

- Introduction: "The time has come," the Walrus said, "to talk of other things."
- Stephanie Otts: This is a podcast, not about shoes and ships and sealing wax, but about the who, what, where, why and how of shellfish aquaculture, including the many different legal challenges that can arise. We're the National Sea Grant Law Center, and we invite you to sit down and get ready for a wave of knowledge.
- Stephanie Otts: Hi, I'm Stephanie. I'm the Director of the National Sea Grant Law Center.
- Cathy Janasie: Hi, I'm Cathy. I'm a Senior Research Counsel at the National Sea Grant Law Center.
- Amanda Nichols: And I'm Amanda. I'm the Ocean and Coastal Law Fellow at the National Sea Grant Law Center.
- Stephanie Otts: You're listening to Law on the Half Shell.
- Stephanie Otts: On today's episode we'll be talking about the impact of disaster events on shellfish aquaculture. Farmers grow shellfish outdoors in rivers, estuaries, bays, and the ocean. So like their land-based counterparts, shellfish farms are often at the mercy of mother nature. Hurricanes, floods, harmful algal blooms, and oil spills can all take their toll.
- Amanda Nichols: Strong storms can damage or wash away a farm's infrastructure, gear and crop, which is the shellfish themselves. It's estimated that the shellfish aquaculture industry in North Carolina, for example, suffered losses totaling nearly \$10 million due to storms in 2018. Powerful waves and storm surge damaged docks, waterfront buildings and gear, and also had severe impacts at shellfish hatcheries and nursery operations.
- Amanda Nichols: Hurricane Florence brought record-setting rain not only to North Carolina's coastal region but also inland causing an increased flow of fresh water into estuaries for weeks. As the freshwater poured in, salinity decreased. Oysters and clams are marine species that thrive in saltwater, as we've discussed in earlier episodes, and extended periods of low salinity can result in the total loss of a farmed shellfish with devastating economic consequences.
- Stephanie Otts: Oil spills and harmful algal blooms can introduce toxins into the water, raising concerns over the safety of seafood that can result in prohibitions on harvest. So has anyone heard of a red tide?
- Cathy Janasie: I have.
- Amanda Nichols: Alabama Crimson Tide.

Stephanie Otts: So red tide is a common term for what's known in the scientific community as a harmful algal bloom. Algal blooms are caused by phytoplankton, the free-floating and microscopic algae that are found in both marine and freshwater ecosystems. A small percentage of these algae species can produce biotoxins that are harmful to human health. If conditions in the ocean aren't just right, these species can reproduce rapidly or bloom.

Stephanie Otts: So when this happens, the event is referred to by the scientific community as a harmful algal bloom. Depending on the species, they might turn the water red, hence the more common term red tide. Biotoxins from these algae can concentrate within the shellfish flesh, or meat, then can cause illnesses to humans who eat the contaminated shellfish. And harmful algal blooms can shut down shellfish harvesting for weeks, again, like hurricanes causing economic losses to the farmers.

Cathy Janasie: Unfortunately, accidents like BP's Deepwater Horizon spill can also have far reaching negative impacts. The spill began on April 20th, 2010 when an explosion at a BP owned drilling platform causing approximately 4.9 million barrels of oil to eventually spill into the Gulf of Mexico. That's equal to 210 million gallons, and that's a whole lot of oil.

Stephanie Otts: That is an awful lot of oil.

Cathy Janasie: A massive response to protect beaches, wetlands, and estuaries from the spreading of oil by utilizing skimmer ships, floating booms, controlled burns, and approximately 1.84 million gallons of oil dispersant.

Cathy Janasie: In last week's episode, we talked about Apalachicola Bay's reaction to the spill. In an effort to escape the creeping oil, the area's oystermen were authorized to harvest oysters almost constantly. While they were able to beat the oil, they unfortunately decimated the bay's natural oyster populations by harvesting so many adult oysters that the remaining juveniles had no hard substrate to adhere to and grow.

Stephanie Otts: The oil spills can also harm shellfish populations directly due to compounds that are found within oil such as polycyclic aromatic hydrocarbons. Wow, that's quite a mouthful. Otherwise known as PAHs that also can bioaccumulate or concentrate within the animals. Oysters, unfortunately, cannot move away from the oil either because they're cemented, fastened directly to the reefs themselves, or they may be contained within an aquaculture growing area. Oysters are also less efficient at removing chemicals from their bodily tissues compared with other animals like fish or crabs.

Stephanie Otts: Here's a fun fact for everyone. Though studies are limited, some scientists think that oysters and other bivalves that live in areas where oil naturally seeps from the ocean bottom may be more tolerant of oil compared to bivalves living in

locations without such natural seeps, so they have grown to tolerate the excess oil that's around them from the natural seeps in the area.

Stephanie Otts: The different type of bacteria living in and around oyster reefs may have evolved over time to help the oysters rid themselves of oil and oil related chemicals. These bacteria break down the oil and could be the reason why some scientists have seen little to no impact to oysters living in some areas impacted by the BP spill.

Stephanie Otts: So it's a bit ironic maybe that because they were already in an area that had been exposed to oil for natural reasons, they were better able to recover from the massive influx of oil from the BP spill.

