# CONTRIBUTION 4.4

# Reflections on a Collaborative Program to Build Capacity in the Caribbean Fisheries Resource Management Sector

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## Abstract

Capacity development, a process by which an organization or institution strives to improve the skills of its professional staff, is often cited as a priority for strengthening fisheries and ocean management in developing regions, including the Caribbean. Needs span the disciplines of social, physical, and environmental sciences and include topics related to aquaculture development; marine spatial planning; data collection and analysis; geo-spatial technologies; and fisheries stock assessment (Montes and Sidman, 2019). These skills may be imparted to staff on-the-job and/or through participation in professional trainings, typically provided through partnerships among governments, regional institutions, and international organizations. Trainings are often of short-duration and provide participants with basic knowledge and exposure to needs-related concepts. Extended learning opportunities that provide cultural exchange, knowledge sharing, and incorporate user-defined projects can equip participants with greater expertise and added confidence to apply the knowledge gained, given sufficient support from their organizations or institutions.

During the past decade, the Caribbean Regional Fisheries Mechanism (CRFM) has prioritized capacity building, in part, through its support of a training program for fisheries management professionals at the University of Florida, undertaken through a cooperative agreement with Florida Sea Grant (FSG). This program has also benefited from the sponsorship of professional organizations, such as the Gulf and Caribbean Fisheries Institute (GCFI). The evolution of this capacity-building program from on-site to virtual learning platforms – made necessary in response to COVID-19 – is evaluated through a survey of former program participants. The paper explores the reach of the training program throughout the Gulf and Caribbean regions; the motivations that drive program participation; the ways in which learned skills are being applied; the personal and professional benefits that have accrued to former participants; and future training opportunities.

*KEYWORDS: fisheries management, capacity building, workforce development, training*

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# 1. INTRODUCTION

Capacity development, a process by which an organization or institution strives to improve the skills of its professional staff (human capacity), and their institutional development, is often cited as a priority for strengthening fisheries and ocean management in developing regions, including the Caribbean (Cicin-Sain et.al., 2000; Ansong et.al. 2021; Montero, 2002; Miquelajauregui et al., 2022). Needs span the disciplines of social, physical, and environmental sciences and include topics related to aquaculture development; marine spatial planning; data collection and analysis; geo-spatial technologies; and fisheries stock assessment (Montes and Sidman 2019). These skills may be imparted to staff on-the-job and/or through participation in professional trainings typically provided through partnerships among governments, regional institutions, and international organizations. Trainings are often of short-duration and provide participants with basic knowledge and exposure to needs-related concepts (Crawford et.al., 1993).

The Caribbean Regional Fisheries Mechanism (CRFM) has prioritized capacity building, in part, through its support of a Gulf and Caribbean Fisheries Professional Development Program (GCFPDP), undertaken through a cooperative agreement with Florida Sea Grant (FSG) at the University of Florida (UF). The main objectives of the training program are to promote knowledge/skills sharing and to enhance collaboration among organizations that promote fisheries resource management in the Gulf of Mexico and the Caribbean regions (Sidman, 2016; Montes and Sidman 2019).

Periodic evaluation helps measure the success of training programs in achieving their objectives (Phillips and Phillips, 2001; Eseryel, 2022; Passmore and Joao, 2015). Integrated evaluation provides a feedback mechanism between participants, organizers, and sponsors, and it helps to detect and manage issues effectively and timely. One of the most popular models for evaluating training effectiveness is the Kirkpatrick's model described in Figure 1 (Tamkin, et.al., 2002).

