





Florida LAKEWATCH

Training Manual and Instruction Booklet

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OVERVIEW

WHAT IS THE FLORIDA LAKEWATCH PROGRAM?

Florida LAKEWATCH is a team effort in which volunteers, working with researchers at the University of Florida, collect water samples that, when analyzed, will contribute to the understanding of Florida's waterbodies. As a trained LAKEWATCH volunteer, you will help develop a database of water chemistry for your waterbody. These data can then be used to establish trends and develop an overview of how your waterbody fits into the overall picture of Florida waterbodies.

WHAT TRAINING WILL I RECEIVE?

You will receive hands-on training in sampling techniques and use of all equipment. To become a LAKEWATCH volunteer, you must demonstrate proficiency in all sampling and filtering procedures. This booklet contains the information you will learn during your training session.

WHAT WILL I HAVE TO DO TO TAKE LAKEWATCH SAMPLES?

Every month you will sample at pre-determined locations, called stations, in your waterbody. At each station, you will perform the following tasks:

- 1. Fill a sample bottle with water that will later be tested in the Florida LAKEWATCH laboratory for nutrients (total phosphorus and total nitrogen), color, and conductivity.
- Collect a jug of water that you will filter. This filter will later be analyzed in the Florida LAKEWATCH laboratory to determine the amount of chlorophyll (used to estimate the algae levels) in your waterbody.
- 3. Use a device called a Secchi disc to measure water clarity.
- 4. Measure water depth.
- 5. Complete your LAKEWATCH data sheet with information and observations pertinent to your waterbody.
- 6. Freeze all samples (nutrients, algae, and data sheet) and deliver your frozen samples to a LAKEWATCH collection center.

Techniques you will use to sample the water at each station are described in detail in this booklet and will be taught by a Regional Coordinator or LAKEWATCH Certified Trainer during a LAKEWATCH training session at a time and place convenient to you. This information is also available in our Training Video on our website.

HOW LONG DOES IT TAKE TO DO LAKEWATCH SAMPLING?

It usually takes about 1-2 hours to complete the sampling procedure, excluding boating and delivery time.

DO I HAVE TO TAKE SAMPLES ON THE SAME DAY EVERY MONTH?

You do not have to take your samples on the same day every month. The date of your first sampling will determine your 'target range'. You will attempt to sample monthly within plus or minus five days of your first sampling event. For example, if your first sample is collected on August 14, then in September you would try to sample again between September 9 and 19. Ideally, during this 11- day target range, you will be able to accommodate your personal schedule and allow for adverse weather conditions. However, if you cannot collect samples during the target range, take samples sometime during each month. Please do not skip a whole month of sampling just because you cannot hit your target range. Try to allow some time to pass between sampling dates.

HOW CAN I REMEMBER EVERYTHING?

Collecting LAKEWATCH samples is not difficult, but it does require careful attention to detail. Use this booklet or training video for a review every month before you do your sampling. They contain both a detailed description and a summary of each procedure. Also, you will receive a laminated training field guide to carry with you when you sample.



SAMPLING THE WATER: A DETAILED DESCRIPTION

Please wear a life jacket when taking water samples. You will be moving around and leaning out of your boat. So wearing a life jacket is a necessary safety precaution. Never attempt to collect samples if you are feeling ill or dizzy; postpone sampling until you feel well. Your health and safety are the first priority.



Part 1: Collecting Water for Nutrient Testing

The Florida LAKEWATCH laboratory will provide 250 mL water sample bottles to be used for both inland and saline stations. These bottles have been specially cleaned at the lab to prevent sample contamination. They are available at your collection center. If you do not know where your collection center is, please call the Florida LAKEWATCH Program. **Please do not substitute any other containers for sampling.**

Water collected in these bottles will be analyzed monthly for total phosphorus and total nitrogen. In addition to total phosphorus and total nitrogen, station 1 bottles will be analyzed quarterly for color and conductivity. Water sampling procedures described below are the same for both inland waterbodies and saline stations. You will be asked to furnish a waterproof marker for labeling the bottles.

If your boat has a gasoline motor, take the sample on a side of the boat that will allow you to avoid picking up any contaminants that could possibly come from the motor. Always take the nutrient sample as soon as the boat arrives at the sampling site. A useful technique is to cut the engine, coast up to your station location, and take the sample from the front of the boat while the boat is still coasting gently into position.

Step 1: Each bottle has a label on it for identification. Using a permanent waterproof marker, label the sample bottle with the following information:

- Waterbody name
- County name
- Month-day-year
- Station 1, 2, or 3, etc.

You may want to label your bottles before you start out to sample. The labels are very difficult to write on when wet. Be sure your pen is waterproof. Always double check your labels as dates and station numbers are essential to the integrity of your data.

Example:

Waterbody: <u>Little Weston</u> County: <u>Polk</u> Date: <u>3-26-01</u> Station: <u>2</u>



Step 2: At each sampling location, uncap the appropriately labeled bottle. Because your hands may carry traces of contaminating substances, be careful not to touch the inside of either the bottle or the lid.

Step 3: Swish the lid in the water and set it aside. Give the bottle a thorough rinse by gripping it securely, partially filling it with water and shaking the water out vigorously. Repeat the rinse.

Step 4: After rinsing the bottle twice, change your grip on it. With the tips of your fingers, grasp the bottom rim of your upright sample bottle. The purpose of this grip is to keep your hand as far away from the mouth of the bottle as possible to prevent possible contamination.



Step 5: Turn the bottle upside down. The bottle will be lowered into the water in an upside-down position, with its mouth pointing downward . This prevents an inflow of debris from the water's surface.



Step 6: Push the upside-down bottle down into the water until your arm is elbow deep.

Step 7: Turn the bottle to a horizontal position to let it fill, turning the mouth of the bottle so that it points in the direction in which your boat is traveling. This lets the bottle fill with water that has not been in contact with your hand, thereby minimizing the chance of nutrient contamination.



