



*This document is Chapter 16 of the Volunteer Estuary Monitoring Manual, A Methods Manual, Second Edition, EPA-842-B-06-003. The full document can be downloaded from: <http://www.epa.gov/owow/estuaries/monitor/>*

## Voluntary Estuary Monitoring Manual

### Chapter 16: Marine Debris

March 2006

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# Chapter 16

## Marine Debris



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## ***Overview***

Waterbodies have historically been dumping grounds for human-made debris. Rarely can a person visit a stream, lake, river, estuary, or ocean and fail to observe some form of trash. This debris originates from many activities, but is generally categorized as coming from land- or ocean/inland waterway-based sources. Regardless of its origin, however, marine debris impacts human health and safety; poses an entanglement or ingestion threat to wildlife; and degrades critical habitats.

Volunteer groups may be attracted to marine debris monitoring because of the pervasiveness of the problem and the ease with which marine debris pollution can be observed. They may also choose several approaches to dealing with it. Some organizations simply remove trash from shorelines and waterways. Others take it one step further, collecting information about the types and amounts of debris found. This kind of data collection may be done with different levels of scientific rigor, depending largely on the goals of the volunteer effort.

This chapter discusses techniques for organizing a debris monitoring and cleanup program, with emphasis on data collection and data uses.

## Why Monitor Marine Debris?



*Marine debris is typically comprised of plastic, glass, rubber, metal, paper, wood, and cloth (photo by The Ocean Conservancy).*

Once, our nation's beaches were littered only with the likes of dry seaweed strands, shells, plant stems, and stranded jellyfish. These days, the litter is more likely to include cigarette butts, grocery bags, scraps of fishing nets, pieces of foamed coffee cups, fast food containers, and beverage cans or bottles. As the coastal population has risen and society has turned from degradable natural

materials to synthetic ones, the trash problem has worsened.

Of all the human-made goods produced over the past several decades, plastics are among the most persistent and pervasive. The qualities that make plastic such a versatile material for so many products can make it harmful once it is released to the environment. Constructed to be light and durable, plastics break down very slowly—some products even persisting for centuries.

Marine debris monitoring information from volunteer organizations is important in many ways. Data from monitoring efforts 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.

Marine debris monitoring and coastal cleanups serve three major functions. First, they reduce the amount of litter on shorelines in an immediate and visible way—an aspect most gratifying to the volunteers. Second, with careful planning, volunteers can document the types, quantities, and possible sources of debris. Third, the cleanup teaches the public about the problems of marine debris and how citizens can help. The sight of a littered beach transformed into a clean one makes an impression that the community will long remember and gives the

volunteers a strong sense of pride in their accomplishment. Grassroots educational efforts accompanying the cleanup can help prevent future littering.

### *Marine Debris Sources*

As our knowledge about marine debris has increased, two pathways have been shown to contribute to the problem. These sources can be divided into land-based and ocean/inland waterway-based. Land-based debris consists of waste products that have washed or blown into the water from the land. Primary sources of land-based debris include:

- sewers;
- combined sewer overflows;
- illegal dumping;
- beachgoers who leave litter on beaches;
- balloon releases;
- disposal of industrial waste products; and
- loss from coastal solid waste management landfills via wind.

Ocean/inland waterway-based debris items are accidentally or deliberately discharged at sea. Sources include:

- commercial fishing boats;
- recreational vessels;
- floating fish processing plants;
- cargo ships;
- passenger day boats and ferries;
- offshore oil platforms, rigs, and supply boats;
- military vessels;
- passenger cruise ships; and
- research vessels.

For many debris items, however, it is not so easy to identify their source—whether land or ocean/inland waterway-based.

## Plastic Debris

Annex V of the International Convention for the Prevention of Pollution from Ships, commonly known as MARPOL, bans the disposal of plastic into the world's oceans and establishes limits on the disposal of other garbage. Many countries, including the United States, have agreed to this treaty. Over time, this agreement should substantially reduce the load of plastics entering the marine environment. The United States also prohibits the disposal of plastic into the nation's navigable waterways from any vessel—ranging from the largest tanker to an inner tube.

