Making Waves in Equitable Coastal Resilience:
A National Workshop on Social Equity and Coastal Resilience
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Metrics and Mapping of Equity and Coastal Resilience

Summary: Grant applications are increasingly scored using equity, justice, or vulnerability indices that rely on national or aggregate data. However, data at the national level may not translate to the needs of a community. There is a need for metrics that can be applied locally and validly capture the local conditions. Scale is a fundamental consideration as national metrics do not translate to the state level as actionable or transferable, nor do state-level metrics apply consistently to local levels. Of primary concern are logical consistency (e.g., the blurring of metrics when an underserved population may be diluted in representation by adjoining jurisdictions), such as the Modifiable Areal Unit Problem (MAUP) in geography and gerrymandering in political representation, and logical fallacy when metrics at one scale are assumed to represent conditions on the ground at a finer scale. In addition, communities such as neighborhoods are often not conducive to quantitative areal units such as census tracts, block groups, or blocks; overreliance on quantitative spatial indices may confound meaningful action and decision-making. As the resilience landscape is dynamic, data collection must be continuous and ongoing.

Issues and Recommendations for Research and Practice

① Tailored approach to metrics that addresses issues of context, scale, and currency

We need to measure equity and coastal resilience with tailored approaches, not relying on one-size-fits-all. Indices developed at the national level, such as the Social Vulnerability Index, may not have sufficient resolution or community granularity, such as in rural areas. National-level indices based on larger-scale data can be dated and have high margins of error when applied to local geographies. We need appropriate metrics for the context, application, and users.

Recommendations:

- Develop and use tailored indices that consider the community's needs, utility for the application, and end users.
- Identify data, such as elevation, property-specific information, and school quality, that are increasingly becoming available and that can be integrated into context-specific metrics.

② Qualitative, community-embedded, and co-production approaches to defining metrics and collecting data

Climate resilience, vulnerability, and risk should be defined and measured through communities' viewpoints and perceptions. Identify, value, and leverage existing community-based preparedness and non-institutional coping mechanisms. Project evaluation indicators should also be based on local framings and realities. Qualitative methods and data deserve more recognition in resilience, equity, policy, and planning practice. Qualitative methods allow recognition and integration of the lived experiences of people and communities for whom measurement and data are intended to support. Integrating traditional and/or place-based knowledge with Western ways of doing science, data

collection, and analysis is needed. Communities know their pain points and spatial hotspots better than any single index, and enlisting community participants through crowdsourcing, citizen science, and other means (walks, fairs, events, etc.) can provide planning and researchers with myriad data as well as promote inclusiveness, representation, and agency. If quantitative analysis is not married with additional qualitative data, resulting models and tools will only take you so far.

Recommendations:

- Identify and engage users and producers of metrics and data in discussions about methodologies and applications.
- Use a combination of quantitative and qualitative methodologies and data.
- Expand co-production approaches, such as through the application of Traditional Ecological Knowledge (TEK) beyond current use in tribal and indigenous communities.
- Utilize participatory action research and qualitative methodologies such as ethnography.

③ Labeling communities

There are concerns about the potential negative implications of using quantitative indices and labeling communities as at-risk, under-served, under-resourced, or socially vulnerable. Communities labeled as such may not understand how it applies to them and may not want to be seen in that particular way. Such labels raise concerns for further marginalization (e.g., negative impacts on business recruitment, economic development, or other investment, and that such labeling could exacerbate existing 'brain drain' problems). Different labels may resonate differently with different groups.

Recommendation:

- Be sensitive to concerns about labeling a community by discussing with key informants, community representatives, and community leaders which labels may be appropriate and how these labels are perceived.

④ Broader definition, measurement, and modeling of equity and resilience

More comprehensive definitions and measurements of resilience that consider not just the hazards but also infrastructure, health, safety, etc. are needed. This allows better understanding of risk, vulnerability, and resilience, and how different populations are affected. Information, such as on the state of the infrastructure, would help with resilience assessments. Since these data are often proprietary and not easily obtained, they are rarely used in vulnerability and resilience frameworks. We also need to approach definitions and measurements of resilience as a process and not just an outcome. We need to encourage consideration of factors that contribute to vulnerabilities (e.g., policies, practices, barriers to access to funding, etc.). A focus on restorative justice helps to identify and address the historic drivers of systemic injustices causing differences in vulnerabilities across groups and communities.

Recommendation:

- Develop definitions, frameworks, and measurements of resilience that have an equity focus.

⑤ The right metrics for the right application with the right methods and data

We need to identify appropriate problems, questions, and methodologies. appropriate for different uses. Common tools and metrics may readily allow for numeric comparisons but also may not capture reality as well as qualitative data or information.

Recommendation:

- Recognize the limits and applicability of different methods and data to ensure appropriate application.

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