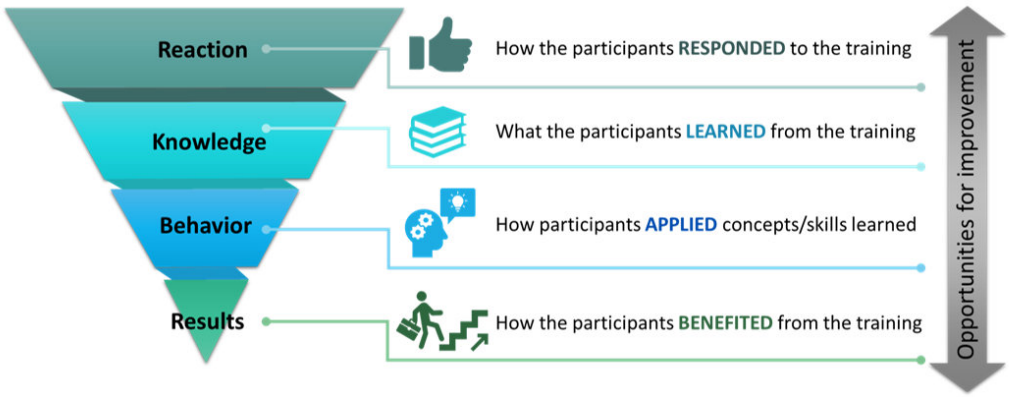


Figure 1. Modified Kirkpatrick's model

The Kirkpatrick model was originally developed in the 1950s, and it can be applied to evaluate any type of training/educational effort where participants are intended to apply the knowledge and skills acquired.

In this paper, we present the results of a recent evaluation of the GCFPDP, adapting the Kirkpatrick framework. Also presented are examples and summaries of how the knowledge and skills acquired during the training have been applied by participants, as well as recommendations and future opportunities.

## 2. METHODS

An online survey was circulated in June/July 2023 to former participants (n=21) of the GCFPD program (Figure 2). A pilot test was first conducted to assess the clarity of questions and to confirm the length of time to complete the survey. The questionnaire was approved by the UF Institutional Review Board (protocol #ET00019467).

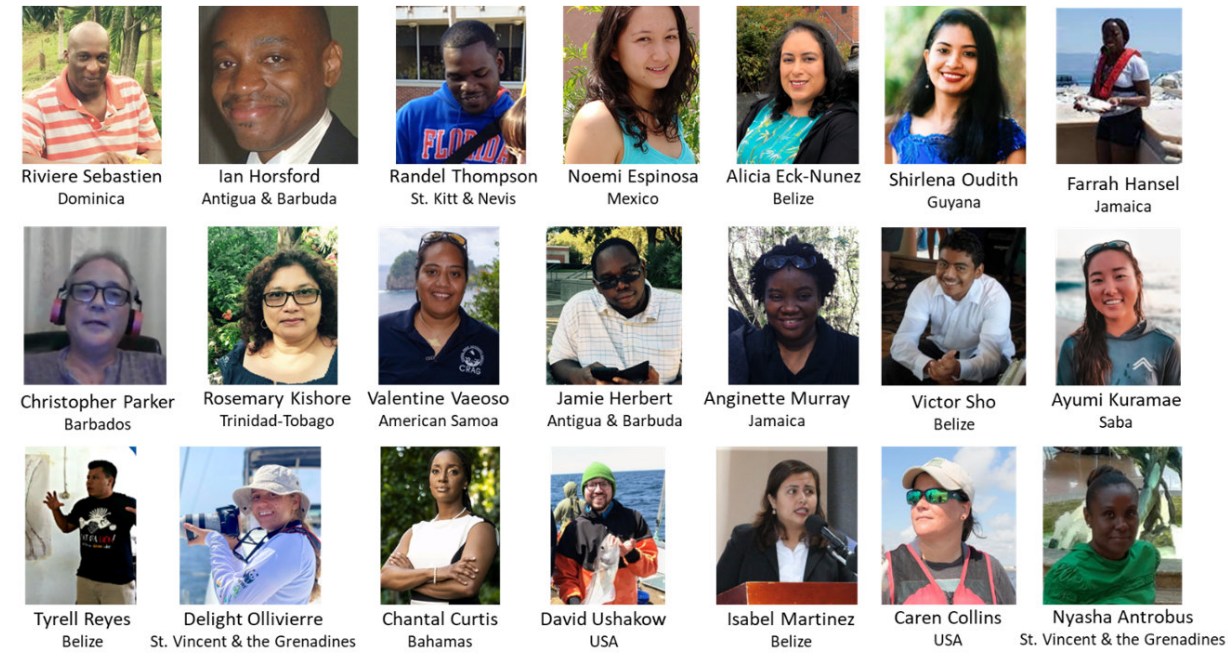


Figure 2. Program participants

The questionnaire was designed using the conceptual elements (evaluative levels) of the Kirkpatrick model as a framework to assess participant expectations and reactions, knowledge, behaviors, and results. An added level solicited information concerning learning barriers and program improvements that facilitated the collection of information categorized as "future opportunities." Due to the nature of the training program, which emphasizes individual capacity development, and constraints on the timing of the work, we omitted Kirkpatrick's organizational impact component in our evaluation. The online survey was created using Qualtrics software. Question types varied and included, check all that apply options, 5-point Likert scale items, open-ended responses, and one drag and drop question. Three survey invitation emails (containing the survey's link and the consent details) were sent to program participants (Dillman et. al., 2007). Analyses of survey data were conducted using the IBM SPSS software version 29.

