

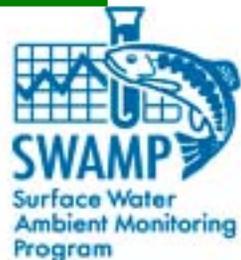
California's Surface Water Ambient Monitoring Program SWAMP Advisor Training Course



Course Topics Covered

- AM
1. Introduction and SWAMP Objectives - Dawit Tadesee
 2. SWAMP Advisor Introductory Presentations – Larry Keith
 - What an expert knowledge system is and its advantages & limitations
 - Advantages & limitations of the *SWAMP Advisor*
 - What the *SWAMP Advisor* will do – and how it works
 - Unique and special features of the software
 - How to navigate and how to produce QAPP files and save them
 - How to produce tables of data and format them
 - How to produce a Master QAPP with a Table of Contents
 - How to incorporate multiple study questions in a QAPP
-

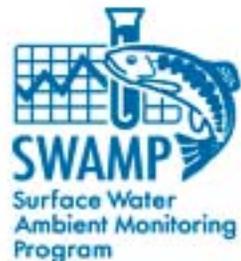
- Lunch
- PM
3. Demonstration of the *SWAMP Advisor*, **Hands-on use**
 4. Questions, Discussion, Evaluation Form Submission



Course Introduction – Dawit Tadesse

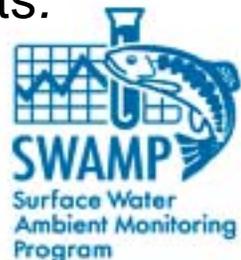
- Who is Dawit Tadesse and What Does he do?
- SWAMP Background Information
- SWAMP Advisor Course Objectives
- Handout Materials With This Training Course
- Materials Posted on the Academy Internet Site
- Housekeeping Notes – breaks, lunch, etc.

9:10 to 9:30 am



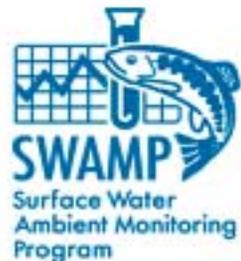
Handout Materials Posted on Internet

- **Slides** - used for an overview and introduction
- **User's Manual** - refer to it during preparation of your QAPP for step by step instructions or for information on a particular feature .
 - **Content Checklist** - an overview of the kinds of information needed for each Element in the QAPP is part of the User's Manual.
 - **Index** – Locates where in the Manual a topic is covered.
- **Review Form** - use it to provide feedback to us.
 - List any errors found as you use the software.
 - Provide your feedback and recommended improvements.



Numbered Screen Labels

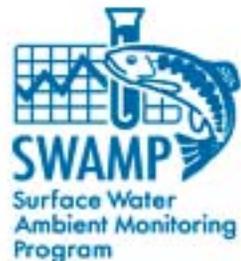
- Numbered screen labels are found in the top left hand corner of screens.
 - There are left hand side labels and corresponding right hand side labels
 - These labels are in two different areas of the SWAMP Advisor so be sure to indicate whether your comment involves the left side or the right side of your computer screen.
- Use these screen labels to report any errors or comments in the Training Course Review Form.
 - That way we can find the error or the portion of the software that you are commenting on.



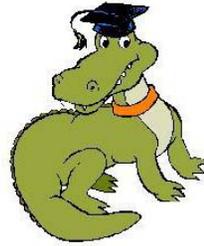
Class Participants & Dr. Keith Introduction

- Who is Dr. Lawrence H. Keith and What Does He Know?
- Who are the Class Participants and What Is their Experience and their Objectives?

9:30 to 9:45 am

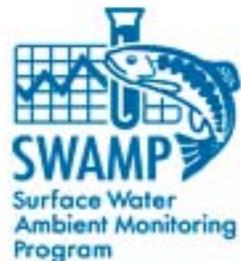


The SWAMP Advisor Introduction



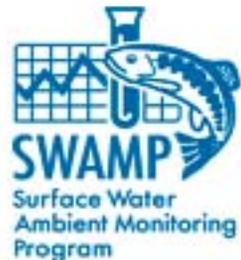
Advantages and Limitations of Expert Knowledge Systems and the SWAMP Advisor