Amanda Nichols: But unfortunately, response actions that are meant to mitigate the negative impacts of an oil spill can also have undesirable consequences. So let's take oil dispersant for example. Oil dispersant is a mixture of emulsifiers and solvents that helps break down oil into small droplets. Those small droplets are easier to disperse throughout the water column and may be more readily biodegraded by aquatic microbes.

Amanda Nichols: However, dispersant use involves a trade-off between exposing coastal life to surface oil and exposing aquatic life to the dispersed oil. While breaking up the oil with dispersants may lessen exposure to marine life on the surface, it creates exposure for animals dwelling underwater. Additionally, oil that is mixed with dispersants may be more toxic to some species than just the oil alone.

Cathy Janasie: Despite the coastal states' swift response to the Deepwater Horizon spill, oyster populations began to plummet starting in 2010 the year of the spill. This can be attributed to a number of spill related factors including those stemming from the oil itself as well as mitigation efforts.

Cathy Janasie: For example, the government released large volumes of fresh water from the Mississippi River in 2010 in order to reduce the movement of spilled oil into sensitive marsh areas. Like in North Carolina with Hurricane Florence, this freshwater decreased the salinity of the oyster grounds below that which the oysters could tolerate and killed a substantial number of them as a result.

Cathy Janasie: Samples taken across the Northern Gulf of Mexico in 2010 found that oyster larvae were rare or absent, and consequently oyster harvest in the following years collapsed. In 2010 and 2011, Louisiana oyster production dropped to roughly half of its historical harvest. It then plunged to a small fraction of historical harvest in 2012 before only slightly rebounding in 2013.

Stephanie Otts: So one of the biggest losses a shellfish farmer can suffer from a disaster event is the loss of their gear. Obviously, if they lose their gear, they're not able to grow the shellfish, and they'd have to replace it, or if they can afford to do that.

Stephanie Otts: To try to help farmers be more prepared, many states have developed guidance to help prevent aquaculture gear loss. Florida, for example, encourages farmers to create a storm plan that helps ensure their operations are ready when a hurricane strikes. It also makes specific recommendations for shellfish farmers, depending on what type of gear they use.

Amanda Nichols: So for example, for shellfish farmers using bottom gear, the state recommends farmers do three things before a severe storm. One, inspect their bag and net anchors to make sure they're secure and in good condition. Two, consider placing additional stakes on newly planted bags as they are the most vulnerable to being dislodged. And then three, add an additional crisscrossed anchor line over bags and nets to keep things in place.

Cathy Janasie: Despite adequate preparation, many of you may be wondering if shellfish farmers have any recovery options in the event that a disaster event negatively impacts their operations. Often time the answer is yes. So crop insurance is one way in which shellfish farmers may be able to recover. The U.S. Department of Agriculture or the USDA offers several permanently authorized programs to help farmers recover financially from natural disasters including droughts and floods.

Cathy Janasie: The Federal Crop Insurance Program offers subsidized policies designed to protect crop producers from risks associated with bad weather as well as weather-related plant diseases among other things. Crop insurance is generally available to growers of large commodity crops such as soybeans or corn and varies by location. While there are some crop insurance plans available to certain shellfish growers such as clam growers in Massachusetts or oysters growers in Louisiana, crop insurance is not available for many aquaculture operators.

Cathy Janasie: Most aquaculture producers must instead use the Noninsured Crop Disaster Assistance Program or NAP. NAP is administered by the USDA's Farm Service Agency or FSA and protects against natural disasters including flooding that results in lower yields or crop losses or prevented crop plantings. Crops that are eligible for NAP include commercial crops that are grown for food but do not qualify for crop insurance coverage, making some aquaculture operations eligible for the program.

Stephanie Otts: However, there are some additional requirements established by the federal government that limit the availability of NAP coverage for aquaculture operations. For instance, the operation needs to be located on private property that the producer leases or owns and which has clearly identifiable boundaries.

Stephanie Otts: Furthermore, the aquaculture species has to be kept in a controlled environment, so if an aquaculture producer is growing oysters or other shellfish offshore and leasing state-owned water bottoms, then they will need to check with their local FSA office to see if the operation is eligible for NAP coverage

since the state-owned water bottoms may not be considered private property under the terms of the program.

Stephanie Otts: To be eligible for NAP catastrophic coverage payment, a producer must first apply for coverage by the appropriate closing date and pay the administrative application fees. For aquaculture, the coverage period runs from October 1st to September 30th of each year, and the deadline to sign up for the next year's coverage is September 1st.

Stephanie Otts: Furthermore, a producer must either experience a 50% yield loss caused by a natural disaster or be prevented from utilizing more than 35% of their lease. For any losses greater than the minimum threshold, a producer can receive 55% of the average market price for the covered commodity.

Stephanie Otts: However, farmers do have the option to buy additional coverage called buy-up coverage.

Amanda Nichols: NAP coverage is only applicable to future situations. For example, an oyster grower who had not previously enrolled in NAP for this year who has already sustained damage to his or her oysters would not be eligible for NAP payout and would need to talk to their local FSA agent to see what other aid maybe available. Producers of non-insured crops are subject to annual payment limits of \$125,000 per person for catastrophic coverage and \$300,000 for buy-up coverage.

