

Outcomes from the Workshop to Improve Monitoring and Abundance Estimation of Fish Spawning Aggregations

Resultados del Taller para Mejorar el Monitoreo y la Estimación de la Abundancia de las Agregaciones de Desove de Peces

Résultats de l'Atelier Visant à Améliorer la Surveillance et l'Estimation de l'Abondance des Regroupements de Reproducteurs de Poissons

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EXTENDED ABSTRACT

The Gulf and Caribbean Fisheries Institute (GCFI) and National Oceanic and Atmospheric Administration (NOAA) have sponsored a series of workshops over the years to help improve data-limited assessments in the Gulf and Caribbean region. This year's GCFI-NOAA workshop to improve the monitoring and abundance estimation of fish spawning aggregations (FSAs) in the Gulf and Caribbean region was held in Punta Cana, Dominican Republic during November 2-3, 2019. The workshop brought together expertise and diverse perspectives of 51 participants from 12 countries (Figure 1) to address the priorities and gaps to improve the scientific information of FSAs for fisheries management. A pre-workshop survey guided the framework of the workshop, and survey responses highlighted the interest and need training in the use of new technologies and methods to enhance the monitoring of FSAs (Figure 2). The workshop focused on two primary goals: 1) enhance the scientific capacity and networks within the GCFI community toward establishment of best practices in research and monitoring approaches for FSAs, and 2) evaluate the data requirements for fishery stock management and spatial management strategies that seek conservation and sustainable uses of fisheries in the region.

Workshop goals were addressed through a series of plenary discussions, break-out group exercises, and interactive case studies. Plenary presentations introduced workshop participants to emerging optical, acoustical and remote sensing technologies that can be used to improve scientific information on FSAs. Two plenary case studies highlighted successes in



Figure 1. Participants of the 2019 Gulf and Caribbean Fisheries Institute Workshop to Improve Monitoring and Abundance Estimation of Fish Spawning Aggregations held in Punta Cana, Dominican Republic in November 2-3, 2019.

long-term assessment and monitoring programs for FSAs. Breakout group discussions gave participants the opportunity to design a monitoring program for a hypothetical fishery, as well as provide advice for a number of real-world FSA management scenarios. Breakout sessions also established criteria for survey and monitoring designs for data streams that could inform stock assessments, and identified high priority actions that could help fill important information gaps to improve the conservation and management of FSAs.

Considerable discussion was focused on the need to address the information gaps associated with the spatial uncertainties in the assessment of FSAs. The size and extent of many FSAs are often only periodically assessed, leaving gaps in survey data for detecting trends and dynamics in FSAs that could be linked to management actions. Cost-effective tools and survey designs were discussed to better understand the spatial-temporal variation in FSAs, especially at a time with environmental changes in response to climate change. There was also discussion on how to characterize FSAs populations with limited resources, and to assess their potential recovery when adequate management practices are implemented. There was consensus that cost-effective technologies can improve FSAs monitoring and biomass estimation, and data on length compositions and sex ratios would be most useful data to enhance assessments of stock status and/or trends. More tagging and genetic studies are needed to understand how FSAs might represent status and

trends of the population, particularly in terms of connectivity across geopolitical boundaries. Finally, concerns were raised during the workshop that highlighted the need for new technologies for monitoring illegal fishing activity and enforcement of protected FSAs.

Throughout the discussions to improve monitoring programs and scientific information for informative FSA assessments, specific attention was paid to the varying levels of funding and staffing resources available for fisheries management among the countries of the wider Caribbean region. Developing networks of collective expertise and collaborative studies remain the more cost-effective strategy to build consensus on the best practice and scientific capacity toward the goal of improved FSA assessments. The workshop participants have collectively provided recommendations built upon a rich history of recognition and ongoing research on the significance of spawning aggregations in maintaining healthy coral reef ecosystems across the Gulf and Caribbean regions. This GCFI-NOAA workshop and previous workshops provide the foundation to develop technical capacity throughout the region to optimize survey design and data collections with cost-effective technologies and methods for fisheries management decisions, and ultimately strengthen governance in the region for the sustainability of living marine resources.



Figure 2. Word cloud produced from responses to the pre-workshop survey to assess interest and priorities for improving assessments of FSAs.