

In 1997, the interagency National Water Quality Monitoring Council (NWQMC) was established to implement a voluntary, integrated, nationwide strategy to improve water resource monitoring, assessment and reporting. The Council sponsored its first conference in Reno, Nevada in 1998. Over 400 attendees participated in workshops and discussions on a variety of topics related to water monitoring issues. The proceedings from this conference can be viewed at <http://nwqmc.site.net>.

CONFERENCE OVERVIEW: 75-ORAL & 45-POSTER PRESENTATIONS AMONG 6 GOAL DEFINED TOPIC TRACKS, 8 WORKSHOPS, AND FIELD TRIP:

Conference Track A	Conference Track B	Conference Track C	Conference Track D	Conference Track E	Conference Track F
Public Awareness and Stakeholder Outreach	Institutional Collaboration	Data Management	Water Information Strategies	Methods and Data Comparability	Monitoring Interactions Among Watershed Components
The goal of Track A is to explore efforts throughout the country to heighten public awareness of, and to increase public involvement in, water resource monitoring.	The goal of Track B is to explore efforts to build creative partnerships to foster collaboration among the water monitoring community.	The goal of Track C is to explore ways of improving the management and accessibility of water resource monitoring data through state of the art technologies and efforts to increase data sharing, public access and utility.	The goal of Track D is to explore how we can enhance the accountability of water quality monitoring to produce information that supports water quality management needs.	The goal of Track E is to evaluate the impact of PBMS on the generation and evaluation of monitoring information; assess the ability to allow rapid communication and comparison of critical methods related parameters, and how this information is to be reported; present information on state-of-the-art methodology used to provide monitoring data-organic and inorganic, biological and microbiological; and to present information on proven uses of measurement methods to provide monitoring data.	The goal of Track F is to provide a national forum to promote consistent and scientifically defensible basis and criteria for monitoring the quality of ground water, and for demonstrating how the interaction of this resource with other components of the watershed can impact the ecological integrity of the entire system.

WORKSHOP DESCRIPTIONS:

Workshop 1: Source Water Monitoring: The Use of all Available Monitoring Data in Source Water Evaluations - Facilitators: **Mike Houts and Paul Jehn**

This workshop will discuss and demonstrate the Environmental Information Management Suite (EIMS) source water utility. This computer program, developed for the Oklahoma Department of Environmental Quality, is an interactive web based GIS and data management system. Internet users are able to access this database to create reports and view the data in both tabular and spatial formats. Data layers contained in this system include: EPA (Storet, Envirofacts), USGS (hydrography), Oklahoma DEQ (drinking water monitoring data, drinking water source delineations, water quality monitoring sites, lagoons, NPDES discharges, hazardous wastes sites, air quality monitoring sites), Oklahoma Water Resource board (water quality monitoring data), Oklahoma Corporation Commission (Oil & Gas, underground storage tanks), Oklahoma Geological Survey, and the Oklahoma Department of Agriculture (confined animal feeding operations). Participants will be able to access this database via the Internet during the workshop.

Workshop 2: Communicating Monitoring Results the People Can Understand - Facilitator: **Abby Markowitz** (Abstract #113 – Paper 49-54)

Communicating your results in a format that can be understood by a variety of audiences goes beyond charts, graphs, and plots. When communicating monitoring results, a series of questions must be answered. Who needs to hear the information? What do we want them to do with the information? How will the information be distributed? This session focuses on the tools and techniques to effectively communicate monitoring results to a variety of audiences. This workshop will explore communication strategies developed and implemented by various programs:

- USGS Provides Science-Based Insights for Improved Watershed Management, **Pixie Hamilton** (Abstract #115)
- Providing Water Quality Data for Research, Decision-Making, and Education, **Karen Brettschneider** (Abstract #116 – Paper 55-62)
- From the Mountains to the Sea: the State of Maryland's Freshwater Streams, **Dan Boward** (Abstract #117)

Workshop 3: Performance Based Systems (PBMS) in Ambient & Compliance Monitoring - Facilitators: **Andy Eaton and Jerry Parr**

This workshop will explore the concept and approaches to PBMS. Topics discussed will include method verification vs. validation; PBMS and ambient monitoring; PBMS and compliance monitoring (drinking water/waste water); and the legal ramifications of PBMS. This workshop will also incorporate examples and specific case studies, including:

- MDCB approach to PBMS, **Jerry Diamond**
- Devil's in the Details – COD case study, **Rick Dunn**
- Determining and Documenting the Suitability of Analytical Procedures Used for Analysis of Environmental Samples, **Jerry L. Parr** (Abstract #118 – Paper 329-336)
- Legal Ramifications, **Eric Nottingham**
- PBMS and compliance monitoring in Drinking water and Wastewater, **Jim Hanlon**
- Interagency Water Quality Data Comparison in Illinois, **Daniel Sullivan** (Abstract #119)
- Quality Assurance in Coastal Monitoring, **Adriana Cantillo** (Abstract #120)

Workshop 4: Strategies for Establishing Water Quality Information Systems: Goal-Oriented Monitoring Systems - Facilitator: **Robert Ward**

This workshop will examine various strategies for establishing goal-oriented monitoring systems. Topics discussed will include: common approaches to establishing water quality monitoring programs; viewing monitoring as an INFORMATION system; considerations in developing a more information-focused monitoring program; identifying and quantifying information goals for monitoring; developing data analysis and reporting protocols focused on meeting information goals; and implications to network design and laboratory and sampling methods.

