



SWRR April 25 & 26, 2006 Meeting

Top of the Town, 1400 N. North 14th Street, Arlington VA 22209

Participating in the meeting were

Rina Aviram, National Academies;
Sarah Berry, Support;
Randy Davis, US Forest Service, Soil Program
Michael Eberle, Bureau of Land Management
John Gasper, Argonne Nat. Lab
Robert Goo, EPA Office of Water
Ted Graham, Metropolitan Washington Council of Governments
Ted Heintz, White House Council on Environmental Quality
Joe Hoffman, Interstate Commission on the Potomac River Basin
Toni Johnson, US Geological Survey
Gina Mathias, Alice Ferguson Foundation
Laura Miner, DOE Wind Program
Wende Pearson, Alice Ferguson Foundation
Tim Smith, SWRR
Bette Stallman, Ecological Society of America
Rick Swanson, US Forest Service
Doug Wade, Metropolitan Washington Council of Governments
Bob Wilkinson, UC Santa Barbara

David Berry, SWRR;
Tracy Bowen, Alice Ferguson Foundation
John Dawes, W. PA Watershed Program
Warren Flint, Five E's Unlimited
Stephen Gasteyer, U. of Illinois
Elisa Graffy, Department of the Interior
Rhonda Kranz, Kranz Consulting
Beth McGee, Chesapeake Bay Foundation
Brand Niemann, EPA
Richard F. Schwer, DuPont Company
Chuck Spooner, EPA Office of Water
Al Steinman, Annis Water Resources Inst.
John Wells Minnesota Env't. Quality Bd.

Day 1

Opening and welcoming remarks: David Berry opened the meeting reminding participants to go beyond their official positions and titles and think of water resources as a whole multifaceted system that connects us all and is seen from many viewpoints. Rick Swanson, US Forest Service, SWRR Co Chair gave opening remarks on why water resources were important the Forest Service and why he supports the work of the SWRR.

Update on the National Indicator Efforts: Ted Heintz, White House Council on

Environmental Quality, Summarized the Collaboration on Indicators on 'the Nation's Environment (CINE): The CINE will recommend the institutional arrangements the U.S. needs for statistical reporting on the environment and will use a collaborative process involving institutional partners and high level leaders from both the Federal and non Federal sectors. Collaborators include CEQ, Heinz Center, the National Council for Science & the Environment, Meridian Institute, Key National Indicators Initiative, Federal agencies: Interior, Ag, EPA, NOAA, NGOs, State and local governments, Congress and Deans of environmental schools.

The main objectives the CINE seeks to achieve are an enduring institutional capacity to regularly publish a comprehensive set of indicators and statistics on natural and environmental resources. This would comprise a few highly respected and trusted institutions responsible for publishing "Gold Standard" indicators and statistics.

The key tasks to be performed are:

1. Determine the Scope for a National System of Indicators
 2. Identify Desirable Institutional Features
 3. Survey Existing Institutional Capacities
 4. Develop Institutional Options
 5. Develop Recommendations Collaboratively
- (Ted Heintz' full presentation will be posted on the SWRR web site in PowerPoint)

Panel on Potomac and Regional Water Sustainability Issues and Indicators

Moderator **Warren Flint, Five E's Unlimited** opened the session with comments about the importance of water sustainability in the National Capital Region and introduced the presenters from this area.

Ted Graham Water Resources Program Director **Metropolitan Washington Council of Governments** gave a presentation on water quality issues in the region highlighting the Anacostia River Restoration. The goals of the project are:

Restoration of the Anacostia Watershed

- Water quality
- Habitat
- Stewardship

Institutional Framework for Restoration

- Setting for Indicators & Targets

Indicators and Targets: How are They Helping?

- Keeping score
- Setting program targets
- Creating incentives based on the indicators

The priority water quality problems in the Anacostia River are fecal bacteria, low oxygen levels, sediment, toxics, trash, and degraded habitat.

