

# Subcommittee on Sedimentation

of the

## Advisory Committee on Water Information

### Minutes of the September 14, 2004, Meeting

The Subcommittee on Sedimentation's (SOS) 2nd meeting since becoming a subcommittee under the Advisory Committee on Water Information (ACWI) was held from 9:00 a.m. to 3:30 p.m., September 14, 2004, in room 7530, U.S. Environmental Protection Agency's Ariel Rios Building, Washington, D.C. The SOS last met on January 13, 2004 (see [http://water.usgs.gov/wicp/acwi/sos/minutes/sos\\_minutes\\_final\\_1\\_13-2004.pdf](http://water.usgs.gov/wicp/acwi/sos/minutes/sos_minutes_final_1_13-2004.pdf)). The following constitutes the meeting minutes, which contain some information obtained after the meeting that was deemed relevant and appropriate.

#### SYNOPSIS OF ACTION ITEMS AND OTHER NOTABLE RESULTS

The following are provided in abbreviated format in the order in which they appear in the minutes:

1. **Next SOS Meeting:** Tuesday, April 12, 2005, Silver Legacy Hotel, Reno, Nevada.
2. **SOS Meeting Attendance:** Chairman Gray will remind members and advise prospective SOS representatives of alternative mechanisms to participate in SOS meetings.
3. **SOS Membership:** Gray will draft a letter for signature of the ACWI alternate chair Bob Hirsch and the SOS Chief encouraging ACWI member agencies and others – particularly non-Federal organizations – to consider joining the SOS.
4. **Technical Committee, Federal Interagency Sedimentation Project (FISP):** Terminated as a working group of the SOS, but continues as an independent committee to manage the FISP.
5. **National Sediment Monitoring Network and Federal Data Storage and Availability:** Gray will present the workgroup's general results to the ACWI on September 15, highlighting the need for a National Sediment Information System, with the following conclusions:
  - The SOS believes the System is important and needed.
  - If the ACWI concurs, SOS seeks counsel on how to proceed.
6. **Reservoir Information System-II (RESIS-II):** Gray will present the workgroup's findings to the ACWI on September 15, with the following proposed formal ACWI resolution:
  - Recognize the importance of implementing, updating, and maintaining a national reservoir sedimentation survey database as an interactive, web-based application.
  - Seek ACWI concurrence and support to develop the ways and means for RESIS-II implementation.
7. **SOS VISION:** SOS members will review selected papers published on-line as part of the USGS 1997 sediment workshop (<http://water.usgs.gov/osw/techniques/workshop/>); review the SOS prospectus; reconsider their agency priorities related to fluvial sediment (in any order); and submit their agency perspectives to the SOS chair. Responses are sought before December 31, 2004.

#### COMPLETE MINUTES OF THE SEPTEMBER 14, 2004, SOS MEETING

On behalf of the USEPA, Doug Norton welcomed the participants (appendix A). Chair John R. Gray led a role call of meeting participants; received approval of the agenda (appendix B); and noted that this meeting preceded the ACWI's annual meeting on September 15, at which Gray will present SOS perspectives.

**NEXT SOS MEETING:** Tuesday, April 12, 2005, Silver Legacy Hotel, Reno, Nevada.

**APPENDICES:** The appendices to these minutes are listed as follows:

- A: Meeting participants.
- B. Annotated agenda.
- C. Status of SOS workgroups at meeting closure.
- D. August 2003, letter from the Technical Committee to the SOS regarding establishment of the Technical Committee and Federal Interagency Sedimentation Project as a cooperative venture, independent from, and not linked organizationally to the SOS.

**SOS MEMBERSHIP LIST:** The list was updated based on participants' input, distributed to the full SOS as a final check, and then posted at: [http://water.usgs.gov/wicp/sed\\_sub\\_com\\_addresses\\_1\\_21\\_2004.pdf](http://water.usgs.gov/wicp/sed_sub_com_addresses_1_21_2004.pdf). The revised list will be posted before the next SOS meeting.

**SOS MEMBERSHIP:** No petitions for membership were received, although interest from the American Society of Civil Engineers Environmental and Water Research Institute, and Colorado State University, have been expressed.

Addendum 1: At the September 15 Advisory Council on Water Information (ACWI) meeting, the Interstate Commission on Water Policy, and the Electric Power Research Institute (EPRI) expressed interest in joining the SOS; EPRI followed up with an email nominating Bob Goldstein, Palo Alto, CA, and Doug Dixon, Gloucester Point, VA, to represent EPRI on the SOS. Gray responded with a summary of steps to petition for SOS membership, and a request for information from EPRI that could be distributed to the SOS. EPRI's web site is [www.epri.com](http://www.epri.com).