## 3. RESULTS

A total of 20 out of the 21 former participants completed the survey (95% response rate).

**Level 1: Reaction**

Overall, the training program exceeded participant expectations (Mean=4.9 out of 5.0, SD=0.4, n=20). Participants also rated their overall experience and the quality of this training to be very high (Mean=4.7 out of 5.0, SD=0.4, n=20).

**Level 2: Knowledge**

The major professional goals for participants were to improve skills for their current job (77%), followed by job promotion (19%). Regarding participants' learning goals, most of them were interested in learning new technologies and quantitative methods (28%), improving their skills for conducting fisheries science (26%), learning new perspectives on fisheries (24%), and improving their knowledge pertaining to ocean resource management (14%).

Participants' professional goals (Mean=4.6 out of 5.0, SD=1, n=20) and learning goals (Mean=4.9 out of 5.0, SD=0.3, n=20) were largely met by the training.

All the respondents agreed with the statements related to sufficient information and communications provided prior to the training (Table 1). However, some of them either disagreed or were neutral regarding the statement about the application and UF registration process citing issues with understanding UF admission and course registration website tools.

Table 1. Degree of agreement with statements related to information provided prior to the training (n=20). Highest percentage per statement is bolded

| Statement | Strongly disagree | Disagree | Neither agree nor disagree | Agree | Strongly agree |
|---|---|---|---|---|---|
| There was an open communications channel between me and the training organization | 0% | 0% | 0% | 5% | **100%** |
| I understood the purpose of the training program at the start of the course | 0% | 0% | 0% | 26% | **79%** |
| I had enough time to prepare for the training | 0% | 0% | 0% | 47% | **58%** |
| The application process was straightforward | 0% | 5% | 5% | 26% | **68%** |
| The registration at UF was straightforward | 0% | 0% | 11% | **47%** | **47%** |

Regarding participants' experiences during the training, they all strongly agreed that the training organizers were helpful and responsive to their needs (Table 2). They were satisfied with the learning content and materials (95%), the professor/instructor were responsive to their needs (95%), and that they were given enough time to complete the training assignments (95%). Respondents also agreed or strongly agreed with the statement that the training materials and examples were inclusive to all backgrounds (90%) and that they were provided with enough resources to complete the training (85%). The questionnaire did not distinguish between the source of desired resources - their organization versus the training program.

Table 2. Degree of agreement with statements related to information/resources provided during the training (n=20). Highest percentage per statement is bolded.

| Statement | Strongly disagree | Disagree | Neither agree nor disagree | Agree | Strongly agree |
|---|---|---|---|---|---|
| Training organizers were helpful and responsive to my needs | 0% | 0% | 0% | 0% | **100%** |
| I am satisfied with the learning content and materials | 0% | 0% | 5% | 15% | **80%** |
| The professor/instructor was responsive to my needs | 0% | 0% | 5% | 15% | **80%** |
| I was given enough time to complete the training | 5% | 0% | 0% | 30% | **65%** |
| The training materials and examples were inclusive to all backgrounds | 0% | 10% | 0% | 40% | **50%** |
| I was provided with enough resources to complete the training | 0% | 5% | 10% | 10% | **75%** |

Most participants stated that the course(s) offered during the training were well organized (95%), easy to follow (85%), and engaging (85%) (Table 3). Responses to these questions are supported by the statistic that roughly 50% disagreed with the statement that their course(s) was overwhelming, Nonetheless, a significant number of participants expressed neutrality (30%) or agreed (20%) with the statement, suggesting that a portion of participants found the courses to be overwhelming.