(Ted Graham's full presentation will be posted on the SWRR web site in PowerPoint)

Joe Hoffman, Interstate Commission on the Potomac River Basin gave a presentation on water supply and demand in the Potomac River Basin. Rising population and increased water demand have put pressure on available supply including ecosystem needs. One sobering thought is that in some tributaries of the Potomac current uses exceed the record low flow level suggesting that a future drought could mean a severe shortfall in meeting needs.

(Joe Hoffman's full presentation will be posted on the SWRR web site in PowerPoint)

Tracy Bowen, Alice Ferguson Foundation Trash Free Potomac Initiative gave a

presentation on how the foundation, after many years of leading a Potomac River Cleanup every year, began the campaign for a “Trash Free Potomac by 2013”. There has been a major stepping forward of local and regional governments with support at the state and federal level to accomplish this task which Tracy say can be accomplished through:

- Research
- Legislation & Enforcement
- Economic Incentives & Disincentives
- Public Education & Awareness

Tracy showed two videos which show the link among litter on the land, storm water run off and trash in the river. With the energy she and her team have applied to this initiative, they have been very effective in explaining the trash issue and attracting support. Tracy made the important point that the public and local governments can get galvanized around the trash issue and the interest and financial support can also help with chemical run off and other problems that are less visible and more complex. (Tracy Bowen’s full presentation will be posted on the SWRR web site in PowerPoint)

John Dawes, Western PA Watershed Program gave a graphic photo presentation of acid mine drainage problems that severely degrade some tributaries of the upper Potomac and over 4,000 miles of waterways in western Pennsylvania. He gave background information on the history of abandoned mine lands (AML), programs to identify the problem areas and efforts to remediate them. He estimates that the cost to remediate just the AML and associated waterways in Pennsylvania will cost between 5 and 15 billion dollars. (John Dawes’ full presentation will be posted on the SWRR web site in PowerPoint)

The question and discussion period that followed was lively and interesting particularly to the federal people who often work on issues at a national level and in this conversation were learning about the water issues in their own back yard.

SWRR Preliminary Report and Current State of Indicators: Rhonda Kranz and John Wells gave an overview of the interim SWRR report and indicators. They reminded participants that SWRR is a national collaboration of federal, state, local, corporate, non-profit and academic interests. The progress so far includes:

- A conceptual framework for understanding water resources sustainability
- Principles, criteria and indicators to support decision-making
- Collaboration on research needs

They next listed the principles of water resources sustainability as outlined in the SWRR report:

- **The value & limits of water:** People need to understand the value and appreciate the limits of water resources and the risks to people and ecosystems of unbounded water and land use
- **Shared responsibility:** Because water does not respect political boundaries, its management requires shared consideration of the needs of people and ecosystems up- and downstream and throughout the hydrologic cycle
- **Equitable access:** Sustainability suggests fair and equitable access to water, water dependent resources and related infrastructure
- **Stewardship:** Managing water to achieve sustainability challenges us in meeting today’s needs to address the implications of our decisions on future generations and the ecosystems upon which they will rely

SWRR has reached over 300 active participants from federal, state and local governments; corporations; nonprofits and academia. Meetings have been held in California, Minnesota, Michigan, Washington DC, Maryland, and Virginia. There have also been numerous publications and conference presentations. John and Rhonda went on to give a review of the

SWRR indicator categories and indicators which can be found as part of their PowerPoint presentation on the SWRR web site.)

Lunch Presentation: Dr. Beth McGee, Senior Water Quality Scientist, Chesapeake Bay Foundation gave a presentation on the Chesapeake Bay and the work of the Foundation. The foundation was founded in 1967 to 'Save the Bay'. Today it has 140,000 members, 36,000 Action Network members and 10,000 student, teacher and citizen volunteers. CBF works to Save the Bay through:

- Education
- Advocacy
- Restoration and
- Litigation

Beth then gave a good summary of the indicators from the State of the Bay Report. The indicators focus on pollution, habitat and fisheries. She candidly shared with the participants that with her strong science background including work in the US Fish and Wildlife Service, she was at first skeptical about the rigor in such a report. But as she saw the impact on public awareness that the report had combined with continuous improvement as the science and data got better, she has become a strong advocate of using indicators to report on water and ecosystem status.

