

# Chemical Station Materials & Methods

## Materials:

- 3 Tall Plastic Vials with Caps
- 1 Nitrate Tablet #1
- 1 Nitrate Tablet #2
- 2 Dissolved Oxygen (DO) Tablets
- 1 Small Glass Vial with Cap
- 1 pH Tablet
- 1 Phosphate Tablet
- Color Comparison Charts

## Methods:

Record the date and time in the data book.

### Nitrate Test

1. Fill a tall plastic vial to the 5 mL line with water from the wetland.
2. Drop a Nitrate #1 tablet into the vial. Cap the tube and slowly mix until the tablet has dissolved.
3. Add one Nitrate #2 tablet. Cap the tube and slowly mix until the tablet has dissolved.
4. Wait for 5 minutes. Compare the color of the sample to the Nitrate Color Chart (on back of this page)
5. Record nitrate in parts per million.

### Dissolved Oxygen Test

6. Fill the small glass vial to overflowing with water from the wetland.
7. Add TWO Dissolved Oxygen tablets into the vial. Cap the tube. Be sure that no air bubbles are in the sample.  
Mix by slowly inverting the vial until the tablets have dissolved.
8. Wait for 5 minutes. Compare the color of the sample to the Dissolved Oxygen Color Chart (on back of this page).
9. Record dissolved oxygen in parts per million.

### pH Test

10. Fill a tall plastic vial to the 5 mL line with water from the wetland.
11. Drop one pH tablet into the vial. Cap the tube and slowly mix until the tablet has dissolved.
12. Wait for 5 minutes. Compare the color of the sample to the pH Color Chart (on back of this page).
13. Record the pH.

### Phosphate Test

14. Fill a tall plastic vial to the 5 mL line with water from the wetland.
15. Add one Phosphorus tablet. Cap the tube and slowly mix until the tablet has dissolved.
16. Wait for 5 minutes. Compare the color of the sample to the Phosphate Color Chart (on back of this page).
17. Record phosphate in parts per million

**Dispose of ALL the vial water in the classroom SINK, not in the WETLAND  
Clean all materials used and return them to the bucket.**

## What to Record

- Date and Time
- Nitrate (in ppm)
- Dissolved Oxygen (in ppm)
- Phosphate (in ppm)
- pH
- Each participant and what they accomplished (record absent team members, too)
- Photo of at least one team member with a scientifically significant discovery to paste into SW book

# Physical Station Materials & Methods

## Materials:

- Wind Compass
- 2 Thermometers
- Tennis Ball
- Internet Access to [www.intellicast.com](http://www.intellicast.com)
- Forel Ule Scale
- Secchi Disk Container & Comparison Chart
- Stopwatch

## Methods:

Record the date and time in the data book.

### Wind Test

1. Hold the wind compass up into the air, with the back of the compass in the opposite direction of the wind.
2. Read the wind speed indicated on the wind compass, and record the speed in miles per hour.

### Water Color Test

3. Hold the Forel-Ule scale against a white background (paper) and compare the color of the wetland water to the colored vials within the Forel-Ule scale. Record the color as a roman numeral.

### Water Turbidity Test

4. Fill the clear plastic container to the black line.
5. Place the container onto the comparison chart (on back of this page).
6. Look down through the water and compare the visibility of the secchi disk to the comparison chart.
  - If the secchi disk is not visible when the container is filled to the black line with water, then empty half the water and try again. The result should then be multiplied by two.
  - If the secchi disk is still not visible, empty half the water (now at one-quarter) and try again. The result should then be multiplied by four.
7. Record the result in NTU (Nephelometric Turbidity Unit)

### Air and Water Temperature Test

8. To measure the temperature of the wetland, hold one thermometer in the air and insert the other 3 to 4 inches into the water. After two minutes, read the temperature of both thermometers. Record the result in degrees Celsius.

### Water Flow Test

9. To measure flow rate in the riffle zone, find the metal spike of rebar and measure one meter downstream.
10. Measure the time (in seconds) it takes for the tennis ball to float the one meter distance
11. Divide distance by time to calculate speed.
12. Record the result in meters per second.

### Daily Precipitation

11. Log on to <http://www.intellicast.com> and search for the zip code 27519. Click on “past observations” and record the “24 hour precipitation” in inches.

