



June 4-7, 2023



*Boise, Idaho*

# 40TH ANNUAL MEETING

American Society of Reclamation Sciences

Boise Centre | 850 W Front Street



# ASRS

# ASRS 2023 Preliminary Conference Program

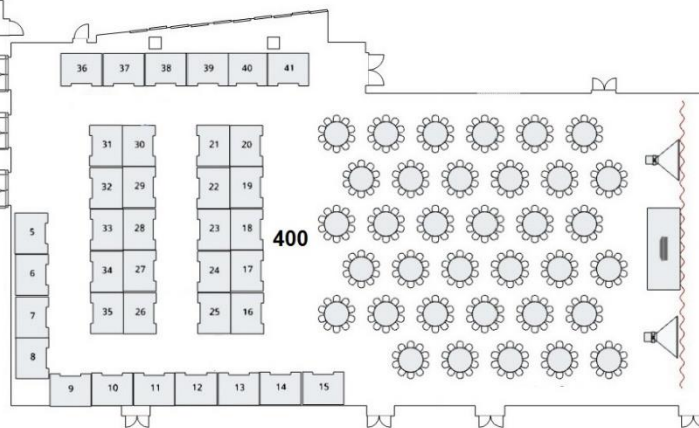
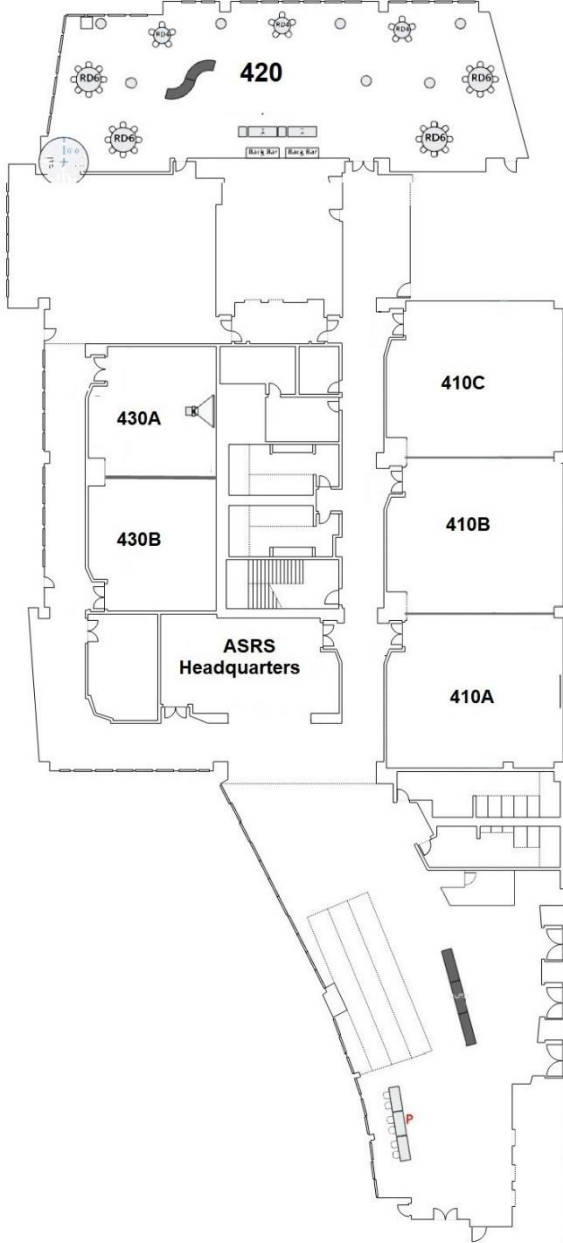
## 40 Years of Reclamation

The 40<sup>th</sup> Annual Meeting of the American Society of Reclamation Sciences (ASRS) will be held at the Boise Centre in downtown Boise, Idaho from June 4-7. This conference will focus on the research, technical, and regulatory issues associated with the land and water reclamation across the US and abroad, with focused sessions on the projects and successes across Idaho. It will provide a forum for the dissemination of information through presentation of research findings, case studies, field tours, and open discussion of public policy relating to the applied science of reclamation, rehabilitation, remediation, and restoration. Focus will be on areas disturbed by mining, oil and gas, conventional and alternative energy production, contaminated sites, agriculture, railroad/road construction, large-scale commercial development, and other disturbances to land and water resources.

### 2023 Schedule Snapshot

SUNDAY June 4		MONDAY June 5	TUESDAY June 6	WEDNESDAY June 7
<b>Registration and Exhibitor Setup</b>  12:00 – 5:00 pm SW Foyer	<b>Breakfast on Own</b>	<b>Haulin' ASRS</b> 6:30 – 7:30 am	<b>Haulin' ASRS</b> 6:30 – 7:30 am	<b>Haulin' ASRS</b> 6:30 – 7:30 am
		<b>Breakfast</b> 8:00 – 9:00 am Room 400C	<b>Wild Women of Reclamation</b> 7:00 – 8:30 am Room 430B	<b>Breakfast</b> 7:30 – 8:30 am Room 400C
	<b>DeLamar Mine Field Tour</b>  <b>Hosted By:</b> <b>Integra Resources</b> 7:45 am – 4:30 pm	<b>Opening Plenary Session</b> 9:00 am – 12:00 pm Room 400C	<b>Technical Sessions</b> 8:30 am – 12:00 pm Rooms 410 A/B/C	<b>Technical Sessions</b> 8:30 am – 12:00 pm Rooms 410 A/B/C
		<b>Awards Lunch and ASRS Business Meeting</b> 12:00 – 2:00 pm Room 400C	<b>Lunch on Own</b> 12:00 – 2:00 pm	<b>Student Awards Lunch</b> <b>Ryan Sistad - Speaker</b> 12:00 – 2:00 pm Room 400C
	<b>Reclamation Sciences Advisory Board Meeting –</b> 1:00 – 2:00 pm Room 430B	<b>Technical Sessions</b> 2:00 – 5:30 pm Rooms 410A/B/C	<b>Technical Sessions/ Seeding Certification Class</b> 2:00 – 5:30 pm Rooms 410A/B/C & 430A	<b>Technical Sessions</b> 2:00 – 3:30 pm Rooms 410A/B/C
<b>NEC Meeting</b> 4:30 – 6:00 pm Room 430B	<b>Dinner and Social Event</b> 6:00 – 8:00 pm Beside Bardenay	<b>Student Poster Social</b> 5:30 – 7:00 pm Room 420	<b>NEC Meeting</b> 3:30 – 4:00 pm Room 430B	
<b>Welcome Exhibitor and Sponsor Reception</b> 6:00 – 8:00 pm Room 400		<b>Dinner on Own</b>	<b>Student/ECP Social</b> 4:00 – 6:00 pm Room 420	