(Beth McGee's full presentation will be posted on the SWRR web site in PowerPoint)

Considering the Indicators: Al Steinman, Annis Water Resources Institute. Al began by defining indicators as: Measures that present relevant information on trends in a readily understandable way. He then reviewed the factors for identifying and choosing indicators from the SWRR report:

- Consider the condition and capacity of ecological, social and economic systems
 - direction and rate of change; interactions
- Focus on what's most relevant to sustainability
- Adopt appropriate time horizon and scale
- Demonstrate integrity - measurable, unbiased, scientifically defensible, spatially explicit
- Be understandable

Al went over the list of 17 SWRR indicators spending some time with a few selected samples.

A. System Capacities, Quality, and Allocation

1. Gross water availability
2. Total withdrawals for human uses
3. Water in the environment (what's left)
4. Water quality
5. Total capacity to store, deliver, and treat the water supply over unit of time
6. Social and organizational capacity

B. Consequences of the Way We Allocate Water Capacity

7. Environmental conditions
8. Resources and conditions (e.g. fish contamination)
9. Quality and quantity of water for human uses (for different sectors)
10. Resources withdrawals and use
 - uses of harvested resources
 - uses of non-harvested water-dependent resources

C. Effects on People of the Conditions and Uses of Water Resources

11. Human conditions
 - measures of value people receive from uses of water and the costs incurred

- D. Important Factors Affecting Water Resources
12. Land use
 13. Residual flows (point and nonpoint sources)
 14. Social and economic processes
 15. Ecosystem (environmental) processes

- E. Composite Sustainability Assessment
16. Water use sustainability
 17. Water quality sustainability

AI then posed the following questions to the group:

- What water information and statistics are needed to develop indicators?
- What sources of data or statistics should be considered for developing indicators of sustainable water resources?
- If new data should be collected for these indicators, what organizations should do it and why? What gaps exist?
- In setting up the breakout sessions on indicators, AI and David Berry asked the participants to Review each of the indicators, take regional considerations into account, if appropriate and suggest any modifications and additions to make the set more useful.

(AI Steinman's full presentation will be posted on the SWRR web site in PowerPoint)

Breakouts on Indicators: In three breakout groups the participants reviewed each of the current indicators. Regional people were invited to offer suggestions to make the indicator set more useful to them. Here are the reports of the groups:

Group 1. Compiler: Rick Swanson

1. System capacities, qualities, and allocation: consider adding:
 - Gallons of water used per kilowatt hour generated.
 - Gallons of water consumed per kilowatt hour generated.
2. Water Quality: consider adding:
 - Clarity - maybe Secchi disk readings.
3. Land use: consider adding:
 - Erosivity measurement (similar to candidate indicator #337 (in Report Appendix) - Ground Cover - Land disturbance)
 - Land conversion metric -e.g. Farmland to suburban - irreversible (similar to #336 - Composition and Land Use)
 - Run-off potential metric (similar to #335?)
4. Water Quality Sustainability: consider adding:
 - Numbers or percent watershed / water quality impairment
5. Adding new category: Composite indicator for land impairment (no final resolution)

Group 2. Compiler Wende Pearson

1. Generally speaking, we agree that 1) the five criteria/categories are well-organized and complete; and 2) the seventeen indicators represent the key areas necessary to express a story about the sustainability of water resources.
2. Potential immediate/short-term Applications for SWRR Indicators list:
 - a. Validate SWRR work if initial feedback indicates that regional initiatives fit into indicators
 - b. SWRR indicators can be used as a guide/outline for how to approach regional water resource sustainability (use indicators as a template for planning)