9:45 to 10:05 am



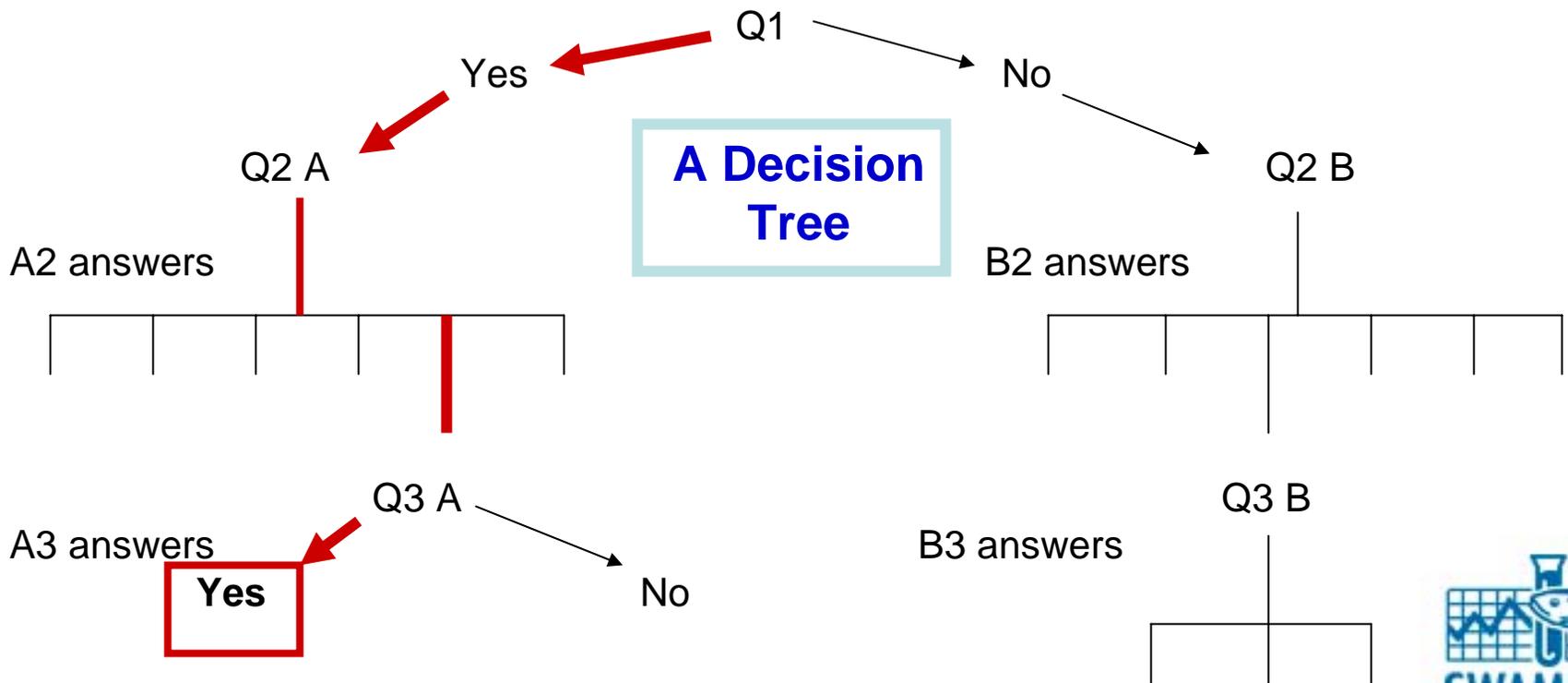
What is an Expert Knowledge System?

- An “*expert system*” is an interactive computer program that provides the same answers and advice to questions that a human expert would.
 - It emulates a human expert’s decision-making process in a particular domain of knowledge.
- Advantages Include:
 - Ensures that all necessary questions are addressed and all forms needed are available.
 - Advice and information is available at any time day or night 24 hours a day 7 days a week.
 - Users quickly find specific information and advice for a particular situation without wasting time on extraneous information.
 - Provides consistent advice (unlike humans).

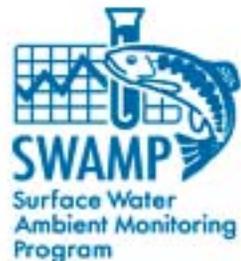


How an Expert Knowledge System Works

User Follows a Decision Tree Path to the Correct Answer

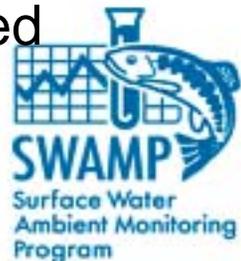


Result: Get to right answer rapidly & skip all extraneous information.



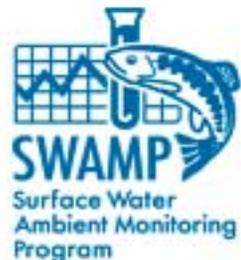
Importance of the SWAMP Advisor

- Many water monitoring projects supported by SWAMP
- All monitoring projects require a QAPP in consistent format and meeting SWAMP protocols & directives.
- Users often unfamiliar with Data Quality Objective (DQO) process and some decisions involving Method Quality Objectives (MQOs), method selection, etc. are complex.
- Electronic QAPP template doesn't guarantee an acceptable QAPP that will meet SWAMP QAPP requirements.
- Rejected QAPPs result in wasted staff time and frustrated applicants.

