

*Voyage into science*

# MARINE QUEST



Virtual Event

# SCHOOL DAZE 2020 SESSION CATALOG

# Session Schedule

**9:45 - 10:15 am**

A Day in the Life of a HAB Sample

Fisheries Dependent News 19

FKI: Fish Kill Investigation

FWC Law Enforcement

**10:30 - 11:00 am**

Electron Microscopy

Freshwater Plants

FWC K-9 Program

Offshore Fisheries Monitoring

Stock Enhancement

**11:15 - 11:45 am**

The Eastern Oyster

Horseshoe Crabs

Inshore Fisheries Monitoring

Marine Turtles

Walk Through a Coastal Wetland

**12:00 - 12:30 pm**

Florida Biodiversity Collection

Florida Panther

Name that Fish

Stone Crabs

What Makes a Good Habitat?

**12:45 - 1:15 pm**

Age and Growth of Fish

Coastal Wildlife Conservation Initiative

Manatee Rescue

Survival of Seagrass

**1:30 - 2:00 pm**

Blue Crabs

Coral Reefs

Marine Fish Biology

Niche Finder

# A Day in the Life of a HAB Sample

After an introduction about what microalgae are, how important they are, and how some species may form Harmful Algal Blooms (HABs), the students will watch a show-and-tell video about “A day in the life of a HAB sample”. This video will demonstrate how we take water samples from a boat and from a pier, what we do to analyze the sample for cell counts and toxins, and how they can find information about red tide themselves. The activity will conclude with a decision tree game where the information provided will be revisited in an interactive manner.



## Learning Points

1. Marine microscopic algae come in all shapes and forms, are the base of the aquatic food web, and responsible for the air we breathe; but that some of them may form blooms that have harmful effects to wildlife and human health.
2. *Karenia brevis*, the red tide organism, and its toxin are invisible to the naked eye so that from a water sample we need a microscope to see and count how many cells we can find and specific chemistry methods to detect the toxin.
3. Students can find a lot of information about red tide and other HABs on their own.

# Fisheries Dependent News 19

Fisheries Dependent Monitoring (or FDM for short) biologists work outdoors with anglers and fishermen all throughout Florida. To show some footage from biologists in the field, FDM created a pretend news station – “FDM News-19” – to give students firsthand answers to the who, what, where, why, and how behind the work we do to monitor Florida’s fisheries. During MarineQuest, news anchor Anne Chovvy will be live to guide you through a series of interviews, reports, and videos with FDM scientists playing the roles of biologists, fishermen, and more. You dolphintely don’t want to miss this oh-fish-al FDM news report – it’s a fin-tastic oppor-tuna-ty to learn about Florida’s fisheries and sustainability!

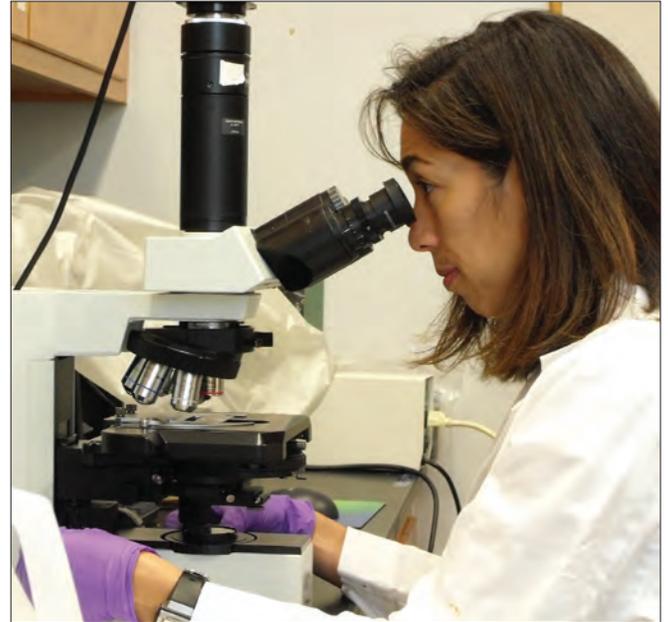


## Learning Points

1. The difference between recreational and commercial fisheries.
2. We monitor a wide diversity of fisheries across the state of Florida, from Pensacola to Key West and up the Atlantic coast. We study these fisheries by gathering data from recreational and commercial fishers directly and by sampling the fish they catch and keep.
3. It’s important to study recreational and commercial fisheries in order to manage our fisheries sustainably.