# Boise Centre East Convention Centre – Fourth Floor



Abnova Ecological Solutions	15	Foam Concepts LLC	16	Pioneer Technical Services, Inc.	20
Albemarle	29	Granite Seed	8	Rocky Mountain Bio Products	30
ACZ Laboratories Inc.	36	Grouse Mountain Environmental Consultants	12	Stevenson Intermountain Seed	21
ASRS	39	Haley & Aldrich	31, 32	SVL Analytical	10
Barr Engineering Co.	18	Integra Resources	35	Tetra Tech	14
Brierley Associates	17	KC Harvey Environmental, LLC	9	Truax Company, Inc.	8
CDM Smith	23	OSMRE - Headquarters	37, 38	Voss Signs	27
Costmine	25	Pace Analytical Services	33	Western States Reclamation	26
Energy Laboratories, Inc.	41	Perpetua Resources	34	Wyoming AML Division	5

# Meeting Financial Sponsors and Exhibitors

## PLATINUM



## GOLD

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ALDRICH**

**Peabody**

## SILVER



# Meeting Financial Sponsors and Exhibitors

## BRONZE



# Thanks to Our Exhibitors



# 2023 Conference Planning Committee

## Dustin Wasley, ASRS Annual Meeting Chair, Haley & Aldrich

- John Haney, Haley & Aldrich
- Kevin Houck, Haley & Aldrich
- Jason Poulsen, Haley & Aldrich
- Nick Tucci, Haley & Aldrich
- Jo Combo, Haley & Aldrich
- Todd Glindeman, Brown and Caldwell
- Doug Stiles, Hecla Mining
- Ben Davenport, Idaho Mining Association
- Tricia LaRue, Integra Resources
- Rob Mullener, Integra Resources
- Rio Franzman, KC Harvey
- Kennet Bertelsen, Morrison-Maierle
- Devin Clary, Montana Rail Link
- Chris Norman, Pace Analytical
- Dale Kerner, Perpetua Resources
- Hayley Rambur, Perpetua Resources
- Rachel Roskelley, Simplot
- Rob Orr, Teck Resources

On behalf of the ASRS Boise 2023 National Meeting Local Planning Committee and the ASRS National Executive Committee (NEC) we want to thank our sponsors and exhibitors for their support, as well as our meeting attendees in Boise for their continued support of our Society.

## Professional Field Tour Information

### Sunday, June 4 – DeLamar Mine Field Tour (Hosted By Integra Resources)

**7:45 am – 4:30 pm**

- 7:45 am** Assemble at The Grove bus cut out on Front Street for a prompt 8:00 am departure.
- 8:00 am** Board bus and depart for the DeLamar Mine roughly 115 miles south southwest of Boise.
- 10:15 am** Arrive at Stop 1 - Water Treatment Plant, Historic Tailings Facility and DeLamar Pit.  
**(Please note – all stops are weather dependent, and the schedule may be revised)**
- 11:15 am** Depart Stop 1 for Stop 2.
- 11:30 am** Arrive at Stop 2 - Overlook of Sullivan Gulch Waste Rock Dump #1 and Sullivan Gulch Water Treatment Facility.
- 12:15 pm** Lunch (Box lunch and water provided).
- 12:45 pm** Depart Stop 2 for Stop 3.
- 1:00 pm** Arrive Stop 3 - Historic Florida Mountain Pit and Exploration Drilling Historic Disturbance Overlook.
- 2:00 pm** Depart for Boise.
- 4:30 pm** Arrive in Boise.



## Agenda for Sunday, June 4

All Day	ASRS Office and Headquarters – Room 440
7:45 am – 4:30 pm	Integra DeLamar Mine Tour – Meet in The Grove Lobby
12:00 – 5:00 pm	Registration and Exhibitor Setup – Exhibit Hall Room 400
4:30 – 6:00 pm	NEC Meeting – Room 430B
6:00 – 8:00 pm	“Ice Breaker” Welcome Reception – Room 420

## Agenda for Monday, June 5

6:30 – 7:30 am	Haulin’ ASRS – Meet at The Grove Hotel Lobby The ASRS Running group meets every morning
8:00 am – 5:00 pm	Registration – SW Foyer
8:00 – 9:00 am	Breakfast – Room 400
9:00 am – 5:30 pm	Exhibitor Displays – Exhibit Hall Room 400
9:00 am – 12:00 pm	Plenary Session/Keynote Speakers – Room 400 Dustin Wasley – Conference Chair – Welcome Michele Coleman – ASRS President – President’s Welcome Mike Crapo – US Senator – Mining in Idaho Dan Silver – Coeur D’Alene Trust – An Idaho Reclamation Success Story Ron Quinn – Simplot – 40 Years of Reclamation at Smoky Canyon Mine 40 <sup>th</sup> Annual Meeting Celebration
12:00 – 2:00 pm	Awards Luncheon/ASRS Annual Business Meeting – Room 400
2:00 – 5:30 pm	Technical Sessions – Rooms 410 A/B/C
6:00 – 8:00 pm	Social Dinner at Beside Bardenay



Join us for catered appetizers and drinks at Beside Bardenay at 600 West Grove Street. Set in the heart of Boise’s famous Basque Block, Beside Bardenay is one block away from the Boise Centre and downtown’s vibrant nightlife.