Step 8: When the bottle is full, turn the bottle right side up underwater and bring it straight up out of the water.

Step 9: This sample will be frozen and if the bottle is overfilled, it might crack or split open. Pour enough water out to leave a 1-inch space for the freezing water to expand. If the bottles bulge after they are frozen, pour out a little more water next time.



Step 10: Cap the bottle and screw the lid on tightly.

Step 11: Record the time each water sample was collected. This information will be recorded on your LAKEWATCH data sheet in the 'Sampling Time' Column.

Step 12: If you will be spending more than an hour on the waterbody, put the bottle on ice in a cooler. Otherwise, just keep it out of the sun.

Part 2: Collecting Water for the Algae Testing

You will be provided with ½ gal jug for each station. You will be asked to provide a dark towel, dark plastic bag, or cooler. To prepare the jugs, simply rinse them in tap water. Never clean them with bleach, any chemical cleaner, or soap. You may use chlorinated tap water to rinse the jugs. Even if recycled milk jugs are being used, rinse them in water only. The same jugs can be used month after month if no fungus or mold is growing in them. Store them with the caps off so they can dry out thoroughly between uses.

Using a permanent waterproof marker, write your station numbers on each of the jugs so they can be identified later.

Step 1: Remove the jug lid and rinse it in waterbody water.

Step 2: Rinse the jug by filling it with a couple of inches of water and vigorously shaking the water out. Repeat once.



Step 3: Turn the jug upside down and push it underwater to elbow depth.

Step 4: Once at the proper depth, fill the jug by turning its mouth in the direction the boat is moving. If clumps of vegetation flow into the jug, empty it and start over. If it is too difficult to force the underwater jug into an upright position to fill, smaller bottles may be substituted.

Step 5: Bring the jug out of the water and cap it.

Step 6: Cover the jug with a dark towel to block out light. Intense sunlight can stimulate the growth of algae, resulting in an inaccurate measurement of the chlorophyll level in your waterbody.

Step 7: The water should be filtered as soon as possible. Filtering may be postponed several hours if necessary, but the jugs must be stored in a cold dark location, preferably on ice or in a refrigerator. The filtering procedure is explained in detail on page 6.

Part 3: Measuring Water Clarity

A Secchi disc will be used to measure water clarity. Florida LAKEWATCH uses a white eight-inch disc with a line marked at one-foot intervals attached to its center. A weight on the bottom of the disc helps it sink quickly.



To get the most reliable measurement:

- Choose a day when there is full sun and minimal wind.
- Sample between 9 a.m. and 3 p.m. if possible. During these hours, the sun is at a higher angle, reducing glare and permitting sunlight to penetrate further into the water.
- Do NOT wear sunglasses while taking the Secchi reading.
- If the wind is blowing the boat around, anchor so that the Secchi rope will be vertical when the reading is taken. Anchor carefully to avoid stirring up bottom sediments that may interfere with water samples and water clarity. It is preferable to take water samples before anchoring the boat.
- Put the sun at your back and take the reading from the side of the boat that will allow you to cast your own shadow out on the water. Lowering the Secchi disc in your shadow helps to minimize interference from surface glare. Taking the Secchi reading from the side of the boat that is downwind may minimize interference from waves.

Step 1: Lower the Secchi disc over the side of the boat while feeding out the rope. Watch the disc until it vanishes from sight.

Step 2: After the Secchi disc is lowered into the water to the vanishing point (where it absolutely cannot be seen at all), raise and lower it a few times to determine the exact vanishing point of the disc.

Step 3: When the disc is at the vanishing point, clip the clothespin onto the rope at the waterline. Do not put the provided clothespin on the rope where your hand is unless your hand is at the waterline.



Step 4: As soon as the clothespin is clipped onto the Secchi disc rope, check to see how much cloud cover there is over the sun. Record the cloud coverage when the Secchi reading was taken in the column headed "Sun Code #" by writing a number between 1 and 5 chosen from the data sheet column headed "Sun Codes." Do not indicate how much cloud cover there was in the sky at the time the Secchi reading was taken; record the cloud cover directly over the sun only. For example, if the sky was very cloudy, but the sun popped out from behind the clouds during the time the Secchi disc was being read, a #1 would be entered for the Sun Code #.

Step 5: Pull the disc into the boat and count the rope markings to read how many feet below the surface of the water the disc was when it vanished from sight (the length of the line from the disc to the clothespin). Estimate the Secchi reading to the **nearest quarter of a foot.**



Step 6: Useing a pencil or waterproof pen, write the Secchi reading on your data sheet by writing the whole number in the space provided and circling the appropriate quarter foot increment and using special notations if applicable (B for bottom or W for weeds).

Part 4: Measuring Water Depth

The very last measurement taken at each station is the depth of the water. This is done last, because the disc hitting bottom may stir up sediments that could affect all other measurements.

Step 1: Lower the Secchi disc until it rests on the bottom; the rope will go slack. Take up the slack, mark the waterline with a clothespin, pull up the disc and count the feet between the clothespin and the disc. Estimate the water depth reading to the nearest quarter of a foot.

Step 2: Record the depth on the data sheet by writing the whole number in the space provided and circling the appropriate quarter foot increment (if needed). Use a pencil or waterproof pen.



Part 5: Filling in the Data Sheet

Step 1: Complete the top section with Waterbody and Sampler information. Check "yes" to indicate that you collected water for total phosphorus, total nitrogen (small 250 ml bottle) and chlorophyll ½ gal jug and "yes" that you took a Secchi depth reading (if you measured the water clarity).

Step 2: Make sure you have filled in all the information on the data sheet including the waterbody name, county, your name, phone number, sampling date, vanishing point and the 1/4 foot increment if applicable, the sun code number, and the water depth with the 1/4 foot increment if applicable. Your sheet should resemble the filled in example below.

