

**Final, Approved Minutes
ACWI—Subcommittee on Sedimentation (SOS)
meeting of April 12, 2005, Reno, NV**

The SOS is a subcommittee of the Advisory Committee on Water Information (ACWI)

ACTIONS

Motion <> Reservoir Information System II, short-term action: Pursue Alternative B, to post web-based searchable index with links to PDF images/files of individual reservoir survey records as short-term solution to providing public access to available reservoir sedimentation survey data.

See “Reservoir Sedimentation Survey Data” discussion below for a description of alternatives. After much discussion, the motion passed unanimously. Jerry Webb (USACE) will lead a work group comprised of John Gray (USGS), Bob Stallard (USGS), Christi Young (USBR), Jerry Bernard (USDA-NRCS), Doug Dixon (EPRI) and work to see if RESIS-II data sheets (in pdf format) can be brought into the National Inventory of Dams, NID, under its funding mechanisms. Part of this work presupposes that Bob Stallard will provide a summary of the current status of the database and its web-based development.

Motion <> Reservoir Information System II, long-term action: The SOS should pursue Alternative A, to implement a web-based relational database for existing and new reservoir sedimentation survey data.

In the short term, we should build on what is learned from pursuing Alternative B (see above), and begin to seriously consider all possibilities for hosting, development, funding, etc. Motion passed unanimously.

Motion <> SOS Terms of Reference: The SOS will not edit its Terms of Reference to require funding of travel costs for member organizations.

The motion passed unanimously. All members agreed that it was appropriate for each member to continue to fund their own travel for participation at SOS meetings.

Motion <> SOS Prospectus : Form a work group of three SOS representatives to draft a revised Prospectus for comment and finalization before next meeting, 09/15/2005.

Proposed members of this work group are the representatives from USDA, USGS, and ASCE. Motion passed unanimously. The Chairman will send out a set of questions to be answered by each agency representative.

MINUTES

New Member Organizations, Requests for Membership, and status of membership. Jerry Bernard commented on the fact that the SOS is a rechartered subcommittee under ACWI, and that the SOS meetings are open to the public. He also noted that we now have nonfederal members who should bring different, fresh perspectives to the SOS. Jerry Bernard asked for the SOS to consider what other entities should be invited to participate in the SOS. Suggestions included the US Society of Dams, National Hydropower Association, ASDSO, National Association of State Engineers, River Basin Commissions, Water Users Groups, NCASI (National Council for Air and Stream Improvement).

Copies of **minutes from the previous meeting of 09/14/04** were distributed. These minutes were previously approved via electronic vote. See:

http://water.usgs.gov/wicp/acwi/sos/minutes/sos_minutes_final_9_14_2004.pdf.

RESERVOIR SEDIMENTATION SURVEYS

Jerry Bernard handed out Prospectus plus PowerPoint handout to be discussed later in the afternoon. An extensive discussion about RESIS-II occurred. Jerry Bernard passed out PowerPoint handout and made brief presentation of four alternatives. Motion 1 approved: Pursue Alt. B as short-term solution. Jerry Webb (USACE) will lead work group comprised of John Gray (USGS), Bob Stallard (USGS), Christi Young (USBR), Jerry Bernard (USDA-NRCS), Doug Dixon (EPRI) and work to see if RESIS-II data sheets (PDFs) can be brought into the NID, under the NID's existing funding mechanisms. Part of this work will be with Stallard to determine the current status of the database and its web-based development. John Potyondy (FS) noted that what is needed is for someone to perform focused analyses of the data and write a report that summarizes what the data collected from the 1920s to the present tells us. Some people have asked for output from the database: what has been done with it? Did they write reports, publish, etc.? Christi Young noted that agencies need to be submitting research proposals. Motion 2 approved: The SOS should pursue Alt. A, build on what is learned from pursuing Alt. B, and begin to seriously consider all possibilities for hosting, development, funding, etc.

Summary of Recommendations to the ACWI presented Sept. 15, 2004, by the SOS Chair.