## Agenda for Tuesday, June 6

6:30 – 7:30 am	<b>Haulin' ASRS – Meet in The Grove Hotel Lobby</b>
7:00 – 8:30 am	<b>Wild Women of Reclamation – Room 430B</b> Every woman is welcome. Previous topics: Choosing your own path, mentoring, starting a business, and juggling a career with family and community obligations.
7:15 – 8:30 am	<b>Breakfast – Room 400</b>
8:00 – 5:00 pm	<b>Registration – SW Foyer</b>
8:30 am – 12:00 pm	<b>Technical Sessions – Rooms 410 A/B/C</b>
9:00 am – 5:30 pm	<b>Exhibitor Displays – Exhibit Hall Room 400</b>
12:00 – 2:00 pm	<b>Lunch on your own</b>
1:00 – 2:00 pm	<b>Reclamation Sciences Advisory Board Meeting – Room 430B</b>
2:00 – 5:30 pm	<b>Technical Sessions – Rooms 410 A/B/C</b>
2:00 – 5:30 pm	<b>Wyoming AML Seeding Certification Class – Room 430A</b> The Wyoming AML Division will host a Seeding Specialist Certification Class. In this half-day practical training, reclamation professionals will learn to develop diverse seed mixes, the nuances of ordering seeding material, equipment performance standards, proper calibration and operation techniques with seeding equipment. The class will also focus on planning, designing, construction management techniques, and tools aimed at improving vegetation establishment of diverse native plant communities.
5:30 – 7:00 pm	<b>Student Poster Presentations Session – Room 420 – Sponsored by Kleinfelder</b>

Students will present their research posters and network with other academic and business professionals! There will be food, beverages, and a full bar.



## Agenda for Wednesday, June 7

6:30 – 7:30 am	<b>Haulin' ASRS - Meet in The Grove Hotel Lobby</b>
7:30 – 8:30 am	<b>Breakfast – Room 400</b>
8:00 am – 5:00 pm	<b>Registration – SW Foyer</b>
8:30 am – 12:00 pm	<b>Technical Sessions – Rooms 410 A/B/C</b>
9:00 am – 5:30 pm	<b>Exhibitor Displays – Exhibit Hall Room 400</b>
12:00 – 2:00 pm	<b>Lunch/Student Awards and Guest Speaker:</b> <b>Ryan Sistas – Better in our Back Yard – Room 400</b>
2:00 – 3:30 pm	<b>Technical Sessions – Rooms 410 A/B/C</b>
3:30 – 4:00 pm	<b>NEC Meeting – Room 430B</b>
4:00 – 6:00 pm	<b>Early Career Professionals (ECPs)/Student Social Event – Room 420</b> <b>Sponsored by Haley &amp; Aldrich and Navajo Transitional Energy Company</b>

This FREE event will bring together ECPs, students, and experienced professionals for valuable mentorship. The event will include food, beverages, and fun interaction. **OPEN TO EVERYONE!**



## Technical Sessions – Monday, June 5

Time	BIOCHAR AND AML RECLAMATION SESSION 1A Room 410A Moderator – Debbie Page-Dumroese	WATERSHED AML AND AMD/ARD SESSION 1B Room 410B Moderator – Rio Franzman		WATER TREATMENT SESSION 1C Room 410C Moderator – Kennet Bertelsen
2:00 – 2:20 pm	Opportunities for Biochar to Remediate Forest Soils at Abandoned Mine Lands <b>By Derek Pierson</b>	2:00 – 2:30 pm	Beyond Reclamation and Remediation, Next Steps in a Recovered Watershed <b>By Natalie Kruse Daniels</b>	Tioga River Restoration: A Tale of Active Mine Drainage Treatment and Consumptive Use Mitigation <b>By Thomas Clark</b>
2:20 – 2:40 pm	Limiting Factors to Restore Abandoned Mine Lands with Biochar <b>By Carlos Rodriguez-Franco</b>	2:30 – 3:00 pm	Watershed-Based Strategy for Treating ARD/AMD <b>By Jeff Skousen</b>	Treatment of Coal Mine Drainage with Hybrid Vertical Flow Ponds in the Midwest <b>By Paul Behum</b>
2:40 – 3:00 pm	Hydraulic Mines and Process-Based Restoration: Pilot Project at Grizzly Creek Diggins, Sierra County, Calif <b>By Nick Graham</b>	3:00 – 3:30 pm	The Role of Retention Basins in Alleviating Post-Mining Streams TDS Levels <b>By Amir Hass</b>	Water Technical Division Meeting
3:00 – 3:30 pm	Using Organic Amendments to Restore Abandoned Mine Lands in Northeastern Oregon <b>By Debbie Page-Dumroese</b>			
<b>3:30 – 4:00 pm – Break – Exhibit Hall</b>				
Time	SEEDING AND REVEGETATION SESSION 2A Room 410A Moderator – Seth Cude	WETLAND RESTORATION/ WATER MANAGEMENT SESSION 2B Room 410B Moderator – Allen Wellborn		SAGEBRUSH/ SAGE GROUSE DISCUSSIONS SESSION 2C Room 410C Moderator – Paul Griswold
4:00 – 4:30 pm	Mulching and Soil Depressions for Revegetation of Oil and Gas Wells in Arid Ecosystems <b>By Rebecca Mann</b>	Early Water Quality Changes from Stream and Wetland Restoration in Former Agriculture Land <b>By Sebastian Teas</b>		Reclamation & Restoration of Sage-Grouse Habitat <b>By Josh Oakleaf</b>
4:30 – 5:00 pm	Seed Mix Design and Implementation – A Practitioner's Guide for Successful Reclamation <b>By Seth Cude</b>	Native Wetland Restoration Projects in the Tongue River Valley of the Powder River Basin <b>By Allen Wellborn</b>		The Effects of Root Enhancement Seed Technologies and Timing of Seeding on Wyoming Big Sagebrush Establishment <b>By Michaela Owens</b>
5:00 – 5:30 pm	Loblolly Pine Survival and Growth on a Mineral Sands Mine <b>By Sara Klopff</b>	Observe, Orient, Decide, Act: Using the OODA Loop in Long-Term Water Management During Mine Closure and Reclamation <b>By Theresa Hughes</b>		Soils Technical Division Meeting
<b>6:00 – 8:00 pm – Social Dinner at Beside Bardenay</b>				

