



Flooding on the Niobrara National Scenic River

by Bobbie Roshone

I grew up in the Missouri Ozarks. Flooding, for me, involved torrential downpours, significant water rise, and the occasional tree floating upright down the waterway. During spring, creeks and rivers tended to rise overnight or in hours depending on the rainfall. Narrow rocky hills created instant tributaries to smaller streams and creeks that fed into rivers. Occasionally dry creeks would run full, leading to Tolkienesque adventures to get folks from rural areas into towns.

The karst topography, where underlying bedrock is close to the surface, and not easily permeable, in the Missouri Ozarks is an interesting study regarding how ground and surface water intertwine. While growing up, floods were dangerous things that happened rapidly. For example, my hometown suffered a 33-foot rise from the Current River in 2017. It crested almost ten feet above the previous historic high. It began on April 27; by April 30, water was covering most of the town before receding the first week of May. It took months for the communities to recover. I had already moved to Nebraska prior to the 2017 flood, but I still felt the echo even 796 miles away.

Ice jam completely obstructing river below Cornell Dam, seen as a line across the river near the building at top left of photo. (NPS Photo / Steve Thede 1/16/2019)

For several years, I worked for Ozark National Scenic Riverways in Missouri interpreting the flooding cycle, among other things, to visitors. Now, I work for Niobrara National Scenic River as a park interpreter. After moving to Nebraska, I came to understand how subtle a flood could be and how drastically ice can change the course of river.

Growing up in southern Missouri I did not experience ice jams. For my first few winters in northern Nebraska, I was fascinated by how they formed and the damage they could cause. To me, after the ice was gone, the Niobrara didn't really flood, it just got faster. However, that is a limited view of what was actually happening. When the ice jams occur, it is due to the melting of snow into water or the water speed changing. When the temperature starts to rise, it causes ice chunks to fall into the main current and coming to a natural or manmade obstruction,

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RMS Main Office
Risa Shimoda, Executive Director
PO Box 5750, Takoma Park, MD 20913-5750
(301) 585-4677 / cell (301) 502-6548
executivedirector@river-management.org

National Officers
Linda Jalbert, President, Flagstaff, AZ
(928) 638-7909 / l_jalbs@yahoo.com

Bo Shelby, Vice President, Corvallis, OR
(541) 760-1000 / bo.shelby@oregonstate.edu

Helen Clough, Secretary, Juneau, AK
(907) 790-4189 / hcloughak@gmail.com

Dave Cernicek, Treasurer, Jackson, WY
(307) 739-5417 / dcernicek@fs.fed.us

Jane Polansky, Chapter Liaison
Nashville, TN
(615) 456-3843 / jane.polansky@tn.gov

Ex-Officio Advisors
Bob Randall, Kaplan, Kirsch & Rockwell LLP
(303) 825-7000 / brandall@kaplankirsch.com

Nate Hunt, Kaplan Kirsch & Rockwell LLP
(303) 825-7000 / nhunt@kaplankirsch.com

Steve Chesterton, US Forest Service
Washington, DC
(202) 205-1398 / smchesterton@fs.fed.us

Marina Metes, U.S. Geological Survey
Baltimore, MD
(313) 410-0336 / mjmetes@gmail.com

River Training Center
River Studies and Leadership Certificate
Steve Storck, Training Coordinator
(301) 585-4677 / training@river-management.org

National Rivers Project
National River Recreation Database
Jack Henderson, GIS and Program Assistant
jack@river-management.org

Professional Purchase and Merchandise
Judy Culver, Prescott, AZ
(928) 443-8070 / judyculver@fs.fed.us

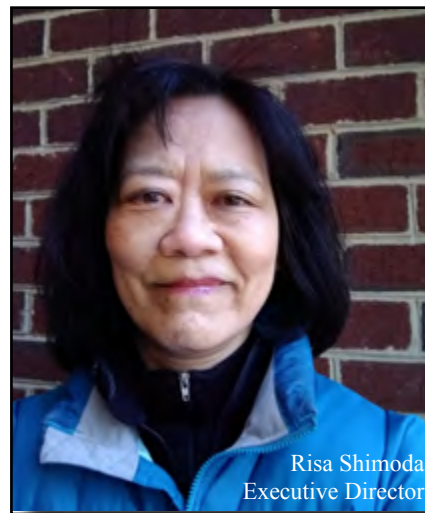
RMS Journal
Caroline Kurz, Missoula, MT
(406) 549-0514 / caroline@river-management.org

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Executive Director's Eddy

We are beginning to experience what was once only a lofty aspiration: establishing a student and early career component of RMS's plans, profile, member base and leadership team. As we plan the *Mountain Creeks to Metro Canals 2020* River Management Training Symposium, students and faculty are playing major planning roles as Virginia Commonwealth University is a partner, along with Virginia Department of Conservation and Recreation. We've become accustomed to learning from students and sharp, enthusiastic early career professionals in our meetings — they have become solid resources as we prepare to welcome you and your colleagues to Richmond next May.



Risa Shimoda
Executive Director

Beyond the infrastructure of the upcoming symposium, though, we are loving an emerging generation of members who have 'met' us through fellowships at member agencies and firms, and through associated networks such as the Society of Outdoor Recreation Planners. As examples, former National Park Service fellows Joni Gore and Kelleen Lanagan are back in school, yet have joined on their own while pursuing advanced degrees, and Joni has jumped into a leadership position as the Events Coordinator for the RMS Northwest Chapter!

We continue to expand the pursuit of our mission through the River Studies and Leadership Certificate (RSLC), proud to have been joined by Western North Carolina and University of Tennessee, Chattanooga this academic year. You'll read in this issue about the National Science Foundation 'incubator' grant, an effort led by RSLC advisors.

Increasing student participation has been assisted in a big way through the National Parks Service, a BLM-supported partnership with the Public Lands Foundation, and time offered by RMS members.

Here are two examples of how RMS is touching individuals on whose expertise and future leadership we will rely to shepherd our rivers' management, wisely: Member Jessy Stevenson, a Public Lands Foundation award winner in 2018, authored her story in the Summer 2019 RMS Journal and has shared the following reflection: "I want to extend my gratitude to RMS for being so incredibly supportive, from the Symposium in Vancouver to publishing this article - you have all been wonderful mentors and sources of inspiration. I graduated this past spring from the University of Montana and have been working a fun, guiding job this summer. I will hopefully have another opportunity to deepen my experience in the world of river conservation and management, and hope to work with the RMS team in some capacity down the road! I really can't thank you enough for your support and the work that you do!"

Mid-September 2019, River Training Center Director Steve Storck organized a webinar for those seeking federal agency employment for students at RSLC institutions and their advisors. RMS members Monica Zimmerman and David Cernicek shared their perspectives as veteran BLM and USDA Forest Service river managers, respectively, and Dave stayed on to answer questions about using USAJobs.gov, and offered individual coaching on resume building for a Colorado Mesa student.

Dr. Denielle Perry, RSLC Advisor at Northern Arizona University offered, "Thanks so much, Steve, David, and Monica for sharing this information with our RSLC students. We'll be in touch with more questions soon... Hire my students!" Thanks to scholarship gifts from members, agreements with partner agencies, and enthusiasm among RMS staff, students, faculty advisors and members like you, we are evolving to better prepare river managers for a world that will welcome challenge and surprise. Thank you all for the part you are playing. Let's do it some more! ♦

RMS President's Corner

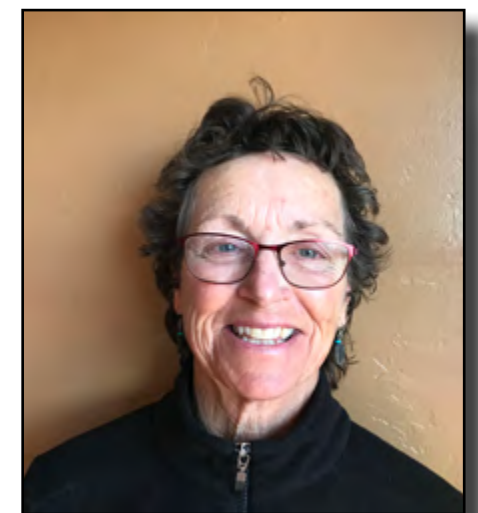
Keeping up Tradition

It's been nearly one year since the RMS community gathered in Vancouver, Washington, to celebrate rivers, exchange ideas, vet policies and management strategies, and renew professional connections and friendships. For many, the energy from the 2018 biennial symposium carried well into 2019 as RMS staff, chapter leaders, volunteers, and partners joined to organize more events and trainings.

