

SUBCOMMITTEE on SEDIMENTATION
Advisory Committee on Water Information
Meeting Minutes
Tuesday, April 24, 2018

Meeting Host

Bureau of Land Management
 20 M Street SE
 Washington, DC 20003

Roll Call

Subcommittee on Sedimentation (SOS) Chair, Eddy Langendoen, called the meeting to order and began with a roll call of member organizations.

Organization	Representatives	Mailing Address
American Society of Civil Engineers (ASCE)	Absent	American Society of Civil Engineers; West Consultants, Inc., 2601 25th St. SE Suite 450, Salem, OR 97302
Colorado Water Resources Research Institute (CWRI)	Peter Nelson	Colorado Water Resources Research Institute, Colorado State University; 1372 Campus Delivery, Fort Collins, Colorado 80523-1372
Consortium of Universities for the Advancement of Hydrologic Sciences, Inc. (CUAHSI)	Absent	The Consortium of Universities for the Advancement of Hydrologic Science, Inc., Executive Director, CUAHSI Cambridge, MA
Cooperative Institute for Research in Environmental Sciences (CIRES)	Absent	Cooperative Institute for Research in Environmental Sciences, 216 UCB University of Colorado Boulder, CO 80309
DOI - Bureau of Land Management (BLM)	Doug Curtis	Water Resources Specialist Bureau of Land Management Environmental Quality and Protection 20 M St., SE, Room 5282 Washington, DC 20003
	Bob Boyd Scott Davis	Bureau of Land Management Denver Federal Center, Building 50 Denver CO 80225-0047
DOI - Bureau of Reclamation (USBR)	Tim Randle Jennifer Bountry	Bureau of Reclamation Denver Federal Center, Building 67 PO Box 25007, 86-68240 Denver CO 80225
DOI - National Park Service (NPS)	Absent	National Park Service, 1201 Oakridge Drive Suite 250, Fort Collins CO 80526

Organization	Representatives	Mailing Address
DOI - U.S. Geological Survey (USGS)	Tim Straub Molly Wood	U.S. Geological Survey, 405 N. Goodwin Avenue Urbana IL 61801
DOT - Federal Highway Administration (FHWA)	Absent	Federal Highway Administration, Central Federal Lands Division, 12300 West Dakota Ave., Suite 340, Lakewood, CO 80228
Federal Energy Regulatory Commission (FERC)	Absent	Federal Energy Regulatory Commission, Division of Hydropower Licensing, 888 First St. NE, Washington, D.C., 20426
Missouri Water Resources Research Center (MWRRC)	Amanda Cox	Missouri Water Resources Research Center, Saint Louis University, 3450 Lindell Blvd, Saint Louis, Missouri 83103
NOAA - National Marine Fisheries Service (NMFS)	Matt Collins	NOAA Fisheries, 55 Great Republic Drive Gloucester, MA 01930-2276
Tennessee Valley Authority (TVA)	Absent	Tennessee Valley Authority, Dam Safety Governance & Oversight, WT 10C-K, 400 W. Summit Hill Dr., Knoxville, TN 37902
U.S. Army Corps of Engineers (USACE)	Paul M. Boyd	River and Reservoir Engineering Section, U.S. Army Corps of Engineers - Omaha District, 1616 Capitol Avenue, Suite 9000, Omaha, Nebraska 68102
U.S. Environmental Protection Agency (USEPA)	Joseph Schubauer- Berigan	Chief, Environmental Stressors Management Branch, U.S. Environmental Protection Agency, Office of Research and Development, National Risk Management Research Laboratory, 26 W. Martin Luther King Drive, Cincinnati, OH 45268
USDA - Agricultural Research Service (ARS)	Eddy Langendoen	Agricultural Research Service; United States Department of Agriculture; Watershed Physical Processes Research Unit; 598 MC ELROY DRIVE Oxford, MS 38655
USDA - Forest Service (USFS)	Dan Cenderelli Steven Yochum	U.S. Forest Service, Fluvial Geomorphologist/Hydrologist, National Stream and Aquatic Ecology Center
USDA - Natural Resource Conservation Service (NRCS)	Jo Johnson Jon Fripp	National Resources Conservation Service, NDCSMC, 501 W. Felix St., Fort Worth, TX 76115
U.S. Society on Dams (USSD)	Marty Teal	USSD; WEST Consultants, Inc., 11440 W Bernardo Court, Suite 360, San Diego, CA 92127- 1644

The people attending in person at the Bureau of Land Management Offices at 201 M Street SE, Washington, D.C. included Doug Curtis, Amanda Cox, Paul M. Boyd, Eddy Langendoen, Jo Johnson, and Marty Teal. Everyone else participated remotely by phone and internet.