# FKI: Fish Kill Investigation

In this episode of *FKI: Fish Kill Investigation*, join Fish and Wildlife Health scientists on a quest to solve a fishy case in Florida waters! We'll record conditions at the scene and look for environmental clues in the field. Then we'll bring physical evidence back to the laboratory and use a variety of methods to track down the offender. You'll see how different tools work to unravel the mystery, explore factors that contribute to fish diseases, and learn ways you can help scientists study fish kills around the state.



## Learning Points

1. Learn about the tools we use.
2. A general covering of some of the factors that cause fish disease.
3. How you can help scientists.

# FWC Law Enforcement

FWC officers and investigators protect fish, wildlife and their habitats as well as Florida's residents and visitors. They provide service on Florida's waters and state-owned lands, including wildlife management areas, state parks and state forests. FWC officers patrol more than 34 million acres of state and private lands, protecting game and non-game wildlife, as well as endangered species, like the Florida panther. FWC officers are responsible for patrolling all of Florida's woods, including public and private lands, as well as its waters, so they must be well versed on a wide variety of topics and information. It is this blend of resource protection and law enforcement that makes the FWC Division of Law Enforcement unique.



## Learning Points

1. Officer's responsibilities and duties.
2. Academy and training, including specialty units.
3. Boating safety.

# Electron Microscopy

Electron microscopy explores the microscopic world! Students will be introduced to plankton and why it is so important to study something that is too small to see with our bare eyes. We will showcase the three types of microscopes used here at the institute and explain how each one works. Students will also view harmful algae and other marine specimens through the eyes of these different microscopes. Finally, students will participate in a game of 'What am I?' where they can try to identify microscopic organisms and structures that we see in real life!



## Learning Points

1. Why are phytoplankton important?
2. How can they be harmful?
3. What is the difference between a light microscope and an electron microscope?

# Freshwater Plants

Our Freshwater Plants crew is going to take you in the field to learn about aquatic plants! Join us on a boat ride where we will introduce different types of aquatic plants, explain the importance of plants in our ecosystems, and teach you how you can help the environment! We will also show you what our biologists do on a typical field day. So come along with us on a day in the life of a plant biologist!



## Learning Points

1. Why plants matter.
2. How plants adapt.
3. What plant biologists do.

# FWC K-9 Program

The FWC K-9 Program consists of specially trained K-9s that compliment the FWC mission. FWC K-9s are highly skilled and receive advanced training in evidence recovery, article searches, human tracking, wildlife detection, and resource detection. The K-9s receive no aggression training and are very “user-friendly.” In addition to their law enforcement functions, they have proved to be a great community-oriented policing relations tool.



## Learning Points

1. The history of FWC's K-9 program.
2. The three disciplines our K-9's are trained in.
3. Some differences between the mainstream patrol dogs and our K-9's.

# Offshore Fisheries Monitoring

During the Fisheries-Independent Monitoring (FIM) offshore presentation, students will learn about a variety of research methods conducted by scientists to study the Eastern Gulf of Mexico. FIM offshore research focuses on identifying various sea floor habitats and fish populations that are sampled using different techniques such as sidescan sonar, underwater camera arrays, and bottom trawls. The students will learn about different ocean habitats and how fisheries biologists sample them. We will discuss the importance of long-term monitoring and how these data are used to provide information for making decisions about fishing rules and regulations.



## Learning Points

1. How FIM scientists map the ocean floor.
2. Why cameras are used and what information they gather from them.
3. What a trawl is and what data are collected by using one.

