Ministry of Environment Water Quality Sampling Techniques Summary

Preparing for water quality sampling

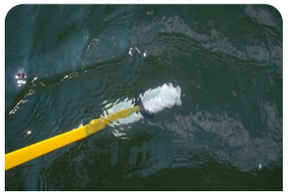
Water sampling requires several pre-trip activities: ensuring sampling equipment is clean, preparing sample containers, and calibrating the YSI equipment. It is not necessary to wash sample containers because sealed and sterilized containers are received from the lab. The Kemmerer water quality equipment for depth sampling is cleaned using laboratory grade phosphorous free soap. Then the YSI is calibrated prior to entering the field. The YSI uses standardized laboratory grade solutions to ensure the machine is reading the correct field values. Standard quality assurance and control measures used include field replicates, field blanks, and/or equipment blanks. After sampling equipment and containers are collected, then a trip plan is prepared.

In Situ Sampling

1: YSI Instrument Field data

The YSI has a barometric sensor which is connected to a hand held device and probes. The probes are lowered and the values are recorded at 1 m intervals for surface water or 5 m intervals for deep sites. The probes can detect several water quality parameters: pH, dissolved oxygen, turbidity, specific conductance, temperature, and conductivity. The information is used to determine which depths are sampled. Image shows biologist feeding cord to desired depth.

Grab Sampling



2: Mechanical grab sample

Surface water quality and phytoplankton samples were collected using grab sample method.

3: Manual grab sample

Bottles are labeled with the site location, date, time, depth and parameter to be analyzed. Some parameters require preservation which is added after the sample is collected. Several bottles will be collected at each site and depth. To sample, the bottle is placed in the water and with one continuous motion, the sterilized bottle is held by a mechanical claw or by hand and plunged about 0.5 meters beneath the surface. The container is held beneath the surface until container is filled.

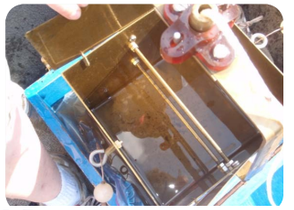
Depth Sampling

2: Kemmerer depth sampler

The Kemmerer sampler container shown is placed into the water with both ends open. The container is lowered to the desired depth. A messenger is then sent down the rope to the container to trip the closing mechanism which snaps the ends closed and seals in the water taken at desired depth. The water is then released into sample bottles via the tube while ensuring the tube does not touch the sterilized sample bottle to prevent contamination.

Once collected, the sample is labeled with location, date, time, depth, and parameter to be analyzed. The lid is also labeled with location and depth. Some parameters require preservation which is added after the sample is collected.

Sediment Sampling



5: Ekman sediment sampler

6: Sediment sample

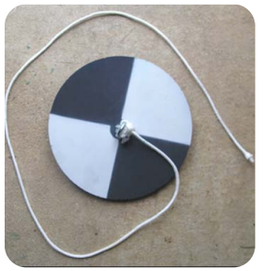
The Ekman sampler utilizes a marked cord and messenger similar to other water quality equipment. The sampler is lowered while it is in the open position until it reaches the river/lake bottom. The messenger is then sent down the rope to trip the closing mechanism. The sediment sampler jaws close and the sample is pulled up. Depth is measured using the cord markings. Sediment samples are then released into a plastic bag before being eased into sterilized, labeled containers.

Zooplankton Sampling

7: Zooplankton net

The net is lowered to desired depth. The net is then pulled directly up through the water column. The zooplankton is trapped inside the removable cup located at the bottom of the net. The cup is disconnected and the contents are decanted into a sterile, labeled container. To ensure sample completeness, the cup is then rinsed with de-ionized water and the rinse water is added to the sample container. Once collected, the sample is labeled with location, date, time, depth range of water and sample method (i.e. vertical tow) collected. If appropriate, a preservative solution is added at this time.

Secchi Depth Readings



8: Secchi disk

Secchi readings are a visual measurement of water clarity that is used around the world. The disk is lowered until it disappears and then is brought back up until it is just visible. The depth is read at the water surface. Any particles in the water will result in shallower secchi readings while very clear water has deeper readings.

All samples are stored and transported within ice packed coolers along with the lab requisition forms. The coolers are then taped shut and transported by courier or airplane to the lab to be tested.