## Technical Sessions – Tuesday, June 6 (morning)

Time	THE IMPORTANCE OF GEOCHEMISTRY SESSION 3A Room 410A Moderator – Nick Tucci	CLIMATE, MICROBS, AND CARBON DIOXIDE SESSION 3B Room 410B Moderator – Gwen Geidel	PLANTS, PHYTOREMEDIATION, AND REVEGETATION SESSION 3C Room 410C Moderator – Sara Klopff
8:30 – 9:00 am	Anthropogenic Versus Geogenic Source Determination of Heavy Metals in Residential Soils <b>By Jenna Adams</b>	Carbon Dioxide Mine Gas Investigation and Remediation <b>By Omar Beckford and Paul Huemrich</b>	Revegetation on the Flat Creek Iron Mountain Mine Superfund Site <b>By Damon Sump</b>
9:00 – 9:30 am	Geochemical Fingerprinting of Legacy Mining Activities at the Historic Jordan Creek Mining District <b>By Nick Tucci and Rob Mullener</b>	Microbes In Mine Reclamation: Bioecology, Biofertilizers, Bioeconomy <b>By Andrew Harley</b>	Progress Toward Restoring Native Vegetation in Northwest Montana and Central Wyoming <b>By Mark Gentry and Taylor Cross</b>
9:30 – 10:00 am	Engineering and Construction Technical Division Meeting	Innovations and Advancements to Enhanced Weathering <b>By Adegbite Adesipo</b>	Open
<b>10:00 – 10:30 am – Break – Exhibit Hall</b>			
Time	RECLAMATION ACROSS IDAHO – SILVER VALLEY SESSION 4A Room 410A Moderator – Tony Wesche	MAMMAL AND INSECT IMPACTS FROM RECLAMATION SESSION 4B Room 410B Moderator – Mike Curran	GIS/MAPPING/DATA SESSION 4C Room 410C Moderator – Michele Coleman
10:30 – 11:00 am	Bunker Hill Complex, Ninemile Basin Remediation Progress Update <b>By Tony Wesche</b>	Risks of Biointrusion: Small Mammal and Insect Implications on Isolated Waste Cover Systems <b>By McCall Barney</b>	Missouri’s Land Reclamation Information System (LRIS) Success <b>By Bill Zeaman</b>
11:00 – 11:30 am	Remedial Action Effectiveness at the Bunker Hill Superfund Site <b>By Christina Johnson</b>	Ecological Restoration for Insect Conservation within Natural Gas Fields <b>By Mike Curran</b>	Abandoned Mine Site Characterization using Electronic Field Tools <b>By Nick Anton</b>
11:30 – 12:00 pm	Ninemile Waste Consolidation Area <b>By Cody Lechleitner</b>	Concurrent Vegetation and Wildlife Mapping Assists Reclaimed Desired Plant Community Planning <b>By Penny Hunter</b>	Listening to the Noise: What's in your Data Besides Data? <b>By Kevin Krogstad</b>
<b>12:00 – 2:00 – Lunch on Own</b>			
<b>1:00 – 2:00 pm – Reclamation Sciences Editorial Board Meeting – Room 430B</b>			

## Technical Sessions – Tuesday, June 6 (afternoon)

Time	RECLAMATION ACROSS IDAHO – HISTORIC DISTRICTS SESSION 5A Room 410A Moderator – Dale Kerner	ARD/AMD DISCUSSIONS SESSION 5B Room 410B Moderator – Kennet Bertelsen	WYOMING AML SEEDING CERTIFICATION CLASS SESSION 5C Room 430A
2:00 – 2:30 pm	Perpetua’s Stibnite Project – Milestones on the Road to Restoration <b>By Dale Kerner</b>	Efficacy of Activated MgO on the Treatment of AMD: A Comparative Study <b>By Matome Lucky Mothetha (recorded)</b>	<b>Wyoming AML Seeding Certification Class</b> Instructors: Seth Cude, Joe Schroeder, and Josh Oakleaf
2:30 – 3:00 pm	Historic DeLamar Mining District - Emphasizing Reclamation and Closure Planning, Stakeholder Engagement and Community Outreach <b>By Rob Mullener and Emily Hendrickson</b>	A Hybrid and Stepwise Approach Using a Series of Planted Constructed Wetland for the Treatment of AMD <b>By Beauclair Nguegang (recorded)</b>	
3:00 – 3:30 pm	Technology Technical Division Meeting	Management of Acid-Producing Materials for the Route 220 Project in Virginia <b>By Lee Daniels</b>	
<b>3:30 - 4:00 – Break – Exhibit Hall</b>			
Time	RECLAMATION ACROSS IDAHO – PHOSPHATE PATCH SESSION 6A Room 410A Moderator – Allison Knutson	TAR CREEK SUPERFUND SITE DISCUSSION SESSION 6B Room 410B Moderator – Julie LaBar	WYOMING AML SEEDING CERTIFICATION CLASS (Continued) SESSION 6C Room 430A
4:00 – 4:30 pm	Innovative Cover Methods/Approaches in the Phosphate Patch <b>By Chris Guedes</b>	Superfund Case Study, Tar Creek, Quapaw, OK <b>By Summer King</b>	<b>Wyoming AML Seeding Certification Class</b> Instructors: Seth Cude, Joe Schroeder, and Josh Oakleaf
4:30 – 5:00 pm	How Risk Assessment Avoided Unnecessary Reclamation <b>By Jon Bronson and Anne Thatcher</b>	Nature-Based Solutions Linking Reclamation to Remediation and Restoration on Derelict Mining Sites <b>By Robert Nairn</b>	
5:00 – 5:30 pm	Open	Effect of Water Chemistry and Time on the Sustainable Reuse of Recovered Iron Oxides as Phosphate Sorbents <b>By Dayton M’Kenzie Dorman*</b>	
<b>5:30 – 7:00 pm – Student Poster Session – Room 420</b>			