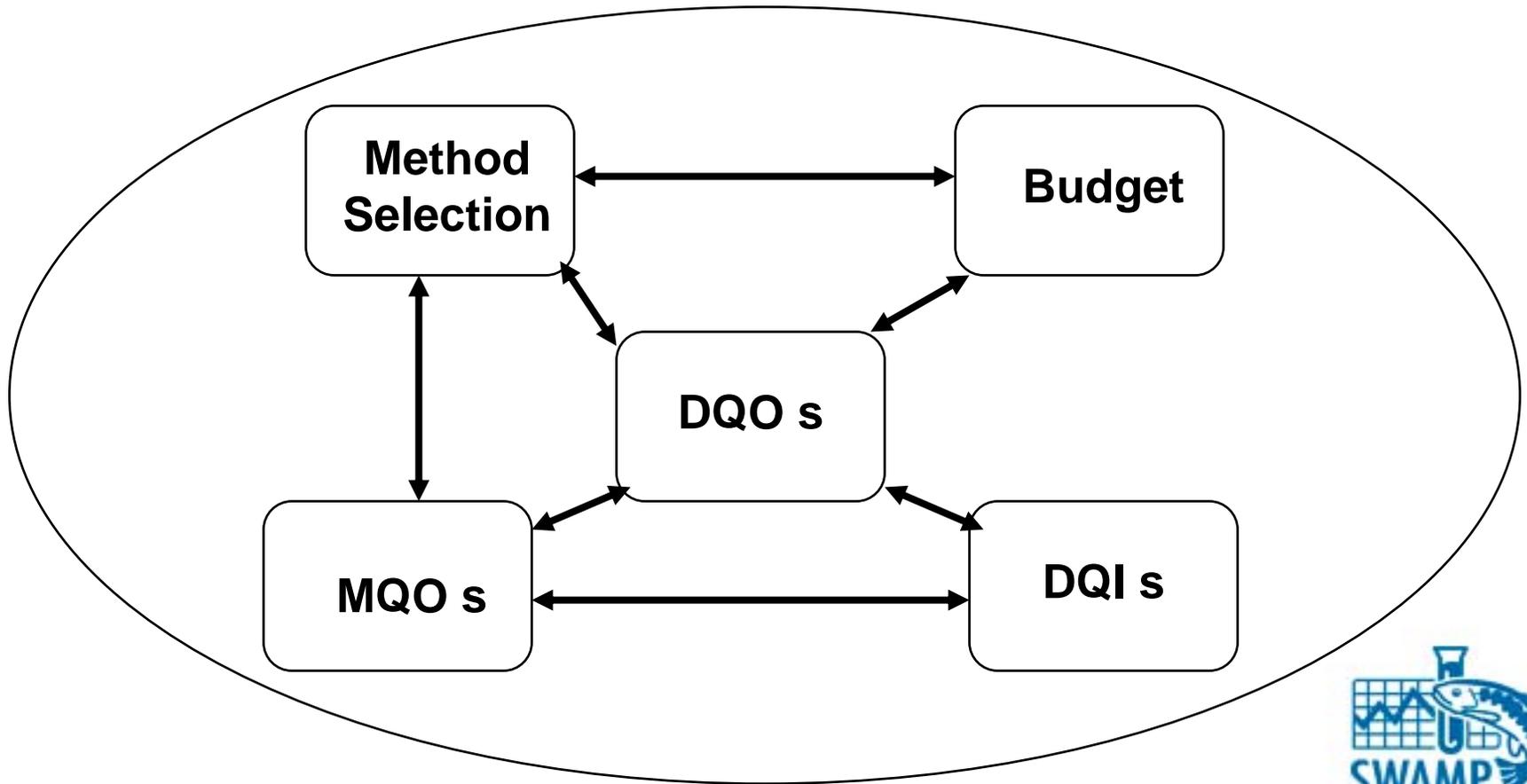


What the SWAMP Advisor Does

- Leads users through a complex decision-making process.
- Prepares QAPP components step by step – one for each ‘element’.
- Provides advice as well as information.
- Users write an acceptable QAPP in less time.
- Doesn’t take the place of a human but simply is a tool to help the human be more efficient and not forget things.
- Results in more scientifically rigorous QAPPs.
- Saves SWAMP staff time by eliminating need for revisions.
 - Principal: *Do it right the first time every time and save time (and \$).*



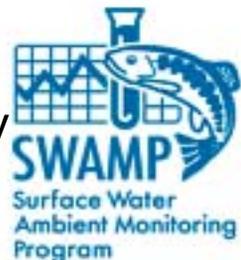
Complex Relationship of QAPP Components



QAPP

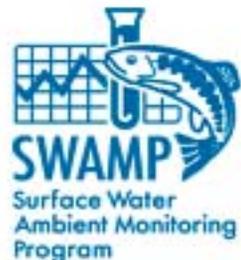
SWAMP Advisor Advantages

1. Advice and information is available for QAPP preparation 24/7.
2. Allows entry to any QAPP Element at any time to facilitate revising draft QAPP reports.
3. Draft reports for each QAPP Element are saved on the user's computer.
4. Allows multiple lines of inquiry (study questions) and helps users to prepare technical descriptions that are specific to each by looping through applicable questions as many times as needed (i.e., once for each study question) in order to gather all necessary information.
5. Eliminates the arduous preparation of performance criteria tables in Elements 7, 11, 12, 13, 14, and 16 by automatically “looking up” *SWAMP Comparable* data based on parameters selected for monitoring and then providing it for all of them at once in a summary report using a “Measurement Core Loop” for each study question.

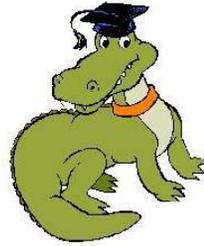


SWAMP Advisor Limitations

- Limitations based on your computer
 1. You must have Java installed (most computers come that way and Java is free and easily installed if you don't have it.)
 2. Your browser must be set to allow Java to be used with it.
 3. Your computer must allow reports to be sent to it using your browser so pop-up blockers and some firewalls must be disabled so that you can receive your reports.
- Limitations based on the SWAMP Advisor
 1. Tables are produced in comma delimited format so you must use the "Covert Text to Table" tool to change the text into regular tables.
 2. Once you exit the SWAMP Advisor, all data and information gathered from your session that was not saved in draft reports on your computer is lost (this can be changed if desired next year).