Draft 09/14/2004 paper by Jerry Bernard (current SOS Chair) and John Gray, then SOS Chair

Implementation of the Reservoir Information System (RESIS-II) a database on storage and deposition in Federally managed reservoirs

A Decision Paper submitted to the Advisory Committee on Water Information (ACWI) from the Subcommittee on Sedimentation, September 15, 2004

WHAT IS SOUGHT? ACWI concurrence with the SOS resolution on the importance of implementing, updating, and maintaining the existing RESIS-II database as an interactive, web-based application; and assistance in developing the ways and means to implement RESIS-II.

WHAT IS RESIS-II? RESIS-II is a relational database that includes results from almost 6,000 surveys of sediment deposits in 1,816 U.S. reservoirs. Although the first survey is from 1827, most of the data post-date the early 20th century.

The Subcommittee on Sedimentation has historically coordinated the collection of reservoir sedimentation data among Federal agencies and others. The initial work in developing the database was done by the Soil

Conservation Service (now Natural Resources Conservation Service) in the early 1980's. The database, in its current form, was developed through efforts and resources of the USGS and USBR through a recommendation from the Subcommittee on Sedimentation.

WHY IS RESIS-II NEEDED? A reservoir sedimentation data system that is readily accessible is needed by natural resources decision-makers. Sediment continues to be one of the most prevalent impairments of waters in the United States, according to the USEPA. Reservoirs trap sediment from their watersheds and are reflections of the conditions of natural resources in those watersheds. Sediment deposits in reservoirs represent a loss of water capacity and may impair the safe function and operations over time. That is, reservoirs are designed to safely operate based on a certain water holding and handling capacity. When that capacity falls below a critical threshold, the safe operation and integrity of the impoundment may be in jeopardy.

There are a number of reasons that support the need for a web-based RESIS-II. Decisions are being made in many communities to maintain, alter, or rehabilitate reservoirs for continued safe operation, because they are critical sources of water, power, flood protection, recreation, and wildlife habitat. Decisions are also being made to remove some dams because of changed watershed condition, local needs, or due to increased liabilities. Sediment deposits may also sequester carbon and trap chemicals derived from watershed runoff, hence, information about the composition and (or) quality of reservoir sediment may directly affect decisions to rehabilitate impoundments.

A RESIS-II database, fully accessible and updated, will complement existing and future Federal sediment-monitoring efforts, and will provide valuable information for smaller drainage areas. If RESIS-II is implemented, it will provide the opportunity to systematically store new reservoir sedimentation surveys and assure the quality of these data.

WHAT KINDS OF INFORMATION WILL BE AVAILABLE? Initially, queries will show existing quantities of sediment in reservoirs, as well as water capacity. For the first time, Federal agencies, researchers, and the public will have access to this rich collection of resource data. For reservoirs on which multiple surveys have been conducted, rates of sediment deposition can be measured and related to watershed natural resources conditions for the period reflected by the complementary surveys. Sediment-quality or composition, including organic carbon and chemical contaminants, may also be added as inputs to the database.

WHAT WILL BE THE EARLY RESULTS? A thorough analytical synthesis of existing data will be done, with reports generated by major basin. Early analysis will reveal any data gaps, where additional surveys or other sediment data-collection efforts are needed. Existing reservoir data will also be coordinated with the National Inventory of Dams. The Homeland Security-related issue of reservoir locations will be resolved in terms of what locational information may be accessible from the RESIS-II database (e.g., latitude, longitude, town).

WHAT WILL BE NEEDED TO MAKE RESIS-II FULLY OPERATIONAL? About \$250K first year, \$150K second year and third year, about \$75K annually thereafter.