Update list of USACE members – Paul Boyd – Primary, Sean Smith – Secondary, remove Keith Flowers and John Remus.

Subcommittee on Sedimentation Member Reports

The SOS asked a representative from each organization to describe their recent sediment-related activities and agency needs.

DOI - Bureau of Land Management (Bob Boyd)

- Colorado River sediment transport model for salinity control program in partnership with ARS.
- Controlling terrestrial sources.
- Monitoring is underfunded due to budget cuts (just a couple of gages left).

USDA - Agricultural Research Service (Eddy Langendoen)

- Continuing improvements to USDA watershed-, field-, and channel-scale computer models:
 - SWAT - Soil and Water Assessment Tool
 - AnnAGNPS - Annualized Agricultural Non-Point Source
 - KINeros – KINematic runoff and EROSION
 - RHEM – Rangeland Hydrology and Erosion Model
 - *WEPP – Watershed Erosion Prediction Project
 - *RUSLE2 – Revised Universal Soil Loss Equation
 - APEX – Agricultural Policy Environmental Extender
 - CONCEPTS – CONservational Channel Evolution and Pollutant Transport System
- *NRCS is replacing RUSLE2 with WEPP for conservation planning.
- Improved relations and measurement techniques for soil resistance-to-erosion parameters.
- New transport relationship for mixed sand and gravel streambeds that uniquely relates transport rate to bed topography and roughness.
- Continuing advancement of surrogate bed-load measurement techniques: impact plates and sediment generated noise.

Missouri Water Resources Research Center (Amanda Cox)

- Finished project to estimate suspended sediment transport. 30x30m via remote sensing. Spatial resolution good but temporal resolution has issues (satellites pass every 16 days)
- Prepared some sediment budgeting with good results.
- Evaluating using laser diffraction instrument (i.e. LISST) for particle size distribution and concentrations.

NOAA - National Marine Fisheries Service (Matt Collins)

- Large dam removal sediment release in Maryland using multiple survey methods for pre- and post-removal.
- West coast looking at San Clemente Dam removal. Focus is on fish passage and dam removal.

DOI - U.S. Geological Survey (Molly Wood)

- National prediction tool for erosion and sedimentation is to be tied in with National Water Model.
- Evaluating existing modeling tools and platforms and sediment fingerprinting tools.
- Internal workgroup on acoustic measuring devices.

U.S. Army Corps of Engineers (Paul M. Boyd)

- EM 1110-2-4000 Reservoir Sediment Studies progress has slowed due to funding. Expect to review in FY19.
- Comparing survey methodologies at Tri-Lakes Denver report is in progress
- Reservoir Sedimentation – collaborative pressure flushing study with USBR.

- Mr. Dalton noted at research meeting the need to identify reservoirs of concern – may be upcoming projects on that in FY19. Possible plus up for reservoir surveys in FY19/20.
- Hydrologic Engineering Center – River System Analysis (HEC-RAS) and ADaptive Hydraulics model system (ADH) development of model functionality for Reservoirs – refinement of Bank Stability and Toe Erosion Model (BSTEM) functionality in RAS.
- Reservoir Analogues Research Group (RARG) meeting – support and approval of Engineer Research and Development Center (ERDC) led reservoir flushing research unit.
- Reservoir Sedimentation Information (RSI)/Sediment yield from watersheds as it relates to infrastructure vulnerability assessment continuing
- Regional Sediment Management (RSM) program continues to fund sediment projects from all districts and labs.
- RSM-U has hosted a thin-layer placement and reservoir sedimentation workshops in 2017 and in 2018 will host a Reservoir Sediment Management for Engineers in Kansas City, June 2018.
- Section 1122 from (Water Resources Development Act (WRDA) 2016 – Beneficial Use of Dredge Material – submissions from private sponsors for 10 pilot projects, currently being identified by USACE Headquarters.
- Coordination of Reservoir discharge permitting between state regulatory offices.
- USACE has developed a river engineering curriculum with Tulane University, New Orleans. Aim to get a river engineering certificate, graduate credit.

