

SOP #7: Light Measurement

Version 1.0 (November, 2018)

Revision History Log: Only changes in this specific SOP will be logged here. For minor changes, version numbers increase incrementally by hundredths (e.g., version 1.01, version 1.02). Major revisions should be designated with the next whole number (e.g., version 2.0, 3.0, 4.0). Record the previous version number, new version number, date of revision, author of the revision; identify paragraphs and pages where changes are made, the reason for making the changes, and the person who approved the revision.

Previous Version Number	New Version Number	Revision Date	Author	Changes Made	Reasons for Change	Network Regional Reviewer Approval

Purpose

This Standard Operating Procedure (SOP) describes measuring light at anchialine pools for the Pacific Island Network Anchialine Pool Monitoring Protocol.

General Considerations

The purpose of measuring light exposure of anchialine pools is to evaluate the influence of light on animal populations. Light exposure is not expected to change over time at a pool unless the riparian canopy or aquatic macrophyte cover changes, e.g. due to the cutting down or burning of trees. Because the position of the sun in the sky and cloud cover strongly influence the amount of sunlight reaching the surface of the water, sampling for light exposure may be conducted at a time other than the annual sampling trip. Hence light is not measured at the time of annual sampling unless environmental conditions are acceptable. Mean light exposure is used to characterize the pond.

Timing

Light measurements will be taken between 11 AM and 1PM, Oct.1st to Dec 31st, when there is <10% cloud cover. Because light measurement is not dependent on regular sampling, measurements may be opportunistically taken during quarterly water quality sampling trips, when scouting locations, or whenever cloud conditions are suitable.

Equipment

- Waterproof light sensor (e.g. Licor LI-193SA Spherical underwater quantum sensor).
- Light Sensor Logger (e.g. Licor LI-1500)
- 10m underwater cable (e.g. Licor 2222UWB-10)
- Frame to hold sensor (e.g. Licor Lowering Frame)
- Pole

Procedure

1. Establish a transect across the pond.
 - a. *A transect is established across the longest axis of the pool.*
2. Attach the sensor to the lowering frame.
 - a. *The probe may be permanently affixed to the frame if this is convenient for storage and transportation.*
 - b. *The probe should be level, as indicated by a bubble level on the frame.*
3. Turn on the Logger
 - a. *Procedures will be specified for a particular logger when purchased.*
4. Measure light at five points along the transect.
 - a. *Measure light at the water surface, but not below the water surface. If the pool is covered in emergent aquatic macrophytes, the probe should be above the water surface, but below the canopy of the plants. Planktonic algal blooms are not emergent macrophytes, and the probe should remain over the water surface.*
 - b. *Measuring points will be the pool edge, 25% of the distance across the pool, 50% of the distance, 75% of the distance, and the other edge of the pool.*
 - c. *Affix the frame to a pole, and extend to pole to each measuring point.*
 - d. *You may reposition yourself on the other side of the pool to reach sample locations if necessary.*
 - e. *Record the light level at each point.*
5. Calculate the mean and standard deviation of measurements
 - a. *All five measurements will be entered into the database. The light exposure level of the pool is defined as the mean of the five measurements taken in the field.*
 - b. *The mean and standard deviation of light measurement (e.g. 95% confidence interval) will be calculated in the anchialine pool database.*