Florida LAKEWATCH Freshwater Data Sheet

Waterbody Name: My Lake	County:_ <u>Alachua</u>
Sampler: Jenny Gator	
Phone:(352)_867-5309	Sampling Date: August 14, 2020
Yes <u>X</u> No: Surface Water Collecte	d for Total Phosphorus and Total Nitrogen.
Yes_X_No: Surface Water Collecte	d for Chlorophyll and Filtered Within 48 Hours.
Yes_X_ No: Secchi Depth Reading	Taken

Secchi Disc Measurements:

• For **Secchi depth** and **water depth** measurements, please indicate the number of feet and then estimate and circle the appropriate fraction, if needed.

• If your disc is visible on the bottom write B, if your disc disappears in the weeds write W, in the vanishing point column and the depth at which your disc disappears.

Va	nishing Point	Sun Code Number	Sun Code Key Use the codes from below to fill in the Sun Code Number column.	Water Depth	Sampling Time
Sta 1	2 ft. 1/4 1/2 3/4	1	1 = full sun	8 ft. 1/4 1/2 3/4	10:00 AM
Sta 2	1 ft. 1/4 1/2 (3/4)	3	2 = haze over sun	9 ft. 1/4 1/2 3/4	10:20 AM
Sta 3	2 ft. (1/4) 1/2 3/4	2	3 = thin cloud	8 ft.(1/4)1/2 3/4	10:45 AM
Sta 4	ft. 1/4 1/2 3/4		4 = medium cloud cover	ft. 1/4 1/2 3/4	
Sta 5	ft. 1/4 1/2 3/4		5 = heavy cloud cover	ft. 1/4 1/2 3/4	

FILTERING PROCEDURE: A DETAILED DESCRIPTION

Water from the ½ gallon jugs is filtered to obtain samples of algae (microscopic plants). The water may also contain clay particles, stirred-up sediments, and other substances, which will be filtered out too. The filters will be tested in the laboratory to determine how much chlorophyll (the green substance in plants) they contain.

Keep the jugs of water cool and protected from sunlight while the filtering equipment is assembled. Filter in a shady place or indoors.

Step 1: Learn the names of all the parts of the filtering equipment.



Step 2: Attach one end of the transparent tubing to the hand pump and the other end to the flask.

Step 3: Assemble the filter funnel. There are several types of filter funnels. Some use a magnet between the cup and the base while others screw on or twist into place.

The base for all types has a rubber stopper on the bottom. Grasp the cup base by the rubber stopper if possible and gently twist it downward into the mouth of the flask.



Step 4: Using the forceps (tweezers), pick up one of the smaller filter papers. It can be difficult to grasp just one filter paper, because they tend to stick together. Blowing gently along the forceps toward the filter papers will cause them to flutter apart. If two filters are used inadvertently, process them together as if they were one.

You must use the small filter papers provided by the LAKEWATCH program. They are glass fibers woven together to trap particles out of the water. You cannot substitute anything for the small filter. If you do not have any filters you can pick up a new supply at your local collection center or you can call the LAKEWATCH office at 1-800-525-3928 so we can mail you more.

Step 5: Holding the filter paper with the forceps, place it in the center of the cup base with the 'rough' side upwards. This side looks like terry cloth, while the 'smooth' side looks more like woven fabric or screening.



Step 6: To center the filter inside the rim of the cup base, nudge it from the side with the flat edge of the forceps. Never scoot the filter around by putting the pointed ends of the forceps on it. This might poke holes in the filter paper that could allow algae to pass through. If a filter paper is torn or dropped, discard it.

Step 7: Using tap water, rinse the filter cup. Rinse the cup every time water from a different jug is filtered.

Step 8: After rinsing the cup in tap water, place it on top of the cup base. The cup and base are either held together magnetically or screwed down onto the base to form a watertight seal.



Step 9: Shake the ½ gallon jug of water that is about to be filtered. This is very important and very easy to forget. Some folks have written, "Shake Me" on their jugs as a reminder. Do whatever is necessary to jog your memory. Shaking the jug evenly redistributes any algae that have settled to the bottom. The jug must be shaken even before the water is used for rinsing.

Step 10: Use the shaken waterbody water to rinse the measuring cylinder. To rinse, pour about a cup of water into it. Swirl the water around, and then twirl the cylinder as the water is poured out so that it rinses the sides of the cylinder.

Step 11: Pour waterbody water from the shaken jug into the measuring cylinder up to the anticipated measure line. The cylinder is calibrated in milliliters, which is abbreviated 'mL.' It is very important to keep track of how many milliliters

are filtered. This information will be used to calculate the concentration of algae in the waterbody water.

Note that the line on the cylinder indicating a certain measurement is below the number, not beside it. For example, the 450-mL line is below where the number 450 is written on the cylinder.



Step 12: Use a pipette (dropper) to adjust the water level in the graduated cylinder. When water is measured, it will creep up the sides, forming a slightly u-shaped surface. When seen from the side at eye-level, this u-shaped surface is called the 'meniscus.' To measure volume accurately, adjust the water level so that the bottom of the meniscus rests on top of the target line on the cylinder. To most people, this alignment looks as if the graduated cylinder is slightly overfilled. Squeeze the pipette dry before using it for the next station.



Use your judgment to decide how much water to filter. There is no pre-determined amount of water that must be filtered. The goal is to filter as much water as necessary to turn the filter paper a noticeable color. If there are a lot of algae in the waterbody, only a small volume of water may be necessary. On the other hand, if there are little algae in the waterbody that month, a greater volume may be needed. Do not filter more than 3000 mL even if that amount does not produce a noticeable color change.

On some waterbodies, the filter may clog before it produces a noticeable color change. Clay and some kinds of slimy algae can quickly clog a filter. To judge how much water to filter, watch the flow of water through the filter. When the flow decreases noticeably or the pump becomes very hard to work, do not attempt to filter any more water.

If the filter clogs and the water remaining in the filter cup cannot be pumped through, pour out all the water; reassemble the filter apparatus with a clean filter and start over using less water. For example, if 300 mL of water clogged the filter before all the water could flow through, start over using only 200 mL the second time.

