

# PHASE I



THE MEADOWS CENTER  
FOR WATER AND THE ENVIRONMENT  
TEXAS STATE UNIVERSITY

## TEXAS STREAM TEAM

Email to: TxStreamTeam@txstate.edu  
Send to: Texas Stream Team  
The Meadows Center - Texas State University  
601 University Drive  
San Marcos, TX 78666-4616

For Office Use Only  
Partner ID: \_\_\_\_\_  
Date Received: \_\_\_\_\_  
Date Approved: \_\_\_\_\_  
Approved by (name): \_\_\_\_\_

# CORE ENVIRONMENTAL MONITORING FORM

PLEASE PRINT LEGIBLY

Sample Date  
M M D D Y Y Y Y

Sample Time (military)  
H H M M

Citizen Scientist's Name \_\_\_\_\_

Site Description \_\_\_\_\_

Site ID #  
| | | | |

Sample Depth (meters)  
| | | | |  
(not total depth)

Group or Affiliation \_\_\_\_\_

Core monitoring type conducted  
 Standard Core  Probe Core  Other

**Instrument Calibration:** Conducted within 24 hours of sampling. Store standard solutions and calibrate at room temperature.

Calibration	Date	Time	Standard Value	Standard Temp (°C)	Pre-Test Calibration Initial Reading	Calibrated To	Post-Test Calibration Initial Reading
Conductivity/Salinity							
Dissolved Oxygen							
pH							

### Field Observations:

FLOW SEVERITY: 1-no flow 2-low 3-normal 4-flood 5-high 6-dry

ALGAE: 1-absent 2-rare (<25%) 3-common (26-50%) 4-abundant (51-75%) 5-dominant (>75%)

WATER SURFACE: 1-clear 2-scum 3-foam 4-debris 5-sheen

WATER CONDITIONS: 1-calm 2-ripples 3-waves 4-white caps

PRESENT WEATHER: 1-clear 2-cloudy 3-overcast 4-rain

DAYS SINCE LAST SIGNIFICANT PRECIPITATION (runoff)

RAINFALL ACCUMULATION (inches within the last 3 days)

WATER COLOR: 1-no color 2-light green 3-dark green 4-tan 5-red 6-green/brown 7-black

WATER CLARITY: 1-clear 2-cloudy 3-turbid

WATER ODOR: 1-none 2-oil 3-acrid (pungent) 4-sewage 5-rotten egg 6-fishy 7-musky

### Core Tests and Measurements:

AIR TEMPERATURE (°C)

SECCHI DISC TRANSPARENCY (meters)  
Average Disappears \_\_\_\_\_ Appears \_\_\_\_\_

TOTAL DEPTH (meters)

TRANSPARENCY TUBE (meters)

WATER TEMPERATURE (°C)

CONDUCTIVITY (µS/cm)

DISSOLVED OXYGEN (mg/L)  
Average 1st titration \_\_\_\_\_ 2nd titration \_\_\_\_\_

pH (standard units)

### Presence of Litter:

MONOFILAMENT REMOVED  Yes  No  
Amount (please circle): 0-5 ft 6-15 ft 16 ft+

NURDLE SURVEY  Yes  No

TRASH REMOVED  Yes  No

Please check Yes or No

### Coastal Area Salinity Tests and Observations:

SALINITY (ppt)

TIDE STAGE: 1-low 2-falling 3-slack 4-rising 5-high

### Comments:

\_\_\_\_\_  
\_\_\_\_\_

TOTAL TIME SPENT SAMPLING AND TRAVELING

Minutes

TOTAL ROUNDTRIP DISTANCE TRAVELED

Miles

TOTAL NUMBER OF PARTICIPANTS

I certify that all procedures, including the items listed in the Quality Control Checklist on the following page and in the manual, have been followed.

CERTIFIED CITIZEN SCIENTIST'S SIGNATURE

DATE

# CORE FIELD QUALITY CONTROL CHECKLIST

**Citizen scientists are required to check all applicable boxes for each monitoring event to verify the procedures are followed. If the monitoring event fulfills a Field Audit Session, the trainer must observe the citizen scientist conducting the monitoring event and document observations in the comments field. The trainer will also sign to verify Field Audit Session was conducted.**

## General Procedures

- Gloves were worn or hand sanitizer was applied throughout.
- No reagents used for testing were expired and all reagents were stored in an environment protected from extreme weather prior to use.
- Sampling was conducted at approximately the same time/day as previous sampling events at this site, preferably before noon or after 4pm.
- Monitoring sample was collected from the centroid of flow with minimal streambed disturbance.
- All equipment was rinsed 2X with sample water before the test was conducted.
- All equipment was rinsed 2X with deionized water after testing was conducted.