### *The Role of Marine Debris in the Estuarine Ecosystem*

A walk along any but the most pristine coastal or estuarine shoreline will quickly reveal an astonishing array of human-made products. Beaches are natural accumulation areas for ocean- and land-based debris. Nearshore waves tend to push marine litter landward where it becomes stranded as high tide recedes. Beaches are also popular recreation areas and users often leave their trash behind.

The many marine debris sources make it one of the more widespread pollution problems threatening estuarine and coastal systems. The problem of today's litter is not merely aesthetic. Once litter gets into the estuarine environment, it seriously affects humans, wildlife, and habitats.

### Human Impacts

Plastic debris (e.g., nets, fishing lines, trash bags) can snare boat propellers or clog cooling water intakes, causing substantial damage to the motor. A disabled motor can not only be costly to fix, but can leave boaters stranded in the water—a potentially dangerous situation.

Debris can also affect human health. Medical wastes menace barefoot beachgoers and pose a threat of contamination. Glass or metal shards can cause serious injuries.

Some beaches with marine debris problems face the possibility of losing money. Without regular beach cleaning—an expensive undertaking—many coastal communities risk losing tourism revenues.

### Wildlife Impacts

Wildlife often fare even worse than humans. Marine debris can mean death to estuarine animals. One common cause of death by marine debris is **entanglement**. Many animals can become caught in discarded fishing nets and lines, rope, six-pack rings, balloon ribbons, grocery bags, and other floating debris.

Some animals die from marine debris **ingestion**, mistakenly eating the human-made materials. Endangered sea turtles, for example, consume floating trash bags and balloons, likely mistaking them for jellyfish—a staple in most sea turtles' diets. Several seabird species have been found to swallow plastic pieces and cigarette butts. These materials can damage the animals' digestive systems. Alternatively, animals may stop eating because their stomachs are full. Because the debris in their stomachs offers no nutritional value, the unfortunate creatures may eventually starve to death.

At least 267 marine species are known to have either become entangled in or ingested marine debris (Faris and Hart, 1995; MMC, 1997).



*Wildlife entanglement is just one of the impacts of marine debris. Animals caught in debris may eventually die (photos by The Ocean Conservancy).*

### Habitat Impacts

Marine debris can cause problems for the estuary system. Debris coming from miles away may carry with it opportunistic plants and animals that colonize the debris' surface. These non-indigenous species can have devastating impacts for the region (see Chapter 19). Submerged debris can also cover communities such as coral reefs and smother seagrasses and bottom-dwelling species.

### Levels of Marine Debris

Marine debris is pervasive throughout coastal regions. Similar to most estuarine pollution parameters, the amount of marine debris at any single moment can depend on the estuary location, its surrounding land use, the frequency of cleaning by municipal

agencies, and environmental conditions, among other factors.

Each year, on the third Saturday in September, The Ocean Conservancy conducts the International Coastal Cleanup. During this activity, volunteers remove debris from shorelines and underwater sites. The volunteers also collect information about the items found. The Ocean Conservancy uses the volunteer data to evaluate the success of anti-litter and anti-dumping legislation. The data are also used to identify debris sources and public outreach possibilities.

The Ocean Conservancy compiles the information collected during the International Coastal Cleanup and generates a list of the most frequently found debris items (Table 16-1). The list provides insight to where litter prevention efforts can be concentrated. ■

**Table 16-1.** Most frequently found marine debris items in the United States. Data represent shoreline and underwater cleanups during the 2000 International Coastal Cleanup (*The Ocean Conservancy Web site*).

| Debris Items                    | Total Number Reported | Percentage of Total Collected |
|---------------------------------|-----------------------|-------------------------------|
| 1. cigarette butts              | 1,027,303             | 20.25%                        |
| 2. plastic pieces               | 337,384               | 6.65%                         |
| 3. food bags/wrappers (plastic) | 284,287               | 5.60%                         |
| 4. foamed plastic pieces        | 268,945               | 5.30%                         |
| 5. caps, lids (plastic)         | 255,253               | 5.03%                         |
| 6. paper pieces                 | 219,256               | 4.32%                         |
| 7. glass pieces                 | 209,531               | 4.13%                         |
| 8. beverage cans                | 184,294               | 3.63%                         |
| 9. beverage bottles (glass)     | 177,039               | 3.49%                         |
| 10. straws                      | 161,639               | 3.19%                         |
| 11. beverage bottles (plastic)  | 150,129               | 2.96%                         |
| 12. bottle caps (metal)         | 130,401               | 2.57%                         |
| <b>Top 12 Totals</b>            | <b>3,405,461</b>      | <b>67.12%</b>                 |

## Sampling Considerations and Options

Marine debris cleanup programs generally fall into two categories:

- programs that collect and remove debris; and
- programs that collect and remove debris, and record information on the numbers and types of debris found.