Not much time had passed when the 2020 Symposium Co-chairs from RMS, the Virginia Department of Conservation, and Virginia Commonwealth University began planning next year's biennial River Management Training Symposium. Our leaders, Risa Shimoda (RMS), Lynn Crump (VCDC) and James Vonesh (VCU) dove in head first to gather committee members and develop a program for *Mountain Creeks to Metro Canals*, scheduled for May 2020 in Richmond, Virginia. We have a great event to look forward to.

In April, the Pacific Chapter hosted a symposium that highlighted issues on rivers of the Pacific slope and included an exciting Tuolumne River trip. In coordination with the River Training Center, the Southwest Chapter organized a swiftwater rescue training course on the Arkansas River in May, and the River Ranger Rendezvous on the Colorado River in Ruby Horsethief and Westwater Canyons in early August. In late August, Southeast Chapter folks boated the Chattooga River, and in September, the Northeast Chapter hosted a canoe trip on the Northern Forest Canoe Trail in upstate New York's Adirondack mountains, and the Northwest Chapter members enjoyed a 4-day trip on the Lower Salmon in Idaho.

The biennial training symposia, the Chapter-sponsored river trips, and the River Ranger Rendezvous are the RMS tradition that strengthens our community and shared respect for the rivers and our



collective work. Planning and organizing these events requires a lot of work and commitment and we are grateful to those members, agencies, and colleagues for investing their time and talent to create these opportunities. Thanks again Lynn, James, Bob, Christina, Steve, Risa, Tappan, Rob, Stuart, Jennifer, Reed, Jack, Amanda, Emma, Walter, Lisa, Joni, Joe and the tribe of RMS folks who made this all happen so far in 2019.

RMS is a membership organization. It exists for the benefit of its members and all governance comes from the membership. RMS' health, strength and vibrancy is dependent on an active membership that is diverse both demographically and professionally. You have a voice and an opportunity to become involved with the future and growth of RMS. If you see us doing good things, let us know. If you see us going in a direction that feels uncomfortable, let us know how to improve and how to better serve you. Become involved as a leader, share your knowledge through trainings, symposia, hosting river trips, or through an article in the RMS Journal. We'd love to hear from you. Whatever your comfort level, thanks for your support and engagement with the River Management Society. ♦



Linda Jalbert
RMS President

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Invisible to Visible

by Gary G. Marsh

At a recent trade show in Yokohama, Japan, the car maker Nissan unveiled its future vision for a vehicle that helps drivers “see the invisible” by merging both real and virtual worlds. Invisible-to-Visible, or I2V, is a future technology created through Nissan Intelligent Mobility, the company’s vision for changing how cars are powered, driven and integrated into society.

In a similar fashion each year the River Management Society (RMS) makes invisible heroes visible through its awards nomination process. The four prestigious awards spotlight those members whose efforts are extraordinary, who may have been unnoticed, but can no longer be ignored. The nominations and awards are held tight to the vest for the maximum surprise and impact up until the time they are presented. The competition is fierce each year and the awards committee is forced to make some hard but gratifying choices.

Have you ever nominated someone for an award, specifically a RMS award? Nominations take effort, behind the scenes research, and are usually done by individuals who know the nominee the best. Plus, the nominator has to be stealthy to keep the nomination secret. Having the awardee present at the awards event in person can also be a challenge, e.g., travel distance, expense, scheduling conflicts, etc. Although the nominee/awardee is usually present at the event, sometimes clandestine measures are employed to ‘con or fool’ them into attending the event — completely unaware of what is to unfold. Just to watch the emotional shock or surprise on his or her face is worth every minute. Nominators have been known to convince a supervisor, good friend, or spouse to encourage the nominee’s attendance under, let’s say, some other purpose or suggestion. Additional efforts may include a press release or public service announcement timed with the award announcement and/or follow up congratulatory letter from the awardee’s supervisor, agency head, or manager.

You or your coworkers are doing or have accomplished many things for river management. Also, your nominee may have not been picked in previous years, but that doesn’t mean you cannot renominate that individual. The major work of your justification has been done, so just update it and resubmit.

Take the time to nominate. The awardee will appreciate it beyond measure and become a visible hero to all involved in river management. To get the process started, go to: www.river-management.org/awards. ♦

2019 RMS Awards

Annually, RMS presents awards for Outstanding Contribution to River Management, Frank Church Wild and Scenic Rivers, River Manager of the Year, and Outstanding Contribution to the River Management Society. The years we do not have a symposium, the awards are presented at various events. Award winners do not know they have won until the award is presented. As each award winner this year was recognized at a unique event, there are four separate articles about their contributions. A brief description of the awards and 2019 awardees are named.

Susan Rosebrough (Outstanding Contribution to River Management): This award recognizes a longer history of contributions to the greater field of river management (as opposed to more recent or project/location-specific accomplishments). Susan was honored at a NPS Wild and Scenic Rivers Steering Committee meeting this fall in Washington.

Dr. Thomas O’Keefe, PhD (Frank Church Wild and Scenic Rivers): This award recognizes contributions focused on the management, enhancement, or protection of designated Wild and Scenic Rivers. As with the Outstanding Contribution to River Management, this award recognizes a history of contributions with a broad geographic scope (as opposed to more recent or project/location-specific accomplishments). Tom was presented this award in Boise, Idaho.

Noah Triplett (River Manager of the Year): This award recognizes contributions that are field-oriented and location-specific, with a focus on recent accomplishments. Noah was presented with this award at the river film festival in Coloma, California, by long-time RMS member Bill Deitchman.

Judy Culver (Outstanding Contribution to the River Management Society): This award recognizes contributions to the success of the River Management Society itself. This award recognizes contributions at the national or regional level that result in greater organizational effectiveness, efficiency, growth, positive change, or enthusiasm. RMS President Linda Jalbert presented the award to Judy in front of many of her peers and the RMS Board in October in Arizona. ♦

Susan Rosebrough selected for Outstanding Contribution to River Management Award

In September, Susan was presented the award during the National Park Service Wild and Scenic Rivers Steering Committee meeting to a resounding cheer! There were many heads nodding in agreement as the list of Susan’s accomplishments was read. “Susan is in the midst of a remarkable career, achieving numerous on the ground river enhancement projects and creating multiple new tools for sharing river information,” said Joan Harn in her nomination. Susan has advanced the field of river management through her nearly 20-year career with National Park Service technical assistance programs in Hydropower; Rivers, Trails, and Conservation Assistance; and, Wild and Scenic Rivers. Her dedicated river protection advocacy combined with her outstanding communication, organizational, and geospatial skills, have led to a series of innovations and river protection improvements. Some examples of her outstanding leadership and accomplishments follow.

Since 2013, Susan has been leading coordination to develop a national interagency wild and scenic river geodatabase in partnership with agency partners. This authoritative database contains important information about each of the designated rivers and the interactive maps share this information with the public in a seamless user-friendly way. The basic database is now complete and new web maps and story maps are now incorporated into rivers.gov. This work has provided a basis for the National River Recreation Database developed by RMS.

Susan represents the National Park Service on Federal Energy Regulatory Commission (FERC) proceedings for new hydro development in the Pacific Northwest and works towards protection of streams while creating sustainable hydropower.

Over five years, Susan was involved in settlement negotiations on the proposed Skykomish River hydro project, which would have altered flows over Sunset Falls, advocating for a flow regime that

would minimize aesthetic impacts. In Spring 2018, Snohomish County Public Utility District announced it was no longer pursuing this project after a thorough review of their long-range power needs and conservation goals.

Susan was appointed to the National Park Service Wild and Scenic River Steering Committee in 2015. She contributed to the subcommittee writing the handbook associated on Wild and Scenic Rivers. She led interdisciplinary teams on Wild and Scenic River studies for the Skagit, Elwha, and tributaries of the River Styx within Oregon Caves National Monument and Preserve. She was the National Park Service lead on the Wild and Scenic River Section 7 determination for the Klamath River relicensing of the four dams and then for the removal of those dams.

In partnership with American Rivers, Forest Service, Whatcom County, WA and the Tribes, Susan developed the Nooksack River Recreation Plan which outlines eighty recommendations to enhance recreation opportunities and protect natural resources. The group leveraged support from Western Washington University to conduct the site inventory along the popular North Fork. The group has implemented two early action projects including a new trail leading to a kayak access site and restoring and modifying a dispersed riverside campground so vehicles could no longer drive into the river.

Susan helped support the Pend Oreille River Water Trail. She represented the National Park Service in a hydro settlement agreement on the Boundary Dam, including over six million for recreation and removal of a small dam. Specific to the water trail the settlement agreement includes funding for improvements of developed campsite, six



Susan Rosebrough displays her RMS award.

boat-in only day-use and campsites, one developed day-use site, a portage trail, an on the ground river ranger position, and support on interpretation and map development. She worked with the local community to develop a water trail concept plan.

