

Routine Limno Sampling - 2008

The field procedures can be performed by 2 people in one boat:

Peter and Paul

1.) Both people: light profile

2.) Limnologist A:

collect water for lab analyses using Van Dorn sampler.

(Light depths for Chl and DIC, and PML, Meta, Hypo for POC, DOC, color)

Limnologist B:

calculate light depths for person A

Temperature and Dissolved Oxygen profile

3.) Both people – split up the following as appropriate:

Zooplankton tows

pCO₂

pH glug

secchi depth

Read staff gauge

Detailed Procedures:

Light profile (using LiCor submersible light meter, deck light meter, and data logger): Lower sensor from *sunny side* of the boat, taking readings at the surface and at 0.25m intervals to 1.0m, then at 0.5m intervals to 1% surface irradiance. Calculate the 6 depths where light is 100, 50, 25, 10, 5, and 1% of the surface irradiance.

Water collection for Chl, DIC, POC, DOC, Color Rinse all bottles with water from their respective depths 3 times before collection. Using the 4L Van Dorn, collect fixed depth water from the 6 light depths calculated above, the pooled mixed layer (PML), metalimnion, and hypolimnion. See table for sampling depths.

	Crampton	Peter (R)	Paul (L)	E Long	W Long	Tues
PML	0,1,2,3	0,1,2	0,1,2	0,1,2	0,1,2	0,1,2
Meta	6	4	4	4	4	3*
Hypo	12	12	9	12	12	12
Zoop Tow	12	12	8	12	12	12

*if O₂<1mg/L then 2.5

pH. Collect surface water pH sample using the BOD bottle by glugging the bottle over the side of the boat. Rinse 3x before collecting the sample.

Temperature and Dissolved Oxygen profile. Calibrate the DO as follows. Turn on the probe and let warm up for 15 minutes before using. Calibrate with the probe in the moist cup. Make sure temperature is stable. Switch to DO % saturation. Turn the calibration knob until

DO = 95%. Lock calibration knob without changing the DO. Now it is ready to read. Take DO and temperature readings at 0.5 m intervals from 0-7m then at 1m intervals to 12 m. Read DO on 0.01 scale but record DO and temperature to the nearest 0.1 unit.

Secchi depth. Take the secchi depth reading from the *shady side* of the boat. Lower the disk until it disappears, note the depth and raise the disk until it reappears. Average the two readings.

pCO₂. Before starting, check all syringes for leaks by closing their stopcocks and pressing the plunger down. If no leaks are heard and pressure is maintained in the syringes, continue. If there is leakage, replace the syringe. Fill a 60mL syringe with air from the windward direction, *being very careful not to contaminate the syringe with exhalation*. Close stopcock. Rinse and fill the 2L polycarbonate bottle with surface water and cap with the double-valve stopper, leaving both valves open. Insert the air filled 60mL syringe into the air-intake stopcock (short tube inside the bottle) and one empty 60mL syringe into the water-intake stopcock (long tube inside the bottle). Slowly inject 60mL air while removing 60mL water without creating a vacuum or increased pressure inside the bottle. Close all stopcocks and remove the syringes. Shake the bottle for 100 seconds to equilibrate the headspace. Insert water filled syringe into water-intake valve. Attach empty 20mL syringe into the air-intake valve. Open stopcocks on both syringes and stopper and remove 20mL air while inserting the same volume of water. Close the stopcock on the full 20mL air syringe and the stopcock on the bottle stopper and detach the syringe. While holding the syringe with the stopcock end down, quickly open and close the valve to remove water and equalize pressure. Remove two more 20mL air samples with the second and third syringes in the same manner as the first. Empty the polycarbonate bottle and repeat the entire procedure once more.

Zooplankton for counts. Take 2 vertical hauls for zooplankton with the 80µm mesh Nitex net and pool them into a single 120mL jar. Lower the net to the appropriate depth (see above table) and retrieve at a constant rate of 3 seconds per meter. Thoroughly rinse the zooplankton cup into the sample jar after each tow using the squirt bottle filled with tap water. Rinse the net and cup in the surface water after the samples have been taken.

Field supplies:

- 1 YSI O₂/Temp meter (**turned on to warm up**)
- secchi disk

- Light meter (water)
- Light meter box: data logger, pencils, Li-cor light meter (deck), calculator, Ziploc bag
- Van Dorn sampler

- Zooplankton net (80µm mesh)
- Zooplankton cup (74µm mesh)
- Zooplankton jar (120mL)
- Tap water rinse bottle

- pCO₂ bottle – 2 L. polycarbonate bottle (narrow mouth)
- pCO₂ kit:
 - double valve stem stopper
 - 3 60ml syringes with stopcocks (1 air, 1 water, 1 spare)
 - 7 20ml syringes with stopcocks (4 pCO₂, 2 atm, 1 spare)

- 6 light depth bottles (2 L Nalgene bottles)
- 1 meta bottle (2 L Nalgene bottle)
- 1 hypo bottle (2 L Nalgene bottle)
- 1 PML bottle (4 L Nalgene bottle)
- 9 screw caps for above bottles
- 1 300ml BOD bottle (and stopper) for pH sample

- 1 clipboard with data sheet
- seat cushions and life preservers
- oars

Remember to turn on GC before you leave for the lake.