# Stock Enhancement

Students will learn some basic concepts of aquaculture, marine research and how stock enhancement supports Florida's marine fisheries. During this program students will explore the FWC stock enhancement hatchery to learn how red drum spawn eggs in captivity, how red drum eggs are grown to small fish in the hatchery, and how the hatchery fish are released into the wild. Students will also learn about the benefits of fish habitat and how to become stewards of our natural resources.



## Learning Points

1. What is Stock Enhancement and why is it important.
2. Aquaculture techniques and how we you raise the fish.
3. The importance of 'habitat' on released hatchery fish.

# The Eastern Oyster: A Keystone Species in a Dynamic Ecosystem

This presentation will discuss the eastern oyster (*Crassostrea virginica*) and how it is considered a keystone species, along with defining what a keystone species is. We will discuss many impacts, natural and human made, that affect the health and survival of oyster reefs. These concepts will be visualized utilizing an interactive estuary map and a prop arch way to demonstrate the keystone species concept. Lastly we will discuss how oyster reefs have declined drastically and what can be done to help them going forward.



## Learning Points

1. Define a keystone species and understand how the Eastern Oyster fits the description of one.
2. Understand the dynamics of water quality and ecosystem health in an estuary.
3. Know what can be done to help protect oyster reefs for their future survival.

# Horseshoe Crabs

In this session we will teach students about what qualities make an animal a living fossil. We will go over some examples of living fossils then discuss horseshoe crabs, one of our oldest living fossils.

Horseshoe crabs have unique anatomical features that are uncommon on most living species. Students will learn how horseshoe crabs eat, how the shape of their shells protects them from predators, and how they use their tails to flip themselves over. Attendees will also learn how to flip an overturned horseshoe crab in this session.



## Learning Points

1. Talk with marine biologists about the ancient horseshoe crab.
2. Learn what it means to be a living fossil.
3. Understand the basic biology of horseshoe crabs.

# Inshore Fisheries Monitoring

The Fisheries-Independent Monitoring program's inshore presentation will follow the life cycle of Red Drum within the Tampa Bay estuary. At each life stage, we will give a brief description of the various habitats these fish utilize and describe how the Fisheries-Independent Monitoring program uses different gear types to target these life stages. Additionally, we will discuss how we catch, measure, and identify the different species that can be encountered in the estuary and why our data are important to fisheries managers.



## Learning Points

1. Demonstrate how the Fisheries-Independent Monitoring program targets multiple selected species and collects data using a stratified random sampling multi-gear design.
2. Describe how we measure and identify the various species of fish that are encountered in Tampa Bay.
3. Describe the life history of a red drum in Tampa Bay to demonstrate how sportfish use the estuary as a nursery ground for their development.

# Marine Turtles

The marine turtle session will present kids with a variety of biology, ecology and conservation related topics. Students will learn about the five different species of sea turtles that inhabit Florida waters. We will talk about sea turtle's diet, behavior and threats that they encounter while in the water and nesting on the beach. We will show the students real prey items and other deadly contents (plastic, hooks, fishing lines) that may be found internally upon investigation. Students will see a nest diagram and learn about the hatchlings behavior to find the ocean. We will show students research techniques to monitor sea turtles. Students will learn ways they can help sea turtle conservation in their daily lives.



## Learning Points

1. Identify the 5 species of sea turtles found in Florida.
2. Main threats to sea turtles.
3. Ways to help sea turtle conservation.

# Walking Through a Coastal Wetland: A Virtual Tour

This presentation will feature short video clips of scientists performing wetland monitoring activities in salt marsh and mangrove environment. This footage will be coupled with a live “unbagging” presentation of a typical day’s field kit. Students will learn what salt marsh and mangroves habitats are, why they are important, and what scientists at FWRI are doing to monitor their long-term health and promote future conservation.