Any organization or individual can participate in programs that collect and remove debris from beaches and shorelines. This type of activity is designed to clean the area and raise general public awareness of marine debris pollution. Such programs can elicit a sense of pride and accomplishment in

their volunteers and in the community.

Other cleanup programs go beyond simply collecting and removing debris. Some programs, such as The Ocean Conservancy's International Coastal Cleanup and National Marine Debris Monitoring Program, record data on the numbers and types of debris being found. Data collected from cleanups can be extremely important in



*International Coastal Cleanup volunteers in Puerto Rico (photo by S. Sheavly, The Ocean Conservancy).*

### Case Study: National Marine Debris Monitoring Program

Supported by the U.S. Environmental Protection Agency (USEPA), The Ocean Conservancy coordinates the National Marine Debris Monitoring Program (NMDMP). NMDMP is a scientifically valid marine debris study utilizing volunteer groups to monitor and remove marine debris on U.S. coastal beaches. Trained volunteers conduct beach debris surveys following a strict scientific protocol and procedures.

The NMDMP was started in the spring of 1996. The goal is to establish and maintain 180 marine debris monitoring sites along the entire coastal United States, including Alaska, Hawaii, Puerto Rico, and the U.S. Virgin Islands. Monitoring sites are surveyed monthly by hundreds of volunteers.

The NMDMP is a five-year program designed to scientifically answer two fundamental questions regarding marine debris:

- Is the amount of debris on our coastlines decreasing?
- What are the major sources of the debris?

Information gathered by the NMDMP study will be utilized by the USEPA, National Marine Fisheries Service, National Park Service and the U.S. Coast Guard to better understand the problem of marine debris pollution.

The NMDMP data card can be found in Appendix A.

#### *For More Information:*

The Ocean Conservancy  
Office of Pollution Prevention and Monitoring  
1432 N. Great Neck Road, Suite 103  
Virginia Beach, VA 23454  
Phone: 757-496-0920  
Fax: 757-496-3207  
<http://www.oceanconservancy.org>  
Email: [nmdmp@oceanconservancyva.org](mailto:nmdmp@oceanconservancyva.org)



*The National Marine Debris Monitoring Program is conducted on stretches of beach throughout the United States. Here, a volunteer coordinator measures a 500-meter monitoring site in North Carolina (photo by The Ocean Conservancy).*

convincing politicians to actively solve the marine waste problem and are useful at all levels of government. The use of a data card (Appendix A) facilitates the collection of marine debris information during the cleanup activity.

Any marine debris cleanup program conducted by a volunteer group should be thoroughly planned and

thought out. The following basic questions should be considered before proceeding with the activity:

- Why do we want to conduct a cleanup? What do we want to accomplish?
- Do we just want to conduct a cleanup simply to remove debris, or do we want to collect some kind of data?
- If we want to collect data, how will the data be used? What do we hope to accomplish with the data (e.g., influence legislation, monitor debris type or accumulation trends, identify debris sources, etc.)?
- What kind of data do we want to collect? (The type of data should be determined by what it is you want to accomplish.)
- Will this be a one-day event, or will it need to be repeated periodically? (Collecting meaningful data on debris may take repeated efforts.)

### *Choosing a Sampling Method*

Marine debris monitoring is a very simple process. The sampling method selected will depend largely on the goals of the volunteer program. Sampling methods used as part of the International Coastal Cleanup and the National Marine Debris Monitoring Program

(NMDMP) are briefly summarized here. Only the NMDMP method follows a scientifically valid and rigorous sampling protocol.

### **Method Used for International Coastal Cleanup**

Volunteers fan out over a monitoring site (e.g., by foot on land, by boat, or by swimming), randomly searching for debris. Using data cards, they identify and quantify the debris items. The entire event provides a one-day “snapshot” of the types and quantities of debris occurring along shorelines and in waterways. No scientific protocol is followed during this activity.

