



*This document covers Section 4: Developing a Floatables Assessment and Monitoring Program from the document: Assessing and Monitoring Floatable Debris, published in August 2002. The reference number is: EPA-842-B-02-002. Download the full document at:
<http://www.epa.gov/owow/oceans/debris/floatingdebris/>*

ASSESSING AND MONITORING FLOATABLE DEBRIS

August 2002

Section 4

Developing a Floatables Assessment and Monitoring Program



Marine Debris Survey Manual
Marine Debris Monitoring and Cleanup

Section 4: Developing a Floatables Assessment and Monitoring Program

This section provides recommendations for developing programs to assess and monitor floatable debris, including specific information about designing floatable debris surveys. The section also provides information from volunteer organizations regarding floatable debris monitoring and cleanup strategies.

4.1 *Marine Debris Survey Manual*

The *Marine Debris Survey Manual* (Ribic et al., 1992) provides information useful to managers, researchers, government officials, and others interested in designing marine debris surveys. The manual could be used to develop a floatable debris assessment and/or monitoring program at the state or local government level. Listed in sections 4.1.1 and 4.1.2 are some of the variables the manual discusses as important, which should be considered when developing such a program (Ribic et al., 1992).

4.1.1 Design Protocols for Monitoring and Assessment of Marine Debris

These protocols should be followed when designing a monitoring and assessment program for marine debris:

- State the objectives clearly.
- Define the population of interest.
- Collect information (e.g., physical features, weather patterns, historical information) on the geographic areas of interest to develop a sampling plan.
- Define the field measurements to be made.
- Examine data from previous studies or conduct pilot studies to approximate the likely variability in the field measurements.
- Develop a quality assurance program plan to ensure that the data collected will be of high quality, verifiable, and defensible.
- Develop field sampling designs and measurement procedures that will yield representative data from the defined population, along with a specified variance or confidence limit. If necessary, make decisions on identifying the source of debris (vessel-source versus land-based).
- Determine the statistical analyses to be used.
- Conduct the study according to the written protocol.
- Analyze the data.
- Evaluate the study. (Were the objectives met? Were the collected data adequate to meet the stated objectives? Should the design be modified?)

4.1.2 Variables to Be Considered Overall

When designing an assessment and monitoring program, the following variables should be considered:

- Wind direction and speed.
- Current direction and speed.
- Location of outfalls in the path of the wind and current.
- Size and type of debris.
- Discharge-specific debris.
- Tidal range.

4.1.3 Shipboard Sighting Surveys for Large Debris Items

Open-water sighting surveys are used to identify and count floating debris from an elevated platform on a moving ship. The transect width may vary from 100 meters to the visual horizon, depending on the type of debris being studied. Surveys are typically conducted from the glare-free side of the ship, and objects are sighted visually, unaided or with binoculars. The following are typical objectives for open-water sighting surveys (Ribic et al., 1992):

- Identify types of floatable debris.
- Estimate densities of floatable debris.
- Identify areas of low or high concentrations of floatable debris relative to other oceanographic features (e.g., currents, convergence zones) or man-made structures (e.g., offshore oil platforms).
- Relate floating debris to entanglement or other effects on animals.
- Detect temporal and spatial changes in the occurrence of floatable debris.

In planned studies, debris in specific oceanic areas is considered to be the population of interest, which must be defined by the researcher.

Copies of marine debris survey forms included in the *Marine Debris Survey Manual* are provided in Appendix D.

4.1.4 Contact Information

The information provided in this section was taken from the *Marine Debris Survey Manual*, NOAA Technical Report NMFS 108, April 1992, by Christine A. Ribic, Trevor R. Dixon, and Ivan Vining. Copies of the report can be obtained from the U.S. Department of Commerce, National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161.

4.2 Marine Debris Monitoring and Cleanup

Marine debris monitoring information from volunteer organizations can be used to assess debris sources, identify areas where public education and outreach are necessary, and evaluate the success of legislation enacted against littering and ocean dumping. The information that follows was taken from Chapter 16 of *Volunteer Estuary Monitoring: A Methods Manual*. This information can be used to organize a volunteer floatable debris monitoring and cleanup program, with specific emphasis on data collection and data uses (USEPA, 1993a).

4.2.1 Sampling Considerations and Options

Marine debris cleanup programs generally fall into two categories: (1) programs that collect and remove debris and (2) programs that collect and remove debris and also record information on the amounts and types of debris found. Marine debris cleanup and monitoring programs should address the following questions before proceeding with any activity:

- Why do you want to conduct a cleanup?
- What do you want to accomplish?
- Do you want to conduct a cleanup to just remove debris, or do you want to collect some kind of data? If so, what kind of data should be collected (the type of data should be determined by the goal(s) of the program)?
- What will the data be used for (e.g., monitoring debris type or accumulation trends, identifying the debris sources, or influencing legislation)?
- Will this be a 1-day event, or will it need to be repeated periodically?
- What are the limits of the data?

4.2.2 Conducting a Marine Debris Cleanup

Depending on the scope and data needs of the program, organizing such an event can take either a few days or a few months. The following actions are required for a successful cleanup program:

- Identifying debris collection sites that are safe and accessible to volunteers.
- Identifying site coordinators who can manage cleanup activities at each site.
- Locating a waste hauler who will donate services to the project.
- Planning recycling options.
- Arranging for weight scales and other necessary equipment to be at the site.
- Soliciting volunteers to participate in the activity and providing training prior to the event.
- Working with the media (as appropriate) to obtain coverage of the event or have it photographed or videotaped.

- Maintaining a list of people who might participate to get some indication of the number of participants expected at the cleanup site.
- Preparing for health emergencies.
- Ensuring that volunteers know what to do with dead, entangled, or injured animals.
- Contacting potential sponsors to obtain donations of supplies, food, drinks, prizes, and whatever else might be needed.
- Inspecting equipment.
- Establishing and setting up check-in points.
- Coordinating volunteers at cleanup sites.
- Collecting data cards.
- Distributing prizes and other items to the volunteers.
- Disposing of the debris.
- Compiling cleanup information.
- Following up with site coordinators and key volunteers with results and future action.
- Providing data to state, local, or federal government agencies as appropriate.

4.2.3 Contact Information

The information provided in this section was taken from Chapter 16 of *Volunteer Estuary Monitoring: A Methods Manual*. For more information, visit the EPA web page at www.epa.gov/owow/estuaries/monitor/ or contact U.S. EPA's Ocean and Coastal Protection Division at (202) 566-1200.