Workshop 5: Coordinating Water Quality Monitoring: Lessons Learned - Facilitators: **Emery Cleaves and Charlie Peters** (Abstract #122 – Paper 109-110)

An important and ever expanding approach to providing cost-effective, high quality data is the establishment of water quality monitoring Councils focused on coordination, collaboration, and comparability. This workshop will explore efforts by water quality monitoring groups throughout the United States to formally coordinate and collaborate monitoring efforts. This workshop will highlight the efforts of several groups followed by a moderated panel discussion focusing on the factors that lead to successful Council efforts and the possible pitfalls that may derail such efforts. Case studies included in this session will be:

- The Development of a Collaborative Monitoring Program in the Sacramento River Watershed, California, **Claus Suverkropp** (Abstract #123)
- The Texas Water Monitoring Council, **Cindy Loeffler** (Abstract #124)
- Four Years and Counting – The Maryland Water Monitoring Council, **Emery T. Cleaves** (Abstract #125)

Workshop 6: Volunteer Monitoring: Moving into the Mainstream - Facilitator: **Linda Green** (Abstract #126 – Paper 67-78)

Panel: **Geoff Dates, Tina Laidlaw, Elizabeth Herron** (Abstract #127 – Paper 63-66) and **Abby Markowitz**

The role of volunteer monitoring programs is changing. Increasingly, we are being accepted as an integral part of the mainstream monitoring community. This interactive workshop will focus on how and why to build volunteer components into existing watershed management and protection programs as well as new and innovative approaches for expanding existing volunteer programs. Topics covered will include: building credibility; quality assurance and quality control; organizational development; planning and study design; and data management and presentation. The session will begin with a presentation highlighting the efforts of the New England Regional Monitoring Collaborative (NERMC).

Workshop 7: How to Get the Most Out of Water Quality Data: Using Common Data Elements - Facilitator: Chuck Job

A common set of data elements for reporting water quality should improve sharing of information, improve comparisons of data from different sources, and use funds allocated for water quality monitoring at all levels more effectively. Other scientific and public purposes would likely be served if data could be compared using reasonable and agreed on criteria. This interactive workshop will involve participants in an exploration of two major questions: (1) What is the minimum set of questions you would need answers to in order to use another person's/organization's data?; and (2) What specific information (data elements) would be necessary to report to answer those questions?

Workshop 8: Answering the Critical Questions in the New Millennium: Statistical Survey Design for Aquatic Ecosystem Monitoring Network - Facilitators: Kent Thorton, Tony Olsen, and Steve Paulsen

Federal, State, and Tribal governments are increasingly being asked to do more with less. Providing comprehensive assessments of water resources is among the more recent challenges facing these groups. The EPA Office of Research and Development and collaborating researchers have been working on a unified statistical survey design approach over the last 10 years. Surface water monitoring networks for streams, lakes, and estuaries have been designed and implemented in over 15 states and in all 10 EPA Regions. Through research and on-the-ground implementation, a unified approach to a statistical survey design has been developed that is applicable for all aquatic ecosystems. This workshop will:

- Describe why a statistical survey is a powerful tool for monitoring aquatic systems
- Show you how to define your target population
- Discuss how you determine the number of sites you need to achieve your desired precision on an answer to your question
- Describe how the sites are selected and why this produces unbiased, representative samples
- Show the relation between where you measure and what you measure
- Discuss how this approach complements on-going monitoring programs at minimal cost.
- Show how surveys can provide information on current status and trends in aquatic resource quality and why these conditions are occurring, and
- Illustrate these points with real-world examples from stream, lake, wetland, and estuarine surveys.

FIELD TRIP (THURSDAY, APRIL 27, 1:30 TO 6:30 P.M.) INCLUDES TRANSPORTATION AND CATERED BBQ SUPPER

1. Sediment Coring Demonstration - Peter Van Metre, Mike Dorsey, Jennifer Wilson, and Craig Weiss (USGS), Coordinators

Several piston and box cores will be collected from Town Lake prior to the field demonstration. The USGS Reconstructed Trends Program's pontoon boat will be anchored near shore at the mouth of Barton Creek where attendees can either see equipment. Piston, gravity, and box corers will be shown and their use and limitations will be described. Concurrently, on shore, methods for subsampling and describing the different types of sediment cores will be demonstrated. Town Lake, among reservoirs across the country, was sampled a few years ago using these techniques.

2. Large-Volume Suspended Sediment Sampling - Barbara Mahler and Marcus Gary (USGS), Coordinators

A method for collection and dewatering of large-volume suspended sediment samples for chemical analysis will be demonstrated. The method was developed to determine concentrations of hydrophobic organic and trace metal concentrations in sediments in urban stormwater and is currently being applied in an urban runoff study in Austin. Organics samples are collected by filtration through glass-fiber filters in large diameter (293 mm) stainless steel filter holders. Trace element samples are collected by filtration through teflon filters in acrylic filter holders.