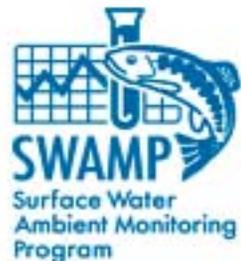


The SWAMP Advisor Introduction



What the SWAMP Advisor Does and How it Works

10:05 to 10:25 am

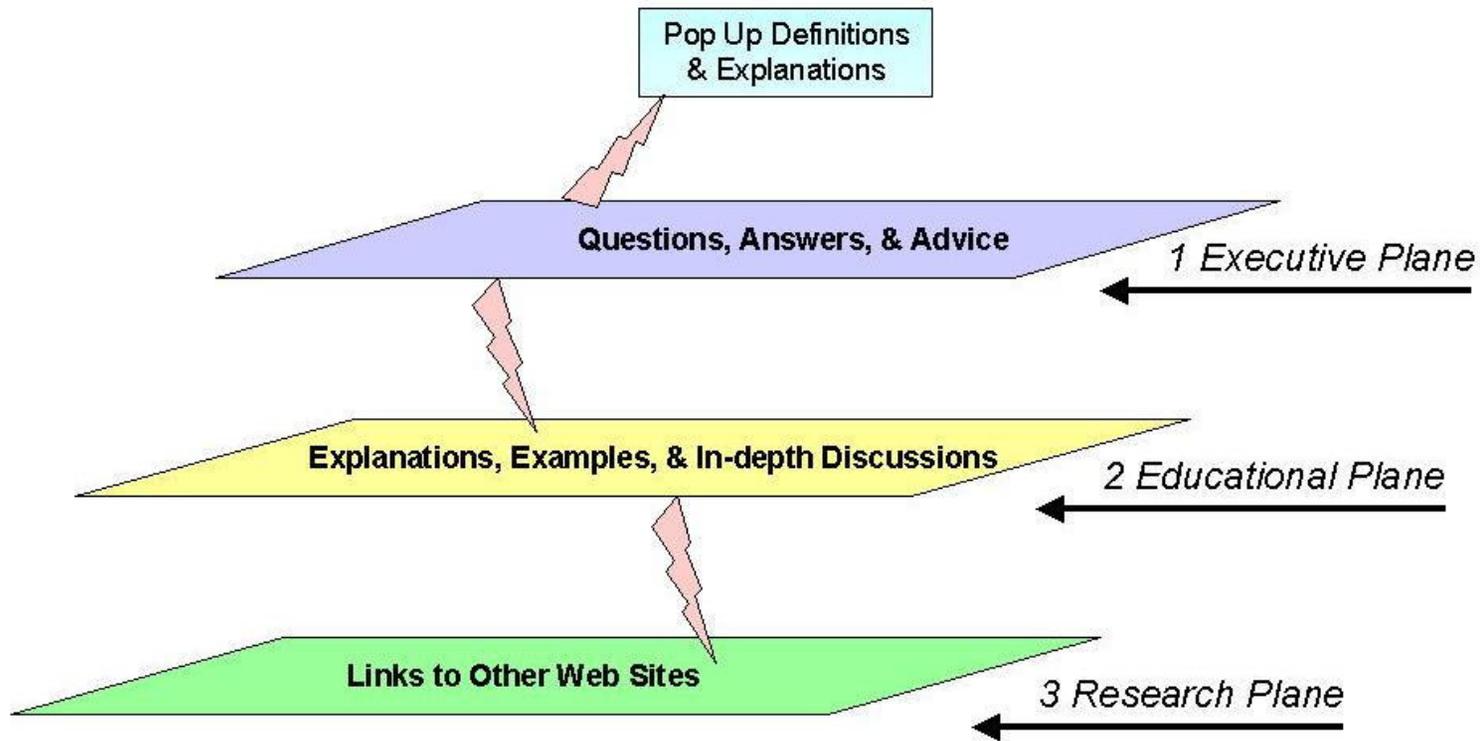


Unique Characteristics: (1) 3 Information Planes

1. The top level "Executive/Emergency Plane"
 - Gives the user advice and answers for his or her specific needs as quickly as possible.
2. The second level "Educational Plane"
 - Provides explanations and ancillary information to help users to understand what is being asked of them, why it is being asked, and what the consequences of their actions may be.
3. The third level "Research Plane"
 - Reached by internal and external hyperlinks from the second plane - contains extensive in-depth discussions and links to other web sites such as those of US EPA, USGS, etc.



Planes of Information Illustrated



Unique Characteristics: (2) Dual Screens

- Has a two panel framework - Left side and Right side.
- Expert system questions and advice are displayed in left frame.
- Explanation, more information and advice accompanies each question in the right frame - often with links to additional info.

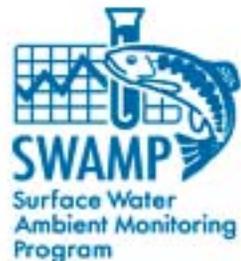
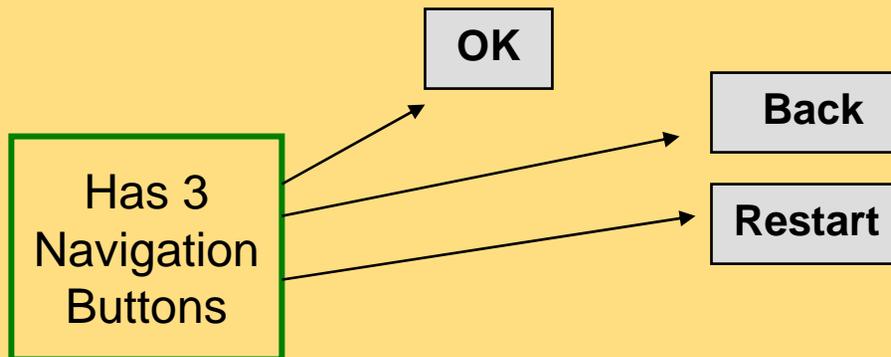


Diagram of the Dual Screen Use

Expert System Side

Text with a question at the top.

- Select Answer #1
- Select Answer #2
- Select Answer #3



Explanation Side

Text with more in-depth explanations, examples, and advice.



[Links](#) to more information.



[Links](#) to Advice



[Links](#) to examples to copy and paste.

Features

1st of 4 - Color Coded Title Bars



SWAMP Advisor

The California Surface Water Ambient Monitoring Program's (SWAMP) expert system for preparing Quality Assurance Project Plans (QAPPs) correctly, consistently, and cost-effectively.

