The Journal of Extension

Volume 58 | Number 1 Article 10

2-1-2020

Offering a Hyflex Fisheries Science Course for Stakeholders of New Jersey's Fisheries

Douglas R. Zemeckis
Rutgers University

Recommended Citation
Zemeckis, D. R. (2020). Offering a Hyflex Fisheries Science Course for Stakeholders of New Jersey's Fisheries. *The Journal of Extension, 58*(1), Article 10. https://doi.org/10.34068/joe.58.01.10

Journal of Extension
www.joe.org

February 2020
Volume 58
Number 1
Article #v58-1iw4
Ideas at Work

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Abstract

Introductory Fisheries Science for Stakeholders (IFISSH) is an Extension course for educating stakeholders of New Jersey's marine fisheries on the science, management, and responsible stewardship of fishery resources. The IFISSH course is offered in a Hyflex (i.e., hybrid and flexible) format to allow for live participation in class or remote participation via webinar, making the course available to a broader audience than what is possible when only one mode of participation is offered. The course serves as a useful model for Extension programming related to fisheries as well as other disciplines, particularly for those interested in serving diverse clientele over a broad geographic area.

Keywords: fisheries management, fisheries science, Hyflex, webinar

Douglas R. Zemeckis
County Agent III
(Assistant Professor)
Department of Agriculture and Natural Resources
Rutgers Cooperative Extension of Ocean County
Toms River, New Jersey
zemeckis@njaes.rutgers.edu

Introduction

Marine fisheries, both commercial and recreational, are vital industries that support many coastal communities throughout the United States. In 2016, these industries provided 1.7 million jobs, $64 billion in income impacts, and $212 billion in sales impacts in the United States (National Marine Fisheries Service, 2018). New Jersey has some of the nation's most valuable fisheries, with the commercial fishing and seafood industry having a $2.3 billion state economic impact and the recreational fishing industry having a $1.2 billion state economic impact in 2016 (National Marine Fisheries Service, 2018). With the high socioeconomic value of these industries, it is imperative that our country's marine fishery resources are responsibly managed to support the long-term sustainability of the industries and associated communities. Additionally, sustainable commercial and recreational fisheries are critical contributors to global food production (Cooke et al., 2018; Food and Agriculture Organization, 2018).

Federal fisheries management in the United States has contributed to rebuilding many depleted populations and reducing the frequency of overfishing (National Oceanic and Atmospheric Administration, 2018). Fisheries management has become increasingly complex, with rapidly advancing fisheries science frequently integrated into continuously evolving management processes. Previous Extension education programs related to fisheries have commonly focused on different fishing gears and behaviors (e.g., La Valley & He, 2008) or on providing seafood recommendations (e.g., Abeels et al., 2015). In contrast, few Extension education programs have focused on educating stakeholders on the complex fisheries science processes (e.g., stock assessment) and management processes affecting their industries. Therefore, I developed a course for stakeholders of New Jersey's commercial and recreational fisheries that is annually offered through Rutgers Cooperative Extension (RCE) to educate stakeholders on the science, management, and responsible stewardship of marine fishery resources so that they are better prepared to make progress on and get involved with issues affecting their industries (e.g., cooperative research, advisory panel participation, submission of public comments).

Hyflex Fisheries Science Extension Course

Inspiration for the syllabus of the RCE fisheries science course, or Introductory Fisheries Science for Stakeholders (IFISSH), which was first offered in 2018, came from the RCE Shellfish Gardener course, undergraduate and graduate level fisheries science courses from multiple universities, and the Marine Resource Education Program (MREP) (https://www.gmri.org/our-work/fisheries-convening/mrep-northeast). MREP offers excellent educational programming for fishing industry stakeholders in coastal regions throughout the United States. However, IFISSH meets the need for a more predictable, low-cost, and annual program tailored to issues affecting industries and resources on a state level.

The IFISSH course has been hosted annually since 2018 and takes place once per week in the evening over a 7- to 10-week period (i.e., course length varies annually) during the winter, when stakeholders' fishing businesses are least active. Each class session meets for 2 hr and includes presentations by up to three experts. Inclusion of a diversity of speakers from many different state, federal, and academic institutions provides participants the opportunity to learn from experts with a wide range of expertise and perspectives. A sample course schedule is shown in Figure 1.

Figure 1.