Amanda Nichols: Producers are ineligible for coverage under NAP if their total adjusted gross income exceeds \$900,000. And in addition to NAP coverage, aquaculture producers may get additional relief from disaster declarations made by the USDA, the Department of Commerce, or even the President from which they can receive emergency loans or congressionally appropriated funds.

Amanda Nichols: For instance, due to the damage to oysters from this year's Mississippi River flooding, the governors of both Mississippi and Louisiana have asked the Secretary of Commerce to declare a fisheries disaster for their respective states.

Cathy Janasie: Another type of disaster relief is the USDA's Emergency Disaster or EM Loan Program and either the President or the Secretary of Agriculture declares the county a disaster area or quarantine area, aquaculture producers in that county may become eligible for low interest emergency disaster loans available through the USDA Farm Service Agency.

Cathy Janasie: Producers and counties that share a border with the county with a disaster designation also become eligible for EM loans. EM loan funds can be used to help eligible producers recover from production losses, for example, when a producer suffers a significant loss of his crop or from physical losses, for example, repairing or replacing destroyed or lost equipment. A qualified

applicant can borrow up to 100% of actual production or physical losses, but not more than \$500,000.

Stephanie Otts: So for those aquaculture producers, if you're still with us, I'm not sure I can really follow all of the ins and outs of these insurance programs, we're not done yet, because once a county is declared eligible, an individual producer must also meet the following three requirements for an EM loan.

Stephanie Otts: First, they must be an established family farmer and a citizen or permanent resident of the United States. They must have experienced a crop loss of more than 30% or an actual physical loss of livestock, livestock products, real estate or property. And they must be unable to obtain credit from a commercial lender but are still able to show they have the potential to repay the loan. And applications must be received within eight months of the county's disaster designation date.

Stephanie Otts: So I can imagine the difficulty faced by farmers attempting to tap into these programs because I couldn't imagine if I had been impacted by a hurricane or storm and are trying to find or repair your house and also get all your paperwork in order for disaster loans. And so it's one of those things that shellfish farmers would need to prepare for ahead of time to understand the programs and know how to tap into the benefits.

Amanda Nichols: It's also important to recognize that states can establish their own relief funds in the wake of catastrophic disaster events. So North Carolina, for example, established the Hurricane Florence Agricultural Disaster Program of 2018 to serve as a onetime assistance program for agricultural producers who suffered a loss due to Hurricanes Florence and Michael.

Amanda Nichols: However, despite the existence of helpful programs like these aquaculture producers may not always have access to adequate aid in a wake of a disaster event. For example, let's look at the struggle Louisiana's oyster farmers experienced with their crop insurance policy in the wake of BP's Deepwater Horizon oil spill.

Amanda Nichols: After Hurricane Katrina hit, the Federal Crop Insurance Corporation known as the FCIC approved what is known as a group risk plan of insurance for oysters. The policy is available for oyster growers in certain Louisiana parishes and is meant to cover financial losses from reduced oyster production due to unavoidable natural causes.

Cathy Janasie: However, a provision in the oyster insurance policy states that the insurance policies will not be offered if there is inadequate data on what the expected oyster landings will be for the year. After the Deepwater Horizon spill in 2010, no one really knew the extent of damage to this state's oyster beds. It was difficult to estimate what oyster landings could be expected for 2012. This

uncertainty led the USDA Risk Management Agency to not offer the oyster insurance in 2012 as well as in the next two years.

Cathy Janasie: The oil spill also impacted the availability of the oyster plan to growers. Most oystermen could not pay their 2010- 2011 premiums, and the premiums were required in full. But most harvest areas had been closed just two weeks after the insurance season started. While the oyster insurance plan is available again, many oystermen are now ineligible for the insurance plan because they missed their premium payments.

Cathy Janasie: It could be that a congressional waiver would be needed to reinstate the ineligible farmers. And as Stephanie was stating before, this is just another reason for oyster growers to really be aware of what requirements they need to be enrolled in these programs because it could be that you think you're eligible for a certain program, and you haven't met one of these requirements. And that could make you ineligible for this financial assistance from the government.

Stephanie Otts: Yeah. And the requirements for every program are different, and so there are disaster declarations often made after other events such as red tides in the Northeast or different toxin problems on the West Coast. And so the eligibility requirements for being eligible for those programs is different. And so farmers around the country really need to be talking with their insurance agents and regional offices to understand what the different policy and disaster programs provide.

Stephanie Otts: Join us next time as we discuss the impacts of invasive species and other unwanted guests on shellfish farms.

Stephanie Otts: This podcast is a production of the National Sea Grant Law Center at the University of Mississippi School of Law. It is made possible in part by funding from the NOAA National Sea Grant College Program. The statements, findings, conclusions, and recommendations are those of the speakers and do not necessarily reflect the views of NOAA or the U.S. Department of Commerce.

Stephanie Otts: Editing and production assistance was provided by Kerrigan Herret, a senior journalism student at the University of Mississippi. Thanks for listening.