Table 3. Degree of agreement with statements related to courses provided by the training at the University of Florida (n=20). Highest percentage per statement is bolded.

| The training courses were: | Strongly disagree | Disagree | Neither agree nor disagree | Agree | Strongly agree |
|---|---|---|---|---|---|
| Well organized | 5% | 0% | 0% | 30% | **65%** |
| Easy to follow | 0% | 0% | 15% | 30% | **55%** |
| Engaging | 0% | 5% | 10% | 20% | **65%** |
| Overwhelming | 25% | 25% | **30%** | 10% | 10% |

The major issues for participants included managing work responsibilities on top of the training (15%) and finding the time to complete the coursework (13%). Reduced networking opportunities, especially for online participants, was also cited (11%) (Figure 3).

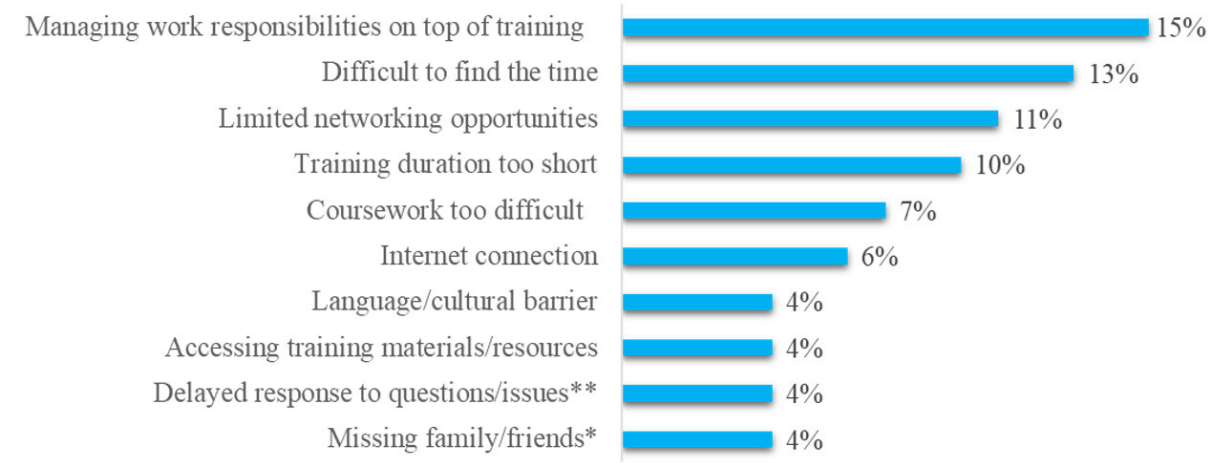


Figure 3. Top-10 issues encountered by participants while taking the training (** displayed only to online training participants; *displayed only to in-person training participants).

### Levels 3 and 4. Behavior and Results

Most participants were strongly agreeable to the statements related to the relevance of the concepts and skills learned in the training (Table 4). All agreed that the training was relevant to their job (100%), and that after they returned to work, they felt confident applying the topics and skills acquired during the training (95%), and that they had applied this knowledge in their current jobs (95%). Ninety percent also agreed that their career benefited because of participating in the training and 90% indicated that they would recommend this training to others. Moreover, eighty percent of participants would like to participate in another training course offered by UF.

Table 4. Degree of agreement with the statements related to the application of the skills/ knowledge gained in the training.

| Statements | Strongly disagree | Disagree | Neither agree nor disagree | Agree | Strongly agree |
|---|---|---|---|---|---|
| The training was relevant to my job | 0% | 0% | 0% | 5% | **95%** |
| I felt confident on the topic(s) at the end of the training program | 0% | 0% | 5% | 35% | **60%** |
| I have applied the concepts and skills learned in the training | 5% | 0% | 0% | 25% | **70%** |
| My career has benefitted as a result of participating in this training program | 5% | 0% | 5% | 20% | **70%** |
| I have recommended this training to my colleagues | 0% | 0% | 10% | 10% | **80%** |
| I would like to participate in another training program like this one | 0% | 5% | 15% | 5% | **75%** |

Participants were asked to provide examples of how they have applied the concepts and skills learned in the training (Box 1). A content analysis of these open-ended questions revealed several areas where the training had the greatest application impact: Management and policy (f=12); research and data analyses (f=8); and communication of research findings to natural resources users, colleagues, and political leadership (f=5).