Group A Elements: Project Management

Element 6 - Project/Task Description

Section 6.1 - Work Statement and Produced Products

6.1.3 - Standard Reports. Please select the types of standard reports that will be generated by your project. Next, other types of reports will be addressed.

- Monthly Reports plus a Final Report
- Monthly and Quarterly Reports plus a Final Report
- Monthly and Semi-annual Reports plus a Final Report
- Quarterly Reports plus a Final Report
- Quarterly and Semi-annual Reports plus a Final Report
- Semi-annual Reports plus a Final Report
- Final Report only

OK Restart Back

ISBN 1-885844-13-1

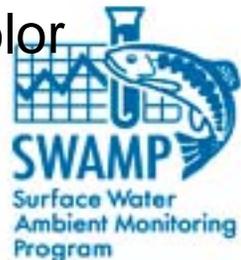
Prepared for the California State Water Resources Board by
Lawrence H. Keith, Ph.D.
www.instantref.com

Groups A, B, C, and D each have Top Level Color Coded Title Bars

Each Element has a 2nd Level Color Coded Title Bar

Each Sub-element has a 3rd Level Color Coded Title Bar

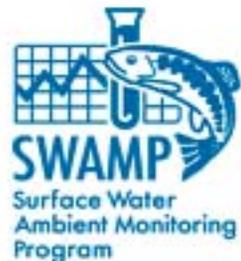
- Same color for text as 2nd Level Title Bar but with a different background color



Features

2nd of 4 – Hyperlinks and “Mouseovers”

- Hyperlinks to other files and web sites use standard underlined blue type.
 - Links to more pages with additional information and examples.
 - Adobe PDF files,
 - PowerPoint slide files,
 - Web pages at other web sites
- Hyperlinks that are “mouseover” (cursor hover) links are differentiated by using underlined red type.
 - Include acronym definitions, technical word definitions, and comments.



Features

3rd of 4 – Selected Vocal Explanations

- Advantage is that sometimes verbal explanations are better and more effective than providing the same information that has to be read.
 - Reduces some explanations that may require lots of text.
- Disadvantage is that the file must be first loaded by the user's browser and then a program such as RealPlayer or QuickTime loads and plays the file.
 - User's computer must have a program that loads and plays music and other sounds
 - Vocal files are large and require 15 seconds or more to load even using broadband or DSL. Dial up would be very slow.



Features

4th of 4 – Information Entry Methods

There are 3 ways to enter information:

1. **Computer-written** Sentence from *Your Selection* to a Question - a pre-formatted sentence into which an answer is inserted to make a complete sentence with all necessary information.
2. **Computer-written** Sentence from *Your Typed Entry* to a Question - a pre-formatted sentence into which your typed entry is inserted to make a complete sentence with all necessary information.
3. **User-written** Sentence - an entry space for you to write a complete sentence to answer a specific question.
 - This is similar to the entry platform described in #2 except that you type in a complete sentence rather than only a few words.
 - You may also copy and paste example answers and edit them as applicable.



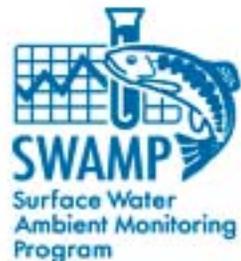
SWAMP Advisor Navigation

Navigation in the left side (Expert System) frame

This is a menu-driven program and throughout it you will be able to navigate among various elements using menus.

- When a question is asked with a round “radio button” next to the possible selections (for example, like the bullet used with this paragraph), then you may select only one of the available choices.

- When a question is asked with square “check boxes” next to the possible selections (for example, like the bullet used with this paragraph) then you may select more than one choice (even all of them if you wish).



SWAMP Advisor Navigation (continued)

Navigation in the left side (Expert System) frame

There are three “navigation bars” in each and every left side frame. These will appear in all screens of the expert system in the left frame.

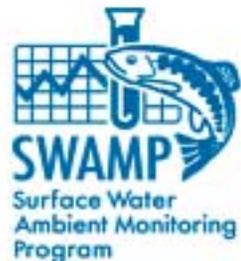
- An “OK” bar will advance you to the next question or answer.
- A “Back” bar will return you to the previous screen.
- A “Restart” bar will exit the current use of the program and restart it.



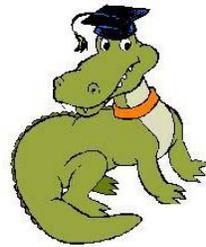
SWAMP Advisor Navigation (continued)

Navigation in the left side (Expert System) frame

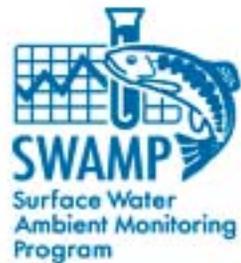
- **Once you make a menu selection you proceed forward, answering questions with buttons and receiving advice and information from the expert system (left side frame) and the associated Explanation Boxes (screens in right side frame).**
- **You may also go back and change your selections using a “Back” bar.**



A Break is Next



Questions?



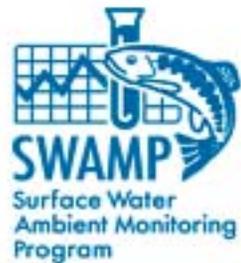
The SWAMP Advisor Introduction



Break!