USDA - Forest Service (Dan Cenderelli and Steven Yochum)

- Updating sediment transport model Bedload Assessment for Gravel-bed Streams (BAGS) and applying to case studies
- Stream restoration projects in National Forest
- New webinar series this year
- Research on Best Management Practices (BMP) for sediment from roads into streams.
- Wildfire research, erosion from post-burn areas and mitigation of these areas.
- Post fire treatments.
- Changing infrastructure to accommodate increased discharge and sediment load.
- Bedload database in the works.
- Several dam removal projects – modeling to predict sediment transport rates.
- Watershed project with municipalities to reduce wildfire hazard risk with a goal to reduce sediment delivery to reservoirs.
- Agency has moved away from numerical modeling in the past 5+ years.
- Working with Kristin Bunte at Colorado State University (CSU) for bedload measurement
- Bedload transport database project ongoing (Rosgen measurements)
- Some dam removal studies.
- Partnerships with municipalities on sediment management practices (Denver Water Board)
- Managing watersheds above reservoirs.

USDA – Natural Resources Conservation Service (Jo Johnson and Jon Fripp)

- A lot of funding for sediment through Watershed Operations Program – planning, design, and construction of small dams and watershed projects. \$150M for FY18, but with decrease in staffing and other limitations, trying to find ways to get the work done.
- Jon Fripp needs technical support on survey scope for Arghandahb dam.
- Stream restoration projects using RAS.

- Working on a United States Agency for International Development (USAID) project in Pakistan with significant sedimentation issues.

DOI - Bureau of Reclamation (Tim Randle)

Sediment-related activities:

- Completed “Adaptive Sediment Management Program Final Report for the Elwha River Restoration Project” (Bountry et al., 2018)
- Completed “Dam Removal Analysis Guidelines for Sediment” (Randle and Bountry, 2017)
- Rio Grande studies in New Mexico, including channel realignment upstream from Elephant Butte Reservoir
- San Joaquin River restoration, California
- Trinity River restoration
- Columbia and Snake River Tributaries: various fish habitat restoration projects
- Reservoir surveys
- Paonia Reservoir sediment management investigations
- Pipeline scour estimates (Navajo-Gallup and Pojoaque Regional Water Supply projects)
- Flood hazard guidelines for Colorado
- On-going Research and Development:
 - Numerical Modeling and Prediction
 - Reservoir sediment pressure flushing
 - Reservoir sedimentation prediction
 - Integrate Sedimentation and River Hydraulics (SRH)-2D into international River Interface Cooperative (iRIC) river simulation framework
 - Simulate observed patterns of gravel dispersion
 - Simulation of Large Wood Structures in SRH-2D
 - 3D Modeling Tools for Rivers with Complex In-Stream Structure
 - SRH-3D model for reservoir sedimentation simulation
 - Improvement in the accuracy and speed of riparian vegetation simulation
 - Mercury transport and transformation processes at reservoirs
 - 2D mesh generation
 - Model uncertainty
 - Remote Sensing of Vegetation Roughness
 - Sediment Measurement
 - Development of Acoustic Doppler Current Profilers (ADCP) software tools for processing of bathymetry and discharge data
 - Acoustic Doppler for monitoring suspended sediment
 - Measuring bed load with hydrophones
 - Elwha Bedload Impact Plate System - accelerometers
 - Ephemeral Tributary Sediment Transport Measurement
 - Using beryllium-10 derived erosion rates as a proxy for reservoir sedimentation
 - Reservoir Sediment Management
 - Pilot Studies of Reservoir Sustainability Options - Flushing and Sluicing
 - RSI Database
 - Time-Based Estimation of Reservoir Sedimentation Impacts
 - Design
 - Design of Low-Flow Ecosystem Features for Urban Flood Control Structures

Future Reclamation sediment needs:

- Reservoir sediment monitoring program
- Methods to estimate reservoir sedimentation prior to measurement
- Sustainable reservoir sedimentation management practices
- More robust 2D and 3D sediment transport models

U.S. Society on Dams (USSD) Membership Vote

The U.S. Society on Dams applied for Subcommittee membership. The USSD representative, Marty Teal, provided a brief overview of the mission of USSD. Tim Randle motioned to add the USSD as a Member of the SOS and Amanda Cox seconded. Unanimous vote to include USSD as a member.

SEDimentation and HYDrologic Modeling (SEDHYD) 2019 Planning

The SEDHYD 2019 Conference will be at the Peppermill Hotel in Reno, Nevada, June 24-28, 2019. The conference theme is “Improving Resiliency and Sustainability of Watershed Resources and Infrastructure.” Tim Randle reviewed the latest organizational chart for the conference planning committee (see figure).

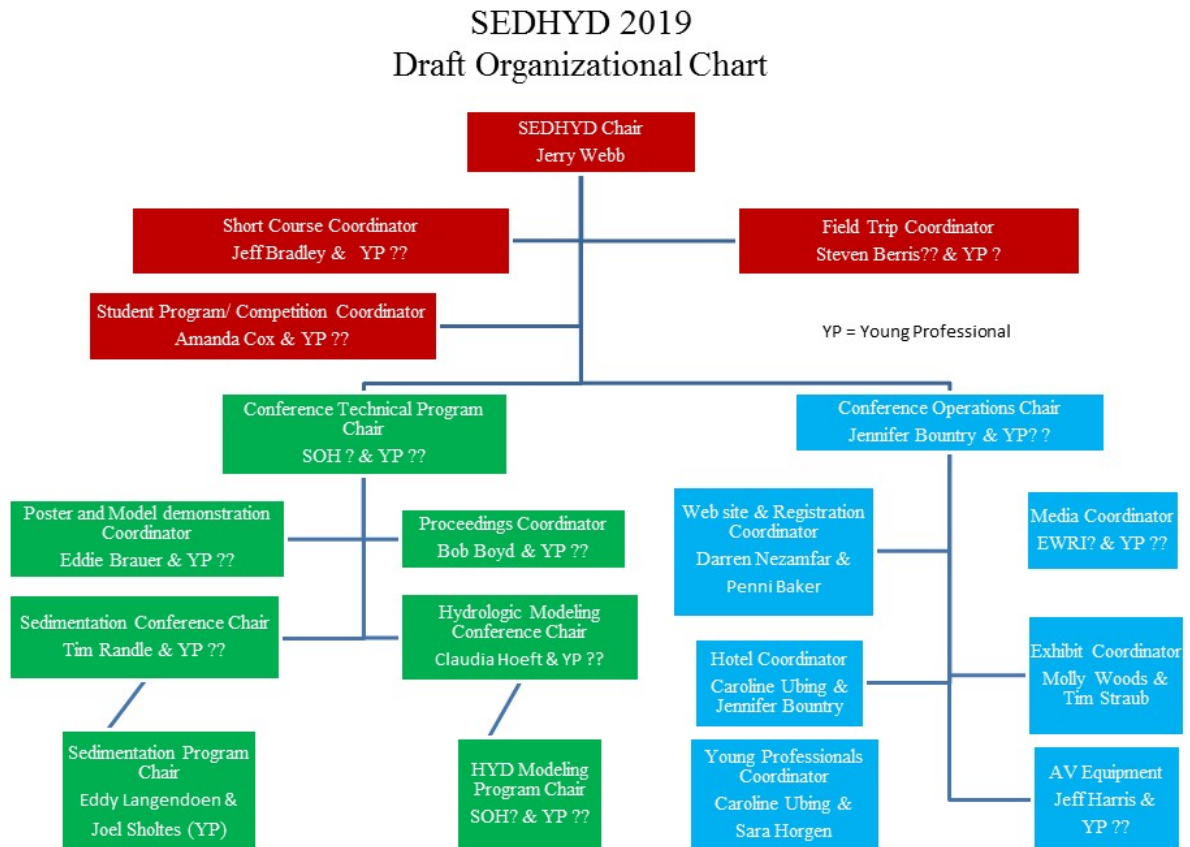


Figure 1. Latest organization chart for the SEDHYD-2019 Conference Planning Committee (as of April 23, 2018)

Tim Randle shared the latest draft call for papers:

- Abstract due date: September 1, 2018
- Notification of abstracts acceptance by October 15, 2018.
- Draft papers due December 15, 2018.
- Final papers due April 25, 2019.

Proposed SEDHYD Conference Topics were discussed (see below). A few new session topics were suggested during the SOS meeting (highlighted in yellow).

SEDIMENTATION TOPICS	HYDROLOGIC MODELING TOPICS
<ul style="list-style-type: none">• Climate Variability and Sediment• Dam Removal or Rehabilitation• Fluvial Geomorphology• GIS and Water Resources Management• Gully Erosion• Hydraulic and Sediment Modeling• Managing Infrastructure in the Stream Environment• Physical Sediment Load Measurements• Remote Sensing• Reservoir Sedimentation and Sustainability• Sediment Impacts on Wildlife and Habitat• Sediment Surrogate Measurements• Sediment Transport and Fingerprinting• Sediment Yield and Transport Modeling• Stream Restoration	<ul style="list-style-type: none">• Earthen Embankment Erosion Prediction• Extreme Floods• Flood Hydrology• Forecasting• Hydroecological Modeling• Infrastructure Vulnerability• Management and Decision Making Models• Modeling of Major River Systems• Non-Stationary Climate Variability• Post Fire Analyses and Restoration• Regional Watershed Management• Restoring and Sustaining River Environments

Reservoir Sedimentation and Sustainability

Tim Randle reported on the activities of the work group and the National Reservoir Sedimentation and Sustainability Team and Paul Boyd reported on the updates on RSI:

- National Reservoir Sedimentation and Sustainability Team
 - Introductory video (6-minues)
 - Webinar series (1 hour each)
 - Reservoir Sedimentation Management – Big Deal! Why should we even care about it?
 - Sedimentation Management Alternatives at Reservoirs
 - Sedimentation Management for Multi-Purpose Reservoirs: A Federal Perspective
 - Permitting for reservoir sediment management
 - Reservoir sedimentation monitoring
 - Economics of Sustainable Reservoir Sediment Management
 - Answers to Frequently Asked Questions (PDF file) https://acwi.gov/sos/faqs_2017-05-30.pdf
 - The web links to the video and to the recorded and future webinars are embedded in the attached PDF flyer <https://www.usbr.gov/research/challenges/waterstorage.html>
 - Tim Randle also showed the progress on the draft white paper titled: “Reservoir Sediment Management: Building a Legacy of Sustainable Water Storage Reservoirs”

- The SOS Policy statement on reservoir sediment management and permitting is on hold by Advisory Committee on Water Information (ACWI) until after Don Cline (ACWI) has a chance to meet with Tim Petty (DOI Assistant Secretary for Water & Science, and ACWI Chair), to outline priorities for ACWI for the rest of this year. Adrienne Bartlewitz is the new Executive Secretary and she will see this task through to its completion.
- Updates on the reservoir sedimentation database (RSI)
 - Districts need to finalize Quality Assurance/Quality Control (QA/QC)
 - Headquarters may use RSI to determine which districts get funding under a plus up for surveying (1-1.5M)
 - USBR – Blair Greimann updating their data – Memorandum of Understanding (MOU) between USBR and USACE
 - Public access will not be available until all QA/QCs have been received from the districts
 - Responses to Climate Change program took a big funding hit this year – future development of RSI is in question
 - Survey of Reservoir sediment management activities ongoing – will complete this FY.

SOS Dam Removal Analysis Guidelines for Sediment

Tim Randle and Jennifer Bountry reported on SOS Dam Removal Analysis Guidelines for Sediment.

- The “Dam Removal Analysis Guidelines for Sediment” (Randle and Bountry, December 2017) has been finalized and is on the SOS web site at (<https://acwi.gov/sos/>). So far, the feedback has been favorable and it is intended to receive wide distribution. There may be value in offering a short course on this guideline at the SEDHYD-2019 conference.
- USGS Dam Removal Information Portal (DRIP) (<https://www.sciencebase.gov/drip/>) has a great database on dam removal in the United States.

Work Group on Environment and Infrastructure

Tim Randle briefed SOS members on the status of the white paper “Managing Infrastructure in the Stream Environment. The completed report “Managing Infrastructure in the Stream Environment” (Sholtes et al., September 2017) is on the SOS web site at (<https://acwi.gov/sos/>) and is intended to receive wide distribution. Sholtes et al. have written and submitted a journal article on this topic.

Task Committee on Climate and Sediment

Matt Collins provided a summary of work group activities. Their focus is to support other work groups, and Matt summarized the products for which they provided review and comment over the last year or so. They have been working on an extreme events briefing paper, but because none of the work group members have funding to support their time on it, the work will move forward in a different (slower) mode with the hope that eventually they will be able to produce a document. Other goals include sponsoring conference sessions on climate and sediment, potentially at SEDHYD.

National Stream Morphology Data Exchange

Eddy Langendoen and Molly Wood provided a summary of work group activities. Work continues on the database proposal. They are currently evaluating options on how to: (1) fund the

database, and (2) cooperate with the Subcommittee on Spatial Water Data and Subcommittee on Hydrology.