## Field Observations

- Algae:** Recorded algae observed on and below the water surface.
- Water Color:** Observed water color in a plastic cup or bucket with a white background.
- Water Clarity:** Observed the relative cloudiness of the water from bridge or banks.
- Water Odor:** Tested by wafting from plastic cup or bucket.
- Present Weather:** Marked cloudy if there is at least one cloud in the sky.

## Instrument Calibration

- The instruments/meters were calibrated within 24 hours of monitoring and conducted in a temperature-controlled environment.
- All meters were held in center of beaker not touching the bottom or sides and stirred for 2 minutes before recording the reading.
- All meters were turned on/off while submerged in solution.
- Meters were rinsed with DI water and caps were replaced immediately after use.
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Parameter	Error limit
Conductivity	± 20% of calibration standard solution
Salinity	± 1 ppt
Dissolved Oxygen (Standard Core)	± 0.5 mg/L
Dissolved Oxygen (Probe Core)	± 6% saturation
pH (Probe Core only)	± 0.5 s.u.

## Core Tests and Measurements

- Sample Depth:** The sample depth is either 0.3 m or 1/3 of the total depth.
- Air Temperature:** Thermometer placed in shade.
- Transparency Tube:** Be careful to not scrape the streambed or disturb or kick up sediment.
- Secchi Disc Transparency:** Secchi lowered in water shaded from the sun. Record average then lower to bottom to get total depth reading.
- Water Temperature:** If using thermometer, air temperature was measured first.

### Dissolved Oxygen:

- Bottles rinsed 2X with sample water and titration vials rinsed 2X with fixed solution.
- Bottles filled so the meniscus is resting on the line.
- Lids capped underwater with no air bubbles.
- Duplicate sample conducted and titration values within 0.5 mg/L of each other.
- Reagent bottles completely inverted when adding drops to prevent interference from air bubbles.

### pH:

- The pH vial cap was removed and the tube was held up against a white background before viewing.
- The test tube was filled so the meniscus is resting on the line.

### Refractometer (tidally-influenced saltwater only)

- Time was allowed for the temperature of the sample water to stabilize before the salinity measurement was recorded.
- Instrument was held up to a light source when gathering the salinity measurement.

## Field Audit Session

*This section should be filled out by a certified trainer ONLY if a Field Audit Session was conducted. Field Audit Sessions are required at a minimum every two years.*

Legible Trainer Full Name: \_\_\_\_\_ Trainer Signature: \_\_\_\_\_

Trainer Comments:

\_\_\_\_\_  
\_\_\_\_\_

# PHASE II



THE MEADOWS CENTER  
FOR WATER AND THE ENVIRONMENT  
TEXAS STATE UNIVERSITY

## TEXAS STREAM TEAM

Email to: TxStreamTeam@txstate.edu  
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# CORE ENVIRONMENTAL MONITORING FORM

PLEASE PRINT LEGIBLY

Sample Date  
M M D D Y Y Y Y

Sample Time (military)  
H H M M

Citizen Scientist's Name \_\_\_\_\_

Site Description \_\_\_\_\_

Site ID #  
| | | | |

Sample Depth (meters)  
| | | | |  
(not total depth)

Group or Affiliation \_\_\_\_\_

Core monitoring type conducted  
 Standard Core  Probe Core  Other

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Conductivity/Salinity							
Dissolved Oxygen							
pH							

### Field Observations:

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ALGAE: 1-absent 2-rare (<25%) 3-common (26-50%) 4-abundant (51-75%) 5-dominant (>75%)

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DAYS SINCE LAST SIGNIFICANT PRECIPITATION (runoff)

RAINFALL ACCUMULATION (inches within the last 3 days)

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### Core Tests and Measurements:

AIR TEMPERATURE (°C)

SECCHI DISC TRANSPARENCY (meters)  
Average Disappears \_\_\_\_\_ Appears \_\_\_\_\_

TOTAL DEPTH (meters)

TRANSPARENCY TUBE (meters)

WATER TEMPERATURE (°C)

CONDUCTIVITY (µS/cm)

DISSOLVED OXYGEN (mg/L)  
Average 1st titration \_\_\_\_\_ 2nd titration \_\_\_\_\_

pH (standard units)

### Presence of Litter:

MONOFILAMENT REMOVED  Yes  No  
Amount (please circle): 0-5 ft 6-15 ft 16 ft+

NURDLE SURVEY  Yes  No

TRASH REMOVED  Yes  No

Please check Yes or No

### Coastal Area Salinity Tests and Observations:

SALINITY (ppt)

TIDE STAGE: 1-low 2-falling 3-slack 4-rising 5-high

### Comments:

\_\_\_\_\_  
\_\_\_\_\_

TOTAL TIME SPENT SAMPLING AND TRAVELING

Minutes

TOTAL ROUNDTRIP DISTANCE TRAVELED

Miles

TOTAL NUMBER OF PARTICIPANTS

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## Field Observations

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- Present Weather:** Marked cloudy if there is at least one cloud in the sky.