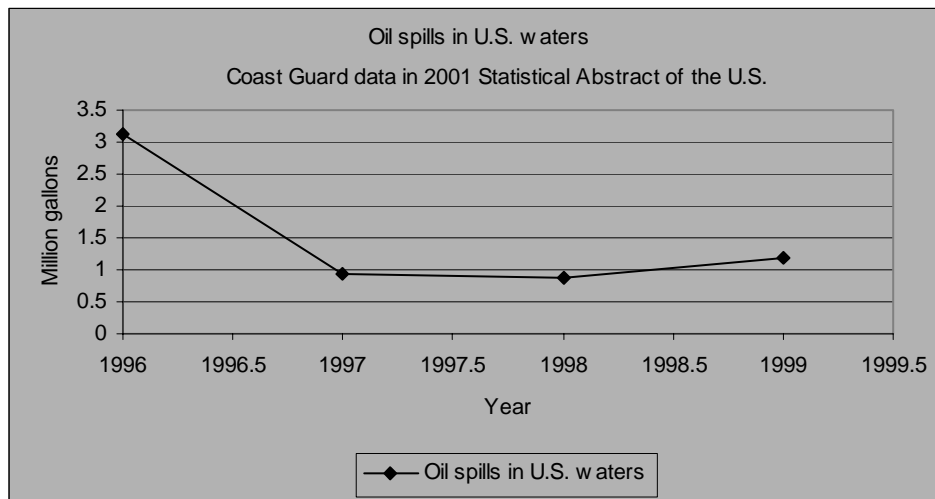
3. It would be useful for SWRR to begin applying indicators at a smaller/regional scale (i.e. Potomac Watershed) for various reasons, including higher visibility for SWRR, field testing of indicators, local education, and addition to SWRR case history studies.
4. Suggestion to have SWRR help apply indicator expertise (“stamp of approval”) for Potomac Watershed Trash Free Initiative. The first step would be to identify the connections between existing trash and water quality data.

Group 3: Compiler Tim Smith

The discussion started by asking if SWRR is following the same pattern as the 1998 SDI report (www.sdi.gov). For example, could a summary chapter be written that lays out the steps needed for implementation? Another approach to force action might be to get the kind of endorsements that the Alice Ferguson Foundation has achieved. Would SWRR do this?

There was general agreement that SWRR should try to relate its work to important current public policy issues, like energy. See for example figure 1, which would be a way to tie water to oil spills. This might be a good indicator.

Figure 1.



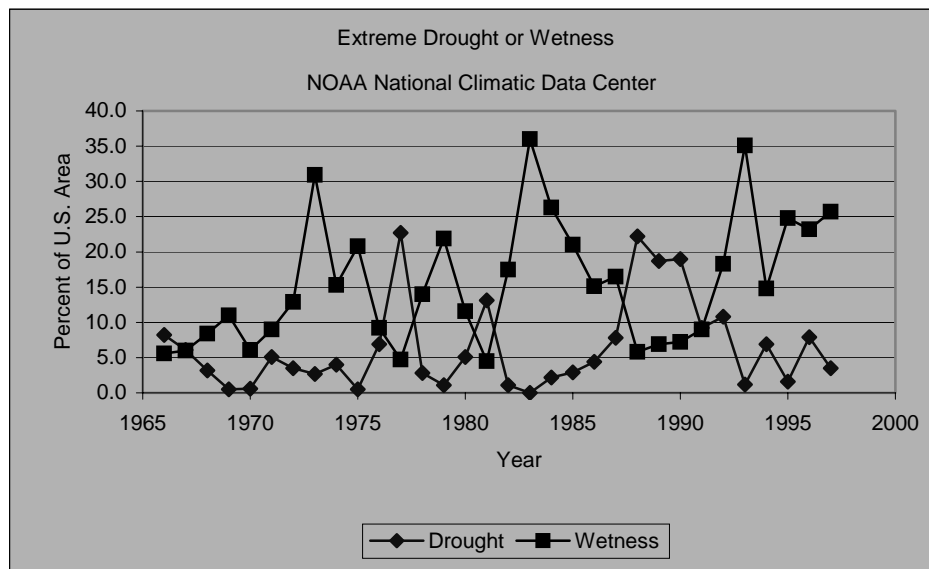
In discussing the allocation of water, it was pointed out that historically the human uses of water have been considered first and the environmental or in-stream uses as an afterthought. This is reflected in the current set of indicators. Perhaps SWRR should reverse this approach, and emphasize first the in-stream or environmental indicators and only later the human indicators. This might be a better way to show sustainability. A second tie to energy via this route is how water availability for human use determines power plant siting and production. In times of low flow power production must be determined by the amount of cooling water available.

