Identifying Priorities for Ecosystem-based Management in the Gulf of Mexico Through a Participatory Process

Identificando Prioridades para la Gestión Basada en Ecosistema en el Golfo de México a través de un Proceso Participativo

Identifier les Priorités pour la Gestion Écosystémique dans le Golfe du Mexique à travers un Processus Participatif

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EXTENDED ABSTRACT

In 2016 NOAA Fisheries released its National Ecosystem-Based Fishery Management (EBFM) Policy, affirming a commitment to support an ecosystem approach to management, applied at regional scales. To engage stakeholders in planning for EBFM and to support evolution of a holistic governance approach, the NOAA Southeast Fisheries Science Center initiated a series of participatory fisheries system modeling workshops with fishing communities along Florida's Gulf coast. The goal of this initiative is to increase information flow between scientists, managers, and stakeholders, in support of improved stock and ecosystem assessments. Through a series of workshops, conceptual flow diagrams of the ecosystem were developed in a collaborative setting among stock assessment scientists, social scientists, and stakeholders. The conceptual model-building exercise takes place in groups of 10 - 15 community members with participants of varying backgrounds and experiences.

The outcome of each workshop is a conceptual model representing the major components of the fisheries system and the linkages between those components. These models provide a framework for documenting stakeholder knowledge and scientific findings in the same currency, and act as a representation of the "ecosystem" in question. The models can be compared and contrasted across groups of participants with different backgrounds, to understand how different stakeholders perceive the system. Discussion revolving around the conceptual models also allows the scientific community to identify the major factors affecting fisheries, understand what people value in the system, and recognize key socio-ecological feedbacks. This information provides foundational pieces that are necessary for prioritizing user-inspired ecosystem research, informing the concept of optimal yield, carrying out risk assessments and management strategy evaluation, identifying key indicators, and assessing the effects of fishery management from a more holistic ecosystem perspective.

A pilot workshop series held in 2018 and 2019 was focused on the snapper-grouper fishery complex of the West Florida Shelf. Workshops with fishermen and community members were held in four Florida fishing communities: Pine Island, Madeira Beach, Panama City, and Destin. Parallel workshops with two groups of scientists and managers were held in St. Petersburg, Florida. A major finding from the initial workshops was that water quality issues, and in particular harmful algal blooms known as "red tides," are perceived to be major threats to sustainability of fisheries in the region. While the impacts of red tides on fish mortality are regularly incorporated into stock assessments, the participatory workshops brought to light a number of additional stakeholder concerns. Stakeholders have observed extensive habitat damage related to red tide, and have noted that recovery of fish populations has been increasingly delayed following recent and frequent red tides. A number of human health impacts were noted, including the direct effects of the harmful algal bloom toxins, as well as other bacterial infections which may be related to other pathogens associated with the bloom. Red tides are impacting not only the fish populations that commercial and for-hire fishing businesses are dependent upon, but other aspects of the fishing communities such as aquaculture activities, private recreational fishing, tourism visitation, local seafood markets, and real estate values. These additive or potentially synergistic impacts have further implications for the stock assessment, the ecosystem, and fishing communities as a whole. By leveraging resources and collaborating with state, federal, academic and private agencies, research has since been conducted to better understand the severe red tide events and their impacts on biological and human communities.

Information gleaned from the initial 2018 - 2019 workshops has already been useful for advancing ecosystem-based fishery management in the region. For example, scientists and stakeholders together were able to identify and fill critical knowledge gaps concerning the effects of red tide on ecosystems and fishing communities. Through these new collaborations, which include a partnership with a local citizen science organization, we have been able to substantially increase our monitoring of red tide and hypoxia zones on the West Florida Shelf. The data and findings resulting from this increased

monitoring can be incorporated into stock assessment and management of grouper and snapper species in the region. Overall, the participatory modeling approach is effective for defining discrete EBFM issues that were highest priorities for additional research and management consideration. At the same time, the approach is effective for engaging both researchers and stakeholders, and building synergies such as public-private partnerships to work toward common objectives.

KEYWORDS: Ecosystem-based fisheries management, snapper-grouper complex, water quality