Action	Description	Requisite Funding ¹	Suggested Organization
Prepare RESIS-II for Internet access:	The database functions only as a "stand-alone" system. A web interface needs to be completed to enable searching, downloading, analysis, and for inputting new reservoir sedimentation survey data.	\$150K 1-time cost yr 1	USGS, with collaboration with USBR and USACE (NID)
Establish "ownership"	A Federal agency needs to be responsible for operating and maintaining the database.	See below	USACE, USGS, other agency?
Complete MOU	An MOU is needed overall coordination of the collection and dissemination of reservoir sedimentation survey data.	0	SOS, USGS, USACE, USBR?
Implement RESIS-II for Internet access	Setup (Server plus software) --Establish protocols for staging new input data and assuring its quality	\$ 25K 1-time cost yr 1	USGS
	Operation and Maintenance (annual)	\$ 75K	USGS
Update RESIS-II data and perform data synthesis	Obtain and input on-hand recent reservoir survey data not yet in RESIS-II. This may be done as part of implementation, but will be an	\$ 75K yr 1	USGS

	ongoing process. Data synthesis component Obtain recent reservoir sedimentation surveys from Federal agencies, coordinate submission of new data	\$75K/yr, yrs 2&3 ?0?	SOS
Future options: Add capability to store sediment quality information	Results of analysis of reservoir sediment deposits could begin to be stored systematically, including soil carbon, chemical contaminants, texture, etc.	TBD	TBD

¹Funding needs are approximate based on information available through August 2004, and will be refined when appropriate.

Reaction of ACWI to 09/14/2004 RESIS-II proposal by John Gray for the SOS, from ACWI PowerPoint file.

- ACWI received resolution on from SOS on endorsement of importance/need for Reservoir Database.
- Discussion indicated SOS should be sensitive to/clarify issues regarding:
- Water security (whether could be on line)
- Water rights issues
- ACWI approved resolution:
Motion was made by Emery and seconded by Will Thomas; all approved.

Reservoir Sedimentation Survey Data (from PowerPoint slides per Jerry Bernard)

- **OBJECTIVE:** To provide public access to reservoir sedimentation survey data.
- **ALT. A:** Implement web-based relational database.
- **ALT. B:** Post web-based searchable index with links to PDF images/files of individual reservoir survey records.
- **ALT. C:** Wrap up the database, including the database management system, and make it available on request as a CD, with caveats that no support will be provided.

- **ALT. A:** Implement web-based relational database.
 - Complete database design.
 - Complete web design for database access.
 - Host and maintain the database.
 - Provide user support
 - Be gate-keeper for new data
 - Compile reports
- **ALT. B:** Post web-based searchable index with links to PDF images/files of individual reservoir survey records.
 - Design web site to house the searchable index and PDF files.
 - Assumed no Homeland Security restrictions on posting reservoir location information. NID currently shows locations.
 - Analysis of trends or for multiple reservoirs in a river basin would be very tedious or impossible.
 - See Common Tasks for more.
- **ALT. C:** Wrap up the database, including the database management system, and make it available on request as a CD, with caveats that no support will be provided.
 - A distribution agent would be needed. Free CDs would require that the agent have a budget for people, materials, equipment, and mailing costs.
 - Future updates or new data could be offered as a free download on the SOS web site.
 - It would be possible to offer the CD itself as a freely downloadable file or set of files.

- **Common Tasks**
 - Survey data sheets currently in the relational database or as PDF files need to be checked against index.
 - Some may be missing or mislabeled.
 - Index of reservoir data sheets needs to be corrected and verified.
 - Also needs to robust enough to permit new surveys to come in.
- **Common Tasks (cont'd)**
 - Reservoir survey data are from the turn of the 20th century through the early 1980's, in general. Reservoir

