



**STANDARD OPERATING PROCEDURES  
FOR  
*Karenia brevis* MONITORING PROGRAM  
AND DATA SHARING ACTIVITIES**

Updated 10/30/2025

**PINELLAS COUNTY PUBLIC WORKS DEPARTMENT  
DIVISION OF ENVIRONMENTAL MANAGEMENT  
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*Pinellas County Division of Environmental Management (DEM) Standard Operating Procedures (SOPs) are adapted from published methods or developed by in-house technical experts. Most of the methods are based on Florida Fish and Wildlife Commission (FWC) and/or Florida Department of Environmental Protection (FDEP) methods, which are referenced throughout the document. This document is intended primarily for internal DEM use. This SOP document should not replace any official published methods.*

*Any reference within this document to specific equipment, manufacturers, or supplies is only for descriptive purposes and does not constitute an endorsement of a particular product or service by the DEM. Additionally, any distribution of this SOP does not constitute an endorsement of a particular procedure or method.*

*Although the DEM will follow these SOPs in most instances, there may be instances in which an alternative methodology, procedure, or process will be used.*

*Personnel performing monitoring tasks must be trained and certified internally according to DEM standards. Use of equipment and reagents are subject to approval by the monitoring QA Officer and/or the Environmental Monitoring Coordinator. Training will be done through annual audit exercises in the laboratory and field to familiarize personnel with operation, calibration, and maintenance. Staff must be familiar with the SOP document and user's manuals, when applicable.*

## Introduction & Program Purpose

*Karenia brevis* is the primary red tide-causing dinoflagellate along Florida's Gulf coast. These "red tide" blooms get their name from an observed reddish-brown water discolor. Red tide blooms have been documented along Florida's coasts since the 1700s.

Many types of dinoflagellates populate the Gulf coast waters and specific species usually draw attention with increased productivity, or "blooms." Red tide blooms can develop 10 or more miles offshore. Winds, storms, and currents allow *K. brevis* populations to migrate near shore. Studies suggest a combination of factors, including chemical, physical, and biological interactions, can lead to harmful algal bloom conditions, but there is not a single condition to predict when a bloom will occur, therefore a common water quality improvement strategy is to reduce nitrogen and phosphorus, or nutrient pollution, that "feed" algal blooms from inland urban sources.

*K. brevis* is of special concern because it can produce brevetoxins. These toxins can affect the central nervous systems of fish and other marine vertebrates and lead to fish kills. During the 2018 red tide event larger species, including sea turtles and dolphins, were harmed through respiratory or dietary exposure. Respiratory or skin irritation can occur in mammals if exposed to toxin released into the air. Brevetoxins can bioaccumulate in the tissues of shellfish, so FWC monitors these levels to protect people from Neurotoxic Shellfish Poisoning when choosing to consume shellfish from monitored regions.

Pinellas County Environmental Management conducts routine sampling of Gulf coast waters to monitor red tide status and share information with the County residents, visitors, and partners.

## Monitoring Overview

The routine monitoring program aims to supplement the FWC FWRI routine collections that occur on Mondays each week and when temporary staff, intern, and volunteer availability allows. The County prioritizes scheduling Tuesday through Friday and closer to the weekend to benefit recreational public interest. Monitoring results can be viewed on the County's [Red Tide website](#) and viewing the [Pinellas County Red Tide Monitoring Results Map](#) under the Red Tide Resources section.

## Routine Red Tide Site Locations

Site locations were selected to provide geographic coverage associated with consistent access; therefore many sites are associated with coastal public access points along the Gulf coast.

Image 1: Red Tide Locations Map



## Red Tide Sample Collection Supplies & Equipment

- Field Book Binder, including the following supplies:
  - TWO field sheets
  - Red Tide Facts brochures
  - Non-gel ink pens, pencils, and/or permanent markers
  - Write-on or pre-printed labels
- Van Dorn sampler for any collection from piers or structures over the water
- Sludge judge pole for any direct grab collections
  - Note:** Ensure you have the collection piece with the ball valve; extension piece is not needed
- Bucket and lid
- Glass vial containers
  - Note:** Bring spare vials for any vial loss or breakage.
- Foam vial holder to protect collected samples
- Handheld cooler to hold supplies and vial holder
  - Note:** Avoid preserving samples with ice. Freezing conditions can damage or lyse living cells and make analysis difficult or impossible.
- Personal Swim gear, towel, booties, and/or waders
- Gloves and/or hand sanitizer
- N-95 mask or other face covering
- Eye protection, including sunglasses and/or safety goggles
- Reserved County vehicle
  - Note:** Check with monitoring or volunteer coordinator to confirm vehicle use.