Addendum 2: During the meeting, ACWI alternate chair Bob Hirsch urged the SOS to aggressively solicit non-federal membership. He subsequently asked Gray to draft a letter for his and the SOS Chief's signature encouraging ACWI member agencies and others – particularly non-Federal organizations – to consider joining the SOS.

**Action:** Gray will draft a letter for signature of the ACWI alternate chair Bob Hirsch and the SOS Chief encouraging ACWI member agencies and others – particularly non-Federal organizations – to consider joining the SOS.

**ATTENDANCE AT FUTURE SOS MEETINGS:** The Terms of Reference ([http://water.usgs.gov/wicp/sos\\_TORS\\_9\\_23\\_2003.pdf](http://water.usgs.gov/wicp/sos_TORS_9_23_2003.pdf)) specify that member organizations not represented at 50% or more of the SOS meetings in a fiscal year will be removed from the membership roles. The attendees agreed that SOS seeks to be an inclusive committee. There are alternatives to membership on-site participation, including sending an alternate or another agency representative; and teleconferencing.

**Action:** Gray will remind members and advise prospective SOS representatives of alternatives for the meeting participation.

**ELECTRONIC MOTION, MAY 25, 2004:** The following electronic motion, submitted by Chairman Gray, passed unanimously: *"The SOS agrees to authorize the USGS to place the errata-corrected Proceedings of the 7 Federal Interagency Sedimentation Conference series on-line."*

All 7 FISC proceedings are on-line at: [http://water.usgs.gov/pubs/misc\\_reports/FISC\\_1947-2001/](http://water.usgs.gov/pubs/misc_reports/FISC_1947-2001/) .

## **WORKGROUP REPORTS:**

### **STATUS REPORT ON THE TECHNICAL COMMITTEE AND THE FEDERAL INTERAGENCY SEDIMENTATION PROJECT (Glysson):**

Per August 27, 2004, letter (see appendix C), the Technical Committee has formally established itself along with its subordinate Federal Interagency Sedimentation Project as an independent venture not officially linked to the SOS. The Technical Committee “looks forward to active exchange of information and working cooperatively with the SOS to improve sedimentation technology and practice.”

The SOS expressed agreement with and support for the Technical Committee’s decision.

**Action:** SOS Chairman Gray will respond to the Technical Committee by letter expressing the SOS’s agreement with and support for the Technical Committee’s decision, emphasizing SOS’s desire to maintain effective communication between the two committees.

The Technical Committee is thereby terminated as a workgroup of the SOS, but continues as an independent committee that manages the FISP.

### **JOINT 8<sup>TH</sup> FEDERAL INTERAGENCY SEDIMENTATION, AND 3<sup>RD</sup> FEDERAL INTERAGENCY HYDROLOGIC MODELING CONFERENCES (Glysson):**

Glysson reported on the recent trip that he and Paula Maker (USBR – Chair, Operations Committee) made to Reno. They met with representatives of several exhibitor contractors, the Silver Legacy, and local agency personnel. They had phone discussions with computer rental companies. They intend to select an exhibitor contractor soon.

#### General:

- The joint conference is scheduled for April 2-6, 2006, at the Silver Legacy Hotel, Reno, Nevada.
- The next planning meeting is set for April 13, 2005, at the Silver Legacy Hotel, the day after the SOS meeting at the same location. The Technical Committee, and the Subcommittee on Hydrology, may meet at the Silver Legacy Hotel also that week.
- 400-600 attendees are anticipated for the joint conference.
- Format will include 6 concurrent sessions due to 2 linked conferences.
- Proceedings - CD planned for distribution at the conference, may issue a printed version of the abstracts, Electronic proceedings will be placed on-line some time after the conference.
- A single registration fee will be charged and will permit registrants to attend both conferences
- Need to promote the soon-to-be-released “call for papers” with ASCE and other groups as appropriate

#### Thinking ahead:

- Field trips must be appropriate for early April weather (not Tahoe or high country due to snow and road closures),
- Short courses: Possible ones include University of Reno visit/view research, post-fire effects on sediment, sediment TMDL’s, sediment criteria guidance, etc. The benefits of being able to offer Continuing Education Credits for these courses was discussed. The fees for each course are determined by the instructor’s request per student plus equipment and conference overhead fees.
- Course length will be ½ to 1 day on Sunday and Thursday. Full-day courses have mainly been conducted on Sunday in past conferences.