3. Reach-based biological and stream habitat assessment - J. Bruce Moring (USGS), Robert Hansen and John Rosendale (City of Austin), Coordinators

At the core of NAWQA biological efforts is the reach-based composite sampling of benthic macroinvertebrates, fish, and periphytic algae. A sampling reach is selected by the types and frequencies of geomorphic channel units such as riffles, runs, and pools at the site. Semiquantitative Richest Targeted Habitat (RTH) and Qualitative Multihabitat (QMH) benthic macroinvertebrate samples are collected using a modified surber sampler and d-frame dip net, respectively. Periphytic algae RTH and QMH samples are collected using techniques that are specific for the bed substrate available for sampling. The fish community is surveyed using boat, barge, and backpack DC-electrofishing equipment; and various seines, fyke nets, hoop nets, and gill nets are used, particularly in large rivers. Stream habitat features are assessed in each reach by the mapping of channel features including bars and islands, measurement of bank characteristics such as slope and height, surveying of channel cross sections, and the assessment of riparian vegetation. Surveying is done with a laser-operated total station, and reach cross sections and upstream and downstream boundaries are permanently monumented and photodocumented.

4. Surface Water Sampling Demonstration - Patricia Ging, Cassi Otero, and Jenny Lanning-Rush (USGS), Coordinators

USGS NAWQA (parts-per-billion or low-level) protocols will be demonstrated for surface water sampling at Barton Creek just below the Barton Springs Pool outflow. Surface-water sample collection procedures, including field QA, will be demonstrated. Procedures to be illustrated will include measurement of field parameters, EWI (equal-width increment) sample collection, field alkalinity titration, use of cone sample-splitting device, collection and processing of organics such as suspended and dissolved organic carbon and pesticides. Also included will be inorganics collection of nutrients and major ions.

5. SPLASH Exhibit (City of Austin). A walk-through exhibit of the Edwards aquifer.

6. Monitoring of Barton Springs – David Johns, Sylvia Pope and Scott Hiers (City of Austin), Coordinators

The City of Austin is engaged in efforts to monitor water in springs discharging from the Barton Springs segment of the Edwards Aquifer, a karst limestone aquifer providing regional drinking water supplies and habitat for the endangered Barton Springs Salamander. These monitoring efforts include analyzing physical and chemical characteristics of spring waters, identifying recharge points, and characterizing storm water impacts. Monitoring water in karst terrain is problematic, calling for integrated data collection methods to increase comprehension of the complex dynamics in this karst system. Data collection methods include grab water samples, multiprobe data recorders, surface flow measurements, automated rain gauges, and dye tracing. Multiprobe data recorders in springs establish physical water characteristics to augment data from traditional grab samples. Multiprobe data are also useful in examining the frequency, magnitude, and duration of short-term event related responses in spring discharge quality after rainfall. Data from automated rain gauges combined with multiprobe data from springs determine lag time between rainfall and storm-related impacts to springs. Surface flow measurements and field mapping identify point recharge features in contributing watersheds. Dye tracing in these features provides data on ground water travel times and flow paths from specific recharge points to springs. Correlating multi-method monitoring data to changing watershed conditions such as impervious cover, may allow the City of Austin to determine specific changes in spring characteristics that may be due to urbanization in contributing watersheds and target methods to conserve and protect these valuable water resources.

7. Ground Water Sampling Demonstration - Lynne Fahlquist, Ann Ardis, and Mike Nyman (USGS), Coordinators

USGS NAWQA (parts-per-billion or low-level) protocols will be demonstrated for ground-water sampling at the Barton Springs Pool or nearby. Ground-water sample collection procedures, including field QA, will be demonstrated. Procedures to be illustrated include measurement of field parameters, alkalinity titration (same as for surface water), collection and processing of organics such as dissolved organic carbon, VOCs, and pesticides. Inorganics collection will include trace elements, nutrients, and major ions. Collection of a variety of special samples such as environmental isotopes (tritium, deuterium/oxygen-18, carbon-13, Sr-87/86 and other metal isotopes) and gases (radon, dissolved gases, chlorofluorocarbons) will also be demonstrated.

8. Gabion Restoration – Mike Lyday and Todd McKane (City of Austin), Coordinators

Gabions are rock-filled wire baskets stacked upon one another to form erosion protection structures for stream banks. As part of the City of Austin's Water Watchdog citizen monitoring volunteer effort, this ongoing project attempts to vegetate gabion structures to not only return the stream bank to a more natural state, but to also help filter and capture nutrients and sediment runoff during storm events.

9. Catered BBQ with Presentation by Raymond Slade (USGS), Robert Hansen and Nico Hauwert (City of Austin) regarding historical studies of the Barton Springs region.