In partnership with the Port Gamble S’Klallam Tribe, Susan developed the Port Gamble S’Klallam Tribe Trail Plan. The plan calls for an eight-mile trail system on the reservation. Committee members included youth leaders and a Tribal doctor. Their input led to inclusion of a one-mile fitness trail. Upon plan completion, the Tribe received \$1 million in grants to implement the trail system. This trail is intimately connected to the now free flowing Elwha River.

Susan partnered with American Whitewater on the Middle Fork Snoqualmie River Access Plan near North Bend, WA. They leveraged support from the University of Washington landscape architecture class on designs for several access sites. Since the plan was created nearly \$400,000 has been leveraged to formalize and enhance 12 public access sites, create a river map, and install signs along the river. ♦

Tom O’Keefe Receives Frank Church Wild and Scenic Rivers Award

This award recognizes contributions focused on the management, enhancement, or protection of designated Wild and Scenic Rivers. It recognizes a history of contributions with a broad geographic scope (as opposed to more recent or project/location-specific accomplishments).

Dr. Thomas (“Tom”) O’Keefe, PhD., Pacific Northwest Stewardship Director for American Whitewater, was recognized for his work in the designation, restoration, and protection of Wild and Scenic Rivers throughout the Pacific Northwest and beyond. Tom has more than twenty years of experience in watershed ecology and river management including scientific research, teaching, public policy, and expertise in federal environmental laws including the Federal Power Act, Clean Water Act, National Environmental Policy Act, National Forest Management Act, and Wild and Scenic Rivers Act. His particular passion for Wild and Scenic Rivers is exemplified in his daily work flying to Washington, DC, to meet with congressional staff, sharing his enthusiasm with family and friends and strangers, to taking off his suit and trademark bowtie to enjoy the waters he spends his life protecting.

Tom had years of research and teaching of watershed ecology and river restoration before leaving his academic career with the University of Washington to dedicate his life to the protection of rivers through his work with American Whitewater. His calm likeable demeanor has resulted in building bridges amongst many partners who might traditionally have been seen as oppositional stakeholders. He is well-known and well-respected from the local level to the national level, from the West Coast to the East Coast, by the kayaking community, dam-relicensing agents, engineers, fishermen, tribal leaders, and politicians. His enthusiasm is infectious, and combined with his professional expertise, he can quickly have engineers changing their construction operations to better protect a Wild and Scenic River and have business leaders become willing to fund large projects on public lands when nobody else would.

Tom’s contribution to Wild and Scenic Rivers is immense. He has helped mastermind the Wild Olympic Bill with over 400 miles of new Wild and Scenic River designations currently working its way through Congress. He has partnered with Smith River Alliance to build educational awareness for Wild and Scenic Rivers and helped protect the headwaters from mining. Tom has been instrumental in the removal of Condit Dam on the White Salmon which resulted from decades of advocacy and working with multiple individuals and agencies. He also helped facilitate the removal of Elwa Dam and was featured in the Patagonia film *Damnation* for his far-reaching work on this project as well as at least six other dams he has worked on to help restore healthy rivers with a focus on salmon recovery, riparian restoration, and new recreation opportunities to enjoy Wild and Scenic Rivers.

Some of the Wild and Scenic Rivers that Tom has had a hand in promoting and protecting include Snoqualmie, Skagit, Nooksack, White Salmon (WA), Rogue, Chetco, North Umpqua, Sandy,



Tom O’Keefe displays his RMS award.

Clackamas, Owyhee (OR), St Croix, Wolf (WI), Aniakchak (AK), and Eleven Point (MO). Megi Morishita who nominated Tom said, “I will never forget the day when my phone rang and it was Tom, whispering, as if speaking too loudly might make his words less sacred.... ‘I think this might be the biggest thing I have ever done. I’m being quoted by the Supreme Court in their ruling to protect rivers.’” Unassuming and disarming, while simultaneously a fierce protector of rivers, Tom has a gift of having people follow him. Whether it be using a rope system to lower a commercial-grade sandblaster down the side of a canyon wall to remove thousands of square feet of graffiti, or holding a peaceful protest to inspire a naked beer commercial in the efforts of bringing down a dam, Tom is a leader for Wild and Scenic Rivers. As one colleague described his “ridiculous capacity, creativity, and care to help out beyond what most other people can even imagine.”

RMS member Robin Fehlau facilitated Tom receiving the plaque and provided a brief description of the presentation. “It was a warm sunny evening at Payette Brewing in Boise, Idaho, where the North Fork Championships held their kick-off event of the NFC River Symposium. The symposium brought people together to talk about the issues that impact the future of our special rivers, and engage participants in current events and research. Idaho Rivers United, American Whitewater, and Idaho Conservation League all had staff in attendance. Participants saw presentations on Bolivia, Canada, and Idaho as well as the River Management Society representative bestowing the Frank Church Wild and Scenic River award to Tom O’Keefe. Tom was surprised and it was gratifying to give him the award in front of his peers.” ♦

River Supervisor Wins National Award

by Kevin Christensen

Many people spend a lifetime searching for their passion but some find it early, taking to it like a fish to water. Noah Triplett, 45, found a love early in life and has been following it ever since. Triplett is the river recreation supervisor for El Dorado County Parks and Recreation. He said he has always been an outdoor enthusiast, but had a particular fondness for the river.

“The river is a special place because it allows people to recreate and is both exciting and peaceful at the same time,” Triplett said. “You learn about yourself on the river and it’s a special experience that binds people when they go on a river trip together. It is very rewarding to share that experience as a guide and teach people, being a steward of the river.”

Triplett was rewarded for his commitment to the river in early June at the 2019 River Film Festival in Coloma. He was presented with the River Manager of the Year award from the River Management Society, a national nonprofit organization whose mission is to support professionals who study, protect and manage North America’s rivers.

“I was shocked and humbled to receive the award. It was a total surprise. I was there because I help support the grange and was under the impression I was just giving a speech on river management,” Triplett said. “I was brought up during the intermission to speak briefly and I never expected it.”

A graduate of California State University, Humboldt, Triplett earned a bachelor’s of science in natural resources with a focus in planning and interpretation. Triplett met his now wife, Amy, in a Latin dance class where she was an instructor. The couple, who live in Placerville, are proud parents of two daughters, Emma, 8, and Ella, 5. Triplett’s parents, Sam and Trudy, were both teachers. He attributes this to his enthusiasm for educating people about the river. When he was a child his father bought land near Ward’s Ferry on the Tuolumne River. It’s there where his love for the river was born.

“I spent a lot of time on the river fishing and recreating,” Triplett said. “I navigated the Truckee River when I was 8 years old and rafted the Tuolumne River at 10 years old, which is a class IV.”

Coloma resident and past Pacific Chapter River Management Society President Bill Deitchman presented Triplett with the distinguished award. “He truly deserved this award and I’m glad he won it. Noah has done a terrific job,” Deitchman said. “Countless lives have probably been saved because of Noah and his crew patrolling the South Fork of the American River and how they educate people about river safety, the environment and history.”

Triplett and his crew, are responsible for patrolling and managing about 21 miles along the South Fork of the American River that falls between the Chili Bar and Folsom Lake. Triplett and his team test river water quality, perform river-use permitting and assist in the training of local emergency responders to patrol the river. He does river rescue, first aid and helps to organize three river clean-ups in the county every year.

“The challenge of managing this part of the river is the amount of private land near it,” Triplett said. “We manage all the outfitter companies on the river that guide rafting trips and the recreation aspect. It can be a delicate balancing act at times, especially with the population growth in the area.”

Triplett represents the county’s interests when negotiations on new regulations come about for current or existing hydro-projects with entities like the Federal Energy Regulatory Commission. The commission provides licensing for companies like SMUD [Sacramento Municipal Utility District] and PG&E [Pacific Gas and Electric].

“The reality of the river here is that public interests, private rights and businesses have to all coexist and be represented to find a positive outcome keeping in mind how all environmentally impact the river,” Triplett said. “It’s challenging but rewarding to represent the county in finding that harmony.” ♦

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Long-time RMS member Bill Deitchman (left) and Noah Triplett with the River Manager of the Year Award. Photo courtesy of Bill Deitchman.





Judy Culver with RMS President Linda Jalbert. Photo: Helen Clough

Judy Culver Receives the Outstanding Contribution to the River Management Society Award

This award recognizes contributions to the success of the River Management Society that result in greater organizational effectiveness, efficiency, growth, positive change, or enthusiasm. RMS President Linda Jalbert presented the award to Judy Culver during the recent RMS in-person board meeting at Camp Verde, Arizona. At an evening social with the board, Southwest Chapter members, Judy's husband and some of Judy's supervisors and co-workers present, Linda acknowledged Judy and presented the plaque.

Judy was selected for her service to RMS as our Pro Purchase Coordinator, for operating the RMS store, and for her incredible work on the Vancouver symposium – serving on the steering committee, leading the marketing committee, and all her amazing work onsite with the RMS store, silent auction, and just anything else we needed.