## Field Sample Collection Guidance

Conditions at each location vary based on wind, waves, and bloom conditions. If you see evidence of a red tide bloom try to collect the sample from the visible bloom area whether you are wading out from a beach or walking out on a pier or other structure. If conditions are unsafe to enter water or access a structure, then adjust collection and make a note in the field sheet comment section or call the Environmental Management staff contact for guidance. Most collection locations are located to access from public beach access with parking. When you're in a logged county vehicle you can park for free while you conduct the sample collection activities. Follow any municipal or posted signs and/or rules while visiting access points on county business.

### Onsite Sample Collection

- Upon arrival, determine if you will be using a Van Dorn sampler or wading into the water to collect using the sludge judge and bucket.
- Gather collection supplies and equipment (e.g. sludge judge, bucket, vial, and/or Van Dorn sampler).
- Label sample vial with site name, date, and time.
- Wear any personal protective gear to protect from weather, coastal, and harmful algal bloom exposure.

**Important:** If you experience respiratory irritation do not continue exposure simply to conduct a sample collection. Remove yourself and complete the field sheet reporting entries with comment that sample was not completed because of extreme bloom conditions.

- Observe water and any red tide bloom conditions to determine sample collection location within the water if wading in or over the water if collecting from a pier or structure.

**Note:** Be informed about Rip Currents using the [National Weather Service](#) or [NOAA Rip Current Risk](#) dashboards and try to collect beyond the wave break to avoid excess suspended sediments in the sample. If you observe suspended sediments in the sampler or bucket briefly let sediment particles settle to the bottom before filling the sample vial from the bucket or Van Dorn spigots.

**Note:** Do the “stingray shuffle” when wading into the water to avoid interacting with nestled species by shuffling your feet along the bottom as you wade into the surf.

If using the Van Dorn sampler, arm the sampler by opening and securing the plungers. Lower the “armed” apparatus down to the water and triple rinse by submerging into the water and lifting to let water drain from open apparatus three times. After sufficient rinsing with sample water, fully submerge the apparatus and plungers before sending the messenger down the line to trigger the plungers and capture the water sample. Pull the sampler up and use the spigots to rinse the vial one time and partially fill the vial to the “neck” so there is air space.

- If using the sludge judge and bucket, wade into water and thoroughly submerge equipment to rinse the sample bucket and sludge judge, making sure all internal surfaces are rinsed with sample water BEFORE collecting a sample. Lower the ball valve end of the sludge judge to the maximum depth while you avoid hitting the bottom sediment, pause briefly, and empty into bucket. Complete three water grabs using the pole and combine in the bucket. If water clarity is poor, and you can't see the bottom, use the sludge judge to measure to the bottom and note the depth on the pole. Take note of a lesser depth on the pole to conduct the three grabs to avoid hitting the bottom. It is important not to collect bottom sediment in the sample. When three grabs have been deposited in the bucket, swirl the water in the bucket, and fill the labelled vial. Dump out any extra water and return to the vehicle.
- Put labelled vials into foam tray inside cooler to keep collected samples protected. Samples should not be preserved on ice.

- Complete the field sheet to document site condition rating, color, odor, observed fish carcasses, experienced respiratory irritation, and wind direction. Add other relevant field observations including tide stage, wave activity, macroalgae and/or seagrass present in the comment section.

**Note:** If there is evidence of a fish kill, please **report directly to FWC** using the FWC Reporter App (<https://myfwc.com/research/saltwater/health/fish-kills-hotline/app/>) or call 1-800-636-0511.

**Note:** If there are any marine mammal or sea turtle distress and/or carcasses discovered, please call FWC Alert at 888-404-3922.

## Post-Collection Activities

- Return to office to deliver and report results in a timely manner.
- Remove all trash, supplies, and equipment out of the vehicle. Rinse any used equipment with the hose and leave the sludge judge pole to dry outside.
- Clean the bucket and lid in the garage sink. Spray a small amount of Liquinox soap solution into bucket using a scrub brush to clean the inside of the bucket. Rinse with DI water from carboy next to sink three times. Place the bucket and lid upside down on the drying rack and complete the cleaning log located on the wall by the door to the lab.

## HABScope Video Reporting


- HABScope reporting is organized for videos being recorded in this listed order, regardless of collection time. The following procedures will be repeated for each sample collected. Once all videos are recorded, tidy the supplies, and make sure all HABScope equipment is turned off.

1. Fort DeSoto Gulf Pier  
27.61336, -82.73746  
Anderson Blvd
2. 22<sup>nd</sup> Ave Pass-a-Grille Beach Access  
27.69800, -82.73852  
2200 Gulf Way
3. City of Treasure Island Beach Access  
27.74299, -82.75914  
8000 W Gulf Blvd
4. Madeira Beach Archibald Park Beach Access  
27.80108, -82.80318  
15100 Gulf Blvd
5. Redington Shores Public Beach Access  
27.83225, -82.83555  
18200 Gulf Blvd
6. Indian Rocks Pinellas County Beach Access  
27.90039, -82.84938  
1700 Gulf Blvd
7. Clearwater Beach at Pier 60  
27.97796, -82.83223  
1605 S Gulfview Blvd