MONDAY, April 24, 2000 - Monitoring for the Millennium						
3:00 – 5:00	Conference Registration - TEXAS FOYER					
4:45 – 6:45	Welcome Reception - TEXAS BALLROOM I-III - hot & cold horsd'oeuvres, ice tea, soft drink, & cash bar					
TUESDAY, April 25, 2000 - Monitoring for the Millennium						
7:30 – 8:30	Registration - TEXAS FOYER coffee, tea, pastry & fruit provided Exhibit / Poster Hall Open - TEXAS BALLROOM IV-VII - Posters highlighted during this session: <ul style="list-style-type: none"> Monitoring the Coastal Ocean: Responses to Hurricane Floyd, Lawrence Cahoon and Janice Nearhoff (Abstract #75) Adaptability of the Holistic Watershed Approach Protocol to Implement Integrated Planning and Sampling for Watershed Characterization, Sheila Vukovich (Abstract #76) A Multi-Tracer Approach for Determining Sources of Nitrate Contamination of Ground Water and Spring Waters, Lafayette County, Florida, Brian Katz (Abstract #77) Preliminary Assessment of Stream Conditions in Nebraska: A Demonstration of EMAP Tools in a State Monitoring Program, Lyle Cowles (Abstract #78) Gabion Re-vegetation: An Experiment in Ecological Restoration, Mike Lyday and Todd McKane (Abstract #79 – Paper 463-466) 					
8:30 – 8:45	General Session - TEXAS BALLROOM I-III Welcome to the 2 nd NWQMC National Monitoring Conference & Overview of NWQMC					
8:45 – 9:45	Keynote Presentations: John Bernal , United States Commissioner, International Boundary and Water Commission for the US and Mexico Elizabeth Fellows , Director of Assessment and Watershed Protection Division, United States Environmental Protection Agency					
9:45 – 10:00	Discussion of Recommendations to Council from the 1998 Conference & Charge to Participants for the 2000 Conference, Monitoring for the Millennium					
10:00 – 10:30	Break - TEXAS FOYER coffee & tea Exhibit / Poster Hall Open - TEXAS BALLROOM IV-VII - Posters highlighted during this session: <ul style="list-style-type: none"> Identifying Sediment Contamination Sources in Watersheds of Austin, TX, Ellen Geismar (Abstract #80 – Paper 467-480) Using the Transparency Tube in Minnesota's New Citizen Stream-Monitoring Program, Jesse Anderson (Abstract #81 – Paper 481-494) Radium in Maryland Coastal Plain Groundwater: An Emerging Issue Resulting from a Multi-Agency Study of Carcinogens in Well Water, David Bolton (Abstract #82 – Paper 495-508) The Kentucky Interagency Groundwater Monitoring Network and the Kentucky Division of Water and Groundwater Monitoring Program, James Webb (Abstract #83) Quality Assurance Techniques used in Monitoring the Flow of Sanitary Sewers, Thomas M. Petri and Mary T. Singer (Abstract #84) 					
Concurrent Sessions	Track A: TEXAS BALLROOM I Public Awareness & Stakeholder Outreach Student Stewardship: School-based Monitoring Programs Moderator: Ellen McCarron	Track B: TEXAS BALLROOM II-III Institutional Collaboration Collaborative Non Point Source Projects Moderator: Jim Cox	Track C: HILL COUNTRY A-C Data Management & Accessibility Web-Based Tools Moderator: Greg Gross	Workshop 1 PANHANDLE RM	Workshop 2 BIG BEND A-D	
	10:30 – 10:45	Cyberways and Waterways: High School Students as Stakeholders in Monitoring Water Quality, Dr. Betty Stapp and Steve Amos (Abstract #1)	Problems in Non-point Source BMP Monitoring: The Greater Good and Others, Niles L. Primrose (Abstract #13 – Paper 79-88)	GEIMS and GeoTracker – Using the Internet to Manage Environmental Impacts and Water Resources, Anne Happel (Abstract #25)	Source Water Monitoring: The Use of all Available Monitoring Data in Source Water Evaluations – Facilitators: Mike Houts and Paul Jehn	
	10:45 – 11:00	Youth Stakeholders for Changing Private Policy, Public Policy, and Community Practices, Vince Meldrum (Abstract #2)	Monitoring the Effects of Implementing Best Management Practices in a Rural Watershed in North-Central Florida, Rick Copeland (Abstract #14 – Paper 89-100)	Web-Based Tools for Environmental Data, Gary Laguna (Abstract #26 – Paper 111-122)		
	11:00 – 11:15	An Innovative and Educational Community-Based Sampling Program for Evaluating Rural Well Water Quality, Steve Wilson (Abstract #3)	An Early Success of the Clean Water Action Plan: The Lake Chocorua Project, Jeffrey Schloss (Abstract #15)	The Las Vegas Water Quality Database: An Opportunity for Interagency Coordination, Kim Zikmund and Stephanie Lien (Abstract #27)		
	11:15 – 11:30	The Rivers Project: Reaching School Students with Water Issues, Dr. Robert Williams (Abstract # 4)	The Brazos / Navasota Watershed Management Project: A Local Approach for Environmental Evaluation, David Collinsworth & Mike Meadows (Abstract #16)	Getting the Data Out-an Example of Web-based Presentations from Washington State, Ken Dzinbal (Abstract #28)		
	11:30– 12:00	Question & Answer Session: Student Stewardship: School-based Monitoring Programs	Question & Answer Session: Collaborative NPS Projects	Question & Answer Session: Web-Based Tools		
	12:00 – 1:00	Lunch - TEXAS FOYER Box lunch & beverage provided Exhibit / Poster Hall Open - TEXAS BALLROOM IV-VII - Posters highlighted during this session: <ul style="list-style-type: none"> Information Needs for Dutch National Policy Evaluation, Joseph G. Timmerman (Abstract #85 – Paper 509-514) Nitrate Analysis at Central Colorado Water Conservancy District, Connie Lance (Abstract #86) New Approaches to Beach Water Quality Monitoring in Milwaukee, Jeffrey A. MacDonald (Abstract #87) Use of a Water Quality Index to Evaluate Watershed Monitoring Data, Mark Munzimeyer (Abstract #88) Background Levels of Nutrients in Streams Draining Relatively Undeveloped Watersheds of the United States, Gregory Clark (Abstract #89) 				
Concurrent Sessions	Track A continued Public Awareness & Stakeholder Outreach Building Public Awareness While Collecting Data: Volunteer Monitoring Programs Moderator: Toni Johnson	Track B continued Institutional Collaboration Collaborative Watershed Monitoring and Management Projects Moderator: Wayne Hood	Track C continued Data Management & Accessibility Innovative Data Management Strategies Moderator: Ellen McCarron	Workshop: 3 Panhandle Room		Workshop: 4 Big Bend A-D