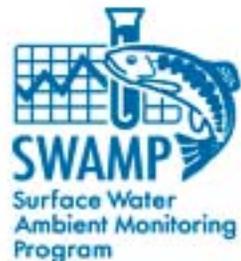
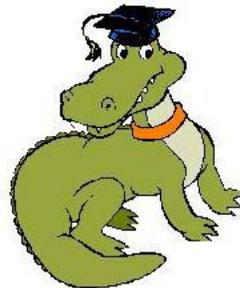
10:25 am to 10:45 am



The SWAMP Advisor Introduction

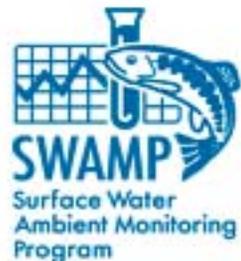
How to Produce QAPP Document Files

10:45 am to 11:00 am



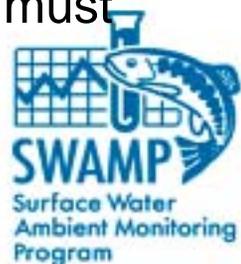
How QAPPs Are Developed – Saving Files

1. At the end of working with each of the QAPP “Elements” (sections) you are asked if you want to save your work.
2. If you select “Yes” the SWAMP Advisor prepares a draft document with your answers in a Rich Text Format (RTF).
3. This RTF document is sent to your computer and you save it to a folder where your QAPP files reside.



How QAPPs Are Developed – Naming Files

- You MUST name the file correctly in order for a MS Word Macro to find it and append it into a Master QAPP document.
 - Files are named using the “Element” number and “-QAPP.rtf”
 - For example, the file for Element 6 must be named “6-QAPP.rtf”
 - For example, the file for element 12 must be named “12-QAPP.rtf”
 - For example, the combined Elements 15, 16, & 17 file must be named “151617-QAPP.rtf”
 - **The extension name “.rtf” must be in lower case.**



These are the Correct File Names

1-QAPP.rtf	9-QAPP.rtf	18-QAPP.rtf
3-QAPP.rtf	10-QAPP.rtf	19-QAPP.rtf
4-QAPP.rtf	11-QAPP.rtf	20-QAPP.rtf
5-QAPP.rtf	12-QAPP.rtf	21-QAPP.rtf
6-QAPP.rtf	13-QAPP.rtf	22-QAPP.rtf
7-QAPP.rtf	14-QAPP.rtf	23-QAPP.rtf
9-QAPP.rtf	151617- QAPP.rtf	24-QAPP.rtf

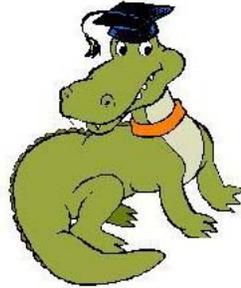
Document File Demonstration



Element 14 will be used
to demonstrate
preparation, naming, and saving
of a typical QAPP file.

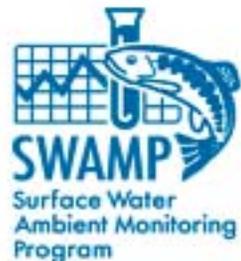


The SWAMP Advisor Introduction



How to Produce Tables

11:00 am to 11:15 am



Advisor Table Formats

- The SWAMP Advisor produces tables in a comma-delimited format.
- Here is an example of a 4 column comma-delimited format:

Analyte, Method Type/Principle, Detection Limit, Precision
Arsenic, Flame Atomic Absorption, 100 ug/L, 20%
Cadmium, ICP-Atomic Emission, 1 ug/L, 10%
Lead, Graphite Furnace Atomic Absorption, 60 ug/L, 15%

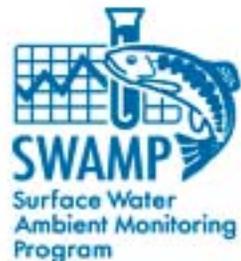


Table Conversion Procedure

1. Highlight the comma-delimited data (including column headings)
2. On the toolbar menu click on “Table”
3. In the Table Menu click on “Convert”
4. In the Convert options click on “Text to Table”
5. Below is the *instant* result:

Analyte	Method Type/Principle	Detection Limit	Precision
Arsenic	Flame Atomic Absorption	100 ug/L	20%
Cadmium	ICP-Atomic Emission	1 ug/L	10%
Lead	Graphite Furnace Atomic Absorption	60 ug/L	15%

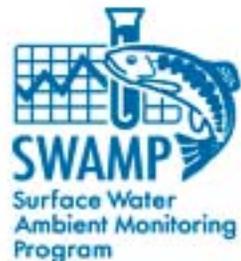
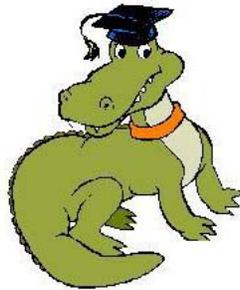
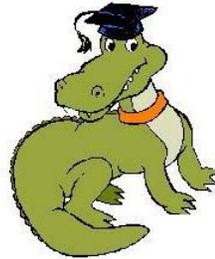


Table Preparation Demonstration



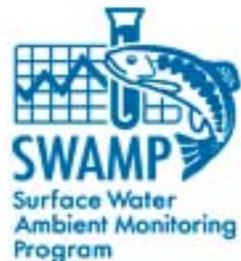
Element 3 (Distribution List)
will be used
to demonstrate
Table Preparation

