

# SAMPLE PROCESSING PROTOCOL

## POLARIS PROJECT AQUATIC SURVEY

### FULL SURVEY SAMPLES

2012

#### Sample Processing Equipment

- GeoPump peristaltic pump with Masterflex C-Flex tubing (size 24)
- Vacuum Pump (1) – for vacuum filtration
- Filter tower, 25 mm (1) – for Chla filtration
- Filter tower, 47 mm (1) – for TSS/POC/PON filtration
- Graduated cylinder, 250-mL

#### Sample Processing Supplies (per each sample location)

- Geotech 0.45 µm capsule filter (1) - *may be used for more than one sample on the same day*
- Whatman 47 mm GFF filter, ashed, pre-weighed in plastic case – *for TSS, POC/PON (1)*
- Whatman 25 mm GFF filter – *for Chla (1)*
- Centrifuge tube – *for Chla filter (1)*
- Glass 25 mL vial, ashed (1) - *for DOC, should be reused*
- Wheaton 20 mL HDPE vial (5)
- Wheaton 20 mL HDPE vial, specially cleaned – *for trace elements (1)*
- Nalgene 60 mL precleaned HDPE bottle (4)

### SAMPLE PROCESSING PROTOCOL

Set up a clean bench in the lab. Wear gloves and maintain a clean work space. Rinse all bottles 3 times with a small volume of sample water before collecting the final sample.

#### A. Unfiltered Whole Water Samples

Install pump tubing (Masterflex C-Flex, size 24) into peristaltic pump. Be very careful to keep the ends of the tube clean (*you can put the ends of the tube inside a latex glove to protect them from contamination*). Place one end of the tube in the 4-liter carboy and pump approximately 500 mL of water through the tube (discard this water). Then fill the following bottles with whole (unfiltered) water.

**Turbidity:** Shake the 4-L carboy vigorously. Pour sample into turbidity vial and measure turbidity on Hach Turbidometer. Record result on Field Data Sheet.

**Bottle 1:** H<sub>2</sub><sup>18</sup>O. 20 mL HDPE vial, fill completely.

*Preservation: Wrap cap with black tape, refrigerate, export.*

**Bottle 2:** Enzymes. 20 mL HDPE vial, fill completely.

*Preservation: Refrigerate, process in Cherskiy ASAP.*

**Bottle 3:** BOD. 1-liter brown HDPE bottle, fill completely.

Do 24-hour and 5-day BOD measurements in Cherskiy.

#### B. Particulate Samples

These samples are filtered using a vacuum pump and filter tower (see figure). This is a change – in 2011 we used the GeoPump for particulate samples. A 25mm tower is used for Chla and a 47 mm tower is used for TSS/POC/PON filter.

The carboy should be agitated periodically to help keep sediments suspended. In all cases, filter water into graduated cylinder and *record amount of water filtered*.

**Filter 1:** Chlorophyll. 25mm Whatman GFF.

*Preservation: Put in 15-mL test tube, label, freeze, analyze in Cherskiy.*

**Filter 2:** TSS/POC/PON. Pre-weighed 47mm Whatman GFF.

*Preservation: Dry at 60C, export.*

### **C. Capsule Filtered Water Samples**

Attach a Geotech 0.45  $\mu\text{m}$  high-capacity capsule filter to the end of the tube and pump through enough water to fully wet the filter surface and fill the capsule (at least 500 mL). Then filter water into the following sample bottles. Rinse each of these bottles three times before filling.

A single capsule filter can be used for more than one sample, but be sure to first force all water out and then flush with plenty of the new sample before collecting new samples. Discard the capsule filter at the end of the day (multiple filters may be needed on busy days).

**Bottle 4:** DOC and TDN. 20 mL ashed glass DOC vial, fill to shoulder.

*Preservation: Acidify with 2 drops 50% HCl and analyze in Cherskiy ASAP.*

**Bottle 5:** Optics (UV-VIS scans and EEMs): 20 mL HDPE vial, fill to shoulder.

*Preservation: Refrigerate and analyze in Cherskiy ASAP.*

**Bottle 6:** Archive 1. 60 mL HDPE, fill to shoulder.

*Preservation: Freeze. Store in Cherskiy.*

**Bottle 7:** Archive 2. 60 mL HDPE, fill to shoulder.

*Preservation: Freeze. Store in Cherskiy.*

**Bottle 8:** Alkalinity. 60 mL HDPE, fill completely.

*Preservation: Refrigerate, export.*

**Bottle 9:** Trace Elements. 20 mL pre-cleaned HDPE, fill completely.

*Preservation: Refrigerate, export.*

**Bottle 10:**  $\text{NO}_3$ ,  $\text{NH}_4$ ,  $\text{PO}_4$ , Si. 20 mL HDPE, fill to shoulder.

*Preservation: Freeze, export.*

**Bottle 11:** Archive. 60 mL HDPE, fill to shoulder.

*Preservation: Freeze, export.*

**Bottle 12:** Archive 3. 20 mL HDPE, fill to shoulder.

*Preservation: Freeze, export.*