Judy offered to be the Pro Purchase Co-Coordinator (with Anja Wadman). When Anja needed to step back due to work obligations, Judy took it all on. She organized the materials, obtained new sponsors, and has been responsive to member requests for pro purchases. Her work has put us in a better position with our vendors and increased the number of vendors who provide professional purchase discounts to members. She also runs the RMS store out of her home.

Judy donated many, many hours of her time for the Vancouver symposium by serving on the steering committee and leading the marketing committee. She did all the work for the RMS store at Vancouver including acquiring the merchandise from Linda, organizing it, driving it from her home in Arizona to the symposium and back (saving shipping costs), and running the store throughout the symposium. She also assisted with the silent and live auctions – overseeing the auction items when others weren't available and helping cash out for both auctions using her personal phone for our credit card processing. All this was done with great professionalism and good cheer. As Vancouver Symposium co-chair Helen Clough said, "If Judy said she was going to do something, I knew a quality job would be done on time and without any reminders from me."

Judy volunteered to lead the marketing committee for our upcoming Richmond symposium. She attended part of the board meeting bringing us up to date with marketing efforts and plans. She also helped organize a float with local chapter members, agency personnel, River Studies and Leadership Certificate students, and others to look at local issues along the Verde River on Sunday of the board meeting. Judy is always willing to step in where there is a need and has done so much to help out our organization. ♦

A Great Christmas Gift!

by Judy Culver

As I began to ready the RMS store supplies for the trip to Vancouver, WA, I pulled up the silent auction items that had been so kindly described on the RMS Symposium website. Zeroing in on a few fly-fishing trips, I gathered the funds set aside for my auction items, packed up the RMS merchandise and headed out in my truck toward the *Wild, Scenic and Beyond!* 2018 symposium.

This was the first long trip I had taken since moving to Prescott, Arizona, and I was itching to get on the road and explore familiar and unfamiliar places. On the way up, I spent time in Stanley, Idaho, and Mount Pleasant, Washington. On the way home, exhausted, with my auction item booty in hand, I called Stokes Landing B&B in Irrigon, Oregon, and luckily, they had a room available — they remembered me from my last visit and I had the entire place to myself. It felt like home.

Arriving back in Prescott, I wrapped my Christmas present to my husband (of just one year) and stashed it away in a drawer. Christmas day he opened his stocking to find an odd gift with a note on it. It was a fishing rod lighter that said Part 1 of II. He dug back into his stocking and found a small fishing tackle box which he opened. Then he looked up at me with a huge grin and big eyes after reading that he had a 1-day fly fishing trip for two on the Arkansas River in Salida, Colorado. Not only had he never been in Colorado, but he had never been on a guided fly-fishing trip — this was a way he could fish without showing me how to improve on my technique (not that he said that out loud).

Our week-long trip took us through many of my favorite places including Moab, Utah, and Glenwood Springs, Colorado. We spent time in Denver with friends and family and then took Highway 285 over to Salida, Colorado. Arriving at the Brown's Canyon Inn, we found a remodeled character hotel that was quiet, comfortable and managed by a wonderful young couple. We hit Walmart the next morning to grab a few things before meeting our fishing guide and owner, Andrew of Salida Fly LLC at his partner store, Salida Anglers Fly Shop.

Having been a Colorado State Parks River Ranger, Andrew was able to provide us with a detailed history of the

development of the Arkansas River fishery and the threats to the fishery including mud slides from fire scars. Jumping into his raft, my husband Mark made a bet with me that he would catch the first fish. We cast our lines out, mine reaching behind a rock on river right. Fish on and of course I won the bet! Sadly, it was a 4-inch trout, and one of only three that I caught, but it was the first fish of the day! Mark proceeded to out fish me not only for the rest of the day by catching 15 to my three, but he out fished me for the rest of the week catching fish every day using the information Andrew had provided about types of flies to use.

With a newfound interest in fly-fishing we armed ourselves with missing tackle, a new pair of waders after Mark's fell apart, and supplies (mostly from Salida Anglers Fly Shop) that we didn't bring with us. A one-night stay extended into two as we fell in love with Salida and the Arkansas River. On our trip, we fished the Arkansas, Gunnison, Umcompahgre and Dolores rivers using the Colorado Fishing Atlas created by the Colorado Parks and Wildlife Service to guide us as we worked our way back to Arizona, always looking for the next piece of open water to fish. For those sitting on the fence about donating trips to the RMS symposia silent auction, we spent over \$550 in Salida during our 2 ½ day stay and over \$1,100 in Colorado when you consider food, gas, hotels, and fishing supplies. Better yet, now that Mark has seen how great the fishing is in Colorado, we are both itching to go back to boat and fish the state and spend more time on the Arkansas River. I can't wait! Thank you to the Southwest Chapter and Salida Fly LLC. Thank You Andrew! ♦





RMS Convenes State River Managers Working Group

by Molly MacGregor

The nation's free-flowing rivers were celebrated at the River Management Society's 2018 Training Symposium in Vancouver, WA, in recognition of the 50th anniversary of the National Wild and Scenic Rivers Act, which protected the nation's outstanding rivers.

River managers acknowledged then - and now - that the national act was significant, but was only one of many tools needed to manage rivers. In his 1993 book, *The Wild and Scenic Rivers of America*, Tim Palmer described river management as a "coordination nightmare" involving "road repairs, agricultural diversions, subdivision, tribal land development, and the gamut of land use activities."

"Conservationists...have been more concerned with getting rivers protected from the extinction threats, and by researchers who are more attracted to ideas than nuts and bolts issues," he wrote.

RMS recognizes that effective river management requires many hands. The May 2020 RMS Training Symposium promises to dig deep into the complexity of river management, exploring issues involving rivers flowing out of remote

Honor the Earth is a group of activists working against Line 3 pipeline by organizing on the ground actions such as this flotilla on the Nemadji River near Duluth, MN, July 2019.

Photo: Keil Troisi. Courtesy of Allen Richardson.

mountains to busy ports. The event location in Richmond, VA, illustrates the symposium's theme *Mountain Creeks to Metro Canals*. Richmond sits at the fall line of the James River, which rises in the Appalachian mountains and flows to Chesapeake Bay on the Atlantic Ocean. It becomes navigable at Richmond, and is one of Virginia's designated scenic rivers. The Virginia Scenic Rivers program celebrates its golden jubilee in 2020.

In preparation for the Symposium, the River Management Society has convened a working group of state river program managers: folks who work with rivers representing state government, local units, nonprofits, outfitters and industry. The Working Group intends to help state river program managers to share information and improve their capacity to work with stakeholders, federal agencies and across state boundaries. The group is facilitated by Molly MacGregor, planner with the Minnesota Department of Natural Resources. (Note: I have been a RMS member since the days of the State and

Federal River Program Managers and have worked on three of Minnesota's wonderful rivers: the Mississippi Headwaters, Red River of the North, and St Louis... those rivers represent the three ways water flows out of Minnesota to the Gulf of Mexico, Hudson Bay and St Lawrence Seaway.)

The initial participants represent: 1) state government in Colorado, Kansas, Maryland, Montana, Oregon and Utah, interested in managing recreational uses of rivers including user conflicts, funding operations, access and use (including private lands along the river); 2) outfitters and nonprofit groups from North Carolina, Tennessee and Virginia, interested in the quality of the rivers (especially how visible discharges affect their operations) and resolving long-standing water quality management initiatives; and, 3) experienced river managers from Oklahoma, Michigan, and Minnesota, who offered assistance on identifying and finding resources, managing programs and finding funding.

Participants responded to a call on the

RMS listserve, asking for folks interested in a state perspective on rivers. Not everyone followed a traditional path to state river management, but all agreed that multiple perspectives will lead to more effective river management. For example, Christy Thrift wrote: "We opened our adventure guide company in Concord, North Carolina, in 2012 and now offer 21 guided adventure trips in NC, SC, and TN. In 2015 we moved to WNC. The following year we joined local Mountain Search and Rescue Team 2 and starting doing voluntary water sampling for the French Broad Riverkeeper for e-coli on the North Toe River. We have since been part of conversations that included the Mitchell County mines doing better due diligence to keep our waterways clean, as well as conversations with the city, county and North Carolina Department of Environmental Quality about storm runoff and e-coli issues," she wrote.

Scott Thrift, Christy's husband and business partner, participated in the first meeting of the state river managers group. They are especially interested in monitoring waste discharge from quartz mining in the North Toe River.

That river is both a drinking water source and a place for fishing, paddling, swimming, and wading. There have been sewage leaks from riparian towns and a hydrofluoric acid spill from one of the mines on the river. The acid is used in treatment of the mining operation's wastewater effluent. Discharges must meet a water quality standard pH between 6 and 10. An alarm sounds within the plant when the level drops below 6, indicating unsafe level of acidity. This discharge resulted in a fish kill; the sewage leak resulted in closing the river to human contact.