In general, the approach is to measure out the amount of water thought necessary, pour it into the filter cup and pump it through. If the filter doesn't become clogged, check for a noticeable color change. If there is not enough color, measure out more water and pump that through too. Pay attention to whether the water is hard to pump and whether the stream of water is diminishing. Either of these observations is a signal that the filter is getting close to the clogging point. If so, add more water in smaller increments (50 to 100 mL), rather than trying to pump a larger volume through. Keep track of the total amount of water filtered.

Step 13: To retrieve the filter paper, either gently tip the empty cup to one side or unscrew the cup so it comes up off the filter paper and base. The filter paper should remain on the cup base. Sometimes the filter paper will stick inside the bottom of the cup. If this happens put a hand under the bottom of the cup to propel the filter paper out. Alternatively, the edge of the filter paper can be carefully loosened and peeled off gently with the forceps.



If the forceps accidentally touch the algae that have accumulated on the filter paper, algae will come off on the forceps and the amount left on the filter paper will not be the proper amount. Any filter paper on which the algae has been touched by fingers, forceps or any other object must be discarded and the filter process for that station must be started over.

Step 14: Assuming the cup comes off the base properly and leaves the filter paper behind on the base, use forceps to remove the filter paper from the base. Grasp the filter paper only by the white outer rim-- do not touch the algae with the forceps. Peel the filter paper up off the cup base.

Step 15: To enclose and protect the algae, fold the filter paper exactly in half—with the algae side inside. You can touch the back of the filter paper with your fingers. **Do not touch the algae during the folding.** No algae should be peeking out along the edge of the folded filter paper.

If the forceps tear off a small piece of filter paper, just encase it inside the folded filter paper and continue processing it.

Step 16: Put the folded sample on a paper towel. Fold the paper towel over the sample and blot it as dry as possible. Let the sample sit on the paper towel while you prepare an envelope for it.



Step 17: Prepare an envelope by folding one of the larger filter labels in half. It can be handled with your fingers. Using pencil only (NEVER use any kind of marker or ink to write on the envelopes. The ink might bleed through onto the sample and ruin it), fill in the blanks on the label on the large filter paper:

- Waterbody name
- County name
- Month-day-year
- Station number
- Volume filtered

Example:

Waterbody: <u>My Lake</u>		
County: <u>Alachua</u>		
Date: <u>8-14-20</u>		
Station: <u>3</u>		
Amount Filtered: <u>600 mL</u>		

Always double-check your label. Be sure you have filled out all the lines with all the required information.

Step 18: Tuck the folded sample inside its envelope.

Step 19: Fasten the circular edge of the envelope with a plastic-coated paperclip, provided in your kit. Never use metal paperclips; rust may bleed into the sample and ruin it.



Step 20: Put the algae envelope in the jar of desiccant (blue and white silica gel crystals). The desiccant crystals absorb moisture from the filter, drying it out to preserve the algae. Gently roll the jar to distribute the crystals around the filter papers. Do not shake the jar.

NOTE If your desiccant is turning pink refer to Appendix B: how to refresh your desiccant on page 18.

Step 21: Filling in the Data Sheet. At the bottom of the data sheet, record the filtering date and time. Please make sure the samples are filtered within 48 hours of collection. Complete this information for each station as you filter them. Yours should resemble the example below.



Date and Time of Chlorophyll Filtration:

Station	Filtering Date	Filtering Time
Sta 1	August 14, 2020	11:30 AM
Sta 2	August 14, 2020	11:45 AM
Sta 3	August 14, 2020	12:00 PM
Sta 4		
Sta 5		

Step 22: Complete the remainder of the data sheet. Write any comments on the back of the data sheet. Include anything that might possibly be useful. For example, "lime rock washed into waterbody from torrential rainfall on roads, "grass carp were stocked in waterbody last week," or "public beach was closed by Health Department on May 10th." If you choose to record water levels, please clearly label the type of gauge you are reading. A copy of both LAKEWATCH data sheets (inland water and saline stations) is provided in Appendix A on page 16.

Step 23: dry your sample bottles, and put them all, along with your desiccant bottle and data sheet, into a Ziploc bag. Put the bag of water sample bottles in the freezer immediately. Include the data sheet! Be gentle with the frozen bottles. They may become brittle and can shatter if they are dropped. Repeat all steps for the remaining jugs of water and put all the filter papers into the bottle of desiccant. Store in the freezer.

After Sample Collection and Filtering...

- Rinse the equipment with tap water and let it air dry.
- Check the number of bottles, filters, and paper clips to assure there is an adequate supply for next month's sampling.
- Deliver your water bottles, data sheet, and desiccant bottle to your local collection center.
- Pick up new supplies at your local collection center or call the LAKEWATCH office at 1-800-525-3928.

SAMPLING THE WATER: A SUMMARY

Part 1: Collecting Water for Nutrient Testing

- 1. Use a waterproof marker to fill in the blanks on the label of each sample bottle.
 - Waterbody name
 - County
 - Month-day-year
 - Station number
- 2. Without touching the inside of the bottle and lid, rinse them in the waterbody twice.
- **3.** Grasp the bottle at its base, turn it upside down and lower it into the waterbody to elbow depth.
- 4. Fill the bottle by turning it horizontal and pointing its mouth in the direction of travel.
- 5. Bring bottle up and pour enough water out to leave a 1-inch space for the freezing water to expand.
- 6. Cap the bottle tightly and put it in a shaded place or ice chest.
- Record the time each water sample was collected on your LAKEWATCH data sheet in the 'Sampling Time' Column.

Part 2: Collecting Water for the Algae Testing

- 1. Rinse the jug and lid in the waterbody twice.
- 2. Invert the jug and lower it into the waterbody to elbow depth.
- 3. Fill jug by pointing its mouth in the direction of travel.
- 4. Bring the jug up, cap it, and keep it in the dark, covered with a dark towel or bag or stored in a cooler.