\* Denotes Student

# Poster Session and Networking Event– Tuesday, June 6

5:30 – 7:00 – Room 420

1	Assessing Indicators of Ecosystem Recovery on Reclaimed Minesites in Eastern Hardwood Forests <b>By: I. Kennedy*, J. Franklin, D. Buckley, and K. Sena</b>
2	Combined Stream and Wetland Restoration on Agricultural Ground: Bloody Run, Ohio <b>By: E. Pokuah*, N. Kruse Daniels, K. Ositimehin, and Z. Rundell</b>
3	Engineering with Nature to Develop Socially Sustainable Nature-Based Solutions: Natural Infrastructure to Address Complex Environmental Challenges <b>By: H.N. Seago*, R.W. Nairn, D.M. Dorman*, J.I. McCann*, C.M. Morgan*, L.H. Olson*, O.C. Overton*, AM Meek*, J.M. Queen*, S.A Dahle*, S.N. Taylor*, A.E. Richardson*, N.L. Shepherd, and R.C. Knox</b>
4	Evaluating Technologies for Mining-Influenced Water (MIW) Treatment: Information and Data Needs <b>By: B.A. Butler and M.K. Mahoney</b>
5	Evaluation of the Use of Manure-Based Biochar for Zinc Retention at the Tar Creek Superfund Site <b>By: J.I. McCann*, R.W. Nairn, and S. King</b>
6	Hydrology and Biogeochemistry of Legacy Sediment Riparian Ecosystems <b>By: C. Morgan* and R.W. Nairn</b>
7	Impact of Riverbank Lupine ( <i>Lupinus rivularis</i> ) on Grand Fir ( <i>Abies grandis</i> ) Ectomycorrhizal Symbioses <b>By: A.B. Labay*, R.A. Bunn, K.L. Poppe, and J.M. Bauman</b>
8	New Tools for Making Science-Based Decisions for Oil and Gas Reclamation <b>By: R. Mann, R. Lupardus, and M. Duniway</b>
9	Physical Classification of Iron Oxyhydroxide Treatment Residuals for Reuse in Stormwater Treatment <b>By: S.N. Taylor* and R.W. Nairn</b>
10	Restoring Riparian Forests Using Assisted Migration as a Climate Change Adaption Strategy <b>By: C.A. Harris*, A.P. Lawrence, and J.M. Bauman</b>
* Denotes Student	



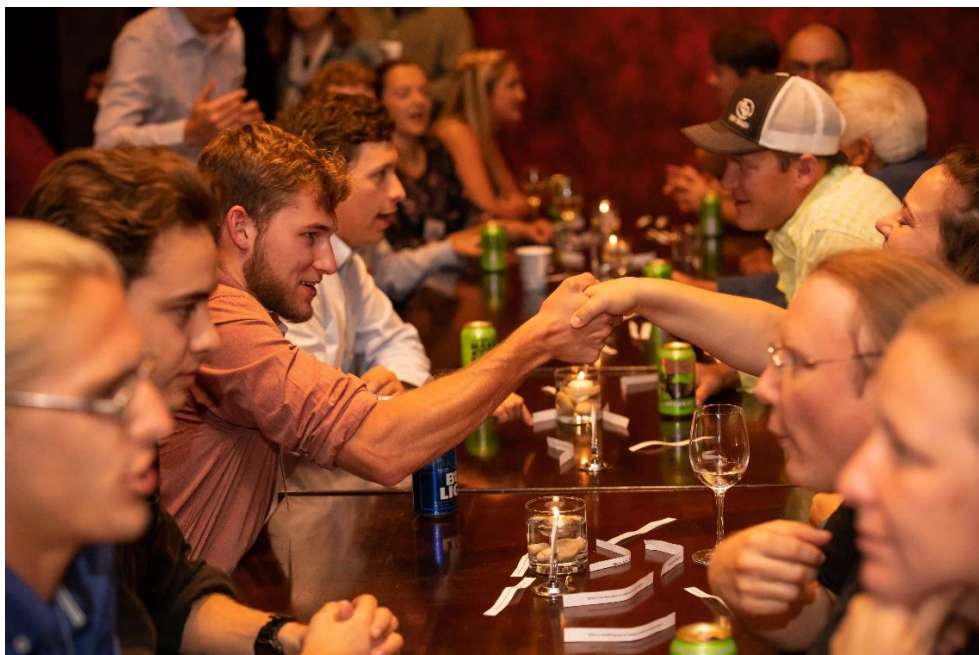
## Technical Sessions – Wednesday, June 7 (morning)