## Instrument Calibration

- The instruments/meters were calibrated within 24 hours of monitoring and conducted in a temperature-controlled environment.
- All meters were held in center of beaker not touching the bottom or sides and stirred for 2 minutes before recording the reading.
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## Core Tests and Measurements

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- Reagent bottles completely inverted when adding drops to prevent interference from air bubbles.

### pH:

- The pH vial cap was removed and the tube was held up against a white background before viewing.
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### Refractometer (tidally-influenced saltwater only)

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Trainer Comments:

\_\_\_\_\_  
\_\_\_\_\_

# PHASE III



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TEXAS STATE UNIVERSITY

## TEXAS STREAM TEAM

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PLEASE PRINT LEGIBLY

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M M D D Y Y Y Y

Sample Time (military)  
H H M M

Citizen Scientist's Name \_\_\_\_\_

Site Description \_\_\_\_\_

Site ID #  
| | | | |

Sample Depth (meters)  
| | | | |  
(not total depth)

Group or Affiliation \_\_\_\_\_

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Average 1st titration \_\_\_\_\_ 2nd titration \_\_\_\_\_

pH (standard units)

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\_\_\_\_\_  
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TOTAL TIME SPENT SAMPLING AND TRAVELING

Minutes

TOTAL ROUNDTRIP DISTANCE TRAVELED

Miles

TOTAL NUMBER OF PARTICIPANTS

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- Reagent bottles completely inverted when adding drops to prevent interference from air bubbles.

## pH:

- The pH vial cap was removed and the tube was held up against a white background before viewing.
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## Refractometer (tidally-influenced saltwater only)

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Legible Trainer Full Name: \_\_\_\_\_ Trainer Signature: \_\_\_\_\_

Trainer Comments:

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## TEXAS STREAM TEAM

# STANDARD CORE FIELD GUIDE – MONITORING PROCEDURES

Please note, instructions include the new TRACER gray conductivity meter. Email [TxStreamTeam@txstate.edu](mailto:TxStreamTeam@txstate.edu) if you need to upgrade your meter.

### Equipment Needed

- Standard Core Kit (with unexpired reagents)
- Bucket
- Deionized (DI) Water
- Waste Bin
- Gloves or Hand Sanitizer
- Conductivity Standard Solution (600 or 1413  $\mu\text{S}$ )
- Transparency Tube (optional for shallow water)

### At Site

1. Record *Field Observations* and *Comments* on Core Environmental Monitoring Form.

2. Hang thermometer out of direct sunlight, wait 2-3 minutes; record *Air Temperature* to nearest 0.5 °C.

3. Measure *Transparency* by selecting a method below that is most applicable to your monitoring site:

- A. *Secchi Disc Transparency* for deeper water, lower Secchi disc until it disappears, mark depth, then raise Secchi disc until barely visible, and mark depth again. Average depth readings and record to nearest 0.1 m.
- B. *Transparency Tube* for shallow water:
  1. Rinse bucket and tube 2X with sample water.
  2. Standing in the centroid of flow of the waterbody and downstream of the tube, dip the tube into the water facing upstream to fill.
    - a. If centroid is not accessible, or the waterbody is unsafe to stand in, use a bucket to collect sample water and pour into the tube immediately after collection to prevent settling of suspended materials.
  3. Holding the tube vertically, look down the tube to see if the disc at the bottom is visible. If disc is not visible, release water until visible and record the water level in meters on Monitoring Form.
    - a. If the tube is filled to the top and the disc is completely visible, record the measurement as > the maximum tube length (>1.2 m or >0.6 m).

4. Measure *Total Depth* by lowering Secchi disc into water until cord becomes slack, then raise until straight. Mark and record to 0.1 m.

5. Conduct bucket grab, rinse bucket 2X with sample water and discard water downstream.

6. Measure *Water Temperature* in the bucket sample with thermometer for 1-1/2 minutes. Read thermometer while in water to the nearest 0.5 °C.

### Conductivity

Record the Conductivity Standard Solution value under *Standard Value* in the *Conductivity/Salinity* row on Monitoring Form.