Part 3: Measuring Water Clarity

- 1. Without wearing sunglasses, lower the Secchi disc into the water on the shaded side of the boat.
- 2. At the point when the disc first vanishes from sight, put the clothespin on the rope at the water line (rope should be vertical).
- Glance to check the sun cover, haul in the disc, and count rope markings to read how many feet underwater the disc was when it vanished from view.
- 4. Record water depth and the appropriate sun code on the LAKEWATCH data sheet.

Part 4: Measuring Water Depth

1. Lower the Secchi disc to the bottom.

- 2. At the point when the rope goes slack, put the clothespin on the rope at the water line (rope should be vertical).
- **3.** Haul in the disc, count rope markings, and record depth on the LAKEWATCH data sheet.

Part 5: Filling in the Data Sheet

Complete top section with Waterbody and Sampler information. Check "yes" to indicate that you collected water for total phosphorus, total nitrogen (small 250 ml bottle) and chlorophyll ½ gal jug and "yes" that you took a Secchi depth reading (if you measured the water clarity).

Make sure you recorded

- The time each water sample was taken in the column headed "Sampling Time"
- The Secchi depth using special notations if applicable (B for bottom or W for weeds)
- The cloud coverage during the Secchi reading in the column headed "Sun Code Number"

FILTERING PROCEDURE: A SUMMARY

Repeat for all Stations

- 1. Assemble the filtering apparatus (out of the sunlight) by inserting the filter base into the flask.
- 2. Using forceps, center a small filter (rough side up) on the cup base.
- 3. Using tap water, rinse the filter cup and set or screw it on the base.
- 4. Shake the jug of water and use some of it to rinse the graduated cylinder.
- 5. Measure water from the jug into the graduated cylinder.
- 6. Pour measured water from the graduated cylinder into the filter cup and pump it through the filter paper until a noticeable color appears on the filter or it starts to clog.
- 7. After pumping the cup dry, tip (if magnetic) or unscrew the cup off the base.
- 8. Pull the relief trigger to break vacuum seal.
- 9. Using the forceps to grip the white part of the filter paper, lift it off the cup base.
- 10. Being careful not to touch the algae, fold the filter in half, algae side in to enclose the algae and blot the small filter thoroughly on a paper towel.

- 11. Using a pencil, label a large filter paper with
 - Waterbody name
 - County
 - Station number
 - Month-day-year
 - Amount of water filtered (mL)
- 12. Fold the large paper filter in half, tuck the small filter inside and fasten with a plastic-coated metal paper clip.
- 13. In the table on the data sheet, record the filtration date and time for each station.
- 14. Repeat all steps for the remaining jugs of water and put all the filters into the bottle of desiccant. Store in the freezer with water samples and data sheet.
- 15. Rinse equipment with tap water, let air dry and check to see if there are enough supplies for next month—GOOD WORK!



SAMPLING AND FILTERING EQUIPMENT CHECKLIST

Boat Checklist

- 1. Life Jacket
- 2. Sample bottles/one per station, in a Ziploc bag
- 3. Waterproof marker*
- 4. Chlorophyll jugs/one per station
- Dark colored towel, black trash bag, or ice cooler*
- 6. Data sheet with pencil

- 7. Secchi disc with clothespin
- 8. Map of station locations
- 9. Laminated reference card
 - *furnished by the volunteer

Sampling Kit Inventory

- 1. Secchi disc with clothespin
- 2. 1000 mL filter flask
- 3. Hand pump with tubing
- 4. Filter funnel cup
- 5. Cup base
- 6. Forceps (tweezers)
- 7. Pipette
- 8. Graduated cylinder
- 9. Desiccant bottle
- 10. 250 mL sample bottles.
- 11. One half-gallon Chlorophyll jugs/one per station
- 12. Small filters: 47 mm type A/E glass fiber filters
- 13. Large filters: 7 cm paper filters
- 14. Plastic coated paper clips
- 15. Data sheets
- 16. Florida LAKEWATCH instruction booklet
- 17. Laminated reference card



FREQUENTLY ASKED QUESTIONS

WHAT DO I DELIVER TO THE COLLECTION CENTER?

Deliver three things: (1) Ziploc bag containing frozen bottles of water; (2) jar of desiccant containing algae filters; and (3) data sheets. You can make copies of your data sheets for your future reference.

HOW LONG CAN I KEEP MY SAMPLES IN MY FREEZER?

You should take your samples to the Gainesville laboratory or to the nearest collection center when it is convenient for you; within a three-month period from the time you take your sample. Some collection centers are picked up monthly, every two months, and some only quarterly. To find out your collection center pick-up schedule please call the LAKEWATCH office.

WHERE CAN I GET SUPPLIES?

When delivering samples to the collection center, you can always pick up any supplies you need. You can always pick up replacement bottles, data sheets and a bottle of desiccant. You may also need more filters and paper clips. If you have any difficulty getting supplies, call the LAKEWATCH office.

IF I RUN OUT OF FILTERS, CAN I USE COFFEE FILTERS OR SOME OTHER KIND?

No, there is no substitute for the algae filters (the smaller filters). They are made of glass fibers, not paper, and are specially designed for chemical analysis.

You may use coffee filters or any soft paper in place of the big filter as envelopes for the algae filters, but not for the algae filters themselves. To assure you have the necessary supplies, check your filters for next month when you are storing your equipment.

HOW WILL I BE ABLE TO GET BACK TO MY STATIONS EVERY MONTH?

If you have access to a Global Positioning System (GPS) the latitude and longitude of each sampling station can be stored in the GPS and used each month to get to the same spots. If you do not have access to a GPS, you can use an app on your smart phone such as Google Earth or Apple Maps.

FOR EVERY SAMPLING TRIP, IS IT IMPORTANT TO LABEL EACH STATION WITH THE UNIQUE STATION NUMBERS?

Yes, it is extremely important that, once located, the stations are referred to by their correct number. For example, Station 1 is always labeled Station 1, never Station 2 or 3.