Time	REVEGETATION AND REFORESTATION SESSION 7A Room 410A Moderator – Dennis Oakley	STREAM/FLOODPLAIN RESTORATION SESSION 7B Room 410B Moderator – Jason Poulsen	URBAN RECLAMATION SESSION 7C Room 410C Moderator – Kenton Sena
8:30 – 9:00 am	Reclaiming the WVU Farm Woodlot for Economic Development <b>By Jeff Skousen</b>	Floodplain Reconnection Stream Restoration Increases Water and Nutrient Retention <b>By Natalie Kruse Daniels</b>	Reclamation of an Urban Limestone Barrens <b>By Jennifer Franklin</b>
9:00 – 9:30 am	Competitive Interactions of American Chestnut During Mine Reclamation <b>By Jenise Bauman</b>	Gills Creek, Columbia, SC, Reclamation Enhancement Project Following 1000-Year Flood Event Impacts <b>By Gwen Geidel</b>	Urban Reforestation as Reclamation: Exploring Opportunities for Reclamation in An Urban Context <b>By Kenton Sena</b>
9:30 – 10:00 am	Wildlife Technical Division Meeting	Building a Stream and Wetland Compensatory Mitigation Plan Integrated with an Active Mine <b>By Dan Kline</b>	Making The Case for Urban Stream Restoration and Urban Stream Channel Management <b>By Natalie Kruse Daniels</b>
<b>10:00 – 10:30 am – Break – Exhibit Hall</b>			
Time	LANDFORM RECLAMATION AND COVER SYSTEMS SESSION 8A Room 410A Moderator – Kevin Houck	PASSIVE TREATMENT SESSION 8B Room 410B Moderator – Tim Danehy	RENEWABLES AND RECLAMATION SESSION 8C Room 410C Moderator – Mehgan Blair
10:30 – 11:00 am	Landform Design in Mine Reclamation: Is this the Future? <b>By Peter Werner</b>	Passive Treatment Systems on Life Support – Pulling the Plug & Rebuilding <b>By Buck Neely</b>	Soil/Site Disturbance and Challenges for Utility Scale Solar facilities in Virginia <b>By Lee Daniels</b>
11:00 – 11:30 am	Agronomic Assessment and Growth Media Management Practices for Reclamation Cover Systems <b>By Jesse Dillon</b>	Passive Treatment System Monitoring Utilizing Solar Powered Telemetry, A Case Study <b>By Dan Guy</b>	Native Grassland Revegetation on a Utility Scale Solar Development in South Texas <b>By Micayla Pearson*</b>
11:30 am – 12:00 pm	Vegetation Technical Division Meeting	Sulfate Reduction in Bench and Pilot-Scale Passive Treatment Systems <b>By Guadalupe Fattore</b>	Application of Geomatics for Assessment of Reclamation of a Large Mechanized Open Pit Mine: A Case Study <b>By Pradeep Kumar</b>
<b>12:00 – 2:00 pm – Lunch/Student Presentation Awards and Guest Speaker (Ryan Sistad – Better in our Back Yard) – Room 400</b>			

\* Denotes Student

## Technical Sessions – Wednesday, June 7 (afternoon)

Time	TEACHING AND LEARNING IN RECLAMATION SESSION 9A Room 410A Moderator – Kenton Sena	REVEGETATION MONITORING AND REPORTING SESSION 9B Room 410B Moderator – Allen Wellborn	MERCURY IN THE ENVIRONMENT SESSION 9C Room 410C Moderator – Steve Dent
2:00 – 2:30 pm	Engineering the Nature of Change: A Presidential Dream Course on Nature-Based Solutions <b>By Robert Nairn</b>	A Practitioners Perspective: Integrated AML Reclamation Monitoring Program <b>By Joe Schroeder</b>	Mercury Contamination in Peru: Community Engagement to Assessment and Remediation <b>By Bryn Thoms</b>
2:30 – 3:00 pm	Campus as a Reclamation Classroom: A Case Study in Urban Reclamation from Lexington <b>By Kenton Sena</b>	Monitoring Strategies for Reclamation Programs Involving Multiple Sites <b>By Mike Curran</b>	Assessing Health Risks at a Soviet-Era Mercury Mine: Validation of XRF for Humanitarian Intervention in Kyrgyz Republic <b>By Ian von Lindern</b>
3:00 – 3:30 pm	Appalachian STEM Enrichment Academy Online and In Person K-12 Curriculum <b>By Natalie Kruse Daniels</b>	Reclamation Monitoring and Management: Metrics, Key Performance Indicators, and Dashboards for Projects Across their Life Spans <b>By Mike Curran</b>	Remediation of Calcines and Site Closure of a Remote Mercury Mine <b>By Caleb Fontenot</b>
3:30 – 4:00 pm	NEC Wrap Up Meeting Room 430		
4:00 – 6:00 pm – Early Career Professional/Student Social Event – Room 420 Hosted by Haley & Aldrich and Navajo Transitional Energy Company			



# Student Scholarship Awards

## Bachelor of Science



**Kendall Hays** is a third year at Oklahoma State University in Natural Resource Ecology and Management and in Plant and Soil Sciences expecting to graduate in May 2025. She is an active member of Sigma Alpha and OSU's Society for Range Management Student Chapter. She plans to continue her studies in a Master's and PhD program to study rangeland soil health and reclamation. She hopes to one day be able to bridge some of the gaps between researchers and producers to create a more sustainable future for everyone. She enjoys a good mystery novel, camping with her fiancé, and being the mom to seven crazy goat kids.

## Master of Science



**Micayla Peterson** is a second-year master's student at Texas A&M University – Kingsville, where she is studying Restoration Ecology. Micayla's masters research evaluates the feasibility of restoring utility scale solar developments to native grassland while they are active sites. Outside of her studies, Micayla has a passion for the natural resources that is very present with her work and all she does. She believes that education about our natural resources to youth and adults alike is the key to helping future generations appreciate the natural things around them. Upon receiving her master's degree, Micayla plans on following her passion for the natural resources and education.