"The Mine's environmental personnel told us that the permitted discharges should be clear and odorless," said Christy Thrift. "However, the discharges we have observed change the color of the water to a white milky color and it smells very strongly of chemicals. This discharge coats all the rocks and the banks in a ton of white sediment," she said.

On the working group call, Ed Fite, long-time Oklahoma scenic rivers manager, offered to provide assistance to the Thrifts as they seek to provide a high quality river experience to their customers. Specifically, Fite said he can help them understand water quality rules, purpose and use of monitoring, and advocating for

healthy water quality goals. He comes by that knowledge through experience.

The Illinois River is one of Oklahoma's scenic rivers. It rises from springs in northwest Arkansas, and flows west into Oklahoma, where it eventually joins the Arkansas River. In 1992, the US Supreme Court ruled that water leaving Arkansas must meet water quality standards in downstream Oklahoma, which set into motion the need to significantly reduce phosphorus discharges from poultry operations.

In 2002, Oklahoma became one of the first states to use a numerical water quality standard for phosphorus. The standard for scenic rivers was set at 0.037 mg/L. Arkansas agreed to target the reduction of instream phosphorus levels by more than 40%, which is still in progress, Fite said.

"In recent years instead of lawyering-up, we've adopted a living room visit approach to mediating the dispute and moving toward the desired result," Fite told the group on the call. "I am very interested in sharing this experience by working with others."

Participants in the first state river program managers call identified many challenges with managing boating use of rivers. In Colorado, the state is currently modifying the name of the existing Special Use Agreement (commercial use) to a Special Use Permit and revising the language contained within to more accurately fit within state regulations. Representatives from Colorado Parks and Wildlife and the Attorney General's Office are working with the outfitting community to implement the changes.

In Maryland, the boating and scenic rivers program are linked, but changes are pending for the state's scenic river programs. Nine rivers have been designated to the program, and management plans developed for each. The plans are administered by the counties that the rivers flow through. An updated plan for the Monocacy River, a tributary to the Potomac, was recently approved by Frederick and Charles counties.

In Montana, river managers are assessing how to tweak the lottery program for river uses to match the increasing use of the Smith River. In Utah, river managers are evaluating how to resolve conflicts from upstream jet boaters and downstream paddlers on the Colorado River. And in Oregon, the state's boating authority is adding a paddling program to

services it supports, and is challenged by the intrusion of private docks into public waters.

Doug Carter, Michigan's riverologist, says that managing private lands is an important component of overall river management, adding to the needs to partner and coordinate with private landowners, local businesses, local governments, the federal government, and nongovernmental organizations.

Virginia's scenic rivers program is one of recognition, with management led by local units of government, through local plans and controls. More than 800 river miles, representing 33 rivers, are so designated, but that's a fraction of the state's 49,000 river miles. While the state supports local governments, the Virginia Conservation Network's *Healthy Waters* campaign works to reduce pollution from sources such as agricultural runoff, coal ash, and fracking. The campaign's goal is to have Virginia removed from the "dirty waters" draining to the Chesapeake. The state has already invested heavily in wastewater plant upgrades, and has recently added funding to limit agricultural run-off and assist land conservation.

The next step for our Working Group is to continue discussing (through scheduled phone calls) how to help each other, and determine which issues are most pressing to address. Group members could serve as mentors, helping navigate challenging issues. Or, members could serve as a clearinghouse, sharing experiences with resources. The group will take into account the River Manager Core Competencies presented at the 2018 Symposium:

1. Laws, Policies and Regulations for River Management
2. River Management Planning
3. River Management Field Skills
4. Visitor Use Management and Monitoring
5. Natural, Cultural and Recreational Resources Management and Monitoring
6. River Information Management Skills
7. Collaboration and Engagement Techniques

The group will meet in person in Richmond at the May 2020 Symposium. This is an open group! If you would like to be included, or have ideas for consideration, please contact River Management Society's Executive Director Risa Shimoda or Molly MacGregor at molly.macgregor@state.mn.us. ♦

Midwest Floods of 2019: epic scale, epic failure, time for a reboot of river management



Floodwaters of the Missouri River spread across the town of Hamburg, Iowa, in March 2019. The town experienced three flood events between March and September this year. Residents rebuilt the levee in May, which helped when the river crested at 22 feet in September. (Photo courtesy of Jenn Ackerman and Tim Gruber for The New York Times)

by Molly MacGregor

2019 has brought epic floods to the Mississippi River system, which drains 40 percent of the nation, from the Upper Midwest, through the country’s cornbelt and into the Delta, down through New Orleans and out to the Gulf of Mexico. The extent and volume of the floods exceed floods of 1993 and 1927 – which changed how we approach flood control and disaster relief. This year’s failures remind us of Mark Twain’s admonition that the Mississippi is a “lawless stream.” And as river managers, we are challenged to redefine river management to fit the historic challenges and geography and the new challenges of more intense and frequent storms.

“This is a year that will remain in our cultural memory, in our history,” the director of NOAA’s National Water Center

told the New York Times in September. He was quoted in a powerful article that compiled satellite data to show how water moved through the river from January through August. Images of floodwaters breaching levees, blocks of homes flooded to the upper floors, and tractors plowing through water were published in all forms of media. High water caused multiple failures along the system of levees along the Missouri and Mississippi rivers, from Nebraska to Louisiana. The failures resulted in heart-breaking personal losses, and massive economic ones as fields went unplanted. Mayors on the Mississippi River predict at least \$2 billion in cost due to infrastructure damages and emergency

response following this year’s storms; they haven’t estimated costs to homes, farms and businesses.

The New York Times and other major publications are useful to help us understand what happened and what conditions caused flooding, plus challenge us as river managers with how to plan for a new normal of 100 year floods every year or so.

First, what happened: On September 11, the New York Times published an interactive map that showed how flooding in the Missouri and Ohio rivers led to the extended flooding of the Mississippi in the delta and below. “*The Great Flood of 2019: A Complete Picture of a Slow-*

Motion Disaster” by Sarah Almukhtar, Blacki Migliozi, John Schwartz and Josh Williams used satellite data to show the normal extent of rivers, the flooded areas, and farmland along the rivers. It shows what it means when scientists report gauges at flood stage. And, it shows the cost of the flood — by the end of June, the flooding was so intense and widespread that at least 11 states had sought federal disaster funds for more than 400 counties, the newspaper reported. “The causes of flooding are complicated, but climate change is increasingly an exacerbating factor. Warmer air can hold more moisture, and that moisture can fall back out of the sky, whether as rain or snow, in greater amounts,” the article concludes.

Which leads us to why it happened. Climate Signals (www.climatesignals.org) is a digital science platform for cataloging and mapping the impacts of climate change. Currently in open-beta release, the platform is designed to identify the chain of connections between greenhouse gas emissions and individual climate events. On August 19, the publication reported in an article how extended flooding of the Mississippi River during Spring 2019 is a classic signal of climate change:

- Significant increases in flooding are well-documented in the Midwest. These increases are attributed mostly to the observed increases in total precipitation.
- A warmer atmosphere can hold more moisture, and can lead to more intense storms. In the Central U.S., severe storms are showing an increase in intensity and frequency, consistent with climate modeling.
- A growing body of scientific evidence has made clear that “increasing precipitation, especially heavy rain events,” across the Midwest and Great Plains “has increased the overall flood risk, causing disruption to transportation and damage to property and infrastructure.”

- Persistent jet-stream patterns are expected to occur more often with a warming climate, and especially as the Arctic warms faster than elsewhere.
- Heavy rainfall is increasing in our warming world, and it is driving up flood risk. Warming temperatures are changing when and how rapidly snow melts.
- The dams and levees that were breached were designed for the climate of the past, not today’s climate.
- Infrastructure tends to collapse when climate change pushes extreme weather past the limits for which projects were designed.

Finally, The New Republic reported a heart-breaking story of how the new normal challenges our response to flooding. On May 28, “*River of No Return: How austerity and climate change put northeastern Nebraska underwater*” explains how the rains of the March bomb cyclone loosened ice, damaged an aging dam, and rushed through a downstream farm, and the farmer watched “as ice floes crushed and carried off his grain bins, his barn and his tractor shed...All of it was scoured away in a matter of minutes.”

Writer Ted Genoway documents that the dire conditions of the flood control system on the Missouri River and its tributaries were well-known in the small towns of Nebraska’s flood control system: “In recent years, when a community like Fremont, Nebraska, or nearby Inglewood, reached out for federal assistance, asking the Corps of Engineers what it would cost to bring its levees and viaducts up to snuff, the city’s leaders often got bad news. In early 2010, Corps officials made a public presentation to Fremont, Inglewood, and county officials. They warned that Fremont’s earthen levee had become overgrown with tall trees - and this meant that, in the event of a major flood carrying ice floes, the trees could be uprooted and tear holes in the levee, allowing floodwaters to course through. The Corps

assembled a proposal for upgrading the system, but it came with the shocking price tag of nearly \$28 million from the city...a new levee, the city reasoned, would take a generation to pay for. It just wasn’t cost-effective.”