HOW OFTEN WILL I BE GETTING RESULTS?

After you have accumulated data for about a year, you will receive a detailed annual report. In this report, we present summary data collected on individual systems that have been part of the LAKEWATCH program. This summary is from the whole period of record for individual systems. The first part of this summary will average the long-term mean nutrient concentrations. The second part of the summary will examine for any long-term trends that may be occurring in the system if you have 5 or more years of data.

IF THERE IS A FISH KILL, WHAT SHOULD I DO?

You can report a fish kill, diseased fish, or fish with other abnormalities directly to the Fish and Wildlife Health Group at the Fish and Wildlife Conservation Commission's (FWC) Fish and Wildlife Research Institute in St. Petersburg. **Call: 1-800-636-0511**.

MY ALGAE FILTER DID NOT FOLD EXACTLY IN HALF AND SOME OF THE ALGAE ARE SHOWING, LIKE AN ALGAE 'GRIN' ALONG THE EDGE. IS THIS OKAY?

No. All the algae must be enclosed in the folded smaller filter; otherwise the exposed algae will rub off onto the larger filter into which it is tucked. If the algae touch anything other than the small filter, the measurement will be invalid.

CAN I TAKE WATER IN MY CHLOROPHYLL JUG AND POUR IT INTO THE SMALLER BOTTLES?

No, the small bottles are specially cleaned, and the jug is not. If you pour water from the jugs into the bottles, the jug will contaminate the water. Also, you used special collection techniques when you filled the bottle, which are designed to prevent contamination from your body. You do not take these precautions when you collect water in your gallon jugs.

THE CRYSTALS IN MY DESICCANT BOTTLE ARE CHANGING COLOR. WHAT IS THE PROBLEM?

The blue crystals in your desiccant bottle will change to pink when they become saturated with moisture. Refer to Appendix B on page 18 to learn what to do about it. The probable cause of your problem is that either you are putting too many samples in one bottle or you are not blotting each sample as dry as possible before you put it in the bottle.

WHAT IS THE MOST COMMON MISTAKE MADE WHILE COLLECTING WATER SAMPLES?

Incorrect labeling of the sample bottle & algae filter labels along with incomplete data sheets.

WHAT ARE THE MOST COMMON MISTAKES MADE WHILE DOING THE FILTERING?

Volunteers sometimes forget to write how much water they filtered. If the amount is not recorded, the concentration of algae in the water cannot be calculated. Of course, we never know how many volunteers forget to shake their jugs of water before they begin the filtering procedure.

MY GRADUATED CYLINDER SEEMS TO BE GETTING DIRTY. CAN I CLEAN IT?

Yes, simply soak it in hot soapy water. Rinse it thoroughly. Never scrub it with a brush or scrubber. Never put it in your dishwasher.

I PUMP AND I PUMP, BUT THE WATER DOES NOT SEEM TO GO DOWN IN MY FILTER CUP. WHAT CAN I DO?

You shouldn't have to 'pump till you slump.' We have found that a small percentage of our hand pumps break down. Test yours by pulling off the plastic tubing and placing your thumb over the open end of the tubing. Pump the hand pump. Remove your thumb. If there was not noticeable suction, then your hand pump is broken. If your pump is broken,

call the LAKEWATCH office. A new one can be sent out to you. Spare replacement pumps are sometimes stocked at collection centers. Please return your broken pump because sometimes the manufacturer will replace the pump, or

we can scavenge them for parts. One possible reason for breakage is that people forget to empty their flask. When it becomes filled with more than 1000 mL of water, water will be sucked down through the plastic tubing and will be spit out through the pump, damaging the mechanism. If you find that your pump is okay, check to see if the rubber stopper is fitted tightly into the mouth of your flask. If it is and there is still a problem, your water may contain clay or other substances that clog the filter easily. In this case, pump only as much water as you can in about five minutes. Remember, you must pump your cup dry, so don't fill it very full to begin with.

CAN I TRAIN OTHER PEOPLE ON MY WATERBODY TO TAKE SAMPLES?

No. Only a designated trainer can certify the LAKEWATCH samplers. In this way we know that every certified sampler has been passed through the same training procedure. It is a quality control provision. We will be glad to train as many folks as are interested; just let us know.

CAN I COME VISIT THE LABORATORY IN GAINESVILLE?

Yes, we would be glad to have you visit between! Please call us to make an appointment for 8:30 am and 4:30 pm on weekdays. Maps are available on the LAKEWATCH website or you can call the LAKEWATCH office for directions.

FINALLY, IF I HAVE QUESTIONS, WHOM DO I CALL?

Call the LAKEWATCH office at 1-800-LAKEWAT (525-3928), or 352-392-4817. Or you can contact your regional coordinator. See Appendix D for coordinator information.



APPENDIX A: FLORIDA LAKEWATCH DATA SHEETS

Florida LAKEWATCH Freshwater Data Sheet

Waterbody Name:	County:
Sampler:	
Phone:()	Sampling Date:
Yes No: Surface Water Collected	for Total Phosphorus and Total Nitrogen.
Yes No: Surface Water Collected	for Chlorophyll and Filtered Within 48 Hours.

Yes___ No___: Secchi Depth Reading Taken

Secchi Disc Measurements:

 For Secchi depth and water depth measurements, please indicate the number of feet and then estimate and circle the appropriate fraction, if needed.

 If your disc is visible on the bottom write B, if your disc disappears in the weeds write W, in the vanishing point column and the depth at which your disc disappears.