1:00 – 1:15	Minnesota Methods for Analyzing, Applying and Disseminating Volunteer Lake Monitoring Data, Jennifer Klang (Abstract #5 – Paper 1-10)	The Kentucky Watershed Management Framework: A Multi-Organizational Monitoring Approach, Allison Anne Shipp (Abstract #17)	Data Automation to Meet Permit Schedules and Quality Objectives for the Water Quality Monitoring of Secondary Sewage Effluent in Massachusetts Bay, Andrew Parrella (Abstract #29 – Paper 123-132)	Performance Based Systems (PBMS) in Ambient & Compliance Monitoring Facilitators: Andy Eaton and Jerry Parr	Strategies for Establishing Water Quality Information Systems: Goal-Oriented Monitoring Systems Facilitator: Robert Ward
1:15 – 1:30	Workshops for Leaders at Volunteer Estuary Monitoring Programs, Ron Ohrel (Abstract #6 – Paper 11-18)	Cooperative Efforts to Monitor and Protect the Water Quality of the St. Croix National Scenic Riverway, Randy S. Ferrin (Abstract #18)	Facilitation Analysis and Archiving of Biological Data, Mellini Sloan (Abstract # 30 – Paper 133-134)		
1:30 – 1:45	Biological Monitoring: Technical Training for Citizen Volunteers, Kristen Travers (Abstract #7 – Paper 19-20)	Clark Fork-Pend Oreille Basin Water Quality Monitoring Network, Tri-State Water Quality Council, Bruce Anderson (Abstract #19)	Washington Data Submittal Guide: Building Access to Environmental Data, Lynn Singleton (Abstract #31 – Paper 135-148)		
1:45 – 2:00	Oregon's Volunteer Monitoring Program, Karen Williams (Abstract #8 – Paper 23-30)	Monitoring Dance Fundamentals: No Partner, Can't Dance, Barry Long (Abstract #20- Paper 101-104)	Remote Estimation of Chlorophyll Concentration in Productive Waters: Principals, Algorithm Development and Validation, Anatoly Gitelson (Abstract #32 – Paper 149-160)		
2:00 – 2:30	Question & Answer Session: Texas Ballroom I Building Public Awareness While Collecting Data: Volunteer Monitoring Programs	Question & Answer Session: Texas Ballroom II-III Collaborative Watershed Monitoring and Management Projects	Question & Answer Session: Hill Country A-C Innovative Data Management Strategies		
2:30 – 3:00	Break – TEXAS FOYER - snack, coffee, tea & soft drinks Exhibit / Poster Hall Open – TEXAS BALLROOM IV-VII - Posters highlighted during this session: <ul style="list-style-type: none"> • Oregon Water Quality Index--Communicator of Water Quality Information, Curtis Cude (Abstract #90) • Groundwater Quality Monitoring and Trends in Southwest Kansas: Information for Decisions, Diane Coe (Abstract #91) • The Application of Data Quality Objectives in the Development of an Interagency Field Manual for Water Quality Data Collection: A Collaborative Effort by the USGS, USEPA, TX Natural Resource Conservation Commission, and International Boundary, Dee L. Lurry (Abstract #92) • The Florida Bioassessment Program: An Agent of Change, Ellen McCarron (Abstract #93) • Biological Early Warning Systems in Drinking Water Production, Eric Penders and Peter Stoks (Abstract #121) 				
Concurrent Sessions	Track A continued Public Awareness & Stakeholder Outreach Stakeholder Outreach: Volunteer Monitoring, Community Action and Restoration Moderator: Dan Smith	Track B continued Institutional Collaboration Collaborative Volunteer and Marine-based Monitoring Projects Moderator: Fred Banach	Track C continued Data Management & Accessibility Data Management on the National Scale Moderator: John Klein	Workshop: 3 continued	Workshop: 4 continued
3:00 – 3:15	Community Based Water Monitoring and Beyond, A Case Study: Pennsylvania, Diane Wilson (Abstract #9 – Paper 31-40)	The Maine Phytoplankton Monitoring Program, Esperanza Stancioff (Abstract #21 – Paper 105-108)	USGS National Water Quality Assessment Data Warehouse, Sandy Williamson (Abstract #33)	Performance Based Systems (PBMS) in Ambient & Compliance Monitoring Facilitators: Andy Eaton and Jerry Parr	Strategies for Establishing Water Quality Information Systems: Goal-Oriented Monitoring Systems Facilitator: Robert Ward
3:15 – 3:30	Reaching Under Served Communities with Home-A-Syst Drinking Water Education, Ginger Wireman (Abstract #10)	A National Monitoring Program for U.S. Coastal Environments, Andrew Robertson (Abstract #22)	Analysis of an "Impairment" Determination Due to Chloride in the Santa Clara River, William Gross (Abstract #34)		
3:30 – 3:45	Sounding the Alarm: How Volunteer Watershed Monitoring Makes a Difference, Maya Conrad (Abstract #11)	Toward Integrated Water Resource Quality Monitoring in South Florida Estuaries, Cecelia Weaver (Abstract #23)	Exploring the Black Hole in Nonpoint Source Water Quality Data, James W. Porterfield ((Abstract #35 Paper 161-168)		
3:45 – 4:00	Lessons Learned and New Challenges Raised While Turning Public Awareness into Action-Ten Case Studies Regarding Public Involvement in Water Quality Protection and Improvement, Barb Horn (Abstract #12 – Paper 41-48)	Bacteria Study on the Tres Palacios River: A Cooperative Water Quality Monitoring Study on the Texas Gulf Coast, Alicia Reinmund (Abstract #24)	Regional Water Quality Modeling to Assist with the Development of Nutrient Criteria in New England, Richard Moore and Alison Simcox (Abstract #36)		
4:00 – 4:30	Question & Answer Session: Stakeholder Outreach: Volunteer Monitoring, Community Action and Restoration	Question & Answer Session: Collaborative Marine-based Monitoring Projects	Question & Answer Session: Data Management on the National Scale		
4:45 – 6:15	Discussion Session: (Texas Ballroom I) Track A - Public Awareness & Stakeholder Outreach Discussion Leader: Linda Green	Discussion Session: (Texas Ballroom II-III) Track B - Institutional Collaboration Discussion Leader: Emery Cleaves	Discussion Session: (Hill Country A-C) Track C - Data Management & Accessibility Discussion Leader: Ellen McCarron and Wayne Hood		