Repairing damages to businesses, homes, and federal roads following March’s flooding is likely to reach \$40 million for these communities, Genoway predicts. The 2019 flood is the second historic flood to hit the area in recent years. He asks, “How do we, as a nation, ready ourselves? How do we get small and medium-sized towns in deep red, rural states to undertake rebuilding and upkeep projects that are based on predictions for climate change and shifting weather patterns over the next 50 to 100 years?”

It could be argued that flood control on the Mississippi River system, draining nearly half the nation’s land mass, is a national system of river management. It is intended to keep the river navigable for commerce and the well-being of the people who live alongside it. The plan is built on combining government at its various levels: federal government provides engineering, oversight and funding, but the system depends on localities to maintain the levees.

When flood stage is the norm from spring through summer, the river is becoming too big for the system. In his *Life on the Mississippi*, Mark Twain was dismissive of efforts to control the river: they “cannot tame that lawless stream, cannot curb it or confine it, cannot say to it, Go here, or Go there, and make it obey.”

We may have learned the hard way that we can’t make the river obey, but how do we manage the river to reduce the harm of floods? ♦

Molly MacGregor works as a regional planner for the Minnesota Department of Natural Resources.

Pipelines Inspire River Protection in the Midwest

by Molly MacGregor

Pipelines are everywhere: 2.5 million miles of them form a web under our feet, our rivers and our roads. In the Midwest, pipeline projects have been put on hold as tribal nations, nonprofits, and some state officials object to the potential harm of transporting oil under rivers.

The hashtag #NoDAPL (no Dakota Access Pipeline) was started by teenagers from the Standing Rock Reservation, and an elder started a camp for resistance to the pipeline in April 2016; by February 2017, the encampment was gone and the pipeline construction resumed, but the protest invigorated communities whose home waters were crossed by pipelines. There has also been new scrutiny by public officials mandated to protect public resources.

Enbridge Energy is based in Alberta and has proposals to rebuild pipelines in Minnesota, Wisconsin, and Michigan. In Michigan, the newly elected state Attorney General sued Enbridge, citing the government's responsibility under the public trust doctrine to protect the Straits of Mackinac. In Minnesota, the Court of Appeals agreed with tribal nations and nonprofits that watershed issues had not been adequately addressed by the environmental assessment for another Enbridge pipeline. And in Wisconsin, the Bad River Band of Lake Superior Chippewa have challenged Enbridge's easements to cross lands within the reservation's boundaries.

Greg Seitz operates the website *St. Croix 360* in partnership with the St Croix River Association, where he has reported on Enbridge and the threat pipelines pose to Midwest's wild and scenic rivers. He compiled comments for another online publication *Agate* (www.agatemag.com), which is focused on the environment and people of Minnesota and the surrounding Great Lakes region. Here's an excerpt from Seitz's article about pipelines:

The St. Croix River rises in northern Wisconsin, where springs bubble up in bogs and trickle together to form the clear, cold river. It's a land full of wildlife and woods and waters, cherished for hunting, fishing, canoeing and kayaking. Just a few miles downstream of the St. Croix's source, the Eau Claire River flows in. Another twenty miles south, the Namekagon joins. A short ways up the Namekagon, the Totogatic River enters it.

Under all four of those rivers, and through countless forests, fields, creeks and wetlands in the region, a 42-inch pipeline carries a torrent of heavy crude oil in a diagonal line from northwest to southeast, ending up at refineries near Chicago. This is Line 61, and it spans Wisconsin from north to south. Enbridge has operated Line 61 since 2009, but in 2014 and 2015 the company added pumps to triple the pipeline's capacity to 50 million gallons per day—supplying America with its predominant transportation fuel, and multiplying the potential for pollution in

sensitive waterways.

The company is also considering a possible "twin" Line 61, another 42-inch pipe along the same route. There is no formal proposal yet, but Enbridge has been surveying the right-of-way and talking to suppliers.

The oil industry considers much of the oil flowing through this system to be "unconventional." It isn't pumped out of the ground, like regular crude, but mined, resembling hot asphalt. It must be processed and diluted with lighter oil and other chemicals to allow it to flow through pipelines. The mixture is known as diluted bitumen, or "dilbit."

For several years, experts have debated the question of whether or not dilbit spills are harder to clean up than regular crude oil. Environmental groups say it sinks in water; the pipeline industry says it doesn't.

An "uncontrolled experiment" occurred in 2010, when an Enbridge pipeline burst in Michigan, resulting in the largest inland oil spill in American history—nearly a million gallons. More than 25 miles of the Kalamazoo River were contaminated when much of the dilbit sank. The riverbed had to be dredged, and the river was closed to the public for two years.

In early 2016, a peer-reviewed study by an independent committee of scientists and engineers answered the question of whether dilbit is harder to clean up. The report found that dilbit differs in significant ways from other crude oils.

"The key differences are in the exceptionally high density, viscosity, and adhesion properties of the bitumen component of the diluted bitumen," the report says.

In the event of a spill, the lightweight petroleum products mixed with the bitumen quickly evaporate, leaving the heavy oil behind. Bitumen sticks to almost anything else in the water — leaves, branches, sediment — which can weigh it down and cause it to sink below the surface.

The study was conducted by the National Academies of Sciences, Engineering, and Medicine (NAS), a Congressionally-designated organization that advises the government on scientific issues. It was reviewed by other experts, and included input from industry representatives. The two-year project was funded by the U.S. Department of Transportation and can be read and downloaded at <https://www.nap.edu/catalog/21834/spills-of-diluted-bitumen-from-pipelines-a-comparative-study-of>

Enbridge Energy says its Line 3 replacement project is the largest in the company's history; it's projected to cost \$2.9 billion in U.S. dollars in the United States, and \$5.3 billion in Canadian dollars in Canada. Although it would be only two inches larger in diameter, the new pipe could carry twice as much oil, at much higher pressure. The aging pipeline is currently approved to carry 390,000 barrels per day. The "expected initial capacity" of a replacement is 760,000 barrels. Line 3 runs from Alberta to



Stop Line 3 banner at Mississippi Headwaters in northern Minnesota. Photo: Rapid Action Team

Superior, Wisconsin, through the headwaters of the Mississippi River, and the homeland of Minnesota's Anishinaabeg nations. Indian tribes and environmental groups have been fighting the proposal since 2014, when Enbridge first brought it to the Minnesota Public Utilities Commission. They suggest the new pipeline would violate treaty rights of native people by endangering the clean lands and waters on which the Anishinaabeg have rights to hunt, fish, and subsist off the land. The proposed route passes under the upper Mississippi twice as well as the upper reaches of the Kettle River, a state-designated Wild & Scenic River with two popular state parks downstream. River crossings are especially problematic for pipelines. A spill in moving water is many times more difficult to contain and clean up than on dry land, and the power of rivers increases the chance of a rupture. Two oil pipelines have ruptured in the Yellowstone River in the past decade, together spilling more than 100,000 gallons of oil. Both breaks were blamed on the pipeline being exposed when the current carried away rock and soil that covered

the pipe in the river. After that happened, floating debris and rushing water damaged the pipes and they ruptured. Less than one percent of the oil spill in both incidents was collected.

Currently, federal law requires that under rivers 100 feet or wider, pipes must be buried four feet beneath the bottom. Under narrower rivers, there is no depth requirement. There is also no requirement that pipes remain buried after they are installed, although if a spill happens and the company failed to consider exposure, it can be fined. If a pipe is exposed on the riverbed, the company might notice the problem during a visual inspection. Enbridge patrols by air every two weeks and on-the-ground patrols are at least that frequent, especially during floods. Or the patrols might not see it through the root-beer colored waters, or the muddy waters of a flood. (end Greg Seitz)

For 66 years, two pipelines have carried oil through Straits of Mackinac. The Straits connect two Great Lakes, Michigan and Huron. In Michigan, an election resulted in a hold on Enbridge's Line 5 replacement that runs through the Straits of the Mackinac.

Stating that the state never should have granted an easement to place the pipelines, Michigan Attorney General Dana Nessel filed a lawsuit against Enbridge. When the state granted an easement to place pipelines in 1953, it did not determine whether the pipelines addressed any of the public rights that it was the state's duty to entrust, and therefore the easement was and is void. Line 5 carries up to 540,000 barrels of oil and natural gas liquids per day from Superior to Sarnia, Ontario, Canada, and carried about 40 percent of the oil and gas products sold in Wisconsin and Michigan.