- sedimentation surveys done since the early 1980's need to be collected and added to the data set.
- This would be a function of the SOS to coordinate this data collection.
 - Survey data collected since the 1980's also need to be analyzed, and reports of trends and conditions prepared and published on the SOS web site.
 - **Common Tasks (cont'd)**
 - Standards for Quality Control and Quality Assurance must be developed for newer reservoir sedimentation survey data.
 - Needed to make credible comparisons and trends.
 - Collection methods
 - Remote sensing vs. coring
 - Watershed conditions that occurred during the period of survey need to be accurately documented, including any changes in operation of the reservoir, including repairs, rehabilitation, etc.
 - **ALT. Q.** Quit and take no further action.
 - Consequences:
 - Continued ad hoc requests for information will be received by SOS members and others who have access to the database.
 - Some requests are for analysis of several to many surveys for several to many reservoirs.
 - People who currently have access to the database are approaching retirement and don't have interest in pursuing it, and don't want the hassle of ad hoc requests.
 - **ALT. Q.** Quit and take no further action.
 - Consequences (cont'd):
 - Reservoir sedimentation survey data collection, analysis, and dissemination are part of the functions in the PROSPECTUS for the SOS.
 - The public, including researchers, will not have ready access to the database.
 - The SOS can spend its time talking about doing other things.

Report on activities of Technical Committee (TC) and the Federal Interagency Sedimentation Project (FISP). Note: the TC oversees the operations of the FISP. The TC and FISP are now independent of the SOS. The purpose of this report is to communicate activities in sedimentation technology and other activities of potential mutual interest.

FISP Chief Wayne O'Neil reported that the following have been developed: (1) a handheld point-integrating sampler, (2) the US D-99 6-liter depth integrating 285-lb bag sampler can sample to depths of 200 feet and velocities up to 15 feet/second, and can be used to collect unbiased samples for trace-element analysis (3) the US DH-2 1-liter bag sampler, also applicable for trace-element data collection, can sample to depths of 35 feet.

The LISST SL (laser in situ scattering transmissometer - streamlined), developed as part of a cooperative research and development agreement between Sequoia Scientific, Inc., and the USGS, was tested by the FISP in January. Results have yet to be analyzed.

Christy Young noted that FISP has operated since 1939. FS, USGS, ARS, USBR, USACE, EPA, and BLM are current TC members (must contribute substantial funding – at least \$10,000 – to support of FISP). FISP is beginning to look at more at surrogate technologies to replace physical sediment samplers. FISP has a hand-held sampler to handle all ranges of depths and velocities. They have a recent publication on their website that describes the characteristics and operating ranges of FISP samplers.

Doug Glysson gave a brief overview of the planning for the **2006 Joint 8thFISC and 3rdFIHMC**. The meeting of 04/13/05 involves the coordinators and will result in decisions made on contracting, logistics, registration, and projected costs.

ASTM Turbidity Standards Development. Doug Glysson reported that ASTM is working on two new standards for high-level turbidity, both in static mode and in situ. The Static mode is chaired by HACH, has an approved draft standard for round-robin testing to proceed. Plans for conducting this testing are being submitted for approval, hopefully for testing to proceed this fall. The purpose of the testing is to analyze differences in results from the various turbidimeters. The *in situ* standard will not go through round-robin testing because there is no sample control (they are put into the stream directly). Settleable material is a problem in the measurements. USGS has implemented system of recording 10 new units. This is in a USGS press release. ASTM intends to present the new standard, once completed, to EPA because of the implications to laws and regulations. This applies to the NPDES permit requirements, if turbidity levels are specified. An NTU measurement, for example, must be tied to the method of measurement (one of the ten units).

Turbidity Workgroup report. The final document from 2002 workshop is USGS Circular 1250 posted at <http://water.usgs.gov/pubs/circ/2003/circ1250/>. Doug Glysson summarized the report's findings, and described significant follow-up regarding turbidity standards development, as described in the next section.

Sediment Monitoring and Data Workgroup report. John Gray gave a presentation about the National Sediment Information Program that has been proposed. There has never been a national sediment information program. 2004 estimate is that the physical, chemical, and biological damages associated with sediment in North America cost about \$20 billion annually. A North American sediment monitoring network would have at least a 40:1 Benefit-to-Cost ratio. John and others recently published an article in the October 5, 2004, issue of the American Geophysical Union's EOS on this subject. He passed out a proposal that was submitted to the U.S. Commission on Ocean Policy in June 2004, but has not received any action. This effectively suspends the function of this working group.