- A decision must be made on recipient(s) for abstracts and short-course proposals (considering that concurrent conferences are being planned). Glysson will resolve this with the Joint committee.
- No 35mm or overhead projectors will be permitted. Computers and LCD-style projectors will be provided, and presenters will not be permitted to use their own laptop computer.
- The roles of participating agencies will need to be clarified at the April 2005 meeting. Those not responsible for a formal role, such as Audio-Visual Coordinator, may opt to participate by assisting at the registration desk or other activities.

**TURBIDITY AND OTHER SEDIMENT SURROGATES WORKSHOP FOLLOW-UP (Glysson):**

- Chapter 6.7 on turbidity in USGS national water quality field handbook ([http://water.usgs.gov/owq/FieldManual/Chapter6/6.7\\_contents.html](http://water.usgs.gov/owq/FieldManual/Chapter6/6.7_contents.html)) has been revised to reflect the new thinking on turbidity measurements articulated in USGS Circular 1250 (<http://water.usgs.gov/osw/techniques/turbidity.html>) and to be consistent with ASTM's efforts. ASTM standards and USGS handbook have 10 units for reporting turbidity. These units are based on each instrument's geometry and light source.
- The ASTM turbidity standard has passed subcommittee ballot, and round-robin tests are planned for this winter. These tests will include measurements of fine materials collected from different parts of the country, realizing that different mineral sources may affect turbidity readings.
- After ASTM completes their work, USEPA acceptance will be solicited. Resistance is expected due to the proposed 10 separate metrics for turbidity.

The workgroup remains in-force but on-hold, as work on development of turbidity standards proceeds through the ASTM standards development process.

**NATIONAL SEDIMENT MONITORING NETWORK AND FEDERAL DATA STORAGE AND AVAILABILITY (Gray):** Gray provided an update on workgroup and related activities since the January 2004 meeting. These include:

- Submission of an American Geophysical Union Earth Observing System (AGU-EOS) letter, "An Invitation to Participate in a North American Sediment-Monitoring Network," signed by representatives from all of the agencies represented in the last two SOS meetings. EOS has indicated that the letter will be published in its September 28 issue. The letter has 3 principal authors and 33 supporting authors, representing 4 countries, 11 Federal agencies, 9 universities, 2 non-profit and one private organization.
- The USGS developed a preliminary proposal, "Formation of a National Sediment Monitoring and Research Network," based on a request by the U.S. Commission on Ocean Policy to, "...develop a strategy for improved assessment, monitoring, research, and technology development to enhance sediment management" ([http://oceancommission.gov/documents/prepub\\_report/chapter12.pdf](http://oceancommission.gov/documents/prepub_report/chapter12.pdf)).
- Development of a summary of a "National Sediment Information Program," intended to be presented to the ACWI on September 15, 2004, as part of the SOS general presentation (available on the SOS web site).

The number of USGS gauging stations operated to produce daily-value sediment data in the United States is about a quarter of the 360 stations operated in the early 1980's, and is at a level similar to that in the late 1940's. According to a paper by the USGS and ARS (1998), sediment damages in North America total about \$16 billion (about three-fourths of which is estimated to be applicable to the United States) annually. Hence, a 1% reduction in sediment damages through better management in the US, based on an

NSMIAR Program, would yield benefits over the annual costs by at least an order of magnitude, and as much as 40-fold, depending on the ultimate cost of the program.

Regarding an observation that “these data are expensive to collect,” and a question regarding, “who needs these data, and for what use?” Gray observed that one of the principal beneficiaries would be USEPA’s Total Maximum Daily Program (Bill Swietlik later stated that ‘clean’ sediment is considered to be USEPA’s top-priority pollutant) but that a national timeseries of sediment data collected on consistent protocols would be beneficial to a large number of additional concerns, including contaminated sediment management, best-management practices evaluations, stream restoration endeavors, ecological assessments, productivity of agricultural lands, dam decommissioning, rehabilitation, or removal, and fire-burn hydrology assessments. The accuracy of model simulations, such as the USGS SPARROW model, is dependent on the availability of a sufficient amount of reliable data.

Regarding the concern that the derivative data may not be readily available to a national audience, Gray noted that the USGS National Water Information System is set up to be able to store such data and is already available on-line.

It was suggested that this concept be considered starting with a user-needs assessment as the first step.

**Action:** Gray will present the workgroup’s general results to the ACWI, highlighting the need for a National Sediment Information System (or another entity that fulfills that role), with the following conclusions:

- The SOS believes that a National Sediment Information System is important and needed.
- If the ACWI concurs, SOS seeks counsel on how to proceed to that end.

The workgroup will remain active until further notice.