The International Coastal Cleanup is very useful for heightening public awareness about marine debris and its prevention and provides insights into the sources and activities producing marine debris. Because it lacks scientific rigor, however, this method may not reveal information about marine debris trends.

### **Method Used for National Marine Debris Monitoring Program**

The NMDMP is an example of a marine debris monitoring program that follows a scientific protocol for data collection.

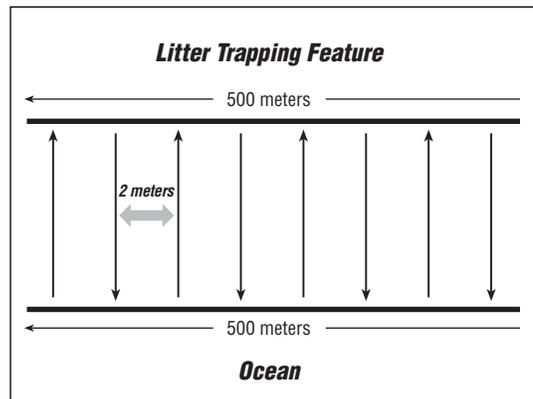
Every 28 days, volunteers remove debris from a randomly selected and pre-measured 500-meter stretch of beach. Each 500-meter survey unit must:

- be of sandy or small gravel composition;
- have a moderate to low slope (15-45 degrees) along the width of the beach;
- receive no other routine cleaning;
- not be protected from the ocean by jetties, breakwaters, etc.;
- be accessible for monthly monitoring; and
- contain at least 500 meters of accessible length.

Not only is there scientific rigor designed into the selection of monitoring sites, but

volunteers are also trained in the proper methods for conducting a cleanup. Instead of walking randomly, volunteers must walk in a prescribed pattern (Figure 16-1) to ensure that the entire survey area is covered. Data cards are used to identify and quantify the debris items. The NMDMP also incorporates a quality assurance protocol (see Chapter 5) to guarantee the validity of the collected data.

The NMDMP utilizes only ocean beach sites; however, volunteer estuary monitoring groups may consider a similar protocol design to suit their particular data collection needs. ■



**Figure 16-1.** Specific walking pattern for inventorying marine debris as part of the National Marine Debris Monitoring Program (NMDMP) (from Center for Marine Conservation, 1997).

## How to Conduct a Marine Debris Cleanup

Depending on the level of sophistication and the data needs of the program, organizing a marine debris cleanup can take minutes or months. Although getting a few people onto the local beach to pick up some trash may seem like an easy task, a successful cleanup can involve hundreds of people and demand months of organization, recruitment, and planning.

Regardless of the program objectives, a few general elements to a marine debris monitoring program are presented here for the volunteer leader. These elements are derived from The Ocean Conservancy's International Coastal Cleanup and can be divided into three categories: before the cleanup, the day of the cleanup, and immediately after the cleanup.

### Helpful Hint

*If you plan a marine debris cleanup during the months of September and October, your data can be included as part of your state's International Coastal Cleanup activity. Call 1-800-262-2322 or email [cleanup@oceanconservancyva.org](mailto:cleanup@oceanconservancyva.org) before your cleanup activity for more information.*

### Before the Cleanup:

**STEP 1:** *Identify debris collection sites that are safe and accessible to volunteers.*

- Ensure that you will have access to the site and that you have the necessary permission to be at the site.
- Verify cleanup date and time.
- Identify potential volunteer check-in site(s) that will be clearly visible and have parking available; for example, if you are conducting a waterway cleanup, it could be located next to a boat ramp or central area of a marina. You may want to post signs or posters directing people to the proper location.
- If scientific data will be collected, volunteers should be trained prior to the activity.



*Volunteers in the National Marine Debris Monitoring Program collect and inventory marine debris (photo by The Ocean Conservancy).*

**STEP 2: Identify site coordinators who can manage cleanup activities at each site.**

Recruit coordinators and hold a coordinators' meeting. This is your opportunity to distribute materials to the coordinators and make sure they understand everything they have to do. They should know the importance of collecting data, completing data forms, keeping track of numbers of volunteers, and working with the media. All site coordinators should visit their site before the cleanup, finalize where they will set up their check-in point, where the dumpster should be located, and where the volunteers will be sent.