“The location of the pipelines – which carry millions of gallons of oil each day and lie exposed in open water at the bottom of the Straits – combines great ecological sensitivity with exceptional vulnerability to anchor strikes,” said Nessel. “This situation with Line 5 differs from other bodies of water where pipelines exist because the currents in the Straits of Mackinac are complex, variable, and remarkably fast and strong. I have consistently stated that Enbridge’s pipelines in the Straits need to be shut down as soon as possible because they present an unacceptable risk to the Great Lakes,” said Nessel. “Governor Whitmer tried her best to reach an agreement that would remove the pipelines from the Straits on an expedited basis, but Enbridge walked away from negotiations and instead filed a lawsuit against the state. Once that occurred, there was no need for further delay.”

The Attorney General filed her lawsuit the same day she filed a motion to dismiss Enbridge’s lawsuit filed in the Court of Claims seeking to enforce agreements made in the last months of the previous administration that purported to authorize Enbridge to build a tunnel and continue operating Line 5.

Nessel’s lawsuit asks the Ingham County Circuit Court to find that Enbridge’s continued operation of the Straits Pipelines under the easement granted by the State in 1953 violates the public trust doctrine, is a common law public nuisance, and violates the Michigan Environmental Protection Act because it is likely to cause pollution impairment and destruction of water and other natural resources.

The Attorney General’s lawsuit identifies a potential anchor strike as the most significant risk to Line 5. In 2017, the State’s contractor, Dynamic Risk Assessment Systems, Inc., identified an anchor strike as the most “dominant threat” to Line 5. Nessel also said: “The continued operation of Line 5 presents an extraordinary, unreasonable threat to the public because of the very real risk of further anchor strikes, the inherent risks of pipeline operations, and the foreseeable, catastrophic effects if an oil spill occurs at the Straits. We were extraordinarily lucky that we did not experience a complete rupture of Line 5 because, if we did, we would be cleaning up the Great Lakes and our shorelines for the rest of our lives, and the lives of our children as well.” In fact, an April 2018 anchor dragging incident – which ripped through several inches-thick steel cables – brought that threat home in a very real way. Although Line 5 was damaged – not ruptured – in that incident because the anchor hit a section lying directly on the bottomlands, if the anchor had dragged across

the bottom of the Straits in an area where Line 5 is elevated, the likely result would have been a complete rupture of Line 5. Nessel’s lawsuit seeks an order from the Court to shut down and decommission the Straits pipelines as soon as possible after a reasonable notice period to allow orderly adjustments by affected parties.

In Wisconsin, the Bad River Band of the Lake Superior Tribe of Chippewa Indians is contesting expired easements. Enbridge needs to renew the easements to continue operating the pipeline, which crosses 12 miles of the reservation. Enbridge offered the Bad River Band of Lake Superior Chippewa at least \$24 million to settle a lawsuit aimed at shutting down and removing Line 5 from the tribe’s reservation, but tribal leaders say their position remains unchanged. Bad River Tribal Chairman Mike Wiggins said in a statement reported by Wisconsin Public Radio that the Tribal Council’s position on Line 5 has never wavered.

“Enbridge’s expired leases were rejected and our litigation is rooted in the protection of the Bad River Watershed hydrology. Whatever that ends up looking like for Enbridge is their problem. Decommissioning and removing the whole of Line 5 sounds like a great start,” wrote Wiggins. “Furthermore, to even respond to media inquiries regarding Enbridge’s monetary terms with the term ‘rejection’ implies ‘process.’ The process the Bad River Tribe chose when it became evident Enbridge would not stop operation was adversarial litigation to remove Line 5’s threat from our waters. All we ask of the foreign-based corporation is to leave the Bad River watershed.”

“It’s about our resources that we have, the water that we have and everything that goes with it — the animals, the birds, our manoomin,” said David Bates, using the Ojibwe word for wild rice. “That’s sacred to us.” Bad River tribal elder Joe Rose Sr. said the Bad River and the surrounding watershed are “priceless.” “I’m looking seven generations ahead. I’m looking out for my grandchildren, great-grandchildren and even those yet unborn,” said Rose. “What kind of a world are they going to live in if we allow Enbridge and these mining companies and all of these others that come in to poison our water and our air?”

In September, the Minnesota Court of Appeals dealt a setback to plans for Enbridge Line 3 when they ruled that state regulators failed to consider the impact of an oil spill in Lake Superior’s watershed, reported the on-line news publication, MinnPost (www.minnpost.com). The court sided with a coalition of tribes and environmental nonprofits in reversing a decision by the state’s Public Utilities Commission.

While the environmental impact study (EIS) — a 13,500 page document — was approved unanimously by the five-member PUC last year, Judge James B. Florey wrote that its failure to address an oil spill that could flow into Lake Superior ultimately made it deficient. “The bottom line is the court decided that the environmental impact statement that was prepared for Line 3 does not meet the statutory standards,” said Scott Strand, an attorney representing Friends of the Headwaters in the lawsuit. “It’s not adequate.”

Activists speaking for rivers and people who depend on



those rivers have changed the conversation in the Midwest. In North Dakota, the Dakota Access Pipeline was delayed for more than a year when members of the Standing Rock Reservation organized an encampment that drew international attention; the pipeline is now operational. Was the protest successful? Judged by whether the pipeline was built, no. But, activists have made it clear that they will question and work against pipeline projects. That commitment has resulted in consideration of bills to criminalize protests at pipelines. More than a dozen states considered “Critical Infrastructure Protection Act” legislation that create penalties for protecting near facilities considered “critical infrastructure.” Thirty-six states have considered 104 bills that criminalize protests; of these, 16 have been enacted, 17 are pending and 69 have been defeated (See the International

Center for Not-for-Profit Law’s US Protect Law Tracker at <http://www.icnl.org/usprotestlawtracker/>). The US Department of Transportation’s reauthorization legislation for its pipeline safety program includes a provision criminalizing protests at critical infrastructure.

If pipelines are to co-exist with rivers, they need to be buried deeply, inspected and monitored routinely, have extra wall thickness under the river, and have block valves to shut off the flow if the pipeline is damaged. Until then, a pipeline is a private use alienating the public’s right to a healthy river. ♦

Molly MacGregor is a regional planner in Minnesota, where the rivers flow north to Hudson Bay, east to the St Lawrence Seaway and south to the Gulf of Mexico. She’s worked on local and state river and watershed management.

RMS and Universities Collaborate to Create a RIVER Field Studies Network

by James Vonesh, Andy Rost, Denielle Perry, John McLaughlin, Steve Storck, Mathieu Brown, Tammi Laninga, Amanda Rugenski, Joshua Viers

The National Science Foundation Research Coordination Network (RCN) in Undergraduate Biology Education (UBE) program recently funded a 1 year \$75,000 incubator grant to develop a network of universities and professional societies focused on fostering experiential STEM education of river systems. The project, titled “RCN-UBE Incubator: Building a framework for the River-based Immersive Education & Research (RIVER) Field Studies Network” was initiated as a collaboration among university faculty and RMS staff involved in the RMS River Studies and Leadership Certificate Program and expanded to include faculty from a number of non-RSLC universities. This incubator funding will support initial steps to establish the network and the development of a full RCN-UBE proposal for 5 years and up to \$500,000 in support. Funding will support a series of workshops the largest of which will overlap with the 2020 RMS Symposium in Richmond, Virginia with the aim of hosting a joint session bringing together university educators and river professionals from diverse backgrounds to “cross pollinate” as the vision for the larger full NSF proposal is being created. The project steering committee includes: James Vonesh (PI; Virginia Commonwealth University); Andy Rost (Co-PI; Sierra Nevada College); Denielle Perry, (Co-PI; Northern Arizona University); Tammi Laninga & John McLaughlin (Western Washington University); Steve Storck (River Management Society); Mathieu Brown (Prescott College), Amanda Rugenski (University of Georgia), and Joshua Viers (University of California, Merced).

Background

Field studies have a rich history in higher education. As a pedagogical tool, faculty recognize immersive in situ educational experiences provide

Want to get involved?

We are just getting started – it’s a good time to get involved and make a difference! To learn more about the RIVER Field Studies Network or get involved, email: James Vonesh (jrvonesh@vcu.edu), Denielle Perry (Denielle.Perry@nau.edu), or Andy Rost (arost@sierranevada.edu). Thank you!

context for complex and abstract course material, heightened student engagement, unique data collection and analysis opportunities, and seamless interdisciplinary course work. Cooperative research teams facilitate greater learning through close student-instructor and near-peer interactions. In addition, tangible relevance of research topics to student career interests or to societal needs and values can increase curiosity, motivation, and learning outcomes, and deep engagement and motivation in turn can lead to higher student enthusiasm and performance. Field research substantially increases student performance as discovery-based learning develops critical thinking skills, and field experiences cultivate interactions between affective and cognitive learning that produce enduring effects. Additionally, field studies provide a framework within which student-to-student and student-to-faculty interactions can be more effective, informal, and rewarding, while enhancing student leadership roles and increasing student confidence and creating professional preparedness opportunities. Indeed, many students describe their field studies experiences as the most rewarding aspect of their higher education careers.