## What to Record

- Date and Time
- Turbidity (in JTU)
- Wind (in mph)
- Color (in roman numerals)
- Air Temperature (in °C)
- Water Flow (in m/s)
- Water Temperature (in °C)
- Precipitation (in inches)
- Each participant and what they accomplished (record absent team members, too)
- Photo of at least one team member with a scientifically significant discovery to paste into SW book

# **Benthic Macroinvertebrates Station Materials & Methods**

## **Materials:**

- 5 Dip Nets
- Identification Chart for Macroinvertebrates

## **Methods:**

1. Record the date and time in the data book.
2. Look for all visible macro invertebrates beneath rocks that are in the riffle area, identifying each organism using the identification chart. Move a dip net back and forth through the grasses and sediment in the wetland, identifying each organism using the identification chart.
3. Record species present and number of individuals per species. Only record aquatic invertebrates!
  - a. Remember to convert all tally marks to numerals (1,2,3, etc.)
  - b. Keep track of vertebrates (fish, tadpoles, etc.), but remember to transfer this data to the Large Biotics group and remove it from today's page.
4. Calculate the Stream Index by counting the number of species in each tolerance group (can be found on the back of this page) and weighting the number.  
(Each tolerant species is worth 1, each moderate species are worth 2 and each intolerant species are worth 3).  
Add these together and record this as the Stream Index. (number of individuals per species do not affect stream index)

## **What to Record**

- Date and Time
- Species Identified
- Number of Individuals per Species
- Stream Index
- Each participant and what they accomplished (record absent team members, too)
- Photo of at least one team member with a scientifically significant discovery to paste into SW book

# **Large Biotics Station Materials & Methods**

## **Materials:**

- 3 Dip Nets
- 1 Seine Net
- Identification Books (*Freshwater Fishes & Guide to Southeastern States*)

## **Methods:**

1. Record the date and time in the data book.
2. Carefully search for any wildlife while walking down into the wetland area.
3. Use the seine net to catch any fish, tadpoles, turtles, and other vertebrates.
4. Use the dip nets to catch any vertebrates along the banks of the wetland.
5. Identify all organisms using the ID guides and record results. Only record vertebrates!
  - a. Remember to convert all tally marks to numerals (1,2,3, etc.)
  - b. Keep track of invertebrates (crayfish, dragonfly nymphs, pouch snails, etc.), but remember to transfer this data to the Benthic Macroinvertebrates group and remove it from today's page.

## **What to Record**

- Date and Time
- Species Identified
- Number of Individuals per Species
- Each participant and what they accomplished (record absent team members, too)
- Photo of at least one team member with a scientifically significant discovery to paste into SW book

# **Forest Transect Station Materials & Methods**

## **Materials:**

- Meter Tape
- Astrolabe or Clinometer
- Identification Book (*Common Forest Trees of North Carolina*)

## **Methods:**

1. Record the date and time in the data book.
2. Randomly select a forest location and choose four nearby trees of at least 5 meters in height
3. Identify each tree using the tree identification book.

### **For Each of the Four Trees:**

#### **Tree Circumference**

4. Wrap the meter tape around the trunk.
5. Record results in centimeters.

#### **Tree Height**

6. Use the astrolabe (or clinometer) to find a 45° angle from the ground.
7. Walk back slowly, not changing the angle, until the top of the tree is seen at a 45° angle.
8. Measure the distance to the base of the tree. Also measure the height of the measurer, subtracting any height above their eyes, and add to the distance measured.
9. Record height of the tree in meters.

## **What to Record**

- Date and Time
- 4x Tree Species
- 4x Tree Height (in m)
- 4x Tree Circumference (in cm)
- Each participant and what they accomplished (record absent team members, too)
- Photo of at least one team member with a scientifically significant discovery to paste into SW book

# Forest Quadrat Station Materials & Methods

## **Materials:**

- Meter Square Quadrat
- Metric Ruler
- Small Shovel
- Identification Books (*Guide to Southeastern States, Insects and Earth Colors*)

## **Methods:**

- 1) Record the date and time in the data book.
- 2) Once inside the forest, randomly choose a spot to place the meter square.
- 3) Make observations about what is living inside the square. Record any shrubs, insects, leaves, detritus, etc.
- 4) Measure the depth of the leaf litter in centimeters.
- 5) Using a small shovel to dig into the soil and measure the depth of the topsoil in centimeters.
- 6) Describe the soil color and texture.

## **What to Record**

- Date and Time
- Leaf Litter Depth (in cm)
- Topsoil Depth (in cm)
- Soil Observations (color, texture, etc)
- Species of Organisms Observed (minimum of three)
- Each participant and what they accomplished (record absent team members, too)
- Photo of at least one team member with a scientifically significant discovery to paste into SW book