

SOP 1 – Field Season Logistics

Version 1.0 (August, 2007)

The following table lists all changes that have been made to this Standard Operating Procedure since the original publication date. Any recommended or required changes added to the log must be complete and concise and promptly brought to the attention of the Project Leader. The Project Leader will review and incorporate all changes, officially complete the revision history log, and change the date and version number on the title page. For complete instructions, please refer to Instructions for Recording Revisions in SOP 13.

Revision History Log:

New Version #	Previous Version #	Revision Date	Author (full name, title, affiliation)	Location in Document and Description of Change	Reason for Change

Safety Training

The Standard Operating Procedures included in this document are intended to be a comprehensive description of the methods associated with Vital Signs monitoring in NPS Northeast Region estuaries. They are not, however, intended to be a comprehensive training manual for field or laboratory personnel. Whether staffed by NPS employees or independent contractors, Vital Signs personnel will need additional training and support in order to successfully and safely complete the work described herein. Safety, in particular, must always be the highest priority.

Specific safety guidance is not provided in this protocol. This was a deliberate decision intended to avoid distributing incomplete, inaccurate, or outdated guidance. A recommended safety resource for NPS or other Department of the Interior (DOI) agencies is DOI SafetyNet (<http://safetynet.smis.doi.gov/>). SafetyNet is a shared, one-stop information source for the safety and health community of the DOI. It is regularly updated, and serves as a gateway to information on DOI safety standards, training requirements, training resources, and personnel contact information. Program safety should be addressed following guidance from NPS Collateral Duty Safety Officers and the office of the applicable Designated Agency Safety and Health Official (DASHO). Non-DOI cooperators conducting work for NPS as part of this monitoring protocol may have other or additional safety and training requirements to consider.

While specific guidance about safety training is not provided within the pages of this protocol, it is important to note that fielding a properly trained field crew can take considerable time. All NPS employees performing field or laboratory work for this protocol should be trained in cardio-pulmonary resuscitation (CPR) and basic first aid. Employees working in laboratory settings must receive safety training to do so even if their immediate work tasks involve no hazardous

substances (dry ice is a safety concern for both lab and field personnel however). Likewise, all U.S. Department of Interior employees who operate motorboats must receive training and safety certification to do so (DOI Motorboat Operator Certification Course). A basic assumption of this program is that all DOI and NPS safety guidelines will be followed while completing the work. Regardless of the methods provided in this protocol and regardless of existing DOI and NPS safety guidance (or lack thereof), it is the job of each employee to work safely. Should the methods in this document contradict your own sense of safety, then it is your obligation to discuss this concern with network supervisors.

Protocol Methods Training

In addition to the safety training, field crews will need general training on protocol implementation for conducting all water column, sediment, and seagrass monitoring. Additionally, personnel will require detailed training on calibration, programming and use of the YSI and LiCor instruments. It is outside the scope of this protocol to review all of the information and methods that are required to operate the various YSI and LiCor instruments and to make effective and accurate measurements. It is imperative that both field and laboratory personnel familiarize themselves with the entire YSI 6-Series Environmental Monitoring Systems Operations Manual, the Multiparameter Display System Operations Manual, and the Technical Notes and Technical Documents available from YSI at their web site. YSI, Inc. offers coursed on instrument calibration and maintenance. We strongly advise that all NER coastal park personnel involved in instrument calibration receive annual training, either directly from YSI or from a Vital Signs representative who has recently completed YSI training.

Field Season Preparation

The ability to successfully complete the annual monitoring will hinge upon thorough preparation in advance of the field season. The most important preparation is to ensure that the program is adequately staffed to accomplish the fieldwork. There are three different models that were used during pilot testing of water-column monitoring procedures (spatial surveys and continuous monitoring at logging stations), and each of these will require its own logistical preparations.

1) Monitoring Conducted by the Individual Park –

GATE and ASIS have well-established monitoring programs for estuarine water quality. For these parks, collaboration will likely be mutually beneficial to both the NCBN and the park. The nature of any cooperative agreement must be negotiated, but a likely model is for the network to provide funding and/or seasonal staff to offset the additional cost of the network monitoring protocol.

2) Monitoring Conducted by an Academic Institution –

For some of the parks, it may be advantageous for the network to contract out the monitoring work to an academic institution. COLO and GEWA are examples where this model would work very well. The Virginia Institute of Marine Science (VIMS)/Chesapeake Bay National Estuarine Research Reserve in Virginia is preeminent with its expertise in estuarine monitoring and their investigators already conduct very similar monitoring with the same or similar equipment in the nearby vicinity of COLO and GEWA. Cooperative agreements for such work will need to be negotiated annually.

3) Monitoring Conducted by the Network –

For parks where neither of the above options is logistically or economically feasible, collection of monitoring data will fall to the network.

In addition to staffing and establishing contracts for services, many of the SOPs in this protocol require preparatory steps that must be completed well in advance of the field season. Field and laboratory equipment used for each SOP must be thoroughly inspected, tested, and repaired or replaced as necessary; expendable supplies must be stocked; and field crews must receive safety and protocol training. For all three of the logistical models, the network must play an active role in methods training for field personnel to ensure the protocol is implemented properly and to assure data consistency and quality. Notable preparations that may require additional lead time are listed in Table 14, and a schedule of training and field activities is provided in Table 15.