2019 Introductory Fisheries Science for Stakeholders (IFISSH) Course Schedule

(1) January 29: Course Introduction and Overview of Fisheries Science
Dr. Douglas Zemeckis (Rutgers University)
Historical and Contemporary Fisheries in New Jersey
Dr. Eleanor Bochenek (Rutgers University)

(2) February 5: Fisheries Biology and Life History
Dr. Chris Chambers (National Oceanic and Atmospheric Administration)
Dr. Douglas Zemeckis (Rutgers University)

(3) February 12: Fish Response to Changing Climate off New Jersey
Dr. Ken Able (Rutgers University)
Fish Behavior, Migration, and Stock Structure
Dr. Douglas Zemeckis (Rutgers University)

(4) February 19: Fisheries Oceanography
Dr. Josh Kohut (Rutgers University)
Dr. John Manderson (National Oceanic and Atmospheric Administration)

(5) February 26: Fisheries-Dependent Data: Commercial and Recreational
Josh O'Connor (National Oceanic and Atmospheric Administration)
Dr. Douglas Zemeckis (Rutgers University)
Dr. Richard Cody (National Oceanic and Atmospheric Administration)

(6) March 5: Fisheries-Independent Data: Bottom Trawl and Other Surveys
Dr. Gregory DeCelles (Massachusetts Division of Marine Fisheries)
Dr. Douglas Zemeckis (Rutgers University)

(7) March 12: Introduction to Stock Assessment
Dr. Olaf Jensen (Rutgers University)
Dr. John Wiedenmann (Rutgers University)

(8) March 19: Federal and State Fisheries Management
Jason Didden (Mid-Atlantic Fishery Management Council)
Mike Celestino (New Jersey Department of Environmental Protection)

(9) March 26: Ecosystem Approaches to Fisheries Management
Brandon Muffley (Mid-Atlantic Fishery Management Council)
Social and Ecological Factors in Fisheries Management
Dr. Bonnie McCay (Rutgers University)
Dr. Roger Locandro (Rutgers University)

(10) April 2: Perspectives of Fishing Industry Stakeholders

The IFISSH course is offered as a Hyflex (i.e., hybrid and flexible) (Beatty, 2014) course where registrants can choose to participate live in class or remotely via webinar. This Hyflex structuring permits participation by a diversity of clientele from throughout New Jersey and beyond. The webinar portion is executed using a Zoom Pro account (https://zoom.us/), and the auditorium is equipped with a Logitech GROUP Video Conferencing System that includes expansion microphones. The webinar system is operated through a main computer that also displays the presenters' slides for in-class participants and shares the screen so that webinar participants can see the presentation in addition to seeing the video and hearing the audio of the presenter. A moderator operates a second computer to cohost the webinar, including by managing questions from both in-class and webinar participants. Classroom setup and equipment used are shown in Figure 2.

Figure 2.

Classroom Setup for Hyflex Class Sessions

In 2018, there were 77 registrants for the IFISSH course, from five states plus Washington DC, including 16 counties in New Jersey. Evaluation results (*n* = 44 respondents, 57%) indicated that 93% of respondents agreed both that they were pleased that they had participated in the program and that the information presented was valuable. Additionally, 88% indicated that they planned to use or share with others what they had learned. In 2019, there were 64 registrants from eight states, including 11 counties in New Jersey. All course evaluation respondents (*n* = 35, 55%) agreed that they were pleased that they had participated in the course and that the information presented was valuable, and 94% indicated that they planned to use or share with others what they had learned. Additional long-term evaluation is in progress to document actual, long-term changes in behavior and attitudes.

Impacts on Extension

The IFISSH course has proven to be an effective means by which to educate stakeholders of New Jersey's fisheries on the science and management processes affecting their industries. Some keys to success have included appropriately timing the course during the evening and winter to minimize impacts on stakeholders' fishing activities and providing a course that includes a diversity of speakers and topics that address key issues frequently discussed or misunderstood by stakeholders. Most webinars permit only remote participation (e.g., Johnson & Schumacher, 2016; Lobley & Ouelette, 2017; Robinson & Poling, 2017), whereas the flexibility of the Hyflex format, by permitting live in-class participation or remote participation via webinar, was instrumental in making the course accessible to a diverse audience from multiple states and multiple counties throughout New Jersey. The Hyflex format also has been implemented with other ongoing RCE education programs (e.g., Shellfish Gardener, Marine Extension Program Seminar Series).

The IFISSH course can be implemented in other coastal states, and nationwide for freshwater fisheries, to educate stakeholders on the science and management issues related to local and regional fisheries. In fact, Sea Grant educators in North Carolina implemented a pilot version of the program in 2019 (S. Baker, personal communication, March 28, 2019). Additionally, this educational model and use of the Hyflex format can be applied to educational programming related to many other Extension disciplines and will be

particularly valuable to those needing to serve diverse clientele over a broad geographic area.

Acknowledgments

Thanks to Kelly Jurgensen (Rutgers Cooperative Extension of Ocean County) for her assistance with planning, coordinating, and executing the IFISSH course. The Alampi Fund through the Department of Agriculture and Natural Resources, Rutgers Cooperative Extension provided funding for the video conferencing equipment. Thanks to all guest lecturers for sharing their knowledge, and thank you to all of the registrants for participating in the course.

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