*"I have provided feedback on national plans for the expansion of Marine Protected Areas and used skills learned about GIS software to provide updated marine spatial use maps that have been used to inform in-house decisions and also to develop internationally funded projects."*

*"I was able to better understand, explain, and manage the oyster fishery in my state. In my current position working with the commercial fishery, I have used it to better understand the impacts of regulations and communicate those perspectives to other fishery managers more effectively."*

*"Overall, the course helped me improve my writing skills and vocabulary so that I am able to better communicate scientific concepts more effectively with the public and fellow professionals."*

Box 1. Examples of comments related to how participants have applied the concepts and skills learned during the training.

A content analysis was also conducted for solicited comments regarding how the respondent's career has benefited from participating in the training (Box 2). The most common benefits listed by participants were obtaining a job promotion (f=7), increased confidence and knowledge of fisheries and management topics (f=6), and dissemination of training materials and concepts with coworkers and fellow national professionals (f=4).

*"As a result of the skills and knowledge gained from the training program, I have earned the respect of my colleagues/ stakeholders. I feel more empowered to share my thoughts and opinions and as a result I believe I am more involved as a team player within my department."*

*"Overall, the concepts and skills that I learned through this training have helped me more effectively communicate with other scientific professionals. I recently moved to a new agency to a position where I have more responsibility. In this position, I frequently use many of the ArcGIS, writing, and R skills that I learned in the program. Additionally, I use the knowledge I gained regarding fisheries management and stock assessments as I serve on a fisheries management plan committee with my new agency."*

*"I was able to share my experience and knowledge with other staff and together our approach to aquaculture management was different."*

*"My career has benefited from the networking and friendships developed from the training program. As a result of the training, the government created a post called GIS and Oceanography officer so that I am able to utilize the knowledge acquired to help the department."*

Box 2. Selected comments related to career benefits resulting from participation in this training.

# 4. DISCUSSION

The results of the survey indicate that the training program is largely performing well and meeting the job and career goals of the participants. Notwithstanding, some areas for improvement suggested by participants are summarized in Figure 4.

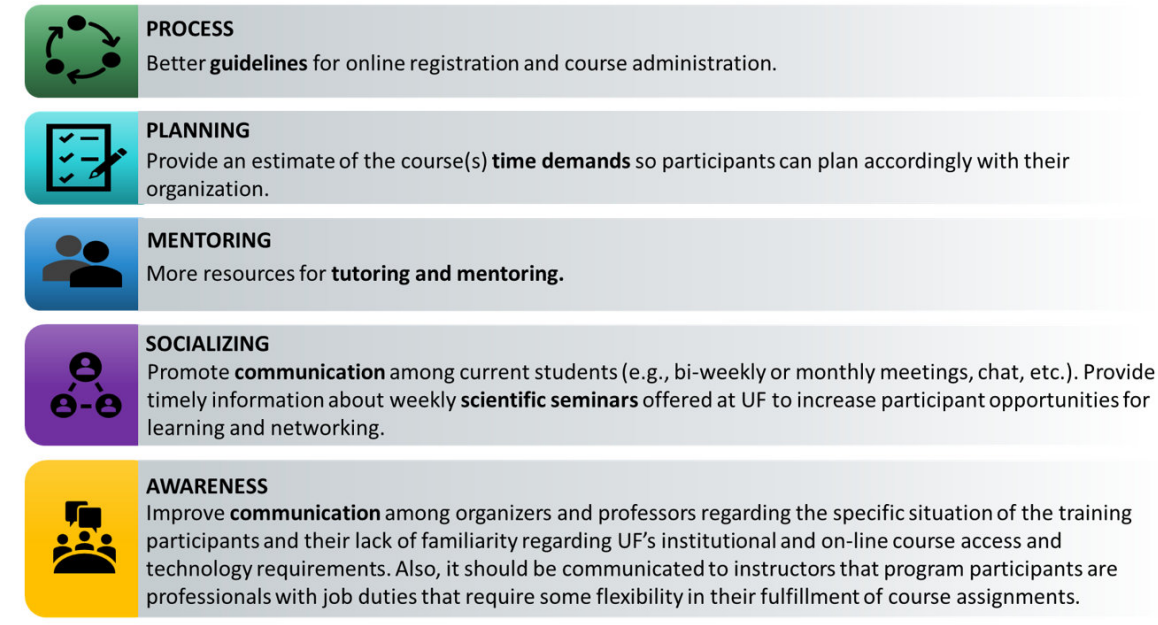


Figure 4. Suggestions provided by participants to improve the training experience.