**RESERVOIR INFORMATION SYSTEM II (RESIS-II) (Bernard):** Bernard, with assistance from Gray developed a 2-page summary of the RESIS-II effort, “Implementation of the Reservoir Information System (RESIS-II) (shown in appendix D) in part with information provided by the USGS’s Bob Stallard (RESIS-II developer with support from the Bureau of Reclamation). Key points made in this summary:

- RESIS-II exists and has been ported to a relational database, but requires refinement and updating before it can be placed on-line.
- The Homeland Security issue will be resolved in terms of what locational information will be approved for release.
- An analysis of the database through about 1985 reveals that, not surprisingly, reservoir storage is being lost with time, particularly as a percentage of storage in smaller reservoirs.
- The following general steps are required to implement RESIS-II:
  1. Establish ownership of the database and related software (single most important requirement).
  2. Develop data-entry and quality-assurance protocols.
  3. Update the graphical user interface and place RESIS-II on-line, consistent with security issues.
  4. Maintain and update the database.
  5. Perform additional data syntheses with the database.
  6. In the future, include sediment-quality information as deemed appropriate.
- Cost are estimated to total \$250K in the first year, \$150K for each of years 2 and 3, and \$75K in outyears to maintain and update the program.

**Action:** Gray will present the workgroup’s findings to the ACWI, concluding with the following proposed formal ACWI resolution:

- Recognize the importance of implanting, updating, and maintaining an existing national reservoir sedimentation survey database as an interactive, web-based application.
- Seek ACWI concurrence and support to develop the ways and means for RESIS-II implementation.

The workgroup will remain active until further notice.

**OUTCOMES OF THE SEDIMENT MONITORING INSTRUMENT AND ANALYSIS RESEARCH WORKSHOP, SEPTEMBER 9-11, 2003 (the following was not presented in the meeting due to time limitations):**

The report for the subject workshop (<http://water.usgs.gov/osw/techniques/sediment/sedsurrogate2003workshop.html>), intended to be released as a USGS Circular, is in review. A full summary, including copies of the report and an on-line version, should be available at the next SOS meeting.

The over-arching recommendations to the SOS in the draft report are as follows:

**Recommendations:**

1. **RESEARCH:** Coordinated research in all sedimentary phases, but particularly on bedload, and for storage and computational techniques, is recommended. This includes basic process-based research, along with research on collection, analysis, and computational procedures.
2. **FLUVIAL-SEDIMENT TIME-SERIES DATA:** Emphasis, effort, and funding should be directed toward collection of time-series data representing substantial quantities of material in transport in each of the fluvial-sediment categories for storage and computation of flux and other characteristics. The data need to be supported by protocols for their collection, analysis, and storage; and comparative accuracy criteria. Most, if not all, data should be associated with a quantitative uncertainty value. The data should be evaluated with respect to traditional technologies, where feasible. These data should be applied to improve estimates of fluxes, particle-size distributions, and other sediment characteristics from models. Clearinghouses for data, tools, and models are needed.
3. **SEDIMENT-SURROGATE TECHNOLOGIES:** Several of the technologies presented at the workshop were considered sufficiently compelling and potentially fruitful to warrant research, testing, and calibration. They should be prioritized and those ranking high in priority, evaluated. Evaluations should be made against absolute standards where possible, but also against traditional data-collection techniques, where feasible. These efforts should be done as part of a formal program such as that described by Gray and Glysson, “Attributes for a Sediment Monitoring Instrument and Analysis Program” ([http://water.usgs.gov/osw/techniques/sediment/sedsurrogate2003workshop/gray\\_glysson.pdf](http://water.usgs.gov/osw/techniques/sediment/sedsurrogate2003workshop/gray_glysson.pdf)).
4. **SEDIMENT MONITORING INSTRUMENT AND ANALYSIS RESEARCH PROGRAM (SMIARP):** Formalize formation of a SMIARP, or a program that contains the major elements of the SMIARP referred to above. Arrange for the Federal Interagency Sedimentation Project, or another sufficiently capable organization to oversee and coordinate the SMIARP.

**ELECTION OF SOS VICE-CHAIR:** Per vote on January 13, 2004, Jerry Bernard, USDA-NRCS, will take over as Chair on October 1, 2004, and Jim Renthal, BLM, will serve as the Vice Chair starting that day. Outgoing Chair Gray thanked the membership for their support over the 2-year period that he chaired the SOS.

**OTHER BUSINESS:**

**SOS VISION, PROSPECTUS, 1997 USGS SEDIMENT WORKSHOP:** With the Technical Committee and Federal Interagency Sedimentation Project no longer organizationally linked to the SOS, Gray noted that the SOS should be able to better focus its energies and resources to:

1. Identifying the Nation's major sediment-related problems in the 21'st century,
2. Endeavoring to coordinate and pool Federal resources to effectively address high-priority problems, and
3. Remain the primary mechanism for interagency communication and coordination on national sedimentation issues.