- Use the HABscope and iPod set up to record videos of the collected samples.
- Turn on the HABscope using the power switch and ensure the magnification is set at 4x. Use the red dial if the magnification needs to be adjusted.
- Use DI water and a lens tissue to clean the glass sample slide. Wipe slide dry of sample water with a lens tissue between each sample.
- Gently homogenize the sample by inverting the sample vial a few times. Use a disposable pipette to capture sample water. Add 3 drops to the sample slide. After each sample, rinse the disposable pipette with DI water. Dispose of DI rinse water in the available waste bottle.
- Using the iPod, load the HABscope app and select “Capture Video” then “Take Photo/Video” icons. Switch the iPod to video mode and zoom in to the full extent on the iPod screen.
- Use the stage directional wand to move around the slide and look for organisms. Adjust focus using the coarse and/or fine-tuning knobs on the microscope until view is clear. Once focused, touch and hold your finger on the iPod’s screen to activate AR lock. A yellow square will appear to indicate that AR lock is on.
- Click the red circle icon to record a 30-second video. *Do not touch or try to adjust anything* during the 30-second recording. If adjustment is needed, you can choose not to use the recorded video and try again.  
**Note:** The HABscope is less accurate with detecting living species in low count samples. County staff will do manual counts of each sample to confirm so don’t reject videos as results show non-detections despite seeing species present while recording.
- Tap “Use video” and then “Upload video.” If the upload was successful, a happy little fish will appear on the screen.
- Use the time that is posted for the video on the Gulf of America Coastal Ocean Observing System (GCOOS) HABscope website on the County’s HABscope log sheet: <http://habscope.gcoos.org/videos>  
**Note:** Adjust time from the website from UTC by subtracting 5 hours.
- After recording videos and verifying that they have been uploaded to the website, preserve the remaining sample by adding THREE DROPS of Lugol’s solution to the vial, gently invert the sample, and place the vials in the foam tray. Put the tray next to the microscope for Environmental Management staff to count.  
**Note:** Once preserved, samples can be stored for several years, and the organisms will remain intact.



## Red Tide Monitoring Program Data Entry

- Use the sample collection time to transcribe the field sheet data into the year's HAB Database:  
[S:\Divisions\WMS\Watershed\MONITORING\PHYTOPLANKTON\HAB\\_Monitoring\HAB\\_Monitoring\\_2024\Weekly\\_reports\HAB\\_Data\\_2024.xlsx](S:\Divisions\WMS\Watershed\MONITORING\PHYTOPLANKTON\HAB_Monitoring\HAB_Monitoring_2024\Weekly_reports\HAB_Data_2024.xlsx)
- Use the sample collection time to transcribe the field sheet data into the Combined Daily Reporting Excel spreadsheet template: [S:\Divisions\WMS\Watershed\MONITORING\PHYTOPLANKTON\HAB\\_Monitoring\HAB\\_Monitoring\\_2024\Weekly\\_reports\HAB\\_WeeklyReporting\\_TEMPLATE\\_combined.xlsx](S:\Divisions\WMS\Watershed\MONITORING\PHYTOPLANKTON\HAB_Monitoring\HAB_Monitoring_2024\Weekly_reports\HAB_WeeklyReporting_TEMPLATE_combined.xlsx)
- Save the file using the sample date in this naming format:  
HAB\_WeeklyReporting\_YYYY-MM-DD
-  Retain hardcopy field sheets in the folder labelled "Completed HAB Field Sheets." Scan hardcopy field sheets to create an electronic copy and save in a shared server or Sharepoint folder.

## Red Tide Monitoring Online Resources

Pinellas County red tide status:

<https://pinellas-egis.maps.arcgis.com/apps/webappviewer/index.html?id=7c18e5858be14368a660bda35f4acc68>

USF Water Atlas:

<https://www.pinellas.wateratlas.usf.edu/maps/coastal-water-quality-map/>

Fish kill database:

<https://public.myfwc.com/fwri/FishKillReport/searchresults.aspx>

Submit a fish kill report:

<https://public.myfwc.com/FWRI/FishKillReport/Submit.aspx>

Red tide status (updated every Friday):

<https://myfwc.com/research/redtide/statewide/>

Beach conditions (MOTE):

<https://visitbeaches.org/map>

## Red Tide Monitoring Program Contacts

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## Appendix A: Pinellas County Environmental Management HAB Monitoring Field Sheet

<b>Date:</b>	<b>Sampler(s):</b>						
<b>Site</b>	<b>Time</b>	<b>Dead fish? (none, few, many)</b>	<b>Odors? (none, mild, strong)</b>	<b>Respiratory Irritation? (none, mild, strong)</b>	<b>Water Color (normal/clear, dark/discolored)</b>	<b>Wind Direction</b>	<b>Additional Field Comments (any cleanup activities, strong incoming or outgoing tide, wave activity, etc.)</b>