RECOMMENDATION: Nested Coastal Observatory System (NCOS)

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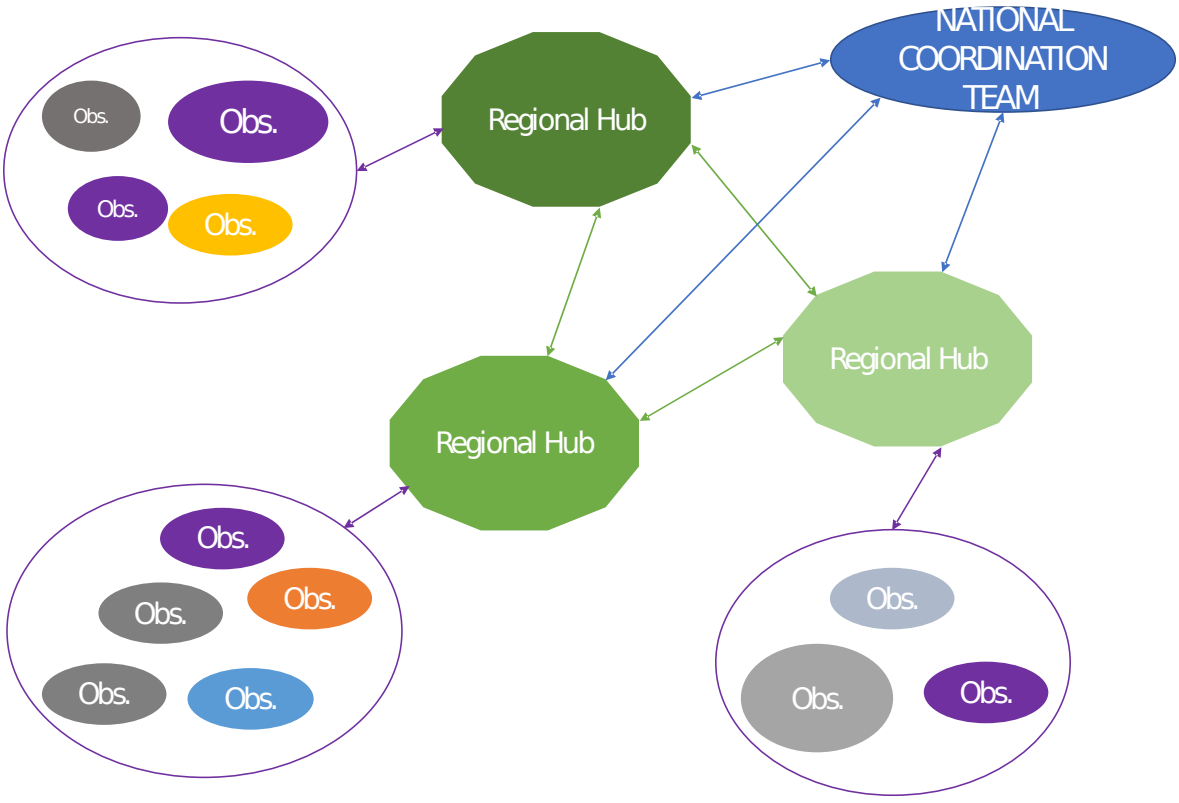
The goal of the Nested Coastal Observatory (NCOS) is to design relevant solutions for generating resilient coastal communities. Formation of the "nested" coastal observatory system structure will enable the co-development of coastal solutions for local communities. In addition, the collective knowledge of the regional hubs will inform the local communities and vice versa.

Local stakeholders and decision-makers often require data on spatial scales as small as at the individual parcel level. However, data analysis at the regional scale is important for identifying larger trends. The Nested Coastal Observatory System (NCOS) addresses the need for both data at the smaller scales necessary for managers, and at the larger scales necessary for regional synthesis. This nested data collection and analysis structure, along with continuous communication and collaboration between local stakeholders and academic scientists, ensures the capacity to collect and process data to address both the needs of both communities.