Review what to do if there is a health emergency (Step 8) and what to do with dead, entangled, or injured animals (Step 9).

**STEP 3: Locate a waste hauler who will donate services to the project.**

- Contact a local waste collection company in your area. Your municipal government may help and may even waive the entrance fees at landfills or incinerators for the event.
- Identify an organization or business willing to donate trash bags.
- Plan ahead on how filled trash bags are going to be removed: (1) Will volunteers carry them back to the check-in point, or some other central location, or (2) will they leave them as they are filled, right on the beach (above the high tide mark), to be picked up by truck or other vehicle? If you chose the first option, have your volunteers start at the far end of the zone they will be cleaning and work their way back to the central location. This will decrease the distance they will have to carry full bags of debris.

**STEP 4: Plan recycling options.**

- A) Contact recyclers in your area and arrange with them pickup and delivery dates and times.

- Recycling debris should be a major emphasis of the cleanup project. Some localities may have recycling coordinators in their solid waste departments who should be able to assist you.
- Try to remove as much other debris from the recyclable materials as possible—particularly organic matter—before sending them to be recycled.

B) Plan ahead how you will collect the recyclables. Either:

- Have volunteers sort as they collect, working in groups of four or more (make sure to have separate bags for recyclables; using bags of different colors may aid the sorting process); or
- Identify a special group of volunteers who will work during and after the cleanup to specifically sort the recyclables.

You can make recycling more fun by making a contest out of it: whoever has the most number of cans or bottles (or most bags, or by weight) may win a small prize or get some sort of recognition at the end of cleanup.

**STEP 5: Arrange for a scale at cleanup sites to weigh trash bags and large individual items (e.g., tires), or be sure you can get a weight from your waste hauler.**

This kind of data helps to dramatize a trash problem and is often of particular interest to the media.

There are several ways to calculate the weight of trash collected:

- Secure a scale similar to those used in seafood markets and grocery stores, or one with a hook on it for hanging bags, and weigh each bag of trash before it is thrown into a dumpster. This is the most accurate way of reporting the weight.

- Your waste hauler may be able to give you the total weight of what was hauled away (either a real weight or a good estimate by the number of filled dumpsters or roll-offs).
- Estimate the total weight by weighing a random sample of 10 filled bags of trash, calculating the average weight per bag, and multiplying that number by the total number of filled trash bags.
- Also estimate the weight of items which are too large for trash bags, including tires, large fishing nets, and building materials.

### **STEP 6:** *Solicit volunteers and work with the media.*

A well-publicized cleanup drive can often attract large numbers of citizen volunteers. The following steps can help:

- Distribute posters and brochures.
- Contact local schools, civic organizations, chambers of commerce, environmental groups, industries, and others willing to participate in the cleanup.
- Distribute media announcements to local media and the groups listed above who may have their own newsletters or flyers.
- If you have the time, contact specific environmental reporters (print and TV/radio media) in your area who may be interested in a “before and after” type of story. Get a photographer out to shoot pictures of a cleanup site before the event to illustrate the trash problem, or supply the press with some of your own. This will help encourage participation the day of the event.

### **STEP 7:** *Maintain a list of people who respond and express interest in the cleanup to get some indication of the number of volunteers to expect at your cleanup sites.*

This may be important in case you have too many people wanting to go to a specific site. Others can possibly be diverted to different sites that may need more participants.

Consider ahead of time how volunteers will be dispersed during the cleanup to cover your whole cleanup area. For example, some groups mark off sections of beach every 1/8 of a mile (or whatever distance is appropriate), and estimate the minimum number of volunteers that are needed for each section. Wooden stakes work well for markers, or telephone poles might be used if the cleanup occurs along a road, etc. You may want to have maps of the cleanup site available for volunteers.