The SWAMP Advisor Introduction



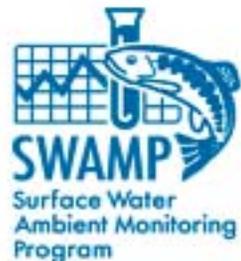
How to Produce A Master QAPP Document

11:15 am to 11:35 am

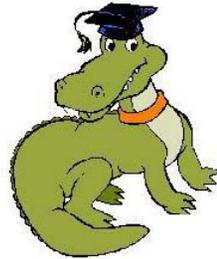


How QAPPs Are Developed – Preparing a Master QAPP

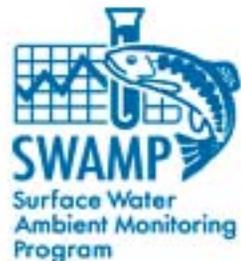
- Your QAPP folder will contain 21 files all ending in “-QAPP.rtf”
- After all files are present then you download the Cover Page.
 1. Download link is in the right side panel of the SWAMP Advisor opening page and also in the last right side panel of the last “element” (Element 24).
 2. Save the cover page to your QAPP folder. It has a Macro that will automatically find and append each of the 21 files in the correct order and then to automatically prepare the table of contents.
 3. Go to the bottom of the page and press the “Alt” and letter “a” keys (Alt + A) to activate the Macro.
 4. Complete all final edits and formatting (including changing comma-delimited tables into regular table format), rename and save the file, and print it.



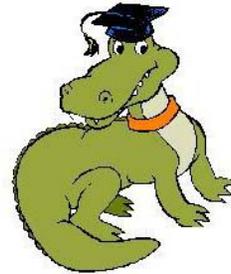
QAPP Preparation Demonstration



A pre-prepared set of files
will be used
to demonstrate
Master QAPP Preparation

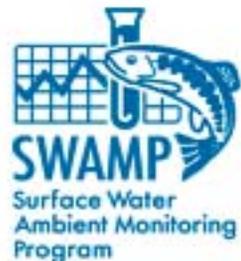


The SWAMP Advisor Introduction



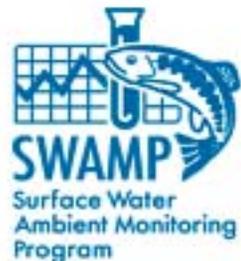
How to Incorporate Multiple Study Questions

11:35 am to 12:00 pm



Planning Monitoring Activities

- Often, a project may have more than one line of inquiry (or study question).
- Examples include:
 - Source identification – where do the analyte(s) of interest come from?
 - Ambient water quality – does the quality of the water support its intended uses (recreation, drinking, etc.).
- Different study questions usually require different sampling strategies, different measuring techniques, different Measurement Quality Objectives (MQOs), etc.



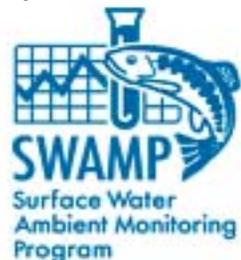
Measurement Core Loop Concept

■ The problem:

- How to handle different sampling and analytical strategies and needs for different study questions.

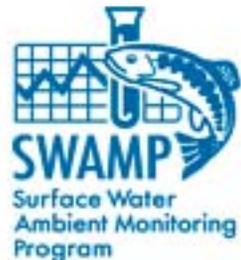
■ The Solution:

- Devise a mechanism so that a user can provide answers that are unique for each study question.
- This mechanism is a “loop” through the same questions multiple times – there is no limit to the number of study questions and associated “loops.”
- Enables users to obtain appropriate data for multiple study questions.
- One caveat is that each “loop” generates a separate document and each document file must be given a unique name.



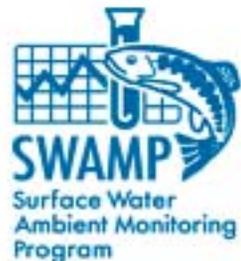
The 5-Step Measurement Core Loop Process (Steps 1-3)

1. Develop study question(s) the project will answer
2. Identify what will be measured to answer each study question and how it will be measured
 - Identify the parameters (what) and procedures/instruments (how)
 - This process is repeated for each study question
3. Select quality objectives to answer each study question
 - For example: reporting limits, precision, accuracy



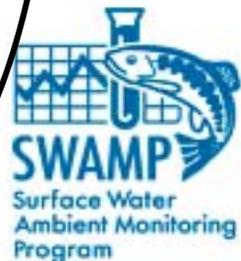
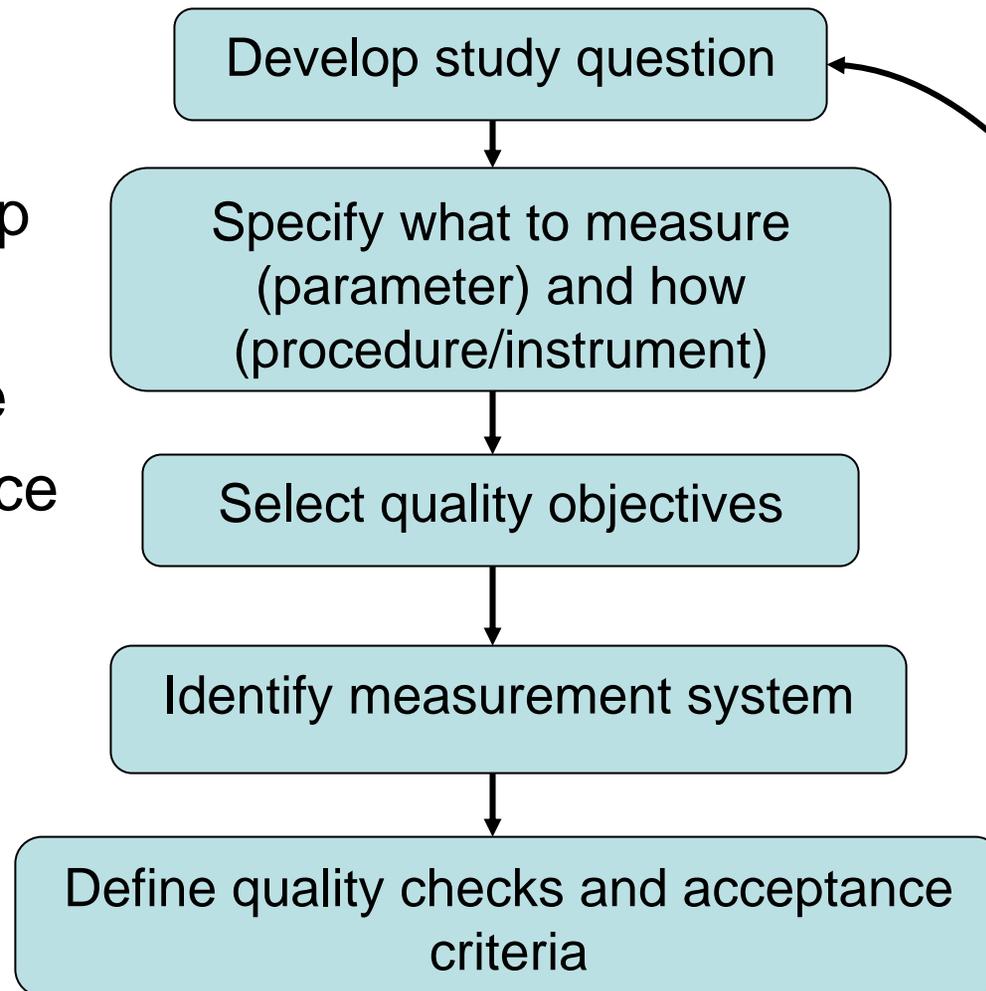
The 5-Step Measurement Core Loop Process (Steps 4 & 5)