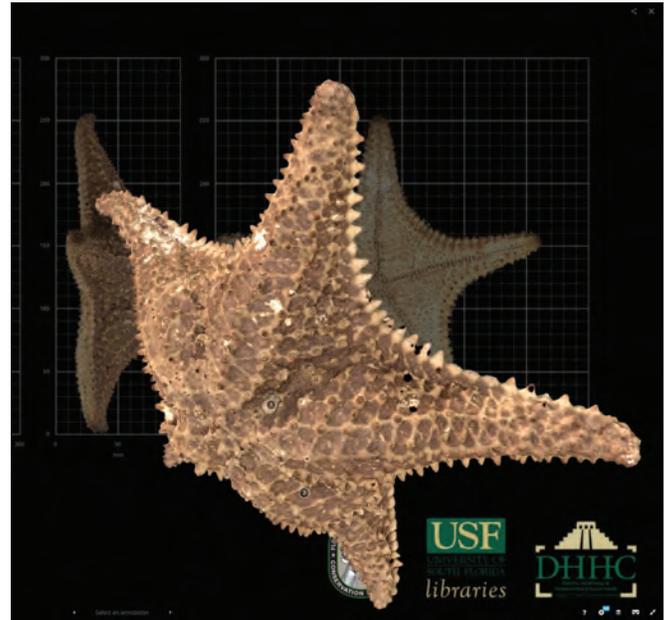


## Learning Points

1. What are salt marsh and mangrove habitats?
2. Why are they important to Florida’s fish and wildlife?
3. What are the tools we use to study coastal wetlands?

# Florida Biodiversity Collection

The Fish and Wildlife Research Institute has three extensive collections which include more than one million cataloged, preserved invertebrates, adult fish, and larval fish. Scientists use these collections as guides as they identify animals collected during research, as sources for research material, or for educational exhibits. In a collaboration with the University of South Florida Digital Heritage & Humanities Collections, specimens from the invertebrate collection have been selected for 3-D scanning. This technology can help make specimens and information about them more widely accessible to students, teachers, and researchers. During this session, view a presentation of digitally scanned specimens displayed in 3-D.



## Learning Points

1. What makes a specimen useful to scientists.
2. The features of some major groups of animals.
3. Specific facts about representative species of those major groups.

# Florida Panther

Join us to learn about our state animal, the Florida Panther. As a top predator, they have an important role in the ecosystem. Panthers need a lot of land and everyone benefits from that!



## Learning Points

1. What is an apex predator?
2. Why large expanses of land are good for panthers and humans.
3. What you can do at home to keep panthers & you safe!

# Name that Fish

For the genetics “Name that Fish” presentation students will learn about DNA. What is DNA and where is it located in our cells? We will also describe how we can extract DNA from tissue samples. Students will then learn how we can use DNA to identify individual manatees, monitor species at a population level, and even discover new species!



## Learning Points

1. What is DNA and where is it located in our cells?
2. How can we extract DNA from tissue samples?
3. How do we use DNA to help identify and conserve species?

# Stone Crabs

The stone crab presentation walks students through what a “day in the life” of a stone crab biologist consists of. It covers what kind of data is collected as well as how that data is collected. The presentation also covers why it is important to collect this data.



## Learning Points

1. How to determine the sex of a stone crab.
2. How to determine whether a claw is a crusher or pincer and whether it is original or regenerated.
3. How strong are stone crabs?

# What Makes a Good Habitat?

## Exploring the Habitat Concept Through the Eyes of the Flatwoods Salamander

Join our team for a discussion about habitat: what it means, what sorts of habitats are good for certain animals and how different animals can utilize many different types of habitats while others need one very specific type. We will also focus on the Flatwoods Salamander, a federally-protected threatened species with extremely specific habitat requirements. Learn how we as habitat ecologists must determine what “good” and “bad” habitat looks like so that we can effectively restore it for species such as the Flatwoods Salamander.



## Learning Points

1. What is habitat?
2. What is the difference between a habitat generalist and a habitat specialist?
3. What are some habitat requirements of the Flatwoods Salamander?

# Age & Growth of Fish

Fish have ears?! In this session, participants will learn how and why fisheries scientists use ear bones to age fish. Staff will discuss the science of sectioning otoliths and ageing fish, with a focus on why the Marine Fisheries Age and Growth Lab is an integral component of fishery conservation and management.