Gray noted that the original draft of the SOS prospectus for the period 2002-2006 ([http://water.usgs.gov/wicp/acwi/sos/prospectus2002\\_2006\\_on-line\\_9\\_10\\_2004.pdf](http://water.usgs.gov/wicp/acwi/sos/prospectus2002_2006_on-line_9_10_2004.pdf)) was developed in 1996, and that the SOS made some modifications to the document in 2003. Even though the prospectus is 'in force' through 2006, the mission of the Technical Committee (which is no longer formally affiliated with the SOS) is apparent in the prospectus. Although instrument development and calibration remain key elements for acquiring quality-assured fluvial-sediment data, they should be addressed by the Technical Committee, and hence, the SOS may not need no longer list these as major elements in the prospectus.

A USGS sediment conference was held in 1997 and included perspectives from several agencies regarding fluvial sediment (<http://water.usgs.gov/osw/techniques/workshop/>).

**Action:** SOS members will review selected papers published on-line as part of the USGS 1997 sediment workshop (<http://water.usgs.gov/osw/techniques/workshop/>); review the SOS prospectus; reconsider their agency priorities related to fluvial sediment (in any order); and submit their agency perspectives to the SOS chair. Responses are sought before December 31, 2004.

**NATIONAL STRATEGY FOR THE DEVELOPMENT OF SUSPENDED AND BEDDED SEDIMENT (SABS) CRITERIA (SEE APPENDIX E):** Guest Bill Swietlik summarized the SABS effort. Potential roles for the SOS/ACWI to play: provide feedback on strategy, possibly initiate a workgroup on the topic, assist in getting tools approved, evaluate appropriate differences for suitable criteria by water body. Swietlik will include the SOS in the strategy review, January-March, 2005. (<http://water.usgs.gov/osw/techniques/TSS/swietlik.pdf>)

**CONSERVATION EFFECTS ASSESSMENT PROJECT (CEAP) (SEE APPENDIX F):** Bernard handed out a map showing locations of watersheds where assessments of the effects of conservation practices are being conducted through 2006, in support of the CEAP. This effort is being led by the USDA-NRCS, and will submit reports to Congress and OMB on the effects of conservation practices and programs, especially those for the 2002 Farm Bill. Modeling and monitoring activities in the watersheds include assessment of the effects of conservation practices on sediment production and transport. Information and results from the watershed studies will also be used to support and improve an National Assessment of effects, which is also being done, using existing and especially collected NRI data, watershed models, and GIS. (<http://www.nrcs.usda.gov/technical/nri/ceap/>)

**CANAAN VALLEY INSTITUTE (CVI) SEDIMENT WORKSHOP REPORT:** Doug Norton reported that the CVI ([http://www.canaanvi.org/canaanvi\\_web/index.aspx](http://www.canaanvi.org/canaanvi_web/index.aspx)) hosted a week-long workshop in Davis, West Virginia, on sediment assessment, monitoring and geomorphic analysis of streams. The 40 participants included approximately 1/2 state technical staff, 1/4 federal agency staff, and 1/4 private/other. Three days of field technique centered mainly on protocols for obtaining channel metrics and sediment monitoring approaches. The indoor program included presentations on FISP sediment samplers (also demonstrated in the field), EPA's Stressor Identification process and web-based tools, and WARSSS, EPA's draft sediment assessment on-line framework (see next business item).

**WATERSHED ASSESSMENT FOR RIVER STABILITY AND SEDIMENT SUPPLY (WARSSS) BETA TEST:** Doug Norton reported on the EPA's progress toward completing the WARSSS on-line sediment assessment framework. WARSSS is a three-phase assessment protocol that was designed to help identify and quantify where possible the total sediment loads and major sources for sediment-impaired waters needing TMDLs or other solutions. The website is still in draft at <http://www.tetratetech.com/warsss/>, and is also available in very limited quantities as a CD for beta-testing feedback before 10/31/04. CDs were provided on request to SOS members. WARSSS was successfully peer-reviewed in 2003 as a paper document but EPA is requesting additional feedback to evaluate and improve the WARSSS web-based design and functionality.

**INTERNATIONAL ACTIVITIES (the following expands on brief statements made in the meeting):** Gray and Bernard will participate in the 9<sup>th</sup> International Symposium on River Sedimentation, Oct. 18-21, Yichang, China (<http://www.irtces.org/issahu/9ISRS.htm>). Gray will also participate in formation of the World Association for Sedimentation & Erosion Research (<http://www.irtces.org/irtces/WASER-en.pdf>), October 16, Beijing, during which he will present the concepts for an International Watershed Research Network (<http://water.usgs.gov/osw/techniques/china.pdf>), and a Bedload Research International Cooperative (<http://water.usgs.gov/osw/techniques/sediment/bedload.html>). The relevance of these activities to the SOS, if any, will be presented at the April 2005 meeting.