Indicators 5 and 6 currently depict a perhaps incomplete picture of how infrastructure (bricks and mortar) and institutions are related. Perhaps the institutions are really the more important sustainability indicator, since they ultimately call into existence the infrastructure. It might be better to concentrate on the institutions as stakeholder groups. In general, they might be divided into at least two different kinds: volunteer/watershed groups like the Alice Ferguson Foundation, and the more formal institutions or associations called for under agreements, like river basin commissions. City, state, and federal institutions seem to belong in the latter group.

More emphasis might be given to indicators of the natural flow regime. See for example reports of the Nature Conservancy. It is important to show measures of natural variability. This for

example might help to establish links to important current issues like climate change. For an example of variability see figure 2.

Figure 2.



It is always wise to see what others are doing in the field of indicators. SWRR has not looked at the EPA Draft Report on the Environment since 2002. It was suggested that much has changed since then, and it would be a good idea to do a side-by-side comparison between the SWRR indicators and the EPA water indicators. EPA is supposed to have actual data and metadata for all their water indicators.

The SWRR report would benefit from use of more advanced graphical display techniques. Most of the present graphics were supplied by using standard software or taken from web sites. However, groups like the George Mason Univ. statistical visualization lab, or GIS people at the National Labs, have command of more advanced techniques. For example, a national map might be developed that shows streams "in trouble" in red, versus streams "restored" in green. If SWRR chooses to try this, funding for these specialists would have to be found.

There are many ways to get expanded commentary on the report. One example would be to use wiki technology so that people could comment on the report on our web site with open availability and tracking of who made which comment. It should be remembered that this is an unsupervised call for comment, and there might be an implicit commitment for SWRR to somehow provide manpower to review and take action on what could become a very large volume of comments.

Bob Wilkinson ended the discussion by showing his early software that traces the energy used in all parts of the water acquisition, distribution, treatment, and return process. He plans to apply the model in future to Vancouver, Canada. A chapter on this energy-water link would be a good addition to the SWRR report, and would tie again into the important concerns about energy issues in the nation. This would be a good thing for SWRR to have.

Presentation of findings by cluster and discussion:

David Berry led the discussion following the presentation of the above reports and then invited out of town guests and others that wanted to join to have dinner at his apartment in the same building as the meeting.

Day 2

The second was opened by **David Berry** and **Rick Swanson**

Taking stock of Day 1: Warren Flint of Five E' Unlimited gave an excellent recap of the discussions and presentations of the previous day.