## Doctor of Philosophy



**Justine McCann** is a second-year PhD student with the Center for Restoration of Ecosystems and Watersheds at the University of Oklahoma. She has a bachelor's degree in geoscience from Penn State University and a master's in environmental science from the University of Oklahoma. Her master's research focused on the leachability of trace metals from hard rock mine drainage passive treatment residual solids, and her current research focuses on quantifying the impacts of legacy mining waste across the Tar Creek watershed in northeastern Oklahoma and developing nature-based interventions to minimize contaminant transport within the stream. She hopes to focus her career on helping communities solve environmental problems by working with nature. In her spare time, she enjoys reading, hiking, and SCUBA diving.



## Professional Awards



### **William T. Plass Award – Gwendelyn Geidel; Nominated by Michele Coleman**

Gwendelyn Geidel, PhD, JD, is a hydrogeologist currently working with mine tailings reclamation and is an environmental attorney focusing on contamination and water quality in the context of land management, reclamation, and utilization. Gwen is an Affiliate faculty member and a Distinguished Research Professor Emerita in the School of the Earth, Ocean, and Environment at the University of South Carolina (USC). After obtaining her PhD in Geology, she began her career in the Department of Geology at USC focused on the prediction and prevention of water quality impacts from coal and metal mining in the US and internationally, which led to not only interesting research questions but legal issues as well. In 1989, she graduated from the USC School of Law and practiced

environmental law in Columbia, SC. When the USC School of the Environment (SOE) was formed in 1994, she returned to USC as the Associate Dean of the SOE until 2006, when it was merged into the College of Arts and Science. While at USC she taught earth resource management and sustainability classes and advised numerous graduate and undergraduate research students through field and laboratory research efforts. She continues her research and consulting related to the remediation of ground and surface water contamination caused by mining and other anthropogenic disturbances and the development of sustainable reclamation practices for improved vegetative, soil and water quality. Her research has been supported by industry, and various state and federal government agencies with the goal of improving our understanding of water rock interactions and their impacts on reclamation practices. She has published numerous articles and book chapters and is active in community organizations including the SC Central Midlands Council of Government environmental committee, and Gills Creek Watershed Association. She has also served on several national committees and forums, including the Global Council for Science and the Environment's University Leaders and, within ASRS, she has served on the NEC, Scholarship Committee and was President in 2018-19.



### **Distinction in Reclamation Award - Quapaw Nation Environmental Department; Nominated by Robert Nairn**

Over a half-century of underground mining and surface milling operations in northeast Oklahoma produced more than 500 million tons of mining waste containing elevated zinc, lead, and cadmium concentrations. As a result, the Tar Creek Superfund Site was placed on the US Environmental Protection Agency (USEPA) National Priorities List in 1983, shortly after the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) was passed. For decades, however, these massive chat piles sat relatively undisturbed on the reservation lands of the Quapaw Nation. In 2012, the Quapaw Nation Environmental Office, along with its construction department Quapaw Services

Authority (QSA) commenced remedial action activities at the Catholic 40 site, a former Catholic mission on tribal land. Based on the exemplary results of an initial pilot project at the Catholic 40 site, the Quapaw Nation and QSA now lead both federal (USEPA) efforts on tribal trust lands and state (Oklahoma Department of Environmental Quality) efforts on non-tribal lands. They are the first tribal nation in the United States to lead Superfund remediation and reclamation effort within their own tribal boundaries. To date, the Quapaw Nation has removed more than six million tons of contaminated mine tailings and returned more than 600 acres to productive use.



### **Richard I. & Lela M. Barnhisel Reclamation Researcher of the Year Award – Dr. Kenton Sena; Nominated by Richard Barnhisel**

Kenton Sena holds a BA in Biology from Asbury University, and an MS in Forestry and PhD in Integrated Plant and Soil Sciences from the University of Kentucky. He is currently a lecturer in the Lewis Honors College at the University of Kentucky, where he teaches the Honors Foundations Seminar "Knowledge and Society," as well as honors courses in ecology and such as "Restoration Ecology," "Appalachian Natural History," and "The Ecology of Middle Earth." His research interests involve reclamation and restoration of sites affected by mining and urbanization. Dr Sena has published multiple research articles in proceedings and journals that have influenced the fields of reclamation ecology and sustainability. He currently is

specializing in the reclamation of urban disturbances to better the culture and living experiences of many individuals. He lives and gardens with his wife and two children in Lexington, Kentucky.



### **Reclamationist of the Year Award – Marie Shepherd; Nominated by Jennifer Schlotthauer**

Marie Shepherd is a Navajo born and raised in Ganado, Arizona on the Navajo Nation. She attended Ganado High School and went to college at the University of Arizona in Tucson, Arizona where she received a Bachelor of Science degree in Civil Engineering. In 2002, she received a Master of Arts in Organizational Management from the University of Phoenix while working at Chevron’s McKinley Mine. She is a registered Professional Engineer in the States of New Mexico and Arizona. She is currently Senior Manager at Peabody’s Kayenta Mine and responsible for all Environmental Department functions including supporting field reclamation activities, compliance work, regulatory oversight, and managing the environmental monitoring program. She works closely with the regulatory authority’s onsite inspection, compliance, bond releases and monitoring programs. Along her career path she has mentored several young engineers.

In the height of Kayenta’s reclamation, she managed to reclaim about 400 acres per year over a five-year period. She has integrated geomorphic concepts into reclamation plans, and because of this effort, Peabody’s Kayenta Mine received the 2019 Office of Surface Mining Reclamation and Enforcement’s (OSMRE) National Reclamation Award. This award recognized not only integrated geomorphic concepts but also tied in Peabody’s unique cultural planting program. These practices result in a sustainable landform for the Navajo Nation to use. She manages the annual grazing program which the local community participates in utilizing the reclaimed lands for grazing. As a rancher herself she understands using grazing as a best management practice. Delivering a sustainable product to the Navajo Nation by restoring Mother Earth aligns with her values and beliefs.