## **APPENDICES:**

### **APPENDIX A: Participants in the September 14, 2004, Subcommittee on Sedimentation Meeting.**

- ARS Jerry Ritchie (filling in for member Mark Weltz)
- BLM Jim Renthal (member)
- BOR Christi Young (alternate)
- FS Chris Knopp (member)
- NPS Doug Curtis (alternate)
- NRCS Jerry Bernard (member)
- USACE Thad Pratt (alternate, by telephone)
- USEPA Doug Norton (member)  
Bill Swietlik (alternate, part of meeting)  
Randall Wentsal (guest, part of meeting)  
Robert Cantilli (guest, part of meeting)
- USGS John Gray (member)  
Doug Glysson (alternate)

**APPENDIX B: Final agenda for the September 14, 2004, Subcommittee on Sedimentation Meeting.**

<b>Time</b>	<b>Topic</b>	<b>Lead</b>
9:00 a.m.	Welcome to the U.S. Environmental Protection Agency	Doug Norton
9:05	Introduction and Welcome to Attendees	John Gray
9:10	Review and Approval of Agenda	Gray
9:20	Approval of Meeting Minutes, January 13, 2004 (see: <a href="http://water.usgs.gov/wicp/acwi/sos/minutes/sos_minutes_draft_2_2_2004.pdf">http://water.usgs.gov/wicp/acwi/sos/minutes/sos_minutes_draft_2_2_2004.pdf</a> )	Gray
9:30	SOS Membership (existing, petitions for new members)	Gray
9:45	Status of SOS and Workgroup Progress Reports	Gray
9:50	Technical Committee and FISP	Steve Blanchard
10:05	8 <sup>th</sup> Federal Interagency Sedimentation and 3 <sup>rd</sup> Federal Interagency Hydro. Modeling Conf.	Doug Glysson, Jerry Bernard
10:30	Turbidity Workgroup report	Glysson
10:45	Break (Continue Workgroup Progress Reports)	
11:00	Sediment Monitoring and Data Workgroup report	Gray
11:20	Reservoir Information System Part II (RESIS-II)	Bernard
11:45	Lunch	
12:45 p.m.	SOS Web Site Current Future	Gray demo Glysson
1:00	Outcomes from the Federal Interagency Sediment Monitoring Instrument and Analysis Research Workshop	Gray
1:15	Developing Water Quality Criteria for Suspended and Bedded Sediments (need verification on this f/EPA)	Norton/Bill Swietlik
1:45	New Business (tbd) and discussion of SOS future	SOS
2:30	Summary of Recommendations to the ACWI to be presented Sept. 15 by the SOS Chair	Gray
3:15	Election of SOS Vice Chair (Oct. 1, Bernard is Chair)	SOS
3:30	Adjourn	

**APPENDIX C: Status of SOS Workgroups at closure of the September 14, 2004, meeting.**

1. Technical Committee, Federal Interagency Sedimentation Project: *Terminated but remains an independent committee.*
2. Joint 8<sup>th</sup> Federal Interagency Sedimentation/3<sup>rd</sup> Hydrologic Modeling Conferences: *Active.*
3. Turbidity and Other Sediment Surrogates: *On hold awaiting results of ASTM round-robin tests.*
4. National Sediment Monitoring Network and Federal Data Storage and Availability: *Active.*
5. RESIS-II: *Active.*

**APPENDIX D: Implementation of the Reservoir Information System (RESIS-II), a Database on Storage and Deposition in Federally Managed Reservoirs: Contents of a 2-page decision paper approved by the SOS on September 14, 2004; distributed to the ACWI that afternoon; and presented to the ACWI the following day by Chairman Gray:**

**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 20<sup>th</sup> 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 <sup>1</sup>	Suggested Organization
<b>Prepare RESIS-II for Internet access:</b>	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)
<b>Establish “ownership”</b>	A Federal agency needs to be responsible for operating and maintaining the database.	See below	USACE, USGS, other agency?
<b>Complete MOU</b>	An MOU is needed overall coordination of the collection and dissemination of reservoir sedimentation survey data.	0	SOS, USGS, USACE, USBR?
<b>Implement RESIS-II for Internet access</b>	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
<b>Update RESIS-II data and perform data synthesis</b>	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 ongoing process.	\$ 75K yr 1	USGS
	Data synthesis component		
	Obtain recent reservoir sedimentation surveys from Federal agencies, coordinate submission of new data	\$75K/yr, yrs 2&3  ?0?	SOS
<b>Future options: Add capability to store sediment quality information</b>	Results of analysis of reservoir sediment deposits could begin to be stored systematically, including soil carbon, chemical contaminants, texture, etc.	TBD	TBD

