

**To understand climate change adaptation we must characterize climate variability. Here's how.**

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## **Supplementary: Recommendations for collaborating with communities**

### **1. Collaborating with communities in data collection**

We recommend researchers consult with communities about what kinds of climate hazards are salient to them and when these last occurred, to ground-truth how satellite and station data translate into on-the-ground experience<sup>1</sup>. Consultations need not involve months in the field, but rather can use rapid-assessment techniques: a few days in the field can be sufficient to produce a timeline for locally salient hazards—especially when following best practices for these short trips, which will often include working with community leadership and/or local organizations and institutions<sup>2</sup>.

**Establish relevant hazards.** Focus groups and individual interviews are efficient ways to identify the types of climate events that are locally salient. In focus groups, a participant can nominate an important local climate hazard and other participants can agree or disagree with their nomination. Researchers can also collect data relevant to the climate characteristics outlined here—for example, with respect to autocorrelation: When one thing happens, does that mean another will soon? In individual interviews with a subsample of the community, researchers can ask participants to list locally salient hazards (e.g., heat, heavy precipitation/flooding, drought, tropical storms); a salience index such as Smith's S offers an objective way to identify the most salient from among these lists.

**Construct time series of events.** Focus groups and two kinds of individual interview—interviews with local experts followed by triangulation interviews with other community members—can be used to construct time series of locally salient events. Recall tends to be poor for events further in the past, as most people have difficulty estimating the frequency of events<sup>3</sup> or reporting any but the highest DIMS events<sup>4,5</sup>. In focus groups, participants can compare memories and construct a time series of events; to promote recall, participants should begin with the most recent event and work backwards in time<sup>6</sup>. Researchers can have local experts in the community, who may have more accurate recall, list low frequency or low DIMS events. Afterward, in individual interviews with non-experts, researchers can ask participants whether they recall each event from the list generated by experts, as well as for further details, such as whether other, similar types of hazards have struck the community, what impacts they had, and what adaptations community members used.

**Climate change adaptations in use.** In focus groups and individual interviews, researchers can ask participants about the strategies they use to respond to the events named and what kinds of events they plan for. This descriptive data can provide a first-pass on the relationship between adaptations in use and characteristics of local climate.

## 2. Collaborating with communities

With the information provided by community-collaborative research, organizations and policymakers can work with communities on next steps that will support them as they adapt to projected climate change. Key here is the word “projected”: adaptations communities are using now may reflect climate conditions further in the past, when anthropogenic impacts on climate were less pronounced. Going forward, communities can expect “certain uncertainty” beyond known climate risks<sup>7</sup>. For example, aerosols (from poor air quality) and changes in land use may impact local experiences of climate change in the future, but there is substantial uncertainty in their projected impacts<sup>8,9</sup>.

As a first step, researchers should consider (1) reviewing changes in the relevant climate hazards and characteristics under different levels of warming, and then (2) while emphasizing the relevant range of uncertainty in projections, sharing this information with communities to help community members envision future conditions. Projections from publicly-available climate model simulations (e.g. Coupled Model Intercomparison Project (CMIP6), or Coordinated Regional Climate Downscaling Experiment (CORDEX)) can be useful in this regard<sup>10</sup>.

After reviewing existing climate data and future projections with communities, we recommend that researchers continue to play a supporting role as communities discuss future plans, assess their adaptive capacity, and seek funding. Communities may already be discussing candidate adaptations; however, if they are not, freely available guides can facilitate these conversations (e.g., <https://wayfinder.earth/>). An assessment of community adaptive capacity, or ability to deal with change, can also help communities think about the future (e.g., <https://mccac.ca/community-climate-resilience-self-assessment/tool/>; <https://toolkit.climate.gov/>). Communities can then leverage the historical and projected climate information researchers provide, candidate adaptations they discussed, and self-assessment results to seek funding—and researchers can often help communities find funders and write grants.

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