<u>NCOS Structure:</u>



Observatories

The observatories will be a collection of local communities and towns, which apply to be an official observatory in the NCOS system. They will propose the coastal issue(s) that are most critical for the community to address and what they would contribute to a regional hub. The observatories will co-develop their critical questions on coastal adaptation with input from local stakeholders, researchers, NGOs, etc. They will determine the data needed to answer their proposed questions and they then conduct a data inventory to identify data gaps. Convergence of data from many disciplines: local context, ecological, economic, governance, cultural, heritage, etc.

Regional hubs

The regional hubs will be geographically-distributed locations responsible for data coordination, team convening, collating best practices and training. The hubs will each have a dedicated staff that assists the observatory members, including: a research coordinator, an education & outreach coordinator, and a budget manager. The hubs will also serve as demonstration sites for local communities and educational institutions.

National coordination team

Representatives from the regional hubs will form the coordination team. This will be a virtual, distributed unit that includes members from each regional hub and meets periodically to coordinate nationally.

The NCOS structure will also have a Data Management and Accessibility Plan that focuses on organizing existing data on ecological, social and biogeochemical (data mining) from the local observatories to a regional level. It also establishes consistent protocols (e.g., National Estuarine Research Reserve System marsh monitoring protocols) for monitoring data collection at the local observatories. This data structure consolidates the data at a regional level to address data gaps at the local community level while providing open access. NCOS also will have a comprehensive and enforced data sharing plan that covers the technical reporting (e.g., to local/state agencies), peer-reviewed publications, and a summary of deliverables and community solutions.

Funding mechanisms within the NCOS are based on a four-tier structure. New projects will begin at the pilot stage, with a small amount of NCOS funding to explore the feasibility of the creation of a site-specific coastal observatory. During Tier 1, interested parties (i.e., a combination of local stakeholders and interdisciplinary scientists) will evaluate the existing data, studies, and literature on an area. An integral part of this evaluation is to engage in consultations with local stakeholders as well as the Regional Hub to establish what existing research and studies are available beyond the scientific literature. They shall ascertain whether there are locally perceived resources through collaboration with local community members, NGOs, and an interdisciplinary group of researchers interested in cooperating with the creation of an Observatory. The second tier of funding provides for the specific identification of data needs. The interdisciplinary Observatory team will co-identify research gaps along with local stakeholders and co-prioritize research foci with the Regional Hubs. During Tier 2, the team shall finalize their research questions in collaboration with local stakeholders

and interdisciplinary teams. Tier 3 comprises the data collection phase of the project. This stage encompasses the research process, including data collection, analysis, the writing of official reports, and the dissemination of findings through the peer-reviewed process. Extensive outreach and dissemination take place in Tier 4, with the translation of findings back to invested and stakeholder communities. Tier 4 is comprised of outreach and deliverable local solutions. The key to this Tiered research process is repeated, continuing, and iterative collaboration between Observatory team researchers and local groups and stakeholders. Community involvement is central to each stage of the research project for all endeavors that take place through the NCOS.

Impacts & Justification

Utilizing a nested approach to research enhances convergence at multiple scales and fosters interdisciplinarity. Similarly, the nested research model of Community Observatories, Regional Hubs, and the National Coordination Team will complement community governance. These nested hubs will encourage research on multiple scales that will address vital research questions and meet community needs.

With sea level rise, changes to fisheries, and other ecosystem threats, coastal communities and ecosystems' resilience and long-term endurance is increasingly under stress. (Kirwan & Megonial,2013; Tebaldi et al, 2013; Tuler et al, 2008). However, extensive social science research demonstrates that nesting of communities (so they can best match the scales of issues and governance solutions) results in strong, long-enduring, resilient communities, especially in resource-dependent areas. (Ostrom 1990; 2012; Marshall 2008). Simultaneously, stakeholder engagement in research design and research process enhances the relevance of research to communities (Sabatier,1988; Zhang et al 2018). The key to successfully nesting communities is to ensure that research is conducted to support these communities and their needs. By creating a nested research structure, we can enhance the creation of appropriately scaled interdisciplinary research that provides the convergence necessary to support coastal community resilience

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