#### **Helpful Hint**

*One site coordinator will not be enough when 40 or more volunteers indicate they will be participating at a site. As a general rule, it takes one additional “assistant coordinator” for every 30-40 volunteers.*

### **STEP 8:** *Be prepared for health emergencies.*

- Have first aid kits available at each cleanup site or check-in location for small emergencies like cuts and scrapes. You and your site coordinators should also review what you would do if there is a major health emergency (heat exhaustion or heatstroke, broken bone, etc.). Write out a plan. Know how to get to the closest hospital or other emergency facility from your cleanup site so you can direct emergency personnel. Some communities may want to have rescue

personnel standing by, particularly for areas expecting several hundred volunteers. Additionally, volunteers suffering deep cuts or puncture wounds should check with their physician on the need for a tetanus shot.

- Try to obtain walkie-talkies, two-way radios, or cellular phones for each site coordinator. This is useful for staying in touch with each other, regardless of possible emergencies. Local cellular phone companies may donate phones for such events.

### Helpful Hint

*Consider contacting your local police department and marine patrol to let them know you will be having a cleanup event.*

**STEP 9:** *Make sure volunteers know what to do with dead, entangled, or injured animals.*

- Contact your local animal/wildlife rescue facilities to let them know that a cleanup will be occurring, and ask them how to properly care for and transport any injured animals that might be found.
- Dead wildlife could simply be left; more often than not, they died naturally and some scavenger will probably take care of them.
- Entangled animals should be removed because other animals may become entangled with them.
- All entanglement and injury incidents should be reported on data cards. Consider sharing your information with local stranding networks, which often keep records of dead, injured, and entangled wildlife.

**STEP 10:** *Arrange for someone to take photos or videos of the event.*

- Good video footage may be useful for future public service announcements or other educational purposes.
- Label clearly all photos and slides with the photographer's name, name and location of site, and date.

**STEP 11:** *Contact merchants and other potential donors who can supply drinks, food, raffle prizes, or whatever else you might need.*

Many merchants will jump at the chance to be involved in a positive and non-political event. It is good public relations, and you can make it even better by remembering to mention all your donors and sponsors in press releases or conversations with the press. Donations of this type also encourage more participation.

### The Day of the Cleanup:

**STEP 12:** *Check your equipment.*

If water quality monitoring is to be part of your cleanup activity, make sure to bring along all the proper equipment designated by the program manager (see Chapter 7 for a general list of equipment). In addition to the standard water quality sampling equipment and apparel listed in Chapter 7, the site coordinator should bring the following items to the site for each cleanup:

- plastic garbage bags to collect debris (have at least two bags for each expected volunteer);
- blank data cards;
- pencils or pens to record data;
- clipboards; and
- *Pocket Guide to Marine Debris* (The Ocean Conservancy and USEPA, 2000).

Volunteers should be told to bring:

- gloves;
- protective shoes;
- sunglasses;
- sunscreen; and
- water.

### **STEP 13:** *Set up your check-in points.*

Be prepared before your volunteers start arriving! Have a table or area that will serve as a volunteer check-in station set up with all materials; sign-in sheets ready for volunteers; and signs, if necessary, to direct volunteers to parking, the check-in point, and where they will be cleaning (e.g., stake off sections of the site to be cleaned). Your dumpsters and recycling bins should be appropriately located.

You may want to display actual examples of the items that volunteers may be less familiar with, if you have them. This will aid with proper data collection.

### **STEP 14:** *Coordinate volunteers at cleanup sites.*

Critical to the success of the cleanup is emphasizing that the volunteers' effort will make a difference. Distribute materials and instruct the volunteers on the following items as they arrive at the check-in point, either individually or in small groups:

- Have all volunteers sign in.
- Emphasize the importance of data collection, including information about unusual situations or observations (see Chapter 7). The International Coastal Cleanup data card serves as a nationwide standard that allows data from any beach in the United States to be compared with any other. Standardized data make the national database more useful and accurate for analysis. The Ocean Conservancy will provide these cards at no charge to beach cleanup programs (see end of this chapter for contact information).

- To facilitate data collection and sorting out the recyclable trash, encourage volunteers to work in teams of four or five. Each volunteer in the team should be given one to two trash bags—one for aluminum, one for plastic bottles, and several others for glass. They should sort as they go. One volunteer, designated the “data captain,” would be responsible for recording the items picked up by the other volunteers on the data card (they can call out the items as they go). This person will quickly become familiar with the card, making the task easier.

