Frequently Asked Questions about Scenarios and Scenario Development

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Why are we taking such a general approach to scenarios?

We are taking a broad approach to scenarios as a way serve both the needs of the modelers and the needs of the stakeholders. As our group has been working, we found that scenarios are increasingly of interest to scientists involved in environmental modeling and integrated assessments. We found only a sparse literature in this area, and found that a lot of research groups are struggling with the same issues we are encountering in SAHRA. We think our broad approach to scenarios will increase the relevance of our work to the broad research community. Further, work with stakeholders (including outside of SAHRA, e.g., with CLIMAS) indicates that stakeholders have difficulty with understanding and using scenarios correctly. We think our broad approach to scenarios will be of use to a greater variety of stakeholders, including in regions beyond those currently addressed by SAHRA models.

Why distinguish among types of scenarios? Which type of scenario are we supposed to use?

Scenarios can support a variety of purposes, requiring different types of scenarios. Generally, SAHRA researchers are most interested in Strategic Scenarios, which are aimed at identifying inconsistencies in the approaches used by different disciplines to describe components of a complex system. In this application, the specific scenarios are not so important, as long as they will highlight where model components need to be adjusted. Strategic scenarios are of limited interest to stakeholders, but of high interest to researchers. Stakeholders are most interested in Anticipatory Scenarios, which correspond to a highly subjective future that is achievable or avoidable only if certain actions take place. This reflects the adage, “The best way to predict the future is to create it.” These types of scenarios require defining some future conditions, and then using Expert Judgment or models to examine whether there are multiple pathways to achieving or avoiding the envisioned outcome. Note that models don’t generally work this way, i.e., backwards in time, or finding multiple common pathways to an outcome.

Exploratory Scenarios are an intermediate type of scenario, and are the most typical kind of scenario seen in application. They proceed into the future based on known processes of change and extrapolations from the past. They use clues from the past to work out the pathways that the future may take. These scenarios can make use of integrated models, and can incorporate Expert Judgment as well. Iteratively running Exploratory Scenarios is one way to approximate Anticipatory Scenarios. Exploratory Scenarios can also be used to compare outcomes from different alternatives that may distinguish specific scenarios (e.g., by changing vegetation coverage).

Why are so many non-hydrology concerns incorporated into the scenarios?

Stakeholders face many challenges beyond hydroclimatic variations. Those other concerns can often be even more important in water management than natural variability in supplies. Historical examples include changing social values (e.g., reflected in the Endangered Species Act), changes in governmental roles (e.g., the free market and states rights movements), technological developments, and the price of money (i.e., interest rates for investments). Stakeholders have made it clear that SAHRA scenarios need to acknowledge these other concerns.

Why aren’t we specifying a Most Likely Scenario? Why aren’t we running a Baseline Scenario with related High and Low Scenarios that are modifications of the Baseline?

Scenarios are not forecasts. It’s scientifically misleading to give people the idea that we can forecast the future decades ahead, especially when so many other factors can affect how water is managed (e.g., changing social values). For this reason, we do not specify a Most Likely Scenario. We have not determined yet whether any SAHRA scenarios will have probabilities associated with them; this is an emerging area of debate with the field of scenarios.

Scenarios are not sensitivity studies. A sensitivity analysis approach could begin with a baseline and adjust various attributes, one at a time, to examine the impacts of each individual component. In a scenario application, especially those encompassing multiple scenario categories (e.g., environmental, socioeconomic), that would require far too many model runs to be practical. Further, we heard from stakeholders, specifically and clearly, that simply running historical periods or slight variations thereof, through SAHRA models will not produce scenarios that are useful for their needs.