Data Needs for Indicators, Chuck Spooner, EPA Office of Water and National Water Quality Monitoring Council. With respect to indicator data needs and management needs Chuck pointed out that water indicators are rarely (if ever) conceived independent of management needs. Agency perspectives influence content through their strategic plans and decision making. As the perception of an Agency's needs change, different data is sought. This is an issue in data collection. EPA gives guidance on data quality objectives:

Systematic Planning for Environmental Data Collection

1. Define the problem
2. Define the decision
3. Define the information inputs
4. Specify the circumstances: Spatial, Temporal and Target population
5. Synthesize the above into a logical choice among alternatives

Systematic Planning for Environmental Data Collection

6. Specify acceptable limits on decision errors
7. Define a sampling scheme
8. Design the analysis

Chuck continued with a discussion of the EPA State of the Environment Report which was based on 23 questions related to air, water, land, human health and ecological condition. He then gave background and outlined the current activities of the National Water Quality Monitoring Council which was a result of the U.S. Commission on Ocean Policy. The report of the Council suggests a monitoring design that:

- Offers National and regional contexts for local programs
 - Continuum of observations and connectivity
 - A basis for cause-effect observations
 - Improved ecological forecasting capability
- Builds on but doesn't replace existing programs
- Raises the bar by promoting
 - Comparable Data
 - Easy access to data

Recognizing the interconnectedness of water resources, the Council suggested a Continuum of Observations

- Estuaries
- Near shore
- Offshore and EEZ
- Great Lakes
- Coastal Beaches
- Wetlands

With Flow and Flux from

- Rivers
- Atmosphere
- Groundwater

(Chuck Spooner's full presentation will be posted on the SWRR web site in PowerPoint)

Review of SWRR Next Steps. Tim Smith and David Berry presented the ten areas of future work that SWRR is considering doing next. The Group was then invited to add to the list and then choose what they would like to gather into breakouts to talk about. They were invited to go to a session on something they could support or participate in - not "what they should do or what you should do" but rather "what I am willing to do". Here is the original list of steps:

SWRR should **complete, revise, and refine indicators** for tracking the sustainability of water resources. This work should include indicators scalable to national, state, and local levels, because there are issues that are relevant primarily at different geographical levels. It is likely that indicators will evolve as better statistics become available, and such changes can be made in the on-line report to keep it current.

SWRR should **assist agencies by describing the need for programs to collect the information** necessary for generating indicators. In turn, SWRR should undertake to develop indicators that more closely support the missions of agencies. This dialogue should lead to a closer relationship with agencies, and may help programs to evolve over time.

SWRR should increase **representation among its participating members** from state and regional water management programs. The policy issues faced by state and regional people may differ from national level issues, and those who work at other geographical levels can contribute important perspectives.

SWRR should **expand relationships with the scientific community**, to draw on the best ideas in water disciplines, and to encourage research into sustainability as it relates to water resources. SWRR has begun such work via its participation in professional societies, such as the Water Environment Federation, the Universities Council on Water Resources, and the American Water Resources Association.

SWRR should consult **with other programs on water-related indicators**, including the National Research Council's Key National Indicator Initiative, the Council on Environmental Quality, and the ecosystem work of the Heinz Foundation. Cooperation is desirable in order to avoid duplication and leverage limited resources so that the joint results can be improved.

SWRR should **plan a National Forum on Sustainable Water Resources**, as recommended in Graham Bullock's Engaging Voices, Stakeholders and the Development of National Environmental Indicators, Case studies from the Sustainable Roundtables, EPA, and the Heinz Center. Submitted to CEQ/EOP. Kennedy School of Government, Harvard University, Boston. April 2005. Such a forum would attract greater attention and help to coordinate SWRR with the other relevant work now underway.

SWRR should develop **a training workshop for education in water sustainability principles**. This kind of workshop could be supported by tuition, and could make use of the large amount of information that now exists on the SWRR website. An effort like this, as a distance learning module, could reach many people at the state and local levels, who are otherwise unaware of the current work.

SWRR should **expand contacts in the industrial community** who bring a fresh viewpoint to the need for indicators that relate to water concerns in manufacturing. Some initial contacts have been made, and the consulting business community is reached via professional organizations, but the needs of manufacturing industry require more attention.

SWRR should **continue meetings to inform and involve those in different regions of the nation** to disseminate information and gain knowledge about regional indicators.