## Learning Points

1. Learn that FWRI's Age and Growth Lab estimates the ages marine fish from 70 different species.
2. See how FWRI scientists use specialized equipment like saws and microscopes, to conduct the science of ageing fish.
3. Understand why knowing ages of economically and ecologically important fish species is essential to their survival.

# Coastal Wildlife Conservation Initiative

The Coastal Wildlife Conservation Initiative works with multiple partners throughout the state of Florida to protect coastal wildlife populations, conserve and manage coastal ecosystems, and achieve balance between these efforts and human use of coastal areas. In this session, we will introduce students to three different types of coastal habitats: primary dunes in the Panhandle, back-beach lagoons in Southwest Florida, and the beach wrack line in South Florida. Three biologists with the CWCI will go to these systems and present them on site via video and will be available to answer questions afterwards.



## Learning Points

1. How to identify differences among the features of the three types of coastal habitats.
2. How to identify flora and fauna typically found in each habitat.
3. Actions you can take to conserve coastal habitats.

# Manatee Rescue

Have you ever wondered what goes into planning a manatee rescue? What happens after the manatee is captured, and how is it decided that a manatee will be released after rehabilitation? Get ready to see what it takes to be a manatee biologist! In this session, we will speak to manatee rescue team members around the state about the three R's: Rescue, Rehabilitation, and Release. After, you will have an opportunity to ask real manatee rescue team members questions about manatees, rescues, and what you can do to help!



## Learning Points

1. Manatee rescue.
2. Manatee rehabilitation.
3. Manatee release.

# Survival of Seagrass

Seagrass habitats are in danger. During the 'Survival of Seagrass' session, seagrass research scientists will explain what seagrass is, why it is important, and how we can protect it. The research scientists will show how they study the health of seagrass, from the equipment they use in the field to the processing of samples in the lab. Come learn about the threats that seagrasses face, and how these threats impact both the seagrasses and the many marine animals that call seagrass habitats their home.



## Learning Points

1. Why is a healthy seagrass habitat important?
2. What does seagrass need to be healthy?
3. How can we study the health of seagrass?

# Blue Crabs

In this session we will show the students what it is like to be a blue crab biologist. We will go over the basic blue crab morphology and life cycle. Additionally, we'll demonstrate how we use count and measurement data to look at trends in the St. John's River.



## Learning Points

1. Talk with biologists about the blue crab morphology and life cycle.
2. Learn how biologists study the blue crabs (videos on the water).
3. Learn how the biologists interpret data to look at crab trends.

# Coral Reefs

In this session, the students participating will learn what coral researchers at FWC do to better understand and protect coral reefs. The presentation will begin with a quick introduction on what a coral is, the environment in which they successfully grow, and different threats to corals. Then we will transition into a brief time line of events that have had major impacts to Florida reefs, ultimately addressing why monitoring of coral reefs is important.



## Learning Points

1. What is a coral?
2. Learn what corals need to grow.
3. Learn about threats to coral reefs.

# Marine Fish Biology

Participants will learn the critical role of habitats in the conservation of fish species. They will explore fish community structure by focusing on key species and following them through various life history stages and habitats throughout Tampa Bay. Scientists will present about research conducted within these habitats by the Marine Fisheries Biology section.



## Learning Points

1. Understand the connectivity between several fish species and various habitats within Tampa Bay.
2. Learn how fisheries scientists use varying sampling equipment and study design to conduct research projects to collect data on fish species.
3. Discover why these habitats are important and require conservation for the preservation of our marine resources.

# Niche Finder

This session will introduce students to a range of ways that maps are involved in marine science. Students will be introduced to many types of maps – including an infrared sandbox that makes an interactive map as the sand is moved around. Then they'll learn about where animals live in the ocean and play an online game with their favorite Florida species. Finally students will receive a link to our FWC Reporter app to report sightings of important animals and be a part of the mapping science team!



## Learning Points

1. What is a niche?
2. How scientists use niche maps to protect and study animals.
3. The importance of following the rules/regulations that scientists create from the maps.