Federal Interagency Sedimentation Project (FISP) Update

The FISP Technical Committee (TC) met at the USACE- Seattle District office on Tuesday, April 17, 2018. Tim Straub is the current acting FISP Chief. He reported on the meeting and FISP activities. The TC still has an important role with the physical samplers and the logistics involved with them. The meeting involved discussion about the physical samplers and details can be found in the TC meeting notes. Additional FISP projects are ongoing and there will be a call for proposals for new projects this year.

- The following is an update on current projects:
 - John Gray's bedload report has gone through colleague review.
 - Contracting has been started for bedload surrogate work that will be led by J.R. Rigby and Daniel Wren.
 - ADCP-SSC (Suspended-Sediment Concentration) surrogate work continues to be a focus of the FISP.
 - The FISP is funding lab analysis for samples collected this year with USACE funding and collected by USACE and USGS staff.
- Other emerging technologies and methods were discussed as potential future work and investigation.
 - As part of the FISP TC meeting, on Wednesday the USGS Washington Water Science Center led field tours to the Oso Landside Site (to discuss landslide events and monitoring/response activities), Sauk River Hydrophone Bedload Surrogate Site, and the Skagit River Site (future project area for testing multiple sediment surrogate technologies).
 - On Thursday, the TC met with Sequoia Scientific to discuss the submersible Acoustic Backscatter Sediment (ABS) sensor and SL2 instruments. Sequoia presented ABS lab results and computation methods in the ABS. Rob Hilldale and Tim Straub presented ABS field and HIF lab results. Sequoia then presented next steps for the ABS which includes combining the ABS technology with optical backscatter. Sequoia also presented and demoed the new LISST-SL2. In the afternoon, Rob Hilldale led a tour of Elwha River sites as part of his checking

Technical Presentation

Bob Boyd presented on sediment management on public lands administered by the BLM. BLM has some dams, reservoirs and erosion control structures (~600 HIGH/significant hazard dams) and thousands of livestock impoundments. Livestock impoundments are smaller structures but most have sediment issues. BLM are doing a lot less paired watershed studies looking at BMP effectiveness.

Subcommittee on Sedimentation Prospectus Development

Tim Randle reviewed the SOS Terms of Reference (September 10, 2003) (https://acwi.gov/sos_TORS_9_23_2003.pdf) and the SOS Prospectus (2007 – 2012) (https://acwi.gov/sos/Prospectus2007_2012_online_12_18_2007.pdf), which are both out of date. The existing terms of reference is based on a time when SOS was primarily focused on data collection and analysis and needs to be updated to reflect current technology and SOS activities. For the Prospectus, Tim Randle reviewed SOS member reports that are documented in the SOS meeting minutes from May 2016, November 2016, and September 2017. These reports indicate what the agencies are actually working on and will be used to inform the next prospectus. In addition, the technical sessions from the SEDHYD

2015 and 2019 conferences will also be used to inform the next prospectus. Coastal processes are described in the existing prospectus, but there is no documented activity in this area in the meeting minutes. However, the Subcommittee would like to keep coastal processes in the new prospectus.

Tim Randle agreed to write a new draft Terms of Reference for SOS consideration and an outline for a new 10-year prospectus.

Subcommittee on Sedimentation Website Review

Amanda Cox provided an update on SOS Website (<https://acwi.gov/sos/>) review in Toby Minear's absence. The review group had a conference call on February 9, 2018; Toby Minear led the call, which included Tim Straub (FISP) and Amanda Cox (SLU). The following are some of the topics discussed:

- Use the National Water Quality Monitoring Council website as an example
- Having control to make changes would be beneficial. Currently we have to go through ACWI to make changes.
- Potential structure for website pages:
 - About Us:
 - Members
 - Purpose
 - Background Authority
- News:
 - Training
 - Other conferences and workshops
- Meeting Minutes
- Current Working Groups
- Products:
 - Publications
 - Dam Removal Guidelines
 - Presentations
 - Training
- SEDHYD Conference and other Workshop

Next Meeting

The next SOS quarterly conference call meeting (1 to 2 hours) is planned for July-August 2018. The next face-to-face meeting is planned for late October to early November in Portland, Oregon, to coincide with a flush of an Army Corps of Engineers reservoir within the Willamette River valley. Tim Randle will send out a poll to determine the specific dates that will work best for everyone.

Adjourn

The meeting adjourned at 4:15 PM.