Preparing for Climate Change with Scenarios: A Marin County Case Study

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Sara Moore writes about using scenario planning as a useful tool for envisioning possible futures under different climate change scenarios and highlights a recent climate change scenario planning exercise with resource managers in West Marin. Sara’s work at the UC Santa Cruz Zavaleta Lab is focused on studying decision-making tools available to resource managers to help them prepare for climate change.

Given the inherent complexities of the climate system, and the many social, economic, technological, and other factors that affect the climate system, we can expect always to be learning more and to be facing uncertainties regarding future risks. This is not, however, a reason for inaction. Rather, the challenge for society is to acknowledge these uncertainties and respond accordingly, just as is done in many areas of life. For example, people buy home insurance to protect against potential losses, and businesses plan contingently for a range of possible future economic conditions.

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Aggressive emissions reductions would reduce the need for adaptation, but not eliminate it. Climate change is already happening, and additional changes can be expected for all plausible scenarios of future greenhouse gas emissions.

- “America’s Climate Choices” (p. 2-3), the final report of a series of studies requested by the U.S. Congress, released May 12, 2011, by the Committee on America’s Climate Choices of the National Academy of Sciences’ National Research Council.

The authors of “America’s Climate Choices” are directing decision-makers to prepare for inevitable but uncertain climate change. How do you prepare for an uncertain future? The businesses which plan contingently for a range of future conditions referred to in this opening statement are probably employing the “scenario planning” tool. Scenario planners imagine multiple futures created by both inevitable change and highly uncertain, critical factors.

This planning tool was pioneered first by the military and then adopted by business. Royal Dutch Shell used scenario planning to prepare for contingencies such as the fall of the Soviet Union, putting it at a comparative advantage when that unexpected event came to pass. Now climate change planners are employing this tool to make decisions robust to multiple climate futures.

The scenario planning consultant used by Shell, Global Business Network (now GBN/Monitor), coaches its clients to create useful scenarios by identifying the factors critical to decision-making, sorting them into “certainties” and “uncertainties,” and using the top-most critical and uncertain factors to build scenarios. For example, an increase in the earth’s surface temperature is a relative certainty, but the
behavior of rain under climate change is both critical and uncertain. Managers might want to plan for a warmer world with both sparse, frequent rain and prolonged drought punctuated by floods. Prioritizing flood control measures would prepare for one future, prioritizing water efficiency measures would prepare for both. Both measures may be necessary, but water efficiency might be assigned greater urgency after considering the different plausible futures.

After preparing its Climate Adaptation Strategy, the State of California became interested in scenario planning as a tool for resource management, and in 2010 I began organizing a one-day scenario planning exercise as part of the state’s climate vulnerability assessment. My principal investigators Erika Zavaleta (UCSC) and Rebecca Shaw (EDF) and I selected the protected areas of West Marin County as our case study site, calling the exercise The Futures of Wild Marin. We selected West Marin for reasons including its importance to the state (as the home of the iconic Muir Woods National Monument) and its mixture of management agencies (i.e., federal, state, county, water district). I followed the model of the scenario planning exercises of the National Park Service Climate Change Response Program, even hiring its facilitator from GBN. However, the park service exercises run three days, and we had only one, so some advance work was needed.

I recruited a team of ten resource managers and scientists working in West Marin to develop the scenarios in advance of the workshop. The team brainstormed critical decision-making factors, labeled them “certain” or “uncertain,” and determined the following as the most useful factors to define our scenarios:

“Certainties”:
- Temperature increasing,
- Sea level rising,
- Seasonal extremes increasing,
- Biodiversity declining.

“Uncertainties”:
- Onset of the dry season (earlier or later),
- Direction of strong wind (more easterly or more northerly, in some discussion groups later replaced with increased La Niña or El Niño conditions),
- Capacity to act in a resource management realm (the same or less, or significantly greater).

In January 2011, 35 local resource managers and scientists gathered to discuss the scenarios produced by these factors. The two climatic factors (dry season onset, wind direction) and their interactions were discussed first. Then we broke into groups to discuss the four climatic futures (earlier dry season and more northerly wind, later dry season and more easterly wind, etc.). The four climate discussion groups were split, and told either “you have a blank check to respond,” or “you have no more resources than you have now, possibly less.” As a result, eight scenarios were imagined. Groups gave their scenarios catchy titles (e.g., “Fryin’ and Cryin’,” “Club Marin”) and described them in terms of news headlines (e.g., “Muir Woods Burns”), and action steps (e.g., give penalties for overuse of water). A few top actions were reported back for each scenario. There was significant overlap in actions within the high
capacity scenarios and the low capacity scenarios, but notably “more collaboration” appeared in both high and low capacity scenarios.

Next, we set our criteria for prioritization, concluding that actions should be prioritized if they:

- Are flexible, robust to multiple scenarios;
- Implement the full adaptive management cycle (e.g., using monitoring);
- Are cost-effective;
- Have clarity of design;
- Are collaborative across silos.

After holding our brainstormed action steps up to the criteria, ten action steps were selected as priorities:

1. Create a regional and collaborative approach to adaptation.
2. Improve fire management.
3. Improve water management.
4. Improve early detection networks to control invasive species.
5. Improve connectivity, emphasizing protecting and restoring riparian areas.
6. Create a Rapid Response Team to work on restoration after climate events or other disasters.
7. Measure change over time to inform adaptive management (e.g., improve monitoring).
8. Integrate restoration with infrastructure, making sure they work together.
9. Develop a triage framework for allocating resources.
10. Create public-private partnerships, using the model of the National Resources Conservation Service.

These actions are part of a Statement of Agreement now circulating among the exercise’s participants, hopefully providing a basis for future collaboration.

In “America’s Climate Choices” the National Academy of Sciences stops short of directly calling for scenario planning, but the implications are clear: we need to plan for more than one future. The scenario planning tool is an excellent way to start conversations about preparing for the many contingencies of climate change. Even if you don’t have the opportunity to participate in an exercise like Futures of Wild Marin, ask yourself: What is equivalent to the fall of the Soviet Union in my own climate change planning work? What event is improbable, but plausible, and should it occur would put me in a completely different decision-making environment? What steps can I take now to prepare for that event? If you think through the stories created by those questions, you may be surprised where they take you.

For more information about the Futures of Wild Marin workshop or scenario planning in a resource management context, contact Sara S. Moore (saramoore@gmail.com).

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