SWRR should conduct **briefings for the legislative branch of the federal government**. (This can be with the collaboration of WEF or EESI). So far, SWRR communication has been primarily with agencies of the executive branch, but briefing the legislative branch would be helpful to inform decisions related to water resources made in Congress.

In the set up for the Breakouts the group suggested Organizing and summarizing SWRR work to date as an additional subject.

There were two breakout groups and one group of two. Here are their reports:

Notes from the breakout of the SWRR working group for Review and Organization of SWRR Activities to Date

Participants: Michael Eberle, Warren Flint, Robert Goo, Rhonda Kranz, Bette Stallman, Doug Wade, John Wells.

Members of the work group acknowledged some confusion among both active and new members regarding the goals, products and activities of SWRR. As is common in a collaborative, volunteer process such as SWRR, there is no one person or group with responsibility to manage, review and organize all the pieces involved. After 3 years of hard work we have reached an important milestone in the first SWRR report. The work group proposes that it is time for a sub group of old and new members to briefly pause to review and provide clarity regarding what has been produced and how we got here, and the tools to articulate this information. The purpose of this review is not to expend effort on rewriting material or looking for a way to express all the different views and ideas represented in SWRR, but to be sure the concepts and products that provide a base for our work are clear and consistent, and that the links among all the pieces are clear and transparent.

The overall purpose of the work group is to validate the SWRR efforts and make them easily understood and usable. Our objectives are to review and assure: 1) the SWRR mission and goals are clear and consistent internally and in outreach; 2) what has been accomplished and the underlining concepts are communicable to new members as well as clear among existing members; 3) products are internally consistent, up to date, and available for use; 4) implementation and next steps are well communicated.

Below is a draft outline of the proposed components of the effort. The work group's first efforts will be to review the mission and goals of SWRR and the existing products. Other steps identified to be taken by SWRR fit with in this framework and separate groups will pursue these activities, hopefully in collaboration and in the context of our efforts.

1. Purpose of SWRR
 - a) Mission
 - b) Clarify goals and objectives
2. Products
 - a) Inventory
 - b) Assess
 - c) Update

- d) Develop new products
- 3. Foundations for Indicators
 - a) Goals of indicators
 - b) Process of getting to the concepts
 - c) Framework
 - d) Alternatives and subsets
 - e) Gaps or revisions
 - f) Next steps
- 4. Outreach
 - a) Education
 - b) Identify potential use of different products
 - c) Review who was contacted in the past and if they should be retargeted
 - d) Expand relationships with other sectors and individuals
 - e) Marketing of SWRR
 - f) Funding
 - g) Agency relationships
 - h) A communications plan
- 5. Implementation
 - a) Use of products in various context
 - b) Pilot projects
 - c) Other directions
 - d) Next steps
- 6. Research

Initial Action Items:

- a. Draft statement of work group purpose (Bette)
- b. Identify how we have described our mission, goals & objectives in various documents and suggest changes, if appropriate, to be vetted subsequently by the group and then SWRR (John)
- c. Invite others to join work group (Rhonda)
- d. Distribute "a" and "b" to Steering Committee and invited work group members

Below is a draft outline of the proposed components of the effort. The work group's first efforts will be to review the mission and goals of SWRR and the existing products. Other steps identified to be taken by SWRR fit with in this framework and separate groups will pursue these activities, hopefully in collaboration and in the context of our efforts.

Notes from the breakout of the SWRR outreach working group for Problems and Solutions in Working with Stakeholder Groups

The group discussed the need to communicate with stakeholder groups, such as those in manufacturing industry or agriculture. Private sector interests of this kind are not well represented in SWRR now. It will be important to define their interests, which may lead to networks of indicators that are different from, but relate to, some of the indicators that SWRR now has.

One thing to do first might be called "pitfall analysis," i.e., check to see what is happening in other groups working on indicators.

