Oyster AQUACULTURE

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These fact sheets for the off-bottom oyster aquaculture industry in the Gulf of Mexico provide guidelines and suggested safety procedures in preparing for tropical storms and hurricanes:

- **Introductory Planning Guide**
- **Adjustable Long-Line Farms**
- **Floating Bag Farms**
- **Floating Cage Farms**
- **Land-based Operations**
- **Workboats**

To access all of the fact sheets in this series, visit the National Sea Grant Library at *nsgl.gso.uri.edu*. Using the "search the catalog" function, search "Oyster Aquaculture Hurricane Preparedness Series."

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Tropical Storm and Hurricane Preparedness for Off-bottom Oyster Aquaculture in the Gulf of Mexico

Adjustable Long-Line Farms Guide

Many oyster growers in the Gulf of Mexico region use the adjustable long-line system (ALS), an off-bottom culture gear. This fact sheet provides guidance related to storm preparation and planning for this gear type. It is part of a series providing an overview of storm preparation and planning for other oyster aquaculture operations, including floating cage farms, floating bag farms, land-based operations, and workboats.

The ALS system uses a tensioned monofilament line strung between anchored pilings with riser posts placed at uniform intervals allowing adjustment of the baskets' height in or above the water column. This guidance is primarily for intertidal operations.

Photo courtesy of USDA Risk Management Agency

INSTALLATION

During installation of the ALS system, there are several important considerations.

- ☐ Assess the site's exposure to storms as a primary factor in site selection.
- ☐ Orient lines perpendicular to the prevailing wind and waves, if possible.
- ☐ Invest in durable line that meets the supplier's recommendation with some protection from chafing, such as an outer sleeve.
- ☐ Invest in basket-to-line clips that secure the baskets in position on the line.

FIGURE 1. Two types of tensioning systems that allow adjustment of line tension in the adjustable long-line system: the donut tensioner (left) and the turnbuckle (right). Photos courtesy of Auburn University Shellfish Lab

- ☐ Be sure lines are taut. Some growers opt to use a donut tensioner or other system to adjust tautness (Figure 1).
- ☐ Install pilings and riser posts and allow to set prior to storm season.
- ☐ If using a sliding sleeve with a clip, install a top pin to ensure that the sleeve cannot come off the riser post top (Figure 2).
- ☐ Limit distance between riser posts to about 8-9 feet, with enough room for no more than three baskets.
- ☐ Bury riser posts at least one-third of their length.
- ☐ Bury at least 50% of the end pilings in the sediment, leaving enough length for at least 3-4 feet to extend above mean high water.
- ☐ Include one "storm position" clip in the adjustable clip system, where baskets are suspended just above the bottom during storm events, beneath the heavy wave action.
- ☐ Place identifying tags on each basket.

PRIOR TO HURRICANE SEASON

Prior to the onset of hurricane season, oyster farmers should take steps to reduce the risk of losses.

- ☐ Check stocking densities and reduce as necessary.
- ☐ Check biofouling and control on a routine basis.
- ☐ Check all lines for chafing (especially near the clips) and repair as needed.
- ☐ Check for good tension on lines.
- ☐ Ensure all basket clips are secured and in good condition.
- ☐ Ensure all clips on riser posts are in place, holding the line as intended, and clear of fouling.
- ☐ Check for fouling on the riser posts and remove barnacles, oysters, and other hard organisms that could wear the line.
- ☐ Have crew conduct timed practices to gauge time needed per line to correctly lower baskets.
- ☐ For shoreside operations, pick up loose pieces of equipment and secure baskets to reduce loss from flooding and wind.
- ☐ Review storm plan with crew and family so they can account for personal preparations alongside farm preparations.

DURING HURRICANE SEASON

A tiered approach to preparation, which has been adopted in each fact sheet, allows growers to stage tasks based on the storm or hurricane's track forecast. The authors developed the following color codes to address increasing levels of concern and actions.

CODE YELLOW

Once a hurricane or tropical storm has formed in the Gulf of Mexico or has a chance of entering the Gulf, it is time to begin preparations according to the farm's plan. Note that the timeline is fluid and will depend on the storm's speed and track.

- ☐ Re-check stocking densities and reduce as necessary, taking special care with any baskets of seed as the smaller mesh can produce more water resistance.
- ☐ Re-check all lines for chafing (especially near the clips) and repair as needed.

- ☐ Ensure all bag clips are secured and in good condition.
- ☐ Ensure all clips on riser posts are in place and holding the line as intended.
- ☐ Secure any empty baskets on shore or on lines.
- ☐ Document the condition of the farm with photographs and notes.
- ☐ Document the numbers of various sizes of oysters.
- ☐ Review workboat(s) plan.

CODE ORANGE

Once a hurricane or tropical storm watch has been issued, final preparations should begin. In the case of a fast-moving storm, proceed with tasks associated with final stages of preparation.

- ☐ Sell product as market allows.
- ☐ Track the storm's progress frequently and carefully. When assessing whether or not to lower baskets, keep in mind the amount of time necessary to carry out the operation. Remember that the day before the storm is to make landfall, you should not plan to be on the water. You will need that day for other preparations and the weather will likely not allow it.
- ☐ If weather conditions warrant lowering baskets based on your judgment, lower all bags to the storm position on the riser clips.
- ☐ Prepare to implement workboat(s) plan.