SOS Web Site. John provided an on-line demonstration and walk-through.
<http://water.usgs.gov/wicp/acwi/sos/>

Bureau of Reclamation research on watershed erosion modeling. Tim Randle introduced Dr. Yong Lai, who gave a detailed presentation on the capabilities and limitations of erosion and sedimentation models, with emphasis on the GSTAR-W model, with specific applications on the Goodwin Creek Watersheds in northern Mississippi.

Outcomes from the Federal Interagency Sediment Monitoring Instrument and Analysis Research Workshop <http://water.usgs.gov/pubs/circ/2005/circ1276/>. John Gray provided a summary of the workshop and passed out copies of the report. Summarized recommendations from document. He proposed that the report be submitted to the Technical Committee for their consideration in implementing any of the recommendations for two reasons: (1), the TC was a working group of the SOS when the workshop took place, and (2) the outcomes of the workshop are substantially more germane to the TC than the SOS. The fourth major recommendation – that the FISP or a FISP-type organization provide oversight for research in new technologies for monitoring and computing sediment transport, was met with skepticism by at least two SOS representatives. The sentiment expressed was that the current FISP staff may not possess the capabilities to address the very different challenges presented by sediment-surrogate technologies.

PROSPECTUS

Discussion of SOS mission, future activities, responsibilities, etc. Revisit Prospectus. "What is the SOS supposed to do? AND What is the SOS doing?" The current edition of the Prospectus is available at http://water.usgs.gov/wicp/acwi/sos/prospectus2002_2006_on-line_9_10_2004.pdf.

See **PowerPoint file** for summary by Jerry Bernard.

The following were noted during discussions:

- Prospectus is good, has many cross-cutting national issues.
- How should SOS interact with ACWI?
 - What are the limitations of the committee with regard to its structure?
- Need to address issues from non-fed members, since the existing prospectus was written 10 years ago.
- Add agenda item for next SOS meeting.
- Need clarification of functions, processes, procedures of ACWI relative to SOS.
- The prospectus needs to focus on outcomes, rather than just the activities and issues.
- Sediment issues also include efforts and technology to reduce sediment production (i.e., erosion reduction, watershed protection, etc.)
- Historic focus has been on equipment and measurement. What are the results, outcomes, etc.? We need the watershed condition information as well as the sediment measurements.
- Maybe it's time for a paradigm shift. Emphasis on equipment is gone. Focus should now be on the overall watershed concepts.
- FISP and TC activities should be removed from the prospectus.
- Revisit the issues expressed in the USGS conference, 1997 workshop results on line, and use as a basis to update the prospectus. Agencies not participating then could provide their issues in a parallel fashion. John Gray offered to edit any refinements/additions to the workshop results. <http://water.usgs.gov/osw/techniques/workshop/>
- Come to next meeting ready to discuss what each agency thinks the SOS should be doing (15minutes or less)
- Motion: Form a workgroup of three SOS representatives to draft a revised Prospectus for comment and finalization before next meeting. Proposed members of this group are the representatives from USDA, USGS, and ASCE. Motion was seconded and passed unanimously.
- Jerry will send out a set of questions to each agency representative.

NEXT SOS MEETING

The next meeting of the ACWI—Subcommittee on Sedimentation is scheduled for September 15, 2005, at USDA in Washington, DC. Please send desired agenda items to the Chair.

Overview of NRCS Stream Restoration Design Guide, Draft #1. Jerry Bernard passed out a two-pager that describes the subject document, currently out for selected peer review. He also passed out a summary document on the **Conservation Effects Assessment Project**, currently underway at USDA: <ftp://ftp-fc.sc.egov.usda.gov/NHQ/nri/web/CEAP-WAS-web-rev121004.pdf>.

