood protection, etc.).

Resources:

- [GecoServ](#) - Gulf of Mexico Ecosystem Services Valuation Database
- [Proposed Lone Star Coastal National Recreation Area](#)
 - 2013 [Presentation](#) by Jim Blackburn (Blackburn & Carter)

Potential Next Steps

- Engage in a series conversations with individuals knowledgeable in PES to explore the potential and applicability of PES for achieving local priorities. Consider scientists, economists, and groups that have launched successful PES programs.
- Pending results of those conversations, engage with partners to explore development of a pilot PES initiative in Mt. Shasta.

Implementation

Despite staff and resource limitations on the municipal level, Mt. Shasta’s place-based pride, engaged community and resident industries might offer a unique blend of resources and capacity to fill in gaps for

implementation. Dialogue participants noted that climate implementation work fares best when tied to risk reduction or infrastructure planning; tie strategic development to people's sense of personal and community protection.

SME Suggestions:

- Many measures can be both cost-saving and climate adaptive, e.g. an earlier effort to convert streetlights to LED lights. Look to cast other initiatives in the same light where possible.
- The most defensible decisions and investments will be based on clear historical data and robust projections. Resources:
 - [Cal-Adapt](#) is a resource for data produced by California's scientific and research community. Their website will soon have high-resolution, verified and scenario-guided climate projection data for the entire state, covering 6km resolution for fire, drought, snowpack and extreme heat.
 - The U.S. Climate Resilience Toolkit has good [data visualizations for Siskiyou County](#) regarding temperature, precipitation and heating/cooling degree days.

Resources:

- [CivicSpark](#) is an AmeriCorps program dedicated to building capacity for local governments to address climate change and water management issues in California.
- The [Thriving Earth Exchange](#) can identify and support city engagement with a volunteer Earth and space scientist to advance a city priority.

General Resources

The following are general resources about climate change resilience planning that were referenced during the Mt. Shasta Community Dialogue. Resources listed here span multiple key focus areas and may be cited elsewhere above in a specialized context.

- [Thriving Earth Exchange \(TEX\)](#) can connect Mt. Shasta with a volunteer Earth or space scientist to launch a project tailored to address a local priority.
- [Community & Regional Resilience Institute \(CARRI\)](#)
- [Resilient Cities Climate Leadership Academy](#) (Institute for Sustainable Communities) is an opportunity for multiple individuals from a single municipality to get together with sister municipalities from around the nation to explore issues of mutual interest.
- [U.S. Climate Resilience Toolkit](#) has case studies, tools, and resources.
- [Climate Adaptation: The state of practice in U.S. communities \(Abt Associates/ Kresge Foundation\)](#) features in-depth actions that municipalities are taking to address climate change
- [Climate Adaptation Knowledge Exchange \(CAKE\)](#) by EcoAdapt
- [American Society of Adaptation Professionals](#)
- The [National Adaptation Forum](#) is a great event to see what others are doing and network. Held

every two years (next in 2019) and provides generous travel funds.

Next Steps for Consideration

The resources and insights throughout this report can serve as the foundation for the planning and implementation of resilience activities in Mt. Shasta moving forward. It is meant to be a tool and resource for wider community and partner engagement in Mt. Shasta. It is not, however, a comprehensive resilience assessment. Further engagement of key community stakeholders will be important to share the outcomes of the dialogues and determine which priorities and next steps are broadly supported. Potential next steps that were explicitly identified within the dialogue are described in detail in the sections above.

The additional list of next steps below was distilled from the dialogue for the consideration of community leaders as they proceed with their resilience building efforts:

1. Hold an interactive workshop to share information about climate change impacts and resilience with city staff and decision makers, with a focus on how to integrate climate resilience considerations into city plan updates and implementation.
2. Explore resources, tools and best practices that can help broaden the integration of resilience into city plans to promote co-benefits from the provision of basic services, and longer-term resilience frameworks.
3. Develop and include shovel-ready projects in city plans that integrate green space and green infrastructure. Seek financing opportunities to support expanded work.
4. Convene a multi-stakeholder conversation to establish a resilience vision for Mt. Shasta and explore opportunities to incorporate a resilience lens into community education and engagement around public safety, wildfire prevention, and water conservation.
5. Focus on leveraging local interest in environmental protection and build a multi-stakeholder coalition of volunteers to advise, collaborate, and engage in local resilience initiatives.
6. Seek to connect and engage with trusted local, regional and national collaborators to enhance capacity, share lessons learned, and advance resilience priorities.
7. Work with the Governor's Office of Planning and Research to develop an approach to incorporating climate into your local plans. *(Note: Follow-Up Meeting has been scheduled for July 21 in Sacramento, CA.)*