WEDNESDAY, April 26, 2000 - Monitoring for the Millennium					
8:00 – 8:30	Morning Break - TEXAS FOYER coffee, tea, pastry & fruit provided Exhibit / Poster Hall Open - TEXAS BALLROOM IV-VII - Posters highlighted during this session: <ul style="list-style-type: none"> • Forest-Stream Interactions Within the Mid-Atlantic Region, Kent Thornton (Abstract #94) • Illinois' Pesticide Monitoring Well Network and the Research that Led to its Development, Steve Wilson (Abstract #95) • Innovative Approaches to Water Research and Education: The Marine Life Education Center, Joel Fogel (Abstract #96) • The Michigan Source Water Assessment Program for Evaluation of Public Surface Water Supplies, Michael Sweat (Abstract #97 – Paper 515-528) 				
Concurrent Sessions	Track D - TEXAS BALLROOM I Water Information Strategies Quantifying Information Goals for Monitoring Programs Moderator: Greg Gross	Track E - TEXAS BALLROOM II-III Methods and Data Comparability General and Inorganic Methods Moderator: Lawrence Keith	Track F - HILL COUNTRY A-C Monitoring Interactions Among Watershed Components Watershed Monitoring Plans Moderator: Fred Van Alstyne	Workshop: 5 PANHANDLE RM	Workshop: 6 BIG BEND A-D
8:30 – 8:45	Monitoring Statistical Design for EMAP Eastern Geographic Study of Streams and Rivers Involving Twelve States and Eight Special Studies, Tony Olsen (Abstract #37)	Development of a Pilot National Environmental Methods Index (NEMI), Lawrence Keith (Abstract #49)	A Proposed Framework for Environmental Monitoring and Related Research in the Delaware River Basin, New York, Peter Murdoch (Abstract #62)	Coordinating Water Quality Monitoring: Lessons Learned Facilitators: Emery Cleaves and Charlie Peters	Volunteer Monitoring: Moving into the Mainstream Facilitator: Linda Green
8:45 – 9:00	Condition of Mid-Atlantic Highland Streams: Challenge, Progress, and Lessons Learned, Steve Paulsen (Abstract #38)	Validating Preservation Techniques for Nitrogen Species Collected by Automatic Sampler, Patricia M. Burke (Abstract #50)	Sources of Variations and Patterns in Water Quality: Forest Watersheds, Ray C. Whittemore (Abstract #63 – Paper 337-352)		
9:00 – 9:15	USGS's National Water Quality Assessment Program – Lessons Learned From the First Decade, Robert J. Gilliom (Abstract #39)	Standardization of Secchi Disk Measurements Including Use of a Viewer Box, David G. Smith (Abstract #51 – Paper 259-266)	Using Temporal Changes in Water Quality in Noonday Creek to Describe Pollutant Transport and Pinpoint Sources, Joseph M. Dirnberger Richard Bowers (Abstract #64 – Paper 353-362)		
9:15 – 9:30	Challenges to Using Performance Measures to Assess the Health of the Nation's Waters, Will Bowman (Abstract #40 – Paper 169-180)	Making Monitoring Tailor-Made in Europe, Joseph G. Timmerman (Abstract #52 – 267-274)	A Watershed Management Approach to Assessment of Water Quality and Development of Revised Water Quality Standards for the Ground Waters of the Mojave River Floodplain, Christopher Maxwell (Abstract #65 – Paper 363-382)		
9:30 – 10:00	Question & Answer Session: Quantifying Information Goals for Monitoring Programs	Question & Answer Session: General and Inorganic Methods	Question & Answer Session: Watershed Monitoring Plans		
