



Participatory Climate Adaptation Scenario Planning

Informed decision making for an uncertain future

What is participatory scenario planning?

A collaborative process where stakeholders such as land managers, scientists, and other knowledge holders, work together to explore possible future climate conditions and impacts, and co-develop strategies to adapt to them.¹ Scenario planning differs from forecasting by exploring multiple potential outcomes, whereas forecasting relies on a single predicted trajectory (Fig. 1).

Why is scenario planning important?

The scenario planning process helps researchers and resource managers prepare for and implement adaptation actions that proactively respond to a range of possible future conditions (Fig. 2). Given the ongoing uncertainty about how climate change will affect the economy, health, biodiversity, infrastructure, and other systems, scenario planning allows for more flexible, informed, and resilient decision-making.



Figure 1. Forecast planning (left) only considers one potential outcome, and scenario planning (right) takes into account multiple possible future outcomes.²

<https://www.nps.gov/subjects/climatechange/scenarioplanning.htm>

Climate Scenarios should be:

- **Plausible:** based on the best available science/data.
- **Relevant:** focused on a management question.
- **Divergent:** characterizes a range of future conditions.
- **Challenging:** effective for critically examining established practices and assumptions and fosters creative thinking.³

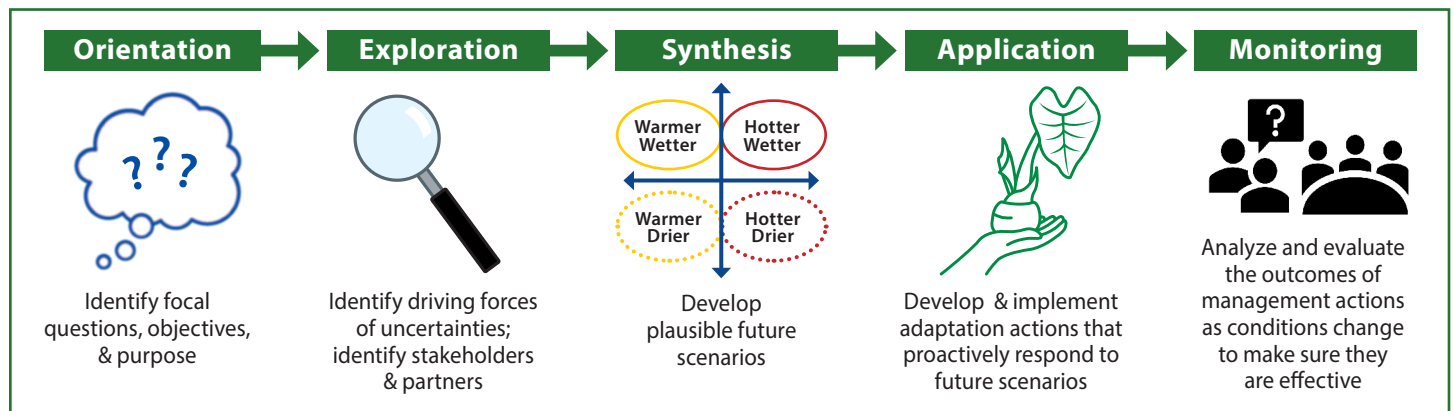


Figure 2. The scenario planning process begins by identifying focal questions and key objectives. Next, critical uncertainties are recognized, followed by the development of plausible future scenarios that are assessed for associated risks and opportunities. The process concludes with ongoing review and refinement, carried out in collaboration with stakeholders to ensure continued relevance and responsiveness to emerging conditions.

Key Features of Participatory Climate Adaptation Scenario Planning

Participatory

- Grounded in local, place-based knowledge and values
- Builds trust and shared understanding
- Encourages diverse voices & co-produced solutions

Scenario-Based

- Uses projected changes (e.g. hotter, drier; warmer, wetter)
- Allows stakeholders to “test” adaptation strategies under different conditions
- Helps prepare for a range of uncertainty, rather than trying to predict one possible future

Action-Oriented

- Focuses on adaptation strategies that are flexible and robust to multiple scenarios
- Helps communities and managers prioritize actions now, while planning for long-term change

2023 Hawai'i Conservation Conference Workshop: Climate Adaptation Strategies for Invasive Species Professionals

The Vision

The Pacific Regional Invasive Species and Climate Change (RISCC) Management Network hosted a workshop at the 2023 Hawai'i Conservation Conference to explore how climate change may affect invasive species and their management. The event brought together resource managers and partners from across agencies (Fig. 3) to promote knowledge exchange, identify research gaps, and facilitate discussion of best practices and lessons learned. The workshop also introduced scenario planning as a tool for climate adaptation and supported the development of strategies that are resilient to future climate uncertainty.



Figure 3. HCC workshop participants.

The Process

Managers from five sites across Hawai'i (spanning marine, dry shrubland, & forest ecosystems) contributed local expertise to support scenario planning discussions. Each group received a site-specific Climate Portfolio from the Pacific Drought Knowledge Exchange (PDKE)⁴, containing future climate projections for the site. This information was then used to evaluate how invasive species might respond to changes in temperature, rainfall, and extreme events like drought or wildfire. The groups identified key knowledge gaps, proposed adaptation strategies, and voted on the most effective actions that could work across multiple climate scenarios (Fig. 4).

The Results

A total of 61 participants (21 federal & 40 non-federal) collaborated in these site-based discussions to identify climate adaptation actions for invasive species. Strategies generated by the groups included assisted migration of rare lowland species upslope, expanding fuel breaks to reduce wildfire risk, seed banking for post-disturbance restoration, and post-fire restoration planning. Marine-focused actions emphasized coral out-planting, managing invasive algae, and improving biosecurity for boats. Participants also highlighted the need for flexible adaptation funding, predator control to protect seabirds, and planting native plant species that are resilient to hotter, drier conditions.

The Workshop Process

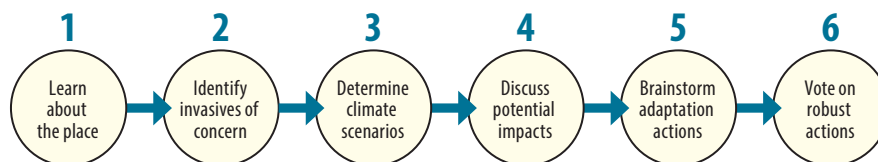


Figure 4. The 2023 HCC workshop guided five discussion groups through a six-step process: learning about the site, selecting focal invasive species, identifying climate scenarios from the Climate Portfolios, exploring possible species responses, brainstorming adaptation actions, and voting on those most robust across scenarios.

New Project: Improving the availability and accessibility of climate data and information for users in Hawai'i

Background

Hawai'i and many other Pacific Islands are already experiencing the impacts of climate change—rising temperatures, less rainfall, more intense droughts, and stronger storms—posing major challenges for natural resource managers. Access to clear, reliable climate data is more critical than ever, especially for communities with limited resources.

With support from the Pacific Islands Climate Adaptation Science Center (PI-CASC), the PDKE Stewardship team are addressing these concerns through the following two objectives:

- Improve the availability and usability of climate data and tools for informed decision-making, and
- Apply participatory scenario planning in Hawai'i to guide climate adaptation in natural resource management.

Methods

We are following a proven co-production approach, beginning with a literature review of scenario planning methods to identify those best suited for climate adaptation. This is informing collaboration with local partners in Hawai'i to co-develop climate knowledge products that support adaptation planning (Fig. 5).



Figure 5: The PDKE team meets with local partners from the Keaukaha-Pana'ewa community on Hawai'i Island to discuss adaptive, community-centered solutions to climate impacts.



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