



Status & Trend Networks Sediment Sampling Protocols

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Sediment Sampling in Large and Small Lakes in the Status Network

- In the annual Status Network, ideally 180 sediment samples would be collected (90 Small Lake; 15 per zone; 90 Large Lake; 15 per zone). But the annual number is less than 180, due to lack of natural small lakes in certain parts of Florida.
- Small Lakes are sampled in the center of open water in the lake, whereas Large Lakes are sampled at the provided latitude-longitude value.



FDEP SOP References for Sediment Sampling Protocols

First, read Sediment Sampling Protocols in the Status and Trend Network Sampling Manual (Section 6). These protocols are based on the existing FDEP SOPs for sediment sampling.

Table FS 4000-1, FS 1000, Table FS 1000-3
(equipment and construction)

FS 1000 and Table FS 1000-6 (containers)

FC 1100 and FC 1300 (cleaning)

FD 1000 (documentation)

FS 1000 Table 1000-6 (preservation/holding times)

To access Sampling Manual, use

http://publicfiles.dep.state.fl.us/dear/DEARweb/WMS/Reports_Docs_SOPs/Standard%20Operating%20Procedures/Sampling%20Manuals/WMS-SamplingManual.pdf



List of sediment analytes performed by the FDEP Laboratory

- **Metals:** Aluminum*, Antimony, Arsenic, Beryllium, Cadmium, Chromium, Copper, Iron*, Lead, Selenium, Mercury, Molybdenum, Nickel, Silver, Zinc
(* = normalizing elements)
- **Nutrients:** Nitrogen (TKN), Total Phosphorous (TP),
Total Organic Carbon (TOC)
- **Organic Contaminants:** PAHs, PCBs, and pesticides were analyzed in Status Network sediments in 2017.



Equipment Selection

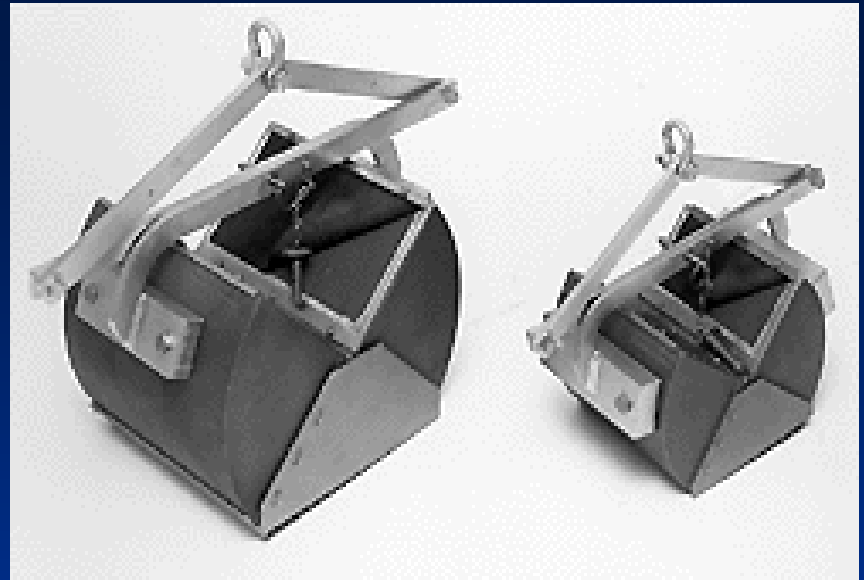
- Use the appropriate sampling equipment approved by the WMS QA Officer.
- Dredges are useful in either soft (mud/muck) or hard (sand/gravel) sediments.
- Coring devices are useful in shallow (wadeable) waters.



**Dredges used in Watershed
Monitoring Program
Status Network**

**Ponar Dredge
Standard and Petite***

* FDEP staff use
the petite version



Ekman Dredge



Dredge Devices

- The Ponar or Ekman dredges are the preferred devices to use in freshwater systems.
- Ponar dredges – useful in sandy or hard substrates
- Ekman dredge - useful in soft, mucky sediment
- With both dredges, to prevent sample washout, make sure the jaws fully close. If washout occurs dump sample and redeploy the sampler.