### **Pioneer in Reclamation Award – Dr. Patrick Angel; Nominated by Kenton Sena**



Dr. Patrick Angel, a native of eastern Kentucky, had been employed by United States Department of Interior, OSMRE in London, Kentucky. His career with the federal government spanned more than 42 years of service. Prior to his tenure with OSMRE, Patrick worked for the Kentucky Division of Reclamation and the University of Kentucky, training Surface Mine Reclamation Technicians and the first group of federal inspectors hired to implement and enforce SMCRA in 1978. Patrick is a graduate of Stephen F. Austin State University with a BS and MS in Forestry and a graduate of the University of Kentucky with a PhD in Soil Science. The focus of his studies was the reforestation of surface mines. During much of the last half of his 42-year service with the federal government, Dr. Angel served as the Senior Forester and Soil Scientist for OSMRE where he was very active with the Appalachian Regional Reforestation Initiative. Patrick is a co-founder with Dr. Chris Barton with the University of Kentucky of the non-profit conservation organization called Green Forests Work (GFW). GFW focuses on restoring ecosystem services on mine-scarred lands and

creating green jobs in the process. Since his retirement from the federal government in 2020, Patrick is continuing his work with GFW planting trees on abandoned surface mines and organizing volunteer tree planting projects across Appalachia. Patrick is also operating a 100-acre sheep farm west of London, Kentucky and has an apiary with a 100-hive capacity. He produces honey and high-quality lean lamb. Recently, Patrick created a non-profit called the Southeast Kentucky Sheep Producers Association, Inc. (SEKSPA). A major project of SEKSPA under Patrick’s direction is to conduct a three-year ‘Proof of Concept’ project that demonstrates productivity and financial viability of large-scale small ruminant enterprises on reclaimed coal surface mines in Central Appalachia. The economics of utilizing the vast acreage of unused and unmanaged hay and pastureland can be profitable and is beneficial to a healthy and sustained ecosystem.

### **Pioneer in Reclamation Award - Bryan Hansen; Nominated by Jennifer Schlotthauer**



Bryan Hansen has spent his whole life in the state of Wyoming while earning a BS degree in Wildlife Management from the University of Wyoming. After a two-year stint with the Wyoming State Game and Fish department, he hired on with Peabody’s North Antelope Rochelle Mine (NARM) as an environmental specialist. Over the next 33 years he progressed into the Environmental Manager for the United States largest surface coal mine with over 32,000 acres of disturbance and more than 14,300 acres of permanently reclaimed ground. This daunting task has many environmental challenges that requires forward thinking and innovation in reclamation practices. Bryan led the way in advancing several reclamation practices that resulted in close to 7500 acres of final bond release in a semi-arid ecosystem to date. The practices he initiated are still used today to continue to have successful final bond release packages submitted to the State of Wyoming. Bryan always encouraged knowledge transfer and the use of best management practices to better the field of mine land reclamation. NARM has received many national and state awards under Bryan’s management

including OSMRE Excellence in Reclamation National Award in 2012 and the 2020 Wyoming State Department of Environmental Quality- Excellence in Reclamation award to name a few. After retirement in February 2023, he continues to push for excellence in the recovery of ecological disturbances and plans to continue to share in his experiences. He also enjoys the outdoors with his family while camping and fishing.



### **Pioneer in Reclamation Award – Dr. Neil Humphries; Nominated by Jeff Skousen**

Dr. Humphries has shown outstanding leadership in reclamation ecology and research while focusing on soil ecology in the reclamation of disturbed ecosystems in the mining industries throughout the United Kingdom. Dr. Humphries education started a long career (50 years) in the development and research of reclamation practices which can be summarized as management, restoration, and re-creation of soil-based ecosystems and biodiversity after drastic disturbances. Dr Humphries received his BS from University of Exeter, his BA from Cambridge University, and his PhD from the University of Liverpool. Activities by his companies always have maintained high standards to ensure that the reclamation and research on soils and agricultural use of disturbed sites be carried out in a meaningful manner. Dr Humphries and his associates always maintained a desire to make sure that others could benefit from their experiences. Dr Humphries first published articles in the Proceedings of ASSMR in 1994 and has since publish more than 18 articles in other ASMR and ASRS proceedings and multiple articles in JASMR.

Dr Humphries has sought cutting edge technology and practices to find practical and meaningful advancements in the reclamation of disturbed ecosystems. His outstanding reclamation practices and research has led to a large array of honors and awards from ASRS including the William T Plass award in 2013 and the Richard and Lela Barnhisel Researcher of the Year award in 2020. Congratulations Dr Humphries on another outstanding honor for your dedication to, and your experience with reclamation ecology.



### **Early Career Award – Travis Tasker; Nominated by Julie LaBar**

Dr. Travis Tasker is an Assistant Professor in Environmental Engineering at Saint Francis University. He received a Biology and Environmental Science dual BS degrees from Allegheny College in 2013 and a PhD in Environmental Engineering from Penn State University in 2018. In addition to teaching Environmental Engineering courses at Saint Francis University, Dr. Tasker directs the Center for Watershed Research and Service (also known as the CWRS) which strives to assist nonprofit organizations, government agencies, and consulting companies on watershed restoration efforts. Since becoming director of the CWRS, Dr. Tasker has led and collaborated on multiple research, service, and technical service projects with a focus on water reclamation and resource recovery.

Currently, Dr. Tasker and the CWRS are assisting collaborators with mass balance analyses, water sampling campaigns, and reclamation plans for several mine contaminated watersheds in Pennsylvania. Dr. Tasker is also involved in many outreach campaigns through the CWRS, including working with local high schools to educate their students on mine reclamation and hosting a water reclamation summer academy at Saint Francis University for high school students. Overall, Dr. Tasker's career efforts focus heavily on mitigating the impacts of legacy mining and educating others on how we can all contribute to preserving Earth's valuable resources.

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