

Community Climate Profiles to Support Adaptation Planning

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Key Partner: Sascha Petersen (Adaptation International)

End Users: Adaptation International; Cascadia Consulting Group, Inc.; City of Flagstaff, AZ; Tohono O’odham Nation – Office of Emergency Management; Town of Oro Valley, AZ – Office of Emergency Management; The Highlands at Dove Mountain, AZ; PROTECT Campaign in Prescott, AZ; City of Prescott, AZ; Pueblo of Laguna, NM; Gila River Indian Community, AZ; City of Sedona, AZ; Arizona Land and Water Trust

Additional Support: Cascadia Consulting, LLC; Adaptation International

Project Dates: 2017 - 2023

Summary of Impact

Access to climate information: As communities in the Southwest begin to plan for climate change adaptation, many still lack access to useful and usable information about climate trends and impacts in their area. This project aimed to close that gap by synthesizing relevant, decision-scale climate information for use in communities across Arizona and New Mexico.

Tailored technical profiles: The CLIMAS team generated tailored climate profile reports for communities that summarized historic climate data, current trends, projections, and likely impacts. Communities wanted local and detailed climate information that was targeted toward their specific planning processes and issues. The team completed nine climate programs for communities across the Southwest. The format of the climate profiles reports – straight-forward, well-referenced, and written for general audiences – appealed to a wide-range of readers.

Increasing awareness and informing action: Feedback from community partners indicated that the profiles, and the process of working with CLIMAS, helped them feel more confident in their own understanding of the science. Several communities and partner organizations used the climate profiles to inform climate adaptation policies, plans, and funding applications.

Problem Statement

Climate change adaptation planning requires decision makers to envision the future of their communities, and make well-grounded assumptions about economic, demographic, and cultural trends that are likely to affect that vision. However, many communities do not have the technical resources to compile and analyze climate data and research findings, making this information inaccessible.

Project Focus

This project addressed the lack of access to climate change information by producing climate profiles for communities to support their adaptation planning efforts. The CLIMAS team sought to work with communities that had a usable outcome for climate information.

Project Activities

Introductory meetings and workshops:

CLIMAS team designed and coordinated the overall process of generating climate profiles for each community. Partners helped define the questions and kinds of analysis that would be useful for them through meetings and workshops. They provided context about what climate changes would mean in their community.

Profile development: The research team analyzed available data on a community-level scale

Sharing findings: The research team held community workshops to report information back to interested stakeholders, which generated rich discussions about findings and next steps.

On connecting with CLIMAS:

Our community was very under-informed about climate change. I called up Dan Ferguson and he introduced me to Alison Meadow and this project. It was a perfect fit. We went down to the University to discuss our situation. They came up to the Highlands to get familiarity with what was happening here. Alison would call from time to time, and we would chat about things that helped her to ensure that the report was focused on us. We've been very pleased with what came out of it. And it was a lot of fun, it was just an enjoyable time to put the profile together.

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Rich Markham, The Highlands at Dove Mountain

Project Outputs

Publications: Climate profile reports included information such as instrumental temperature and precipitation data from 1895 to present, explanations of key climate phenomenon that impact regional climate and weather, current climate trends, projections of climate change for two RCPs (4.5 and 8.5) at regional scales, and summaries of general regional climate impacts. In total, nine profiles were developed for the following places in the Southwest:

- Climate Profile for Prescott area, AZ – 2023
- Climate Profile for the Upper Santa Cruz Watershed, AZ – 2021
- Climate Profile for The Verde Valley, AZ – 2020
- Climate Profile for The Highlands at Dove Mountain, AZ – 2019
- Climate Profile for the Pueblo of Laguna, NM – 2019
- Climate Profile for The City of Flagstaff, AZ – 2018
- Climate Profile for the Gila River Indian Community, AZ – 2018

- Climate-Related Hazards in the Town of Oro Valley, AZ – 2018
- Climate Change Impacts on the North American Monsoon: Summary for the Tohono O’odham Nation – 2018

Presentations:

Climate Profile for Coconino County. 2018.
City of Flagstaff Climate Action and Adaptation Plan Open House.

Pima County Multi-Jurisdictional Hazard Mitigation Stakeholder Workshop. 2018.
Pima County Office of Emergency Management.

Climate Change and the Pueblo of Laguna. October 2019. Laguna, NM.

Mitigating the Urban Heat Island. Desert Horticulture Conference. 2020. Tucson, AZ.

Climate Service Providers Workshop. 2021.
American Society for Adaptation Professionals.

Urban Heat Island workshop. 2021. Seminar training. City of Tucson, AZ.

Arizona Land and Water Trust - Happy Hour. 2021.