Va	nishing Point	Sun Code Number	Sun Code Key Use the codes from below to fill in the Sun Code Number column.	Water Depth	Sampling Time
Sta 1	ft. 1/4 1/2 3/4		1 = full sun	ft. 1/4 1/2 3/4	
Sta 2	ft. 1/4 1/2 3/4		2 = haze over sun	ft. 1/4 1/2 3/4	
Sta 3	ft. 1/4 1/2 3/4		3 = thin cloud	ft. 1/4 1/2 3/4	
Sta 4	ft. 1/4 1/2 3/4		4 = medium cloud cover	ft. 1/4 1/2 3/4	
Sta 5	ft. 1/4 1/2 3/4		5 = heavy cloud cover	ft. 1/4 1/2 3/4	

Date and Time of Chlorophyll Filtration:

Station	Filtering Date	Filtering Time
Sta 1		
Sta 2		
Sta 3		
Sta 4		
Sta 5		

DESCRIBE any unique occurrences since your last sampling date, either in the lake or on the local watershed:

If you wish to record lake levels of your lake, please fill in this last section. Lake Level Measurements: Please circle or describe the type of gauge located in the lake and then record the lake level. Type of Staff Gauge: WMD / City / LCWA / USGS / Other (Please describe):

Lake level:

Rain (in.) since last report:

Call LAKEWATCH (1-800-LAKEWAT) if you have any questions on how to get started.

Florida LAKEWATCH Saline Data Sheet

Waterbod	ly Name	<u> </u>		County:
Sampler:		Phone:()(Sampling Date:
YesN	lo: S	Surface Water Collected for	Total	Phosphorus and Total Nitrogen.
YesN	lo: S	Surface Water Collected for	Chlor	ophyll and Filtered Within 48 Hours.
YesN	lo: S	ecchi Depth Reading Taker	n.	

Secchi Disc Measurements:

• For **Secchi depth** and **water depth** measurements, please indicate the number of feet and then estimate and circle the appropriate fraction, if needed.

• If your disc is visible on the bottom write B, if your disc disappears in the weeds write W, in the vanishing point column and the depth at which your disc disappears.

Va	nishing Point	Sun Code Number	Sun Code Key Use the codes from below to fill in the Sun Code Number column.	Water Depth	Sampling Time
Sta 1	ft. 1/4 1/2 3/4		1 = full sun	ft. 1/4 1/2 3/4	
Sta 2	ft. 1/4 1/2 3/4		2 = haze over sun	ft. 1/4 1/2 3/4	
Sta 3	ft. 1/4 1/2 3/4		3 = thin cloud cover	ft. 1/4 1/2 3/4	
Sta 4	ft. 1/4 1/2 3/4		4 = medium cloud cover	ft. 1/4 1/2 3/4	
Sta 5	ft. 1/4 1/2 3/4		5 = heavy cloud cover	ft. 1/4 1/2 3/4	
Sta 6	ft. 1/4 1/2 3/4			ft. 1/4 1/2 3/4	
Sta 7	ft. 1/4 1/2 3/4			ft. 1/4 1/2 3/4	
Sta 8	ft. 1/4 1/2 3/4			ft. 1/4 1/2 3/4	
Sta 9	ft. 1/4 1/2 3/4			ft. 1/4 1/2 3/4	
Sta 10	ft. 1/4 1/2 3/4			ft. 1/4 1/2 3/4	
Sta 11	ft. 1/4 1/2 3/4			ft. 1/4 1/2 3/4	
Sta 12	ft. 1/4 1/2 3/4			ft. 1/4 1/2 3/4	
Sta 13	ft. 1/4 1/2 3/4			ft. 1/4 1/2 3/4	

Date and Time of Chlorophyll Filtration:

Station	Filtering Date	Filtering Time
Sta 1		
Sta 2		
Sta 3		
Sta 4		
Sta 5		
Sta 6		
Sta 7		
Sta 8		
Sta 9		
Sta 10		
Sta 11		
Sta 12		
Sta 13		

DESCRIBE any unique occurrences since your last your sampling date, either in the coastal waters or on the local watershed, on the back of this data sheet.

Call LAKEWATCH (1-800-LAKEWAT) if you have any questions on how to get started.

APPENDIX B: HOW TO REFRESH DESICCANT

HOW TO REFRESH DESICCANT

Florida LAKEWATCH volunteers put their algae filters into plastic bottles containing blue and white crystals. These crystals are desiccant (a material that absorbs moisture). The blue crystals contain a chemical that turns from blue to pink when the crystals become saturated with moisture. This color change signals that the crystals cannot effectively absorb more moisture and need to be 'refreshed.' To restore the crystals to their initial dry condition, follow these steps:

- Remove all algae filter samples from the bottle of crystals. Tweezers are useful for handling the filters. Put the filter samples in the freezer while you refresh the desiccant. Do not let the samples thaw out.
- **2.** Pour the crystals out of the plastic desiccant bottle into an oven-proof glass container.
- **3.** Cook the crystals in an oven until they turn blue again. Alternatively, you can microwave them for several minutes. An average time might be two minutes on high in a 600-watt microwave oven. Regardless of how you cook them, DO NOT leave them in the plastic bottle. It WILL melt, even in a microwave. If you choose to use a microwave to dry out the crystals, a paper plate works well to hold the crystals.
- 4. Allow the crystals to cool.
- 5. Pour the cooled crystals back into the plastic bottle. The algae filter samples can now be returned to the desiccant bottle.





APPENDIX C: ADDITIONAL LAKEWATCH VOLUNTEER OPPORTUNITIES

ANGLER DIARIES

If you, a friend, or a neighbor fishes the waterbody that you are sampling for water chemistry, you may want to participate in the angler fish diary program through Florida LAKEWATCH. Long-term fish data collected on individual waterbodies through the use of fishing diaries can be used in a similar way as the LAKEWATCH water chemistry data; it gives us hard numbers to use in identifying patterns or trends that may be occurring in your waterbody's fish populations. For example, these data can yield trend analyses of catch per unit effort (number of fish caught per unit of time). If the catch per unit effort decreases significantly over time, this could suggest a problem with the fish population that needs to be looked at more intensely. Additionally, if catch per unit effort remains constant through time then the waterbody and fish populations are probably fine. If diaries are kept on many waterbodies, data will be available for LAKEWATCH personnel to examine relationships among other environmental data (for example, the amount of algae or surface area) and fishing data.