10:00 – 10:30	Break - TEXAS FOYER coffee & tea provided Exhibit / Poster Hall Open - TEXAS BALLROOM IV-VII - Posters highlighted during this session: <ul style="list-style-type: none"> • Design of a Surface-Water-Quality Monitoring Network for Michigan, Denis Healy (Abstract #98) • Status and Trends in Water Quality in Northeast Florida, Aisa Ceric (Abstract #99 Paper 529-534) • Biological Assessment of Streams and Watersheds in Prince George's County, Maryland, Sam Stribling (Abstract #100) • Edwards Aquifer Authority and USGS Collaborate to Install 30 Monitor Wells in the Edwards Aquifer Recharge Zone, San Antonio, Texas, Ann Ardis (Abstract #101) • Back From a Watery Grave, Kimberly Jackson (Abstract #102) 				
Concurrent Sessions	Track D continued Water Information Strategies Defining an Adequate State Monitoring Program Moderator: Wayne Hood	Track E continued Methods and Data Comparability Biological Methods Moderator: Jerry Diamond	Track F continued Monitoring Interactions Among Watershed Components Influences of Land Use on the Quality of Watersheds Moderator: Rodney DeHan	Workshop: 7 PANHANDLE RM	Workshop: 8 BIG BEND A-D
10:30 – 10:45	The Evolving Role of Monitoring in Water Quality Management, Charles Spooner (Abstract #41)	Development of a Publicly Accessible Database for Searching and Choosing Biological Methods for Water Quality Monitoring, Katherine Alben (Abstract #53)	Post-development Assessment of Point Recharge Feature Protective Buffers, Austin, TX, Sylvia R. Pope (Abstract #66 – Paper 383-396)	How to Get the Most Out of Water Quality Data: Using Common Data Elements Facilitator: Chuck Job	Answering the Critical Questions in the New Millennium: Statistical Survey Design for Aquatic Ecosystem Monitoring Network Facilitators: Kent Thornton, Tony Olsen, and Steve Paulsen
10:45 – 11:00	Baselines for State Monitoring Programs, Jon Craig (Abstract #42 – Paper 181-190)	Comparison of Aquatic Macroinvertebrate Samples Collected Using Differing Field Methods, Michael Miller (Abstract #54)	An Integrated Approach for Monitoring the Effects of Urbanization on Stream Quality in New England, Jerry McMahan (Abstract #67)		
11:00 – 11:15	Impact of TMDLs on Indiana's Surface Water Quality Monitoring Program, Jan Henley (Abstract #43 – Paper 191-194)	Evaluation of Alternative Bacterial Indicators for Use in Determining Compliance with Water Quality Criteria, George Guillen (Abstract #55 – Paper 275-290)	Developing a Comprehensive Pesticide Monitoring Program through Interagency Cooperation, Larry A. Rosemann (Abstract #68 – Paper 397-408)		
11:15 – 11:30	Question & Answer Session: Defining an Adequate State Monitoring Program	Development of Biological Criteria for Wyoming Streams and their Use in the TMDL Process, Ben Jessup (Abstract #56 – Paper 291-304)	Relating Shallow Ground-Water Quality to Surficial Hydrology in the Mid-Atlantic Coastal Plain, Scott W. Ator (Abstract #69 – Paper 409-424)		
11:30 – 12:00		Question & Answer Session: Biological Methods	Question & Answer Session: Influences of Land Use on the Quality of Watersheds		