Despite these successes, a number of threats and impediments across scales can limit the effectiveness of field expeditions as a powerful educational tool in undergraduate biology education. Challenges range from student, institutional, and national aversions to perceived and actual risks associated with field studies, a general but precipitous decline in the awareness of and participation in nature, and limited accessibility due to physical, financial, socialization/cultural and/or geographic

barriers. Additionally, programmatic issues exist due to dependence on individual faculty experience and expertise. These issues coupled with the documented decline in field experiences in science education threaten the sustainability, scalability, and viability of field studies in undergraduate biology education. Past NSF RCN-UBE support has largely overlooked this need. Only 1 (1.3%) of 80 previous RCN-UBE awards mentions “field” in the title.

To overcome these obstacles and advance field studies as an effective active learning pedagogy in undergraduate STEM education we will create the River-based Immersive Education & Research (RIVER) Field Studies Network to communicate and coordinate our research, training, experiences, and educational activities across disciplinary, organizational, institutional, and geographic boundaries. Our collaborative network of ecologists, environmental scientists, geographers, hydrologists, and river managers proposes a unique strategy of targeting a specific ‘field’, the river, to advance immersive field studies in undergraduate biology education.

How can rivers benefit active learning of biology and other STEM disciplines? Rivers are nearly ubiquitous, often accessible, landscape features that provide an ideal medium for biology education due to their physical, chemical and biological characteristics, the cooperative and immersive nature of field studies, and the pedagogical efficacy of engaging students in field research. River environs are comprised of diverse geologic structures, hydrologic characteristics, and riparian habitats. Substrate diversity supports commensurate biological diversity in species composition, intra- and inter-

specific interactions, and ecological structures. Many essential ecological processes occur in riparian ecotones where research access is often best facilitated by river travel. This diversity and importance of species, habitats, and processes within and adjacent to rivers provides a broad range of research topics available to immersive field studies on rivers (Fig 1). Such research can be interdisciplinary and integrative, due to strong interactions along axes of physical, chemical, biological, and anthropogenic components of terrestrial and aquatic environs and adjacent riparian corridors. The simple quote, “The biology lives in the hydrology, and the hydrology flows over the geology” highlights the importance of a multidisciplinary approach to understanding the biology of river systems.

Rivers provide unique field study corridors with the potential for modest transportation and costs, while enhancing relevance for students by taking place ‘in my watershed.’ The very nature of river travel by boat can increase the array and quantity of field equipment available for active learning and research, increase personal comfort, and allow a broader range of participants to enroll in immersive field studies due to the lower physical demands of river travel compared to overland trips in remote settings that would require hiking gear in. Immersive river field studies stimulate deep social engagement among students, as well; they are immersive, require teamwork, and minimize distractions common in other learning environments. Engaging students in expeditionary research holds exceptional promise for biology education due to the breadth and importance of river research, the immersive nature of river expeditions, and use of high impact active learning pedagogy. Expeditions on regional rivers can provide the transformative impact equivalent to a study abroad experience at lower costs and thus greater accessibility.

How can active learning benefit our rivers? Rivers are a primary conduit in the hydrologic cycle and are the chief source of renewable water supply for freshwater ecosystems and societal use. Rivers provide vital supporting, provisioning, regulating, and cultural ecosystem services. The economic value of freshwater systems alone may exceed that of all non-marine habitats combined.



Fig. 1. Examples of undergraduate biology students engaged in active learning in the field through immersive river field courses currently being taught by network partners. (A) Studying the species area relationship of river rock pools along the James River, VA. (B) Students in VCU’s “Footprints on the James” course travel 200 miles along the James River, VA, with a historically accurate batteau as the classroom studying the intersection of regional history and biology. (C) Students conduct a sediment transport lab on the Salmon River, ID. (D) Students collaborate with local community to conduct an assessment of ecosystem health along the Pongola River, South Africa. (E) Students measuring stream discharge and variations of stream velocity. (F) Dissolved oxygen concentrations to determine Biological Oxygen Demand on the Rogue River.

Rivers provide essential habitat for remarkable freshwater biodiversity. Although freshwaters cover only 2.3% of the global surface, they are home to nearly 9.5% of known animal species. Rivers also support large numbers of species in adjacent terrestrial habitats. Riparian zones account for more than 50% of species globally, and more than 75% of terrestrial animals in the western U.S. Despite their diversity and importance, freshwater systems are poorly understood relative to terrestrial systems.

Anthropocene pressures disproportionately impact these vital systems (WWF 2018). Threats to freshwater systems are diverse, potentially synergistic, and evolving. They include a changing climate, increasing water appropriation to meet growing population demands, introduction of non-native organisms and pathogens, nutrient pollution and toxic algal blooms, altered flow and sediment regimes from dam operations, emerging contaminants of concern [microplastics, nanomaterials], and freshwater salinization. Impacts of these threats are seen in amphibians, fishes, invertebrates (Vaughan & Ormerod 2012), microbes, plants, turtles, and waterbirds with potential for ecosystem-level changes through bottom-up and top-down processes. Collectively, populations of freshwater organisms have declined by more than 70% in the last 45 years, a rate far exceeding declines in marine or terrestrial systems.

The net effects of these threats raise serious concerns for river ecosystems and the services they provide. Managing fresh waters for human life support as well as biodiversity and ecological function will require hybrid approaches that advance basic understanding of how these essential ecosystems function across spatio-temporal scales. This will require educating students to be leaders and innovators capable of thinking synthetically while moving fluidly across disciplines, technologies, and landscapes.

Network Benefits

We envision that the RIVER Field Studies Network will meet the challenges facing rivers and advance undergraduate biology education at several scales. The network will advance interdisciplinary approaches to undergraduate river biology by growing capacity for active learning through river field courses at individual programs by:

- Developing recruitment and support strategies to increase student access to river field courses, particularly for underrepresented minority students
- Providing expertise and resources to enhance access of new institutions
- Developing and sharing river field course BMPs
- Developing and sharing river field course content
- Developing strategies to increase quality of undergraduate biology research

Further, by leveraging the resources of individual academic programs and professional partners the network will create a collective capacity for active learning in undergraduate biology education that is “greater than the sum of its parts.” These “emergent” and potentially transformative benefits include:

- Facilitating student-driven comparative watershed investigations across courses e.g., across years and river basins through collaborative inquiry and shared protocols,

tools, and data

- Improving networking among academic, government, and non-government organizations around issues of river science, education, and management
- Establishing cooperative agreements for student exchange across network institutions
- Creating an emergent “*Comparative River Field Studies*” curriculum in undergraduate field biology by leveraging courses and sharing students across the network
- Developing a plan for how the RCN-UBE-RFSN will metamorphose into a self-sustaining national umbrella organization supporting interdisciplinary river field studies

Incubator Goals

The time is ripe to establish such a network. Interest in immersive river-based field curricula has arisen independently in at least 16 universities and colleges teaching 24 field courses. **The Incubator will bring together this community to develop a shared vision for the RIVER Field Studies Network built upon expert advice, pilot projects, and broad stakeholder participation.** The Incubator will also begin to create the infrastructure necessary to establish support for a full RCN-UBE project and advance our understanding of active learning pedagogy in field settings. Over the course of 2019 – 2020 the project will host a number of virtual and face-to-face workshops with the goal of producing 1. Full RCN-UBE proposal, 2. Example open source cross-watershed field course teaching module, 3. Initial network web portal framework, 4. Short network promotional video, and 5. A short scholarly paper on status, benefits, and barriers to river field studies.

Our largest workshop will overlap with the first day of the 2020 RMS Symposium in Richmond, Virginia with the aim of hosting a joint session bringing together university educators and river professionals from diverse backgrounds to “cross pollinate” as the vision for the larger full NSF proposal is being created.

The incubator will develop a shared vision for the RIVER Field Studies Network built upon expert advice, pilot projects, and broad stakeholder participation and begin to create the infrastructure necessary to establish support for a full RCN-UBE project. It will advance scholarship of active learning pedagogy and integrating river science into UBE. It will enhance undergraduate education and research by creating novel cross disciplinary and watershed comparisons. It will leverage the resources of individual network participants to create potentially transformative network-scale capacity for active learning in river field studies. Examples of transformative network-scale capacity could include; establishing cooperative agreements for student exchange across the network; creating a national comparative river field studies curriculum by leveraging courses across the network; and developing a plan to metamorphose the network into a self-sustaining national umbrella organization supporting interdisciