

# EMAP West Training Presentations

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# Abstract

The PowerPoint training presentations in this project are in conjunction with the learning materials being developed by the Space-Time Aquatic Resources Modeling and Analysis Program (STARMAP) at Colorado State University in collaboration with a similar program at Oregon State University, Designs and Models for Aquatic Resources Surveys (DAMARS). The presentations are related to aquatic monitoring, intended for use by water quality personnel in the States and Tribes, using the approaches of the United States Environmental Protection Agency's Environmental Monitoring and Assessment Program (EMAP). These specific materials address the following questions: Why monitor? Where to monitor? What to monitor? How to monitor? The actual presentations were given at a field crew training seminar in May, 2004, in Corvallis, Oregon. The primary goal of this project was to compile the presentations into a user-friendly format, with linked audio narration and accompanying text for each slide. The materials are available as the original PowerPoint files, but also made available to individuals on CD-ROM in a Portable Document Format (PDF). The current version of the training presentations includes: detailed instructions for the user, a table of contents that provides an overview of the individual section topics, an expansive list of bookmarks that enhances quick and easy navigation, and an appendix that includes a glossary of relevant terms (some with examples). It is proposed that these presentations be reviewed by administrators and field crews involved in EMAP to determine whether any improvements are needed to further develop the educational value and provide the necessary training background for effective aquatic monitoring.

# Acknowledgments

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Jon L. Stoddard, Dave V. Peck, and Phil Kaufmann, all of the U.S. Environmental Protection Agency, as well as Bob M. Hughes of Dynamac, Inc., A.T. Herlihy of Oregon State University, and Michael T. Barbour and Kristen L. Pavlik of Tetra Tech, Inc, contributed the individual PowerPoint files used in the compilation of this project. Jon Stoddard, Dave Peck, Phil Kaufmann, and Bob Hughes also supplied the comments that were used in the audio narration of the interactive presentation.

The Instructional Technology Department of the Northern Wyoming Community College District in Sheridan, Wyoming, provided the necessary computer hardware and software used to develop the framework of the document and create the audio narrations.

Also, thanks to N. Scott Urquhart of Colorado State University, director of STARMAP, for his contributions to the development and finalization of the finished product.

## **Introduction**

The purpose of this project was to further develop the learning materials for surface water monitoring used by the States and Tribes. The primary goal of this project was to compile a set of PowerPoint training presentations into a user-friendly format, with linked audio narration and accompanying text for each slide.

Gerald Scarzella gives an overview of the concept behind the development of the learning materials in his 2003 paper: “A cooperative agreement between the U.S. Environmental Protection Agency and Colorado State University funds the Space-Time Aquatic Resources Modeling and Analysis Program (STARMAP) in the Department of Statistics; a second cooperative agreement funds Designs and Models for Aquatic Resource Surveys (DAMARS) in the Department of Statistics at Oregon State University. The request for applications initiated by the EPA contained this specific provision:

‘Proposals should specifically address the extension of expertise on design and analysis to States and Tribes. Such a component should consider the level of statistical training that may be extant in State and Tribal environmental management and resource agencies. Research on and demonstration of distance learning concepts that allow individuals with basic statistics training to study and understand the concepts of design and analysis statistics are encouraged. Training as used here does not include work leading to a baccalaureate or advanced degree, but might include seminars, workshops, demonstrations, handbooks, and the like. This component must include an actual case study applying the distance learning concept and be readily transferable to others.’

The primary focus of the learning materials is to train personnel from States and Tribes that are directly or indirectly involved with the monitoring of aquatic resources. This includes field crews, analysts, and scientists, as well as managers and administrators from both State and Tribal organizations. States and Tribes are responsible for monitoring water quality for several reasons. The type of evaluations required by the federal

government in section 305(b) of the Clean Water Act is one main reason for learning about water quality monitoring. A major disadvantage to States and Tribes in this situation is the lack of training and expertise to perform these evaluations, and in some cases, incorrect procedures and analyses are implemented that do not truly represent the water quality as a whole in a particular state or region. The intent of the EPA's proposal is to give guidance to States and Tribes to allow them to make statistically correct conclusions based on properly collected data from the field and to use appropriate statistical analysis methods. In turn, they need to write reports on water quality which should include statements made with statistical confidence. Collectively, all States and Tribes should implement similar procedures in order to make better evaluations of water quality as a whole, especially in a large region such as the Rocky Mountains, which include several states."