Deep Roots Make Strong Trees: Adaptation Rooted in Community History. 2021; Oil Water and Climate – Environmental Histories of Texas; Institute for Historical Studies, University of Texas at Austin.

Prescott City Council Work Session. 2022. Prescott City Council.

Media Coverage:

Arizona Daily Sun, "[The Science Behind the Flagstaff Draft Climate Action Plan,](#)" 10/18/2018.

Arizona Daily Sun, "[Dozens of 90-degree days and less snow in store for Flagstaff by 2100,](#)" 4/1/2017.

Leveraged Funding:

Supporting this project:

- Cascadia Consulting (\$6,000)
- Adaptation International (\$7,300)

On tailoring the profile:

One thing that's very important is defining the boundaries for a downscaled analysis. Like in the case of Pueblo of Laguna, was it the tribal territory, like the land that they own, or was it their traditional use area? And then what's the sweet spot in terms of the size and the validity of the climate projections? That was one of the conversations that we had with the community and with CLIMAS – where does it make sense to draw these boundaries, so that it's valid and also gives the community a sense of ownership over the information. If we just downscaled the analysis for the county using county boundaries, that wouldn't have resonated

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Sascha Petersen, Adaptation International

Societal Impacts by Category

Instrumental:

- City of Flagstaff, AZ directly integrated profile information into the city’s [Climate Adaptation and Action Plan](#), which was adopted by City council in 2018. The Plan won an Arizona Planning Association Award.

On co-development:

One of the things we focus on is the community process and building capacity at the local level. Alison came out to Pueblo of Laguna for some early scoping meetings, when we were talking with the tribe about where climate impacts have already happened, what are the things they care about that are already being affected or that they're worried about being affected. That allowed us to collaboratively refine what products CLIMAS could provide.

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Sascha Petersen, Adaptation International

- Pueblo of Laguna, NM integrated their profile into their vulnerability assessment process, which is part of a larger effort by the Pueblo to develop a climate change adaptation plan.
- Arizona Land and Water Trust used the profile of the Upper Santa Cruz Watershed to inform plans to incorporate climate adaptation into their conservation easements, which are legal agreements between the land trust and landowners regarding future use and conservation of working lands in Arizona. This organization protects over 2.7 million acres of land through its conservation easements.
- The Highlands at Dove Mountain used their profile to inform their Five-Year Trends Planning effort and develop community priorities for action, such as desert landscaping, sustainable golf course management, and greater awareness of physical and mental health impacts of climate change on older adults.
- Consultants used the Highlands at Dove Mountain profile – done at the scale of Pima County – to develop the [City of Tucson’s Climate Action and Adaptation Plan](#). The profile report was a major source of climate science for Tucson’s plan.

Connectivity:

- Word of mouth connections increased interest in Climate Profiles. For example, Prescott, AZ contacted CLIMAS to develop a profile for their region because they heard about it from partners in Flagstaff and Sedona.
- After the profile process, Dove Mountain residents collaborated with CLIMAS researchers to develop and teach classes for their community.
- Through the Pueblo of Laguna profile, CLIMAS formed a solid partnership with Adaptation International that has led to additional collaboration on other projects.
- CLIMAS collaborated with several partners on new funding proposals which extended stakeholder engagement on issues of climate resilience and adaptation.

- In December 2019, The Highlands at Dove Mountain was approved for membership in the [Firewise USA](#) Program, following a recommendation from Alison Meadow. This program teaches communities how to adapt to living with wildfire and encourages neighbors to work together and take action to prevent losses. Residents from The Highlands, including members of the Architectural Landscape, Infrastructure and Common Area Committees, will prepare an Action Plan—a prioritized list of fire risk reduction projects/investments as well as suggested homeowner actions and education activities.

Capacity Building:

- Profile reports were used by communities to apply for funding to do adaptation work. For example, the Town of Oro Valley’s Office of Emergency Management cited the profile to apply for funding from FEMA to enhance the town’s preparedness for climate and weather-related events. Although that funding application was not successful, they were encouraged to apply to another program.
- Arizona Land and Water Trust used the Upper Santa Cruz Watershed profile in a successful grant application from the Land Trust Alliance’s Land and Climate Program.

On use of the profile:

This climate profile became central to a grant we received from the Land Trust Alliance’s Land and Climate Program, and together these opportunities have motivated ... our involvement with groups like the Southwest Climate Hub. We’re eager to share the profile with our landowner partners and other stakeholders in the Upper Santa Cruz Watershed and believe it will provide practical guideposts to encourage climate-adaptive land management across the region. The Trust is very grateful that CLIMAS was able to take on this project, and we hope we’re able to work together again in the future.

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Bailey Kennett, Arizona Land and Water Trust