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

**APPENDIX E: National Strategy for the Development of Suspended and Bedded Sediment (SABS)**

Criteria:



**National Strategy for the Development of Suspended and Bedded Sediment (SABS) Criteria**

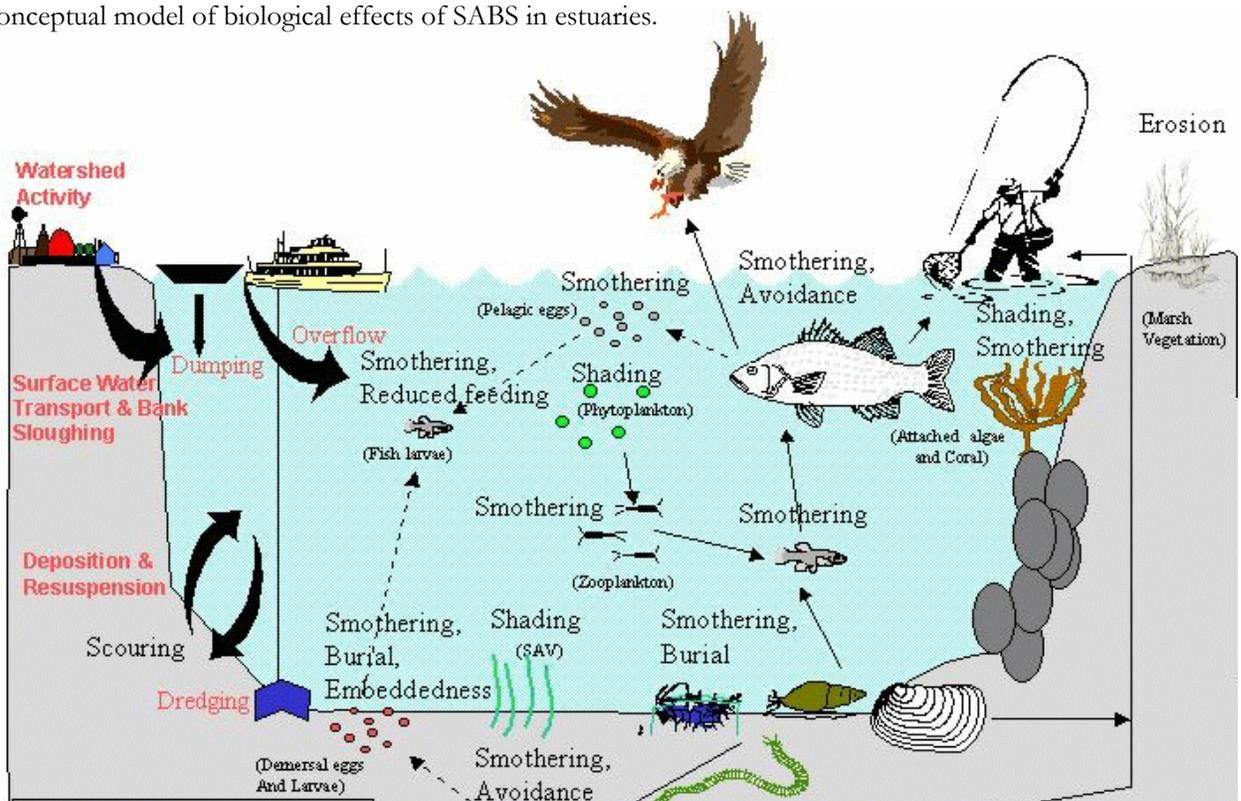
The U.S. Environmental Protection Agency (EPA) intends to publish a draft *National Strategy for the Development of Suspended and Bedded Sediment (SABS) Criteria* in December 2004. A number of States have identified the specific measurements and levels at which sediment impairment occurs in their waters, but many have not adopted such sediment criteria into their water quality standards. As a result, SABS problems are underestimated and the response authorities of the Clean Water Act and other laws are not fully engaged. The *Strategy* will describe approaches EPA is taking to

- 1) develop scientific information relating to SABS imbalance in the Nation's surface waters (i.e., water quality criteria pursuant to Section 304(a) of the Clean Water Act), and
- 2) work with States and Tribes to assure adoption of SABS criteria into water quality standards pursuant to Section 303(c) of the Clean Water Act.