Coring Sampler Device

- Use corer made of material such as stainless steel or an approved plastic material.
- Multiple cores (4 or more) will need to be collected to acquire enough sediment for analysis.



Sampling Protocols

- Sample surface water before sediments.
- Collect a minimum of three grabs at each site, and collect enough sediment to fill provided 500-ml sample jar 2/3's full.
- If you are having trouble collecting a sediment sample (e.g., rocky bottom, vegetation), inform the project manager or QA officer. Note this on the field sheet.



Sampling Protocols

- If necessary, siphon water out of the sampling device with a sampling syringe and plastic tubing. Remove debris with Teflon[®] forceps.
- With the provided white HDPE (high-density polyethylene) scoop, collect the top 3-5 cm of sediment from the dredge in order to focus on the bioactive layer.



Siphoning water out of Petite Ponar Sampler



Remove debris with Teflon® forceps



Remove debris with Teflon[®] forceps



Place top 3-5 cm of cored sediment into sample jar. These roots are a good example of what should be removed with forceps.



Fill 500 ml sample jar 2/3 full. Seal lid to jar by wrapping it with black electrical tape to prevent water leakage.



Sampling Protocols

- If sample is flocculent ('soupy'), you may go deeper (>5 cm) with the HDPE scoop. Note this on field sheet.
- Store samples on ice for shipment to DEP Central Laboratory in Tallahassee.



Sediment Portion of Surface Water Field Sheet

Sediment Sample Collected:	☐ NO / ☐ YES	Sed. Collection Time (24hr):	☐ ETZ / ☐ CTZ
Sed. Collection Depth (m):	_____ (total water depth)	Number of Grabs:	_____ (minimum 3)
Sed. Collection Interval:	☐ Top 3-5 cm / ☐ Other (if top 3-5 cm is too flocculent) _____		
Sed. Collection Area Description	(e.g. near east shore; central): _____		
Sed. Collection Device:	☐ Corer / ☐ Ekman / ☐ Petite Ponar	Device ID:	_____
Dominant Sed. Type (select one):	☐ Clay/Silt / ☐ Sand / ☐ Gravel/Shell Rubble / ☐ Organic Muck (very fine grained, flocculent)		
Sediment Odors (select one):	☐ Normal / ☐ Sewage / ☐ Petroleum / ☐ Hydrogen Sulfide / ☐ Other		
Sediment Color:	_____		
Sediment Sample Comments: 			





Sediment Sampler Cleaning

(Ekman, P. Ponar, corer, HDPE scoops & forceps)

1. Rinse

Pour tap water over the equipment into dedicated tub or cooler.

2. Soak & Scrub with brush.

Use dedicated pump spray bottle of Luminox/Liquinox/DI water to spray inside and out





Sediment Cleaning

(Ekman, P. Ponar, corer, HDPE scoops & forceps)

3. Dispose soapy water, rinse tub
4. Pour 5 gal tap water over equipment into tub
5. Dunk 4-5 times, work jaws
6. Rinse tub
7. Pour 5 gal DI water over equipment into tub
8. Dunk 4-5 times, work jaws
9. Store in clean bag or container



Reminder: you must clean between sediment sampling sites, both at small lakes, and all sites on a large lake

Use of Status Network Sediment Data

- Status Network sediment data are evaluated with two statistical tools. First, WMS staff use a geochemical normalization tool to distinguish sediment metal background levels from elevated values.
- Second, FDEP WMS staff use biological sediment guidelines to judge if the metals concentrations are elevated enough to cause biological harm. These two approaches are cited Chapter 62-780.100 of the Florida Administrative Code
- These results complement WMS water quality data in the biannual Integrated Report, submitted to USEPA by DEAR staff.