- The volunteers should know what sort of debris they are likely to encounter. Accurate debris identification will make the database more valuable and will also help volunteers steer clear of potentially dangerous materials such as medical waste or toxic waste containers. It is best to treat unidentified containers with caution; 55-gallon drums and munitions should be avoided altogether. If volunteers do find suspicious materials, they should stay well away, but note their quantity and location and report this information to the program leaders. The leaders can then determine the best means of removing any potentially hazardous materials.
- Emphasize safety, stressing the importance of:
  - always wearing gloves;
  - picking up glass or metal shards with care;
  - steering clear of injured animals which may harbor disease;
  - avoiding overexposure to the sun;



*A volunteer coordinator reviews data collection requirements for the International Coastal Cleanup (photo by The Ocean Conservancy).*

- not lifting heavy objects without assistance;
  - being aware of snakes and other animals in dunes or grasses;
  - not wading across tidal inlets (currents are often powerful and unpredictable); and
  - reporting any injuries to the program leader.
- Instruct volunteers on what to do if they find dead or entangled animals (see Step 9).
  - Instruct the volunteers on what they are to do with the filled bags of trash (see Step 3).

**STEP 15:** *As the volunteers return, collect all data cards.*

Tell volunteers to return the cards immediately after the cleanup. It is best to have a labeled box at the check-in station where the cards can be returned. Review the cards to ensure they were properly filled out.

**STEP 16:** *Be sure that volunteers get their certificates, hats, t-shirts, or any other giveaways before leaving the site.*

Any awards that you choose to give out (e.g., for most recyclables, most unusual item, etc.) can be distributed at this time as well.

**STEP 17:** *Dispose of debris.*

Oversee sorting of the recyclable debris. Make sure the waste hauler takes all the trash away and no other materials are left behind.

**Immediately After the Cleanup:**

**STEP 18:** *Compile cleanup information.*

Sample information could include the total number of people, pounds, and miles in your cleanup, any entanglements, unusual items, number of trash bags filled, etc. If your cleanup is part of a larger event, send the data cards to the event coordinator. If feasible, make copies of the cards before sending them, in case the originals become lost.

**STEP 19:** *Follow up with site coordinators and key volunteers.*

This is intended to gauge the success of the materials developed for promotion of the cleanup, effectiveness of media coverage, etc. They then use this information to plan for next year's cleanup to make it even more efficient and effective. ■

## References and Further Reading

### Portions of this chapter were excerpted and adapted from:

The Ocean Conservancy. 2002. *International Coastal Cleanup (ICC) Coordinator Handbook*.

### Other references:

Center for Marine Conservation (now The Ocean Conservancy). 1997. *National Marine Debris Monitoring Program Volunteer Handbook*.

Faris, J. and K. Hart. 1995. *Seas of Debris: A Summary of the Third International Conference on Marine Debris*. NC Sea Grant College Program. UNC-SC-95-01.

Marine Mammal Commission (MMC). 1997. *Annual Report to Congress*. Bethesda, MD. 239 pp.

The Ocean Conservancy and U.S. Environmental Protection Agency (USEPA). 2001. *Pocket Guide to Marine Debris*. Washington, DC.

U.S. Environmental Protection Agency (USEPA). 1989. *Marine Debris Bibliography*. Washington, DC. 25 pp.

U.S. Environmental Protection Agency (USEPA). 1992. *Turning the Tide on Trash: A Learning Guide on Marine Debris*. EPA 842-B-92-003. Office of Water, Washington, DC. 78 pp.

### Web sites:

The Ocean Conservancy: <http://www.oceanconservancy.org>

U.S. Environmental Protection Agency: <http://www.epa.gov/owow/oceans/debris/index.html>

### For information about the International Coastal Cleanup for marine debris research:

The Ocean Conservancy  
Office of Pollution Prevention and Monitoring  
Atlantic Regional Office  
1432 N. Great Neck Road, Suite 103  
Virginia Beach, VA 23454  
Phone: 757-496-0920  
Fax: 757-496-3207  
Email: [cleanup@oceanconservancyva.org](mailto:cleanup@oceanconservancyva.org)

### The newsletter *Coastal Connection* can be requested from:

The Ocean Conservancy  
1725 DeSales, Street NW #600  
Washington, DC 20036  
Phone: 202-429-5609  
Fax: 202-872-0619