USDA-NRCS
Stream Restoration Design Handbook*
DRAFT #1



*Intended to become NRCS National Engineering Handbook, Part 654 (NEH-654), when finalized.
March, 2005

The NRCS Stream Restoration Design Handbook presents engineering and ecological assessment and design tools that are applicable to any stream restoration work, whether it primarily follows natural stream restoration approaches or is strictly a structural project. This design document is currently divided into the following chapters:

- Chapter 1. Ecological and Physical Considerations for Stream Projects
- Chapter 2. Design Procedure
- Chapter 3. Goals, Objectives and Risk
- Chapter 4. Site Assessment and Investigation
- Chapter 5. Stream Hydrology
- Chapter 6. Stream Hydraulics
- Chapter 7. Channel Design
- Chapter 8. Sediment Impact Assessments
- Chapter 9. Treatment Techniques
- Chapter 10. Project Implementation
- Chapter 11. Maintenance and Monitoring
- Chapter 12. Permitting Overview
- Chapter 13. Example Projects

Although the above outline appears to be very narrative, the focus is on the "how-to". This is not a document that is meant to be read linearly as a book. This document is designed to provide the user with specific analysis and design tools. Some material is repeated within sections to provide background and context, while in other situations; reference is made to other sections.

Draft #1, dated March, 2005, is currently being reviewed by the Steering Team, ARS-NSL, NCED, and selected external peer reviewers. Draft #2, once assembled, will undergo formal NRCS review in July, 2005, including some selected agencies outside of USDA.

See also http://www.info.usda.gov/stream_restoration, Stream Corridor Restoration: Principles, Processes, and Practices, (FISRWG, 1998) NEH-653, for basic information on planning stream restorations.

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AGENDA: for Subcommittee on Sedimentation (SOS) Meeting, Reno, NV, 04/12/05

Time	Topic	Lead
9:00 am	Introductions and Welcome to Attendees	Jerry Bernard
	Logistics for the day	Doug Glysson
	New Member Organizations, Requests for Membership, and status of membership.	Jerry Bernard
	Presentation of Meeting Minutes, September 14, 2004 (see approved minutes at: http://water.usgs.gov/wicp/acwi/sos/minutes/sos_minutes_final_9_14_2004.pdf)	Jerry Bernard
	Review, Modification, and Approval of Agenda: Additions?	Jerry Bernard
10:00 am	SOS Prospectus for 2002 to 2006. This document will soon need to be updated:	Bernard
10:15 am	<i>Break</i>	
10:30 am	Summary of Recommendations to the ACWI presented Sept. 15, 2004, by the SOS Chair. Also, reactions, actions by ACWI.	John Gray
11:00 am	Report on activities of Technical Committee (TC) and the Federal Interagency Sedimentation Project (FISP).	Wayne O'Neill
Workgroup Progress Reports		
11:15 am	The 2006 Joint Conference: (<i>Restricted to critical information for those not participating in the 04/13 joint conference coordination meeting</i>) 8 th Federal Interagency Sedimentation and 3 rd Federal Interagency Hydrologic Modeling Conference (8 th FISC and 3 rd FIHMC)	Doug Glysson, Jerry Bernard
11:30 am	<i>Lunch</i>	
(Continue Workgroup Progress Reports)		
12:30 pm	ASTM Turbidity Standards Development	
12:45 pm	Turbidity Workgroup report, final document from 2002 workshop posted at http://water.usgs.gov/pubs/circ/2003/circ1250/ .	Doug Glysson
1:00 pm	Sediment Monitoring and Data Workgroup report.	John Gray
1:15pm	Reservoir Information System Part II (RESIS-II). See earlier discussion from morning session.	Jerry Bernard
1:45 pm	SOS Web Site. John provided an on-line demonstration and walk-through.	John Gray
2:00 pm	Bureau of Reclamation research on watershed erosion modeling.	Dr. Yong Lai, Tim Randle
2:30 pm	<i>Break</i>	
2:45 pm	Outcomes from the Federal Interagency Sediment Monitoring Instrument and Analysis Research Workshop http://water.usgs.gov/pubs/circ/2005/circ1276/ .	John Gray
New Business (others TBD at start of meeting)		
3:00 pm	Overview of NRCS Stream Restoration Design Guide, Draft #1	Jerry Bernard
3:20 pm	SOS and travel costs for member organizations	Jerry Bernard
3:30 pm	Loss of USGS gaging stations	John Gray
3:40 pm	Presentation of WaSSIN proposal. John discussed this in an earlier session.	John Gray
3:50 pm	Discussion of SOS mission, future activities, responsibilities, etc. Revisit Prospectus. “What is the SOS supposed to do? AND What is the SOS doing?”	SOS
	Set date and location for next SOS meeting. Also harvest agenda items.	
4:30 pm	<i>Adjourn</i>	