The LAKEWATCH fishing diaries record information from 10 trips or fishing events. It has been designed so that it can easily fit in your tackle box or boat's dry storage compartment. There is even a convenient ruler that can be stuck onto a cooler or an area on your boat to measure each fish caught.



If you are interested in participating in the LAKEWATCH angler diary program, please call the Florida LAKEWATCH office and we will mail you an angler diary.





AQUATIC BIRD SURVEY

Since the inception of Florida LAKEWATCH, there has been a desire to survey bird use of Florida's waterbodies. One LAKEWATCH volunteer collected monthly bird counts for five years when he went out to sample water chemistry. He brought the data to the LAKEWATCH program and it led to a publication in the Journal of Lake and Reservoir Management. The data were used to show that volunteer bird monitoring efforts could provide valuable information on the long-term status of Florida's aquatic bird populations. Similar sampling protocol was developed and is now being offered to anyone

Interested in monitoring the monthly occurrence of bird use on a waterbody. The objective of the Florida LAKEWATCH Aquatic Bird Survey is to establish a standardized, statewide, long-term monitoring program to examine seasonal and yearly trends in Florida's aquatic birds. This data will offer insights into the effects of shoreline habitat, water chemistry, and broad-scale climatic factors on the foraging, nesting, and roosting of aquatic birds.

A considerable number of bird species are known to utilize waterbodies, but few studies have directly quantified their numbers or examined long-term trends in diversity and abundance. As Florida's wetlands continue to be altered or destroyed, the importance of lake habitat to aquatic bird communities needs to be documented. Monitoring the distribution and abundance of birds associated with Florida waterbodies will help us determine which bird species utilize Florida waterbodies and develop future management strategies. If you are interested in participating in the Florida LAKEWATCH Aquatic Bird Survey, please call the Florida LAKEWATCH office and we will mail you an aquatic bird survey.



Figure 1. Green-backed heron. Credits: Lawrence Korhnak



Figure 2. Snowy egret. Credits: Lawrence Korhnak



Figure 3. Double-crested cormorant. Credits: Lawrence Korhnak



Figure 4. Wood duck. Credits: Lawrence Korhnak

Florida LAKEWATCH Aquatic Bird Survey			
Lake: Data Recorder:			
County:	Phone Number:	Method:	
Date: Stop Time: Stop Time:			

Туре	Species	Total Number of Each Bird Species Observed
Diving	Pied-billed Grebe	
	Common Loon	
	Horned Grebe	
	Double-crested Cormorant	
	Anhinga	
Ducks	Hooded Merganser	
	Red-breasted Merganser	
	Mottled Duck	
	Ring-necked Duck	
	Mallard	
	Wood Duck	
	Blue-winged Teal	
	American Coot	
Marsh	Common Moorhen	
	Purple Gallinule	
	Rails	
Wading	Great Blue Heron	
	Least Bittern	
	Little Blue Heron	
	Tricolored Heron	
	Black-crowned Night Heron	
	Yellow-crowned Night-Heron	
	Green-backed Heron	
	Great Egret	
	Snowy Egret	
	Cattle Egret	
	Wood Stork	
	Sandhill Crane	
	Limpkin	
	Glossy Ibis	
	White Ibis	
Hawks	American Kestrel	
	Northern Harrier	
	Red-tailed Hawk	
	Red-shouldered Hawk	
	Bald Eagle	
	Osprey	
	Swallow-tailed Kite	
	Turkey Vulture	
	Black Vulture	
	Mixed Vultures	
Marine	White Pelican	
	Brown Pelican	
	Gulls	
Ch and	Terns	
Shore	Killdeer	
	Plovers	
Song	Crows	
Song	Crows Post tailed Grackle	
	Bodt-talleu Grackle	
	Neu-Willgeu Didukullu Durala Martin	
	Swallows	
	SwallUWS	
Notes on Additional Bird Spa	jak Weather Conditions Water Lovel Painfall etc	
		(Continue notes on back)

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APPENDIX D: REGIONAL COORDINATORS

Mo's Region:

Alachua Lafayette Baker Leon Bay Levy Bradford Liberty Calhoun Madison Clay Marion Columbia Nassau Dixie Okaloosa Duval Putnam Escambia Santa Rosa Flagler Seminole Franklin St. John's Gadsden Suwannee Tayler Gilchrist Gulf Union Hamilton Volusia Holmes Wakulla Jackson Walton Jefferson Washington



Marina's Region:

Citrus Hernando Lake Polk Sumter

Dan's Region:

Lee Brevard Broward Manatee Charlotte Martin Miami-Dade Collier Monroe Dade De Soto Okeechobee Orange Glades Osceola Hardee Henderv Palm Beach Pasco Highlands Hillsborough Pinellas Indian River Sarasota St. Lucie

de ch

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MARINA SCHWARTZ

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THANK YOU FOR BEING A PART OF THE FLORIDA LAKEWATCH PROGRAM!

The information from this manual and other training materials can be found on our website at: <u>https://</u> lakewatch.ifas.ufl.edu/for-volunteers/training

For more information about LAKEWATCH or to inquire about volunteer training sessions contact us at:

Florida LAKEWATCH

Fisheries and Aquatic Sciences School of Forest, Fisheries, and Geomatics Sciences 7922 NW 71st St. Gainesville FL 32653

> 1-800-LAKEWATCH (800-525-3928),**(352)** 392-4817 E-mail: <u>fl-lakewatch@ufl.edu</u>

Website: http://lakewatch.ifas.ufl.edu



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Fisheries and Aquatic Sciences School of Forest, Fisheries, and Geomatics Sciences 7922 NW 71st St. Gainesville FL 32653 1-800-LAKEWATCH (800-525-3928), (352) 392-4817 E-mail: <u>fl-lakewatch@ufl.edu</u> Website: http://lakewatch.ifas.ufl.edu

Florida LAKEWATCH