4. Select measurement systems that will achieve the defined quality objectives
 - Measurement systems are devices and/or procedures used for measuring environmental characteristics
 - For example: instruments used for field measurements, sampling and analysis procedures
5. Define requirements for the types and frequency of quality checks and identify the acceptance criteria for their outcomes
 - Tip: Use the SWAMP Quality Assurance Management Plan to help define the quality objectives



The 5-Step Measurement Core Loop Process Flowchart

Repeat this loop
for each study
question in the
Quality Assurance
Project Plan



Monitoring Plans vs QAPP

Monitoring Plans – Sample Design Planning

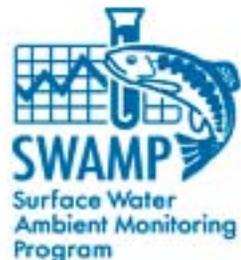
- Focus on operations, contain high level of details, and are used daily by Project Operators (data gatherers).
- Follow the planning thought process.
- Provide rationale for selecting locations and timing to monitor.

QAPP Documents – Measurement Planning

- The SWAMP Advisor is built to accommodate this thought process in the Sampling Design Loop (Element 10).

Monitoring Plans are Usually Developed First

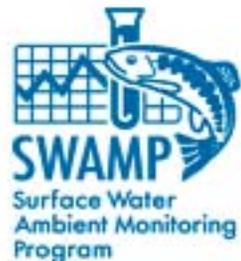
- The SWAMP Advisor does not yet support Monitoring Plans but it is a logical extension.
 - A “cart before the horse” example.



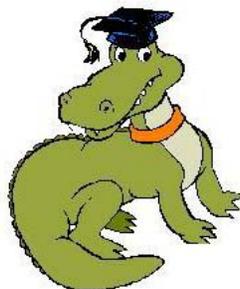
The Sampling Design Process

Element 10 Covers the Sampling Design Process

1. Formulate a specific study question.
2. Communicate the spatial (station selection) intent: why measure at that spot?
3. Communicate the temporal (timing selection) intent: why measure at this particular time?
4. Define the sampling design principle used to select location (at two spatial scales – reach and station).
5. Define the sampling design principle used to select timing (at two temporal scales: seasonal and diurnal).



Demonstrate the Measurement Core Loop



The Measurement Core Loop
will be demonstrated
using Element 10

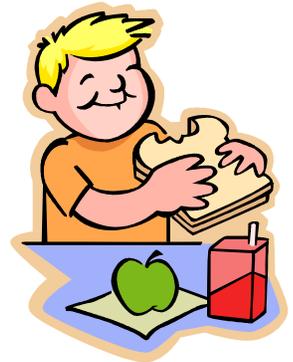


The SWAMP Advisor Introduction



Lunch!

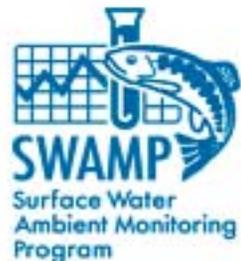
12:00 pm to 1:15 pm



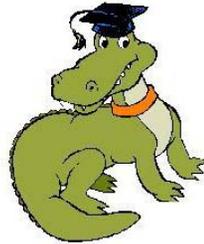
Hands-on Trials With Instruction As Needed

- Element 1 & 2 – Title & Approval and Table of Contents
- Element 3 – Distribution List (Table Preparation)
- Element 6 – Project / Task Description (New Bioassays)
- Element 7 – Quality Objectives for Criteria & Measurement Data (Generate Multiple Tables Simultaneously)
- Element 12 – Sample Handling
- Element 13 – Analytical Methods
- Element 14 – Quality Control
- Elements 15, 16, 17 – Testing, Calibration, and Supplies
- Element 19 – Data Management
- Element 24 – Reconciliation with User Requirements
- Optional Element 10 – Sampling Process Design (if time permits)

1:15 pm to 4:00 pm



Discussion and Training Evaluation



1. Questions?
2. Be sure to fill out the Evaluation Form.

Help us to Make the SWAMP Advisor Better!

4:00 pm to 4:30 pm