CODE RED

When a hurricane or tropical storm warning has been issued and there is a high probability of being in the path of the storm, farmers must conclude final preparations if and only if they can be accomplished safely. Farmers will make a series of personal risk assessments.

- ☐ Conduct last check of farm.
- ☐ Implement workboat(s) plan.
- ☐ Get to safety.

POST-STORM RECOVERY

Oyster growers and their employees must be ready to take care of the needs of the farm as soon as it is safe and reasonable to do so. After a storm has passed, the following tasks should be considered.

- ☐ Assess risk of returning to farm and proceed only when safe.
- ☐ Patrol the area upstream and downstream of your farm for significant debris that could entangle or dislodge your gear once it is raised, and remove or secure debris.
- ☐ Document the condition of the farm with photographs and notes.
- ☐ Return baskets to customary clip height on riser posts.

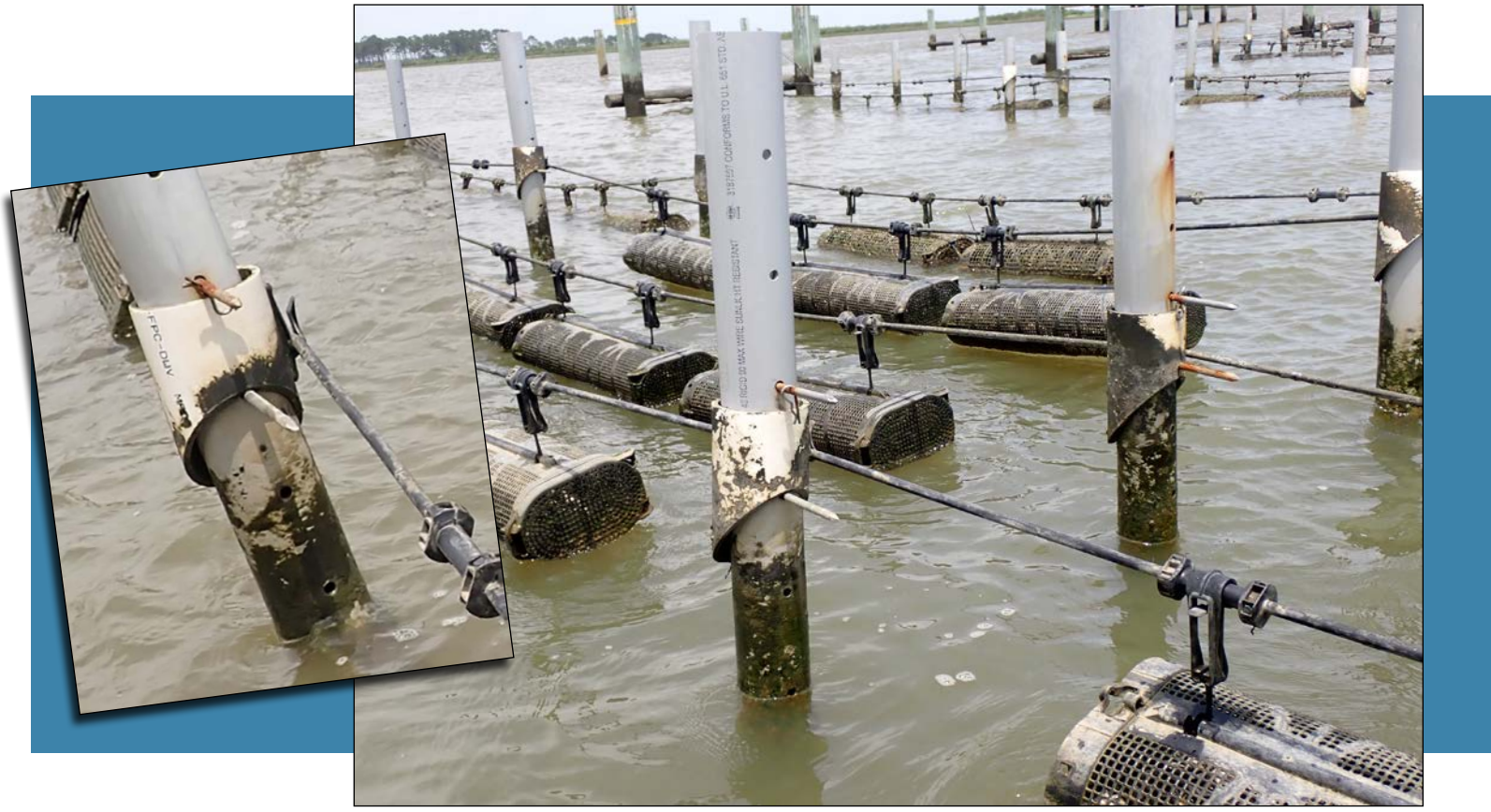

FIGURE 2. Adjustable long-line sleeve that allows the sleeve (with one clip) to be adjusted up or down the riser pole. Photo courtesy of Auburn University Shellfish Lab

- ☐ Assess and document oyster survival, gear condition, and losses.
- ☐ Once mortality risk has passed, move lines to high setting to prevent oyster and barnacle set that may occur after storms.
- ☐ Communicate with public agencies about closures and effects of the storm.
- ☐ Communicate with buyers and suppliers to provide situation and outlook reports.

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Photo courtesy of Auburn University Shellfish Lab

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