This document is Chapter 1 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 1: About the Manual, including its purpose, how it is organized, and how it can be used

March 2006

Chapter 1

Introduction



The inspiration for this manual comes from the people who are dedicated to monitoring estuaries and the environment around them. The people who create volunteer monitoring programs and the people who serve as volunteer monitors care deeply about their estuaries, are concerned about their watersheds, and want the opportunity for more community involvement.

Photos (l to r): S. Schultz, T. Monk, S. Schultz

Where Would Estuaries Be Without Volunteer Monitors?

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Estuary volunteer monitoring programs give men, women, and children a priceless opportunity to intimately know the many spectacular riches of the estuarine environment. As people learn more about how an estuary functions and come to recognize its signs of distress, their concern for its future is increased. So too is their commitment to its protection. The fact is, we will take care of something when we value it.

Volunteer estuary monitoring programs can create citizen leaders who work to reduce pollution, increase education, and better manage our coastal areas, all with the purpose of protecting some very special places.

Estuaries are homes for wildlife, food suppliers, gateways of commerce, and cultural mainstays. They are also imperiled. Volunteer monitors help preserve our estuarine resources (photo by S. Schultz).

By donating their time and talents to a monitoring program, volunteers offer a priceless, enduring legacy to the future. We are collectively responsible for the preservation our natural world for the future generations of people, animals and plants that call an estuary "home." ■

About the Manual

Volunteer Estuary Monitoring: A Methods Manual is a companion document to *Volunteer Water Monitoring: A Guide for State Managers*, published in 1990 by the U.S. Environmental Protection Agency (EPA). The guide describes the role of volunteer monitoring in state programs and details how managers can best organize and administer these monitoring programs. This manual focuses on the concepts and plans developed by the EPA guide and places them in a nuts-and-bolts context specifically for volunteer estuary monitoring programs.

Two other EPA documents are also closely allied with this manual: *Volunteer Lake Monitoring: A Methods Manual* (1991) and *Volunteer Stream Monitoring: A Methods Manual* (1997). Together, these manuals provide guidance on volunteer water quality monitoring in much of our nation's watersheds.

Estuaries support a vast array of wildlife. Some make estuaries their lifelong homes, while others can be seen only during certain times of the year or during particular periods of their lives (photo by S. Schultz).

This is the second edition of *Volunteer Estuary Monitoring: A Methods Manual.* It updates information and adds new topics that have emerged since the first manual was introduced in 1993. ■

Purpose of the Manual

The overriding purpose of *Volunteer Estuary Monitoring: A Methods Manual* is to serve as a tool for volunteer leaders who want to launch a new estuary monitoring program or enhance an existing program. In the process, the manual shows how volunteer groups can collect meaningful data to assess estuarine health.

The manual is not intended to mandate new methods or override those currently being used by volunteer monitoring groups. Instead, it presents methods that have been adapted from those used successfully by existing volunteer estuary monitoring programs throughout the United States. The manual describes methodologies and techniques for monitoring water quality parameters, starting and maintaining a volunteer estuary monitoring program, working with volunteers, ensuring high quality data, and analyzing and presenting the data following collection. ■

Organization of the Manual

This manual is organized into 19 chapters. Chapters 1-8 provide information about estuaries, volunteers and volunteer monitoring programs, and ensuring and managing data of high quality. Chapters 9-19 address specific water quality variables that volunteer monitoring programs may elect to measure. These chapters are grouped into chemical, physical, and biological units. Finally, appendices supply additional information.

A summary of the manual's contents is provided here.

Chapter 1: Introduction

The introduction outlines the purpose of this manual and its relationship to other documents published by the EPA. It also provides information about how and by whom the manual should be used and explains plans for making updated materials available in the future. Finally, the introduction summarizes the contents of the manual.

Chapter 2: Understanding Our Troubled Estuaries

This chapter introduces the concept of an estuary and summarizes the major problems plaguing our nation's estuarine waters. It also discusses the reasons for monitoring estuarine water quality and how monitoring data can ultimately help provide solutions to these diverse problems.

Chapter 3: Planning and Maintaining a Volunteer Estuary Monitoring Program

This chapter covers the basics of planning, implementing, and maintaining a volunteer monitoring program so that it yields credible data that will identify problems and assess trends. Included in this chapter are discussions on establishing goals, liability and other risk management issues, and obtaining financial support. This chapter also presents guidance on developing a user-friendly data form and working with the media to promote your program activities.

