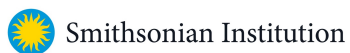


# Protocol: Environmental Monitoring

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## Introduction

The abiotic environment governs where and which species can occupy a given habitat. A number of methods exist for monitoring physical parameters such as temperature, salinity, and turbidity, including: continuously-monitoring sondes and loggers, instantaneous probes, and point measurements using physical equipment (eg, thermometers, refractometers, Secchi disks).

MarineGEO seeks to provide the tools to collect and inherit a variety of monitoring data. Here, you will find materials for reporting point measurements.

If you have continuous data, such as that from sondes or loggers, please contact us for further instructions.

Additional copies of this document, protocols, field datasheets, data entry templates, literature, and more can be found at: <https://marinegeo.github.io/modules/water-quality>.

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## Measured Parameters

This protocol quantifies environmental parameters:

- Temperature (degrees Celsius)
  - Salinity (psu)
  - Turbidity (Secchi depth in m)
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## Requirements

Personnel: 2 people

Estimated Total Time Location:

Preparation: 1 person x 1 day

Fieldwork: 2 people x 30 min per location

Sample Post-processing: None

Data processing: 1 person x 1 days

\*Estimated times will vary by site and conditions

Materials:

- ☐ Fixed monitoring station for continuous data (ex: deployed HOBO loggers) OR
  - ☐ Environmental probe or sonde OR
  - ☐ Thermometer
  - ☐ Refractometer
  - ☐ Secchi disk AND
  - ☐ Field data sheet printed on waterproof paper
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## Workflow

### Preparation:

1. Identify the environmental monitoring strategy that you wish to conduct at your site.
2. If you have access to a system for continuous environmental monitoring at your site, contact [marinegeo@si.edu](mailto:marinegeo@si.edu) for data processing and submission instructions.

### Fieldwork:

1. If you do not access to a continuous monitoring system, plan to take instantaneous environmental data upon arriving at the site, before beginning your survey.
  2. An appropriate probe or sonde may be used to collect instantaneous temperature, salinity, and turbidity data. Deploy the probe and record the measurements on the field data sheet. Record any relevant information about your sampling equipment (such as make and model of probe) at the bottom of the field data sheet.
  3. If you do not have access to a probe or sonde, temperature, salinity, and turbidity data may be collected separately.
  4. Use a thermometer to measure the temperature of the seawater at your site in degrees Celsius. Record measurement on field datasheet.
  5. Use a refractometer to measure the salinity of the seawater at your site in practical salinity units (psu, same as parts per thousands or ppt). Record measurement on field datasheet.
  6. Use a Secchi disk to measure turbidity at your site. (This may need to be done at a higher tide depending on the depth of your site.) Record Secchi depth to the nearest 0.1-m on your field data sheet.
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## Data Submission

1. Scan the completed field data sheets and save both paper and electronic versions locally. We do not require you to submit the scanned forms.
2. Enter data into the provided data entry template. Each template is an Excel spreadsheet. Please provide as much protocol and sample metadata as possible, such as the protocol version and contact information. Use the “notes” columns to provide additional information or context if a relevant column doesn’t already exist, rather than renaming or creating columns.
3. Use our online submission portal to upload the Excel Spreadsheet: <https://marinegeo.github.io/data-submission>
4. Contact us if you have any questions: [marinegeo@si.edu](mailto:marinegeo@si.edu)