SWRR might consider convening stakeholder groups, but it might be easier to get on the agendas of meetings of these groups, at least to start with. Some groups SWRR has contacts with (at least in the past) and could inquire with again, include:

Global Environmental Management Initiative
American Forest and Paper Association
Clean Water Industry Coalition
Edison Electric Institute
Electric Power Research Institute
National Council for Air and Stream Improvement, Inc.
American Chemistry Council
American Petroleum Institute
British Petroleum

This is just an ad hoc list from SWRR files. Some are of these groups are ACWI members too.

SWRR will continue with its outreach via professional groups like Water Environment Federation and American Water Resources Association, and seek ways to define and engage other stakeholders as well.

1. Stakeholders may have missions that are at least in part different, in conflict, or which use differing language to describe important concepts. An example of an important concept might be “sustainability.”
2. It might be possible to begin by seeking agreement on some basic premise, such as the need to act now to describe a jointly important natural resource, before the advent of crises calls for hastily considered reactions. This discussion could be the point at which the special language used by the stakeholder group is learned, thus promoting communication. In some ways this is a step of diplomacy, and may take some time to build trust before it is possible to work together.
3. It is good to ask the stakeholder group to describe what is important to them about the natural resource (e.g., water). The importance may well be linked to their mission (how the resource is used), and any policies or laws to which they may be subject (like regulations). This leads naturally to asking them to specify some indicators that could be helpful to track the resource, given the mission and relevant public policies. If successful, the stakeholder group may evolve a network of indicators, which plug in at one or more points to the parent group of 17 indicators used by SWRR. This kind of approach promotes a sense of ownership of the indicator set, and may result in continuing participation in SWRR.
4. The process for making public the results of the joint effort should be developed at least before the end of the effort. It will be difficult if any resulting papers or reports would be regarded as confidential intellectual property by some but subject to promotion to a wide public by others. A variant of this phenomenon seen in academia is the “publish or perish” problem, wherein authors may feel a need to obtain unique credit for some output. Agreement on the process will avoid many difficulties.

In Addition to the two breakout groups Warren Flint and Doug Wade discussed how to apply the SWRR work at the local level, an area of focus for both of them. The Alice Ferguson foundation was also very interested in this work particularly to create indicators related to trash in the Potomac Watershed.

Lunch Presentation: Energy Water Nexus, John Gasper, Argonne National Labs John made clear that Energy and Water are inextricably linked. Energy production requires water for:

- Thermoelectric cooling
- Hydropower
- Extraction and mining
- Fuel Production (H₂, ethanol)

- Emission controls

Water production and distribution require energy for Pumping, Treatment and Transport. John talked about the constraints on energy development imposed by competing uses of water resources. For future energy development there will be further new demands on water and future water supplies and treatment will be more energy intensive as readily accessible fresh water supplies are limited and have been fully allocated in some areas. Pumping at deeper depths and longer conveyance distance require more energy and to access and treat non-traditional water resources will require more energy per gallon of water. Finally, impaired water, produced water, brackish water, and sea water require significant energy to be made useable.

John gave a summary of Congressional actions related to the Energy Water nexus:

- The Energy Policy Act gives DOE new Authorization for Water-related R&D Sect. 979:
 - Energy-Water Supply Technologies Program
 - Water and Energy Sustainability Program
 - Assessments (collaboration w/ USACE and others)
 - Tools development for long-term planning
 - Report to Congress
- Domenici-Pombo Water Technology bills are pending
 - 2004 press conference, Senate and House introductions, but no hearings
 - 2005 introductions in House (H.R. 3182) and Senate (S. 1860)
 - Latest versions are scaled down significantly from 2004 version

(John Gasper's full presentation will be posted on the SWRR web site in PowerPoint)

Meeting Close

As the meeting closed, small teams were formed to continue working on review and organization of SWRR activities to date and outreach to stakeholder groups.

There was some discussion of where the next meeting should be held, Ideas included Florida, the South West, the Pacific Northwest, the University of Illinois and the Fish and Wildlife Service facility at Shepherdstown West Virginia.