The application of knowledge and skills is one of the most important aspects of the GCFPD program, aligning with one of the central layers of the Kirkpatrick training evaluation model. Although we used this model as a framework for our analysis, it is important to highlight that there are several factors that influence transfer and application of knowledge and skills, particularly for a distance-learning workforce development program like the GCFPD. Firstly, participants are already professionals, which can motivate a high degree of information transfer between them and their colleagues. Secondly, many participants had not engaged in an academic setting for some time, and/or the academic setting in their home country differs significantly to that in the U.S. This created learning barriers for some participants who were unfamiliar with on-line learning platforms or who had insufficient or intermittent internet access. Nonetheless, the longer-duration training opportunity (4-months) is viewed by participants to be highly satisfactory and is consistent with previous studies that found that this format of knowledge and skills transfer has worked well for strengthening human capacity in coastal management (Crawford et al., 1993)

The training program, managed by Florida Sea Grant and hosted by the UF's Fisheries and Aquatic Sciences Program, benefits from close collaboration with regionally encompassing yet locally grounded organizations, including the CRFM and the Gulf and Caribbean Fisheries Institute (GCFI). Together they support the program not only economically but also by circulating program announcements, vetting applications, and providing input on the topics to be covered, thereby ensuring that the training program remains relevant to the capacity needs in the region. CRFM and GCFI involvement is crucial for maintaining program visibility and recognition and sourcing talented applicants among the different countries in the Gulf of Mexico and Caribbean regions.

As described by Burke and Hutchins (2007), the success of this training program can also be attributed to the intellectual ability, self-efficacy, training motivation, and personality of the participants themselves. Vetting for these qualities is an important component of the selection process and benefits from the significant role played by the CRFM and the GCFI, which is augmented by a robust process of evaluation and selection. Training awardees are employed by a fisheries resource management NGO, ministry, or government agency, they hold at least a professional or bachelor's degree from an accredited college or university, and they are proficient in the English language. Furthermore, the application package includes a letter of endorsement and a description of their professional accomplishments, which further documents an applicant's credentials, motivation, and character to the selection committee.

Due to the nature of this program (transnational program with multiple participating countries and organizations), evaluating Kirkpatrick's level 4 results (changes in organizational measures) is a challenge (Phillips and Phillips, 2001). However, there is some indirect evidence to substantiate the applicability of this evaluative model. For instance, one third of participants learned about this opportunity through their supervisor or colleagues. Furthermore, in most of the applicant's endorsement letters we found evidence that the recipient organization values the opportunity for their employees to participate in this international training program. This is affirmed by (1) examples of how applicants would apply the knowledge and skills acquired in their jobs, and (2) letters of commitment affirming the support the applicants from their management agency or organization (e.g., allowing participants to set aside some work time, equipment, and resources to participate in the training).

In response to COVID-19, the program evolved from an in-person to a virtual learning platform. The online training option allowed the program to extend the opportunity to more awardees, and to explore expanding the length of this opportunity through online certification programs (3-4 courses) based on participant performance, interest, and funding availability.

Recent studies suggest that online courses can provide participants with similar outcomes to in-person options (Mallonee et al.,2018; Race et.al., 2021).

## LESSONS LEARNED

Working in collaboration with regionally relevant and locally grounded organizations such as the CRFM and the GCFI:

- Extends the reach, value and impact of the training experiences provided.
- Helps identify course offerings that are relevant to the needs of management agencies and their staff in the region of interest.
- Helps vet and evaluate application packets and identify the best suited candidates.
- Brought attention to the potential benefits of transitioning from in-person to online training, which has allowed for a substantial increase in the number of participants benefiting at a much-reduced cost.
- Provides the opportunity to extend single course training to online certification programs based on the participants academic performance and interest.

## ACKNOWLEDGEMENTS

We would like to thank the former program participants for taking the time to complete the survey and provide helpful input and suggestions to evaluate and improve the training program. We also thank the program awardees as well as their affiliated organizations for participating in the program. Special recognition is due to the CRFM (Milton Haughton, Susan Singh-Renton, and Sandra Grant), which helped conceive of the program and provided the impetus for transitioning the program from in-person to distance-learning curricula. We also recognize support from The Billfish Foundation and the longstanding contribution of the GCFI (Bob Glazer) and the Sea Grant Programs of Florida, Puerto Rico, Georgia, and Hawaii.

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