### Pre-Test Calibration

1. Rinse beaker and meter 2X with Conductivity Standard Solution.
2. Fill beaker with 20-50 mL of conductivity solution, insert meter and stir gently to remove bubbles from probe.
3. Turn meter on WHILE SUBMERGED and slowly stir for 2 minutes.
4. Make sure the meter is in conductivity mode. A small “ $\mu\text{S}$ ” (microsiemens) symbol will appear. If meter is not in  $\mu\text{S}$ , press and hold the MODE button and toggle through until “ $\mu\text{S}$ ” is displayed.
5. Record the *Standard Temperature* and *Pre-Test Calibration Initial Reading* on the Monitoring Form.
6. Press and hold the CAL button until “CAL” appears in the lower display. Release button. When calibration is complete, the meter automatically displays “SA,” then “End” and returns to normal operation mode. The meter is now calibrated and should display the calibration Standard value. Record the Standard value under *Calibrated To* on Monitoring Form.
7. Rinse beaker and meter 2X with DI water.

### Measurement

1. Rinse beaker and meter 2X with sample water.
2. Fill beaker with 20-50 mL of sample water, insert meter, and remove bubbles. Turn meter on and stir

gently for 2 minutes. Stop stirring, hold meter 1/2 inch off bottom and sides, record reading under *Conductivity* ( $\mu S/cm$ ).

3. Turn meter off while submerged and rinse 2X with DI water.

### Post-Test Calibration

1. Rinse beaker and meter 2X with Conductivity Standard Solution.

2. Fill beaker with 20-50 mL, insert meter, and remove bubbles. Turn meter on and stir gently for 2 minutes. Stop stirring, hold meter 1/2 inch off bottom and sides, record reading under *Post-Test Calibration Initial Reading* on Monitoring Form. The difference between the *Calibrated To* value and the *Post-Test Calibration Initial Reading* should fall within  $\pm 20\%$  of the calibration standard solution error limit.

3. Turn meter off while submerged, rinse 2X with DI water, and replace cap.

### Dissolved Oxygen (DO) Measurement (Titration Method)

1. Rinse 2 sample bottles and caps 2X with sample water.

2. Fill each bottle with sample water and cap below sample water surface, check for air bubbles.

#### Fixing the DO Sample:

1. Add 8 drops Manganous Sulfate Solution to each bottle. The bottle will overflow slightly.

2. Add 8 drops Alkaline Potassium Iodide Azide. Cap both bottles, slowly invert 25 times. Allow precipitate to settle below the shoulder of the bottles, then invert 10 more times and allow settling again.

3. Add 8 drops Sulfuric Acid. Cap both bottles and slowly invert for minimum of 3 minutes or until reagent and precipitate dissolve. Sample is now "Fixed" and can be finished at home within 4 hours if weather or other conditions warrant.

#### Titration of the DO Sample:

1. Rinse 1 vial 2X with a small volume of fixed solution from sample #1. Fill vial with fixed solution from sample #1 to 20 mL line and cap. Repeat for sample #2 and set aside.

2. Ensure pink titrator tip is in place and fill titrator with Sodium Thiosulfate – the plunger ring should

be at 0.0. Expel air bubbles from titrator barrel. Place titrator into hole on vial cap. Add 1 drop at a time of titrator solution to vial and swirl to mix after each drop until the yellow-brown solution turns a pale yellow or straw color.

3. Uncap vial with titrator STILL INSERTED and keep tip suspended above mouth of vial. Add 8 drops of Starch Indicator Solution, cap vial, and swirl to mix.

4. Continue titration drops and swirls, 1 drop at a time, until the solution becomes clear. Check against white background for any remaining color.

5. Read and record total number of units at plunger ring to nearest 0.1 mg/L under *1st titration*. Eject remainder of titrator solution into vial and dispose of vial solution in waste container.

6. Repeat titration process (Steps 1-5) with fixed solution for sample #2 and record these results under *2nd titration*. The second result must be within 0.5 mg/L of the 1st titration, if not repeat steps 1-5 for sample #1. If error limit still isn't met repeat steps 1-5 for sample #2. If repeating steps 1-5 for both samples doesn't meet the error limit, collect a new bucket grab and start over from the beginning with step #1.

7. Calculate the average of both titration results to nearest 0.1 mg/L and record under *Dissolved Oxygen*.

8. Rinse DO bottles, titration vials, and caps 2X with DI water.

### pH Measurement

1. Rinse 1 test tube and cap 2X in sample water.

2. Fill tube with sample water to 5 mL indicator line.

3. Invert pH Wide Range Indicator bottle a few times to mix, add 10 drops to sample, cap tube, and invert 10 times.

4. Insert the tube in Color Comparator Viewer, remove cap, and hold up to white background. Estimate to nearest 0.1 s.u. and record under *pH*.

5. Rinse tube and cap 2X with DI water.