Experience gained during the feasibility test phase of this protocol suggests that a field crew of two people can manage the water-quality monitoring at two parks; three people are required if boat logistics are complicated. Four people are required for the 3 -4 days associated with seagrass condition monitoring (for two sites). This number assumes the site is already set up and intact. Initial set-up will require six people over two days for each monitoring site.

Field crews shall perform a thorough reconnaissance of the survey area well in advance of the index period. They must become familiar with general navigation within the survey area, identify particular hazards to navigation, and attempt to identify stations that may be too shallow for sampling and any other potential problems they might face during the index period. Reconnaissance trips also provide an opportunity to make logistical preparations for fieldwork.

Field logistics

For each park, all spatial and continuous monitoring of water-quality vital signs shall occur during a four-week index period. This index period must be scheduled for four continuous weeks during the period from July 1 to August 31 each year. All spatial sampling shall be divided evenly among four weekly survey cruises. For each cruise, all of the trend stations (six) shall be sampled as well as a quarter of the remaining, or annually repositioned, stations (also six). These latter stations should be assigned into the four different cruises to achieve the best spatial balance for each cruise. Detailed cruise planning will be required of the field teams in

Table 14. Preparations for index-period monitoring requiring exceptional lead time and/or advanced planning.

SOP #	SOP Topic	Advance Preparations
2	Continuous logging Station	- If installation of continuous monitoring station is to be permanent, obtain applicable PAToN permit from U.S. Coast Guard. - If installation is to be temporary (<6 months) then make appropriate notifications to U.S. Coast Guard. - Construct and install support structure and mounting brackets in advance of index period.
3&4	YSI-water-quality sonde	- Obtain calibration training from YSI, Inc. - If purchasing new equipment, note that the YSI for SOP 3 is factory customized and may require additional lead time to fill the order.
3&5	LiCor- PAR equipment	- Obtain factory re-calibration of PAR sensors. Calibrate biennially for sensors used only in spatial monitoring and annually for sensors used in continuous monitoring.
6	Discrete chlorophyll <i>a</i>	- Communicate with the analytical laboratory analyzing discrete grab samples for chlorophyll <i>a</i>. Coordinate the timing of shipments so that samples from all parks can be run within the timeframe prescribed by the quality assurance SOP. For ASIS and GATE, which have existing chlorophyll monitoring programs, coordinate with the network's analytical lab to plan an inter-comparison of data from the network lab and that of the individual park.
7	Sediment TOC	- Identify laboratory to analyze sediment samples for TOC. Enter into contract agreement that includes specifics on all required data quality assurance measures.
2-7, 9	Motorboat Operations	- Train and certify boat operators with a DOI approved Motorboat Operator Certification Course (valid for 5 years).
9	Seagrass Condition	- Identify monitoring site and establish monitoring transects - Identify laboratory to analyze sediment samples.

order to address the logistical constraints imposed by tides, currents, and weather on sampling efficiency, vessel navigation and safety. Most parks will be able to accomplish each cruise in a single day, but complicating factors such as weather, park size, or multiple sampling strata may require additional cruise days so that data are gathered within the target sampling window (within 3 hours of local apparent noon).

The continuous monitoring station must also be visited during each of the weekly cruises. Grab samples for extractive chlorophyll *a* analysis from this site are used to calibrate the optical chlorophyll sensor on the sonde, and data from the spatial survey YSI sonde and LiCor PAR profiler are used to post-check all the continuous sensors and correct for any sensor drift (see SOP 3, Continuous Water-Quality Monitoring with the YSI Sonde).

An initial database of 30 random stations has already been generated for every hexagon of every park (or park stratum). Within each hexagon, stations are serially numbered 1-30 and are provided as geographic coordinates of latitude and longitude in decimal degrees expressed to 5 decimal places. The database of random points is available from the NCBN Data Coordinator as a MicroSoft Excel workbook (filename sampling_pt_db.xls). For each hexagon, field crews will use WAAS-enabled GPS (or unit with equivalent or better accuracy) to locate the first of these serialized random stations for sampling. If this first site is not accessible, too shallow, too rocky to obtain a sediment sample², or otherwise unsafe for sampling, then a notation must be made in the appropriate box on the Station Data Sheet, and the crew should proceed on to the next serialized random station. If it is not feasible to sample this next random station, then they should move on to the next; and so on. Once a random station has been either sampled or deemed inappropriate, it is struck from the list of random stations. In future years, field crews will start with the next available random station for that hexagon. When all 30 random stations have been exhausted, a new set must be generated using the methods described in this protocol.

Table 15. Schedule of training and field activities

June:	Safety training Motorboat training YSI and LiCor instrument training Training for water quality and sediment organic carbon monitoring Installation of a support structure to hold a continuous water-quality sonde Reconnaissance and familiarization with the field setting
July:	Seagrass condition training Seagrass condition monitoring Initiation of continuous monitoring at the logging station Initiation of weekly spatial water-quality cruises
August:	Continuation of weekly survey cruises Continuation of continuous monitoring at the logging station Completion of index period monitoring
Late August – Early September	Removal of temporary logging station fixtures Organize and review all data sheets and digital data files Clean, service, and store all equipment

² Note that the ability to obtain a sediment sample is necessary only for the monitoring of sediment organic carbon, and so is only relevant to trend stations and probability stations during survey years when sediment monitoring is being conducted.