12:00 – 1:00	Lunch - TEXAS FOYER AND EXHIBIT HALL - box lunch & beverage provided Exhibit / Poster Hall Open - TEXAS FOYER - Posters highlighted during this session: <ul style="list-style-type: none"> • Aquatic Resources Characterization Study for Three Regional Sub-watersheds to the Colorado, Randy Palachek (Abstract #103) • The Use of Environmental Integrity Indexing System for Ecological Assessment and Storm Water Management in Austin, Texas, Scott E. Hiers (Abstract #104) • Effects of Hydrologic Variability on Biological Assessments of Streams in Austin, TX, Mateo Scoggins (Abstract #105 – Paper 535-548) • Equipment Design and Implementation for Continuous Monitoring in an Estuary, Thomas Cluney (Abstract #106 – Paper 549-554) • Microorganisms in Re-circulatory Water Systems and Their Significance in Fouling, M.T. Pandya (Abstract #107 – Paper 555-565) 				
Concurrent Sessions	Track D continued Water Information Strategies Data Analysis and Interpretation to Meet Information Goals Moderator: Chuck Spooner	Track E continued Methods and Data Comparability Organic Methods Moderator: Herb Brass	Track F continued Monitoring Interactions Among Watershed Components Methodologies for Depicting Interaction Between Watershed Components Moderator: Denise Coutlakis	Workshop: 7 continued	Workshop: 8 continued
1:00 – 1:15	Water Quality Trend Detection in the presence of Changes in Analytical Laboratory Protocols, David Smith (Abstract #44 – Paper 195-208)	A Better Mouse Trap, Simon Litten (Abstract #57)	Historic Monitoring of Trace Metal Concentrations in Rivers: Backcasting using Sediment Cores and Present-Day Water Data, W. Berry Lyons (Abstract #70)	How to Get the Most Out of Water Quality Data: Using Common Data Elements Facilitator: Chuck Job	Answering the Critical Questions in the New Millennium: Statistical Survey Design for Aquatic Ecosystem Monitoring Network Facilitators: Kent Thorton, Tony Olsen, and Steve Paulsen
1:15 – 1:30	Influence of Different Temporal Sampling Strategies in Estimating Loads and Maximum Concentrations on Small Streams, Dale Robertson (Abstract #45 – Paper 209-229)	An Automated Online SPE-GC-MS System for Water Analysis, Yongtao B. Li (Abstract #58 – Paper 305-316)	Linking Chemical and Biological Monitoring Components in the TMDL Process, Anne McFarland (Abstract #71 – Paper 425-434)		
1:30 – 1:45	Fifteen Years of Biomonitoring in Maine: Evolution, Application and Destinations, Dave Courtemanch (Abstract #46 – Paper 225-234)	On-line Monitoring of Oil in Waste Water Using Ultraviolet-Florescence and Light Scattering with an Artificial Neural Network, L.M. He (Abstract #59)	Stream Health: Relating Stream Biota to System Water Quality, Tamim Younos (Abstract #72 – Paper 435-446)		
1:45 – 2:00	De Facto Data Analysis Methods for Goal Oriented Monitoring: What Does Current Practice Tell Us? Lindsay M. Martin (Abstract #47 – Paper 235-244)	Immunoassay Analysis for the Determination of Pesticides in Groundwater Samples: the Texas Experience, Alan Cherepon (Abstract #60 – Paper 317-328)	Rating Unsaturated Zone and Watershed Characteristics of Public Water Supplies in North Carolina, Jo Leslie Eimers (Abstract #73 – Paper 447-462)		
2:00 – 2:15	Using ATiLA (Analytical Tools Interface for Landscape Assessments) to Estimate Landscape Indicators and Target Restoration Needs, Jim Harrison (Abstract #48 – Paper 245-258)	PCB Congener Distribution in Estuarine Water, Sediment and Fish Samples: Implications for Monitoring Programs, Thomas J. Fikslin & Edward Santoro (Abstract #61)	Approaches to Evaluating Ground Water Seepage and Interaction with Surface Water in Estuarine Systems, Rodney DeHan (Abstract #74)		
2:15 – 3:00	Question & Answer Session: Data Analysis and Interpretation to Meet Information Goals	Question & Answer Session: Organic Methods	Question & Answer Session: Methodologies for Depicting Interaction Between Watershed Components		
3:00 – 3:30	Break - TEXAS FOYER AND EXHIBIT HALL: snack, coffee, tea & soft drinks provided Exhibit / Poster Hall Open - TEXAS BALLROOM IV-VII - Posters highlighted during this session: <ul style="list-style-type: none"> • Educating the Public About Water Quality Issues, Kristen Travers (Abstract #108) • Total Maximum Daily Load for Dissolved Oxygen and Biological Assessment of Armand Bayou, Houston TX, Curt Burdorf (Abstract #109) • Development and Implementation of a Strategic Environmental Quality Monitoring Program in Michigan, Gary Kohlhepp (Abstract #110) • Watershed Information Network (WIN), Bob Pierce • Developing a Comprehensive Monitoring Program to Support Implementation of CWA Section 303(d), Armand Ruby (Abstract #112) 				
3:30 – 5:00	Discussion Session - TEXAS BALLROOM I Track D - Water Information Strategies Discussion Leader: Robert Ward	Discussion Session - TEXAS BALLROOM I Track E - Methods and Data Comparability Discussion Leader: Charlie Peters & Herb Brass	Discussion Session - HILL COUNTRY A-C Track F - Monitoring Interactions Among Watershed Components Discussion Leader: Rodney DeHan		
THURSDAY, April 27, 2000 - Monitoring for the Millennium					
8:00 – 8:30	Morning Break - TEXAS FOYER coffee, tea, pastry & fruit				
8:30 – 8:45	General Session - TEXAS BALLROOM I-III Final Announcements and Introductions of Topic Reports				
8:45 – 9:00	Track A Report: Public Awareness & Stakeholder Outreach				
9:00 – 9:15	Track B Report: Institutional Collaboration				
9:15 – 9:30	Track C Report: Data Management & Accessibility				
9:30 – 9:45	Track D Report: Water Information Strategies				
9:45 – 10:00	Track E Report: Methods and Data Comparability				
10:00 – 10:15	Track F Report: Monitoring Interactions Among Watershed Components				
10:15 – 10:45	Break / coffee & tea				
10:45 – 11:45	Open Microphone Session – Discussion of Track Reports				
11:45 – 12:00	Next Steps & Adjourn				
12:00 – 1:30	Lunch – on your own				
1:30 – 6:30	Barton Field Trip - DEPART FROM HYATT BEGINNING AT 1:30 Field Trip Coordinator: Lynne Fahlgvist (See Field Trip Description)				