

## Measuring dissolved oxygen (DO) and electrical conductivity

Adequate dissolved oxygen (DO) is essential for good water quality. Low levels of DO can hinder stream purification processes resulting in negative effects on aquatic life. Although salinity, measured as electrical conductivity, can be naturally high in some systems, waters with elevated salinity levels are usually the result of both nonpoint and point source pollution and can adversely impact aquatic ecosystems.

To measure DO, the Center has several types of electrical conductivity and dissolved oxygen meters (available only for UW students, faculty, and staff). Methods will vary with meter type and habitat type (surface vs. hyporheic).

### Calibrating the meter

For YSI and Hanna electrical conductivity meters - place probe in a known standard (can be ordered from scientific equipment companies). Turn screw on top of the meter until the reading agrees with the known standard.

For best results with the YSI dissolved oxygen meter (the old one), the probe should be calibrated at water temperature (in air). Place the probe into the "plastic wand" and place the wand in the stream water so the probe submerged by the end of the wand is out of water (i.e., no water enters the chamber). Keep submerged for at least 10 minutes. Check the probe membrane to make sure it has not dried out and doesn't contain any air bubbles. If either of these have occurred, the membrane will need to be changed (consult manual).

Push 2 arrow

Screen will read 'altitude'

Press enter

Enter percent saturation (~100 b/cair)

Press enter

Enter percent salinity

Press enter

Press mode (Mode goes back and forth between salinity and saturation)

Take temperature reading from conductivity meter

Lay meter flat

Attach tubing to drill

Make sure there are no air bubbles in the tube

Run until conductivity has stabilized

## **Taking measurements**

### **In surface water**

#### **Materials**

Dissolved oxygen (DO) meter

Conductivity meter

Extra batteries

#### **Methods**

After calibration, place the probe of the meter in the thalweg of the stream

Record the reading when it has stabilized (i.e., no longer changing).

#### **Notes**

If you are using the YSI DO meter (the old one) you must move the probe back and forth to create a current past the probe. Otherwise, you can use the hyporheic setup (see below) and pump the surface water past the probe.

### **In sub-surface water**

#### **Materials**

Dissolved oxygen (DO) meter

Flow-through cell holder (if you are using the "old" meter)

Conductivity meter

Extra batteries

Drill with peristaltic pump head

Drill batteries (charged)

Sampling tubes

## Methods

After calibration, place the meter probe down the well; record the reading after it has stabilized.

When using the old DO meter, you must also use the wooden meter holder (on the shelf in Winkenwerder 212) with the attached flow-through cell.



There is a place on the holder for both a conductivity meter and the DO meter.

Place the probes in the flow-through cell compartment (the DO meter will lay horizontally and the electrical conductivity probe will be vertical).

Connect the sampling tube to the pump head and place the other end down into the well. Pump water so it passes through the flow-through compartment.

Pump continuously until the readings stabilize and record readings.

## Notes

It is important that no air bubbles pass through the tube and by the probe or the DO reading will be incorrect - if air bubbles persist, you will need to pump slower or use another DO meter.

Always place the DO probes back in the meter chamber. Make sure that the sponge is in the chamber and is moist. This prevents the probes from drying out and breaking.