SOS web page: <http://water.usgs.gov/wicp/acwi/sos/>. Terms of Reference: http://water.usgs.gov/wicp/sos_TORS_9_23_2003.pdf

Status of SOS Workgroups
(at closure of the April 12, 2005, meeting)

Workgroup	Status
Technical Committee, Federal Interagency Sedimentation Project	<i>Terminated, but remains an independent committee.</i> Continued communications between SOS and TC are desired.
Joint 8 th Federal Interagency Sedimentation/3 rd Hydrologic Modeling Conferences	<i>Active</i>
Turbidity and Other Sediment Surrogates	<i>On hold, awaiting results of ASTM round-robin tests.</i>
National Sediment Monitoring Network and Federal Data Storage and Availability	<i>Suspended</i>
RESIS-II	<i>Active</i>

ROSTER, ACWI Subcommittee on Sedimentation, as of 04/12/2005

Name	Status		Organization	Mailing Address	Phone	Email Address
Bernard, Jerry	Chair	<u>1/</u>	USDA-NRCS	1400 Independence Avenue, SW, Rm 6132, Wash DC 20013	202-720-5356	jerry.bernard@usda.gov
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Vacant	Alternate		FHWA-USDOT			
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Robinson, Jim	Member		IBW Comm.	<i>Jim has left the IBWC.</i>	915-832-4152	jimrobinson@ibwe.state.gov
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Swietlik, Bill	Alternate		USEPA	1301 Constitution Avenue, NWS, Room 7233R, Wash., D.C. 20460	202-566-1129	swietlik.william@epa.gov
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Glysson, Doug	Alternate	<u>1/</u>	USGS-USDI	412 National Center, 12201 Sunrise Valley Dr., Reston VA 20192	703-648-5019	gglysson@usgs.gov

NEW MEMBERS/ALTERNATES (as of 04/12/05 Meeting)

Bradley, Jeff B.	Member	<u>1/</u>	ASCE	American Society of Civil Engineering; West Consultants, Inc., 2601 25th St. SE Suite 450, Salem, OR 97302	503-485-5490	jeffbradley@westconsultants.com
Dixon, Doug	Member	<u>1/</u>	EPRI	Electric Power Research Institute (EPRI), 7905 Berkeley Drive, Gloucester Point, VA 23062	804-642-1025	ddixon@epri.com
Goldstein, Bob	Alternate		EPRI	Electric Power Research Institute (EPRI), P.O. Box 10412, Palo Alto, CA 94303	650-855-2593	rogoldst@epri.com
Yang, C. "Ted"	Member	<u>1/</u>	CWRRI	Colorado Water Resources Research Institute, Colorado State University; Fort Collins, Colorado 80523	970-491-8160	ctyang@engr.colostate.edu
Watson, Chester C.	Alternate		CWRRI	Colorado Water Resources Research Institute, Colorado State University; Fort Collins, Colorado 80523	970-491-8313	cwatson@engr.colostate.edu
Bartholic, John	Member	<u>1/</u>	UCOWR	Universities Council on Water Resources; Institute of Water Research, Michigan State University, 115 Manly Miles Building, 1405 S. Harrison Road, East Lansing, MI 48823-5243	517-353-3742	bartholi@msu.edu
Pinter, Nicholas	Alternate		UCOWR	Universities Council on Water Resources; Dept. of Geology, Southern Illinois University Carbondale, Carbondale, IL 62901-4324	618-453-7375	npinter@siu.edu

1/ Participant in 04/12/05 Meeting.