The compiled presentations in this document give the States and Tribes ample opportunity to learn about the necessary background and techniques entailed in their responsibilities with surface water monitoring, as well as providing them with a relevant statistical background. From showing how to correctly fill out paperwork to properly collecting water samples or interpreting the landscape, the presentations provide a detailed description of all that the field crews may encounter in their monitoring activities. This project is only a small part of a much larger mission: to accurately describe the quality of our nation's aquatic resources.

## **Content**

The learning materials in these training presentations cover the following topics:

- Why monitor water.
- Where to conduct water monitoring.
- What to monitor (measure) at each site.
- How to monitor (measure) at each site.

The completed learning materials will also include sections on the following topics:

- How to summarize data.
- Case studies.

This project focuses on the communication of the third and fourth topics. It is basically a compilation of presentations given by Jon L. Stoddard, Dave V. Peck, and Phil Kaufmann, all of the U.S. Environmental Protection Agency, as well as Bob M. Hughes of Dynamac, Inc., A.T. Herlihy of Oregon State University, and Michael T. Barbour and Kristen L. Pavlik of Tetra Tech, Inc. The main objective of my efforts was to combine each presentation file into an interactive format with audio narration. I transcribed notes and audio comments from actual training presentations, so that each page in the compiled document would have a corresponding narrative summary. After converting each PowerPoint file into a Portable Document Format (PDF), I then recorded an audio version of the narration for each page. Thus, the finished product includes linked audio and written comments that correspond to each page of the presentation, as well as additional links to a glossary and “bookmarks” that serve as a quick navigational feature.

These learning materials are technically a tutorial that someone can use by reading through the document or listening to the audio, similar to listening to a teacher in the classroom or a speaker at a seminar. All the information contained in the tutorial was provided by the aforementioned contributors. It provides training on methods used in EPA’s Environmental Monitoring and Assessment Program (EMAP), a research program to develop the tools necessary to monitor and assess the status and trends of national ecological resources. The primary goal of this project was to translate this information into a user-friendly format that effectively uses special technological features to properly train and educate all those involved in EMAP.

One of the goals of the STARMAP learning materials is to provide basic statistics training for the personnel from the States and Tribes via distance learning concepts. I strongly believe that my experience at Colorado State University provided me with the

necessary background and tools used to apply relevant statistical concepts to these learning materials, as well as deliver that information in a way that is easily understood by those with limited knowledge in the subject matter. The concepts and procedures described in the training presentations focus on what to measure at each probabilistic site and how to measure in a statistically sound way. If these measurements are done correctly, we can confidently estimate, and in some cases predict, known values that may help in explaining the underlying processes at a particular site or the variability among different sites.

Therefore, it was essential that I utilized my statistical education experience to help train and educate field crews who need to know how to properly collect their data. To do this, I first refined the glossary of terms that Gerald Scarzella developed in his learning materials. Some statistical terms were added to this glossary, as well as relevant examples that provide more detailed information with the application of statistics. In addition to the glossary, I also developed narrative audio with corresponding text to aid in the delivery of the statistical content throughout the materials. The training presentations contain vast amounts of information, much of it involving statistical concepts. In providing the narration, then, the user has access to more detailed information and a discussion of relevant examples, in a format that can be easily understood by someone with a basic knowledge of statistics.

Although most of the work done on this project was spent compiling the training presentations and converting them into a user-friendly format with special technological features, the knowledge in statistics I gained at Colorado State University was instrumental in helping me convey the necessary information. Without my graduate education in the department of statistics, I would not have been able to effectively communicate the statistical concepts that comprise a major portion of the learning materials.

The interactive version of the learning materials has several important features which help make it user-friendly. One important feature of the tutorial is the quick and simple

navigation through the pages of the document. In the interactive CD-ROM version, this is done by clicking on the arrows located at the bottom of the screen in the Adobe Reader program. If someone is more interested in a certain topic and does not want to scroll through the entire document, they can make use of the Appendix Table of Contents or the Bookmarks that are available on the left side of the screen. By clicking on a bookmark, the user will automatically jump to the page in the document that corresponds to that specific topic. Each bookmark is labeled with its relevant topic, making it easy for someone to navigate through the document if they are searching for information on one specific concept. The drawback to the Adobe program that one uses to view PDF files is that the settings may be different for each user, depending on what version of the Adobe program they have on their computer. If the bookmarks are not revealed upon opening the presentation, they can still be accessed by clicking on the “Bookmarks” tab on the left side of the screen. More detailed viewing and navigation instructions are given at the end of this report.

Most pages in the presentation also have the capability of accessing the glossary, which is located in the Appendix at the end of the presentation. These links to the glossary section are useful if a learner comes across a term that they may not understand. The detailed definition of that term can be accessed by clicking on the term or phrase it is included in. In some cases, an unknown term may not be in the glossary. If this occurs, the user may find their explanation by listening to the audio or by reading the corresponding text of the narration. The presentation also includes links to web pages by clicking on the HTML address within the document, as well as a link to contact the administrator if you have questions regarding the learning materials or if you wanted to give any feedback concerning the tutorial.

The primary focus of my project was to add relevant audio links to the training presentations. Using the capability of embedding a recorded sound into a PDF file, I was able to link a narration to each page. By clicking on the sound icon in the upper right hand corner of the page, the learner can access the audio narration at the simple click of a button. The goal behind this was to enhance the tutorial so that it was more interactive,

similar to someone listening to a teacher in a class setting. The audio narration includes concepts that are explained in greater detail, as well as a discussion of relevant and interesting examples.

My main task was to add the linked audio to the presentation, but I came across numerous hardships in my efforts to do so. At first, I attempted to embed the audio links within each PowerPoint file before I converted them to a PDF file. I spent a great deal of time doing this for each individual slide in every presentation before I realized that these links were not supported in the new file format.

I had access to the original audio comments via digital video of the training presentations done at a workshop in Corvallis in May of 2004. However, much of this audio was deficient and difficult to understand. I believe this problem arose when the digital tapes were transferred onto a computer, which were then burned onto a CD-ROM. If this conversion had been done professionally, by someone with more expertise and using a more efficient software package, the resulting audio may have been more functional. Related to this, another setback occurred when I tried to record the audio comments directly from the video to the PDF file. The microphone I was equipped with did not have a strong enough setting to provide an effective audio transfer – most of the recorded audio was ineffective because the recording volume was too low. Again, better equipment and sound engineering may have helped resolve this situation.

Although the transformation from a PowerPoint document into a PDF file was done by the simple click of a button, the PDF file needed some modifications (sometimes major) before setting up the links. Many of the JPEG picture files used in the original documents changed size when the file was converted to a PDF version. Numerous pages of text also changed upon converting to PDF, so modifications were done to alleviate any of these problems.

## **Conclusion**

Although the focus of my project was geared more toward applying technology to the learning materials, as opposed to doing statistical analyses of a set of data, the experience I had at Colorado State University was an integral part in helping me complete the final product. A majority of the topics included in the presentation deal with statistics, and I had to have a solid background in statistics to fully comprehend what was being discussed. This was important because there were many gaps which I had to fill in when it came to narrating each topic. I personally believe that one of the most important characteristics of a good instructor is their understanding of the subject matter. In order to effectively communicate with learners of all abilities, the instructor must have sufficient knowledge to present the material at the level of the learner's comprehension. Thus, my current knowledge in statistics and experience in statistical education played vital roles in the development of these learning materials.

As a math and statistics instructor at a small community college, I am fully cognizant of the different learning styles and abilities of a diverse population of students. As a teacher, I believe that one of my primary goals, and probably my biggest challenge, is to convey the relevant information in such a manner that is understandable by all types of learners, whether that approach be more visual or auditory. In recent years, drastic improvements of technology utilization in the classroom have changed the way students are being educated. We live in an era where computers and technology are a vital part of the learning process, and this can be a great asset to us if we use technology to its fullest potential and in the proper manner. This being said, many people struggle with utilizing technology in an effective manner. Not only is it important for teachers to understand the capabilities of technology and be able to use that in their environment, it is just as imperative for the learners and lay people to comprehend the value in knowing how to use technology. In doing this project, I learned that I do not know as much about technology as I thought I did previously, but I have a newfound respect and a desire to learn more about all that technology offers. With the exception of a few setbacks, my

work on this project has been a gratifying experience. I always feel a great sense of satisfaction when I know that my work has a positive effect on someone else. I hope that those who use these learning materials can find it as useful to them in their field of study as I found it in helping improve myself as a teacher.

The final product of my project contains the printable version of the presentation with the accompanying narrative text, as well as the interactive PDF tutorial available on the CD-ROM located in the inside back cover of this report. The learning materials included in this project should not be put to rest – I will continue to refine the materials and explore new ways to enhance the way that the information is presented. I would welcome any criticism and feedback from people of various abilities and backgrounds so that the learning materials can be continually improved. Any suggestions or comments can be addressed to myself, Jay Araas, or N. Scott Urquhart, the administrator of the STARMAP program at Colorado State University, at the following email addresses:

Jay Araas - [jaraas@sheridan.edu](mailto:jaraas@sheridan.edu)

N. Scott Urquhart - [nsu@stat.colostate.edu](mailto:nsu@stat.colostate.edu)

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# APPENDIX

Reduced Sized Copies of the Content Pages

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