Chapter 4: Recruiting, Training, and Retaining Volunteers

This chapter discusses how to recruit, train, and retain top-notch volunteers. It summarizes potential sources of volunteers and provides detailed information for volunteer coordinators on training techniques that are proven to produce knowledgeable and enthusiastic volunteers.

Chapter 5: Quality Assurance Project Planning

This chapter addresses one of the most difficult issues facing volunteer monitoring programs: data credibility. It details the importance of developing a quality assurance project plan (QAPP) and summarizes the steps involved.

Chapter 6: Sampling Considerations

This chapter reviews four critical questions that a volunteer program must address before taking a single water sample: (1) What parameters will the program monitor? (2) How will the selected paratmeters be monitored? (3) Where will the parameters be monitored? (4) When will they be monitored?

Chapter 7: In the Field

This chapter addresses what happens when volunteers leave their homes for the monitoring sites. It makes points about safety, the right use of equipment, finding the monitoring sites, making general observations about the site, collecting data, and completing the data form.

Chapter 8: Data Management, Interpretation, and Presentation

This chapter discusses the elements of a volunteer program that take place after volunteers collect their data. It introduces data management tools, discusses data interpretation, and gives suggestions for maximizing the distribution of your data.

Unit One: Chemical Measures

This unit describes several water quality parameters that may be included in volunteer monitoring programs. Water quality variables highlighted include oxygen (Chapter 9), nutrients (Chapter 10), pH and alkalinity (Chapter 11), and toxins (Chapter 12). The chapters supply information on sampling considerations and guidance on monitoring.

Unit Two: Physical Measures

This unit provides monitoring guidance for water quality variables that represent measures of the estuary's physical environment. Temperature (Chapter 13), salinity (Chapter 14), turbidity and total solids (Chapter 15), and marine debris (Chapter 16) are included.

Unit Three: Biological Measures

Living organisms can be useful indicators of estuarine health. This unit includes information about monitoring bacteria as indicators of potential pathogens (Chapter 17), submerged aquatic vegetation (Chapter 18), and other biological parameters, including macroinvertebrates, plankton, and non-indigenous species (Chapter 19).

Appendices

Several appendices, referred to throughout the manual, are also included. These sections provide sample data forms (Appendix A), additional resources not listed in the chapters (Appendix B), and information on equipment suppliers (Appendix C). A glossary and acronyms section as well as an index are also included. ■

How to Use the Manual

Intended Audience

This manual is intended to be a resource for leaders of volunteer estuary monitoring programs. Such programs may be managed by environmental groups, educational institutions, or government agencies.

Individual volunteers will also find this manual to be a valuable resource, although some components may not apply to them. Volunteer leaders may elect to photocopy and distribute portions of the manual to volunteers as educational supplements, training reinforcement, or background materials.

Is the Manual the Answer to All Estuarine Monitoring Needs?

Certainly not! It would be impossible to provide monitoring methods that are uniformly applicable to all estuaries or all volunteer programs throughout the United States. Factors such as geographic region, program goals and objectives, and program resources will all influence the specific methods used by each group. This manual, therefore, urges volunteer program coordinators to work hand-in-hand with state and local water quality professionals or other potential data users in developing and operating a volunteer monitoring program.

This manual is only one resource for volunteer programs. Many other resources are available from government agencies and volunteer monitoring programs. Some are listed at the end of individual chapters and in Appendix B.

A Lot of Help from Our Friends

Some portions of this manual draw heavily from other resources. The editors wish to give these sources their due recognition and have listed them at the end of each applicable chapter, separate from other references.

Updates to the Manual

This manual is available in hard copy and on the Internet. It is anticipated that periodic updates will be made. While the updates will be included in future print versions, they will also be made available for downloading from the Internet. By making updates available on the Internet, it is anticipated that volunteer groups can access new information sooner than having to wait for a new print version of the manual. ■

References and Further Reading

U.S. Environmental Protection Agency (USEPA). 1990. *Volunteer Water Monitoring: A Guide for State Managers*. EPA 440/4-90-010. August. Office of Water, Washington, DC. 78 pp.

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U.S. Environmental Protection Agency (USEPA). 1997. *Volunteer Stream Monitoring: A Methods Manual*. EPA 841-B-97-003. November. Office of Water, Washington, DC. 211 pp.