***Ecological Effects of Excessive SABS***

Suspended Sediments	Bedded Sediments
Decreased light penetration reduces primary productivity.	In large amounts, bedded sediments can bury and smother infaunal or epibenthic organisms and demersal eggs.
Increased turbidity reduces visual acuity and capture success for predators and foragers, stimulates drifting behavior in macroinvertebrates, reduces habitat suitability and habitat range for organisms that require clear water.	In smaller amounts, excess fine sediments can fill in gaps between larger substrate particles, embedding the larger particles and eliminating interstitial spaces that would otherwise be used as habitat for reproduction, feeding, and refugia for invertebrates and fish.
At high levels, suspended sediment can clog and abrade filtration and respiratory organs.	

SABS are natural components of all aquatic habitats. However, an imbalance of sediments resulting from human activities can impact the ecological integrity of water resources at several scales and trophic levels, as illustrated below by the conceptual model of biological effects of SABS in estuaries.



## Major Elements of the Strategy

- Description of actions to be taken by the EPA, States, Tribes, and Territories towards developing criteria, adopting criteria into water quality standards, and managing for SABS.
- Identification of appropriate indicators of water resource impairment due to SABS imbalances. Indicators may be direct measures of SABS, their effects on biota, or sources of SABS imbalances.
- Stratification of waterbodies by type (streams, rivers, lakes, estuaries, wetlands and coastal waters), region, and designated uses for the development of SABS criteria that are sensitive to natural variability. Further classification within any of the waterbody types and regions may also be required. For instance, different criteria may be established for high-gradient cobble-bottomed streams than for low-gradient, slow, winding streams in the Mid-Atlantic region.
- Development of a series of analytical approaches and technical tools for deriving sediment criteria specific to a region, waterbody-type, and designated use. Numerical ranges of sediment criteria may be proposed, though it is expected that States and Tribes will develop specific criteria to be incorporated into water quality standards. The water quality standards will provide a basis for a range of pollution control activities, including total maximum daily loads (TMDLs).
- Establishment of resources from which States and Tribes can find assistance for deriving SABS criteria. Resources may include regional technical advisory groups, a website for communicating and disseminating analytical tools, and a case study for illustrating sediment criteria development through theoretical and actual examples.



## Outline of Actions

The EPA will expect all States and Tribes to adopt and implement numerical sediment criteria into their water quality standards at some future date. States and Tribes may accomplish this by developing their own regional criteria values in watersheds where applicable data are available or by using proposed EPA target SABS ranges. EPA will review the new or revised standards under Section 303(c)(3) of the Clean Water Act. EPA will initiate rulemaking to promulgate sediment criteria appropriate to the region and waterbody types if the Agency

- 1) disapproves of the new or revised standard submitted by a State or Tribe (e.g., because it is not scientifically defensible or is not protective of designated uses), or
- 2) determines that a new or revised standard is necessary for a State or Tribe (e.g., because the State or Tribe has not demonstrated reasonable progress toward developing numerical sediment standards).

Any resulting water quality standard would apply until the State or Tribe adopts, and EPA approves, a revised standard.

## Recommendations of the Science Advisory Board

The EPA Science Advisory Board recommended that several approaches to SABS criteria development (see box at right) should be synthesized in an overall approach that can identify impaired SABS conditions as compared to appropriate reference conditions. The Board also found the conditional probability approach was advantageous because it inherently includes statements of uncertainty, which were considered essential for models, management, and evaluation. Several different criteria or indicators would be needed to deal with natural variability in sediments between waterbody types and classes within those types. Criteria should be clearly linked to biological impairment except where they are developed for management purposes (classifying on water body function and designated uses). The Board recommended that methods must be practical, understandable, and consistent across the country. The EPA should assume a supervisory role in defining criteria, especially near jurisdictional boundaries.

### Approaches to Development of SABS Criteria

Reference Conditions  
Conditional Probability  
Toxicological Dose/Response  
Relative Bed Stability  
Fluvial Geomorphology  
Functional Waterbody Uses

### SABS Indicators

Turbidity  
Suspended Solids  
Light Penetration  
Embeddedness  
Percent Fine Sediments  
(surface area or volume)  
Substrate Stability  
Channel Measures  
Shoreline Measures  
Biotic Indicators

## Additional Information

The draft *Strategy* is under development and will not be available until December 2004, at which time it will be published in the Federal Register and on the EPA website. A public comment period will follow publication of the draft. For more information, contact Randy Wentzel, Health and Ecological Criteria Division, wentsel.randy@epa.gov.

**APPENDIX F: CONSERVATION EFFECTS ASSESSMENT PROJECT (CEAP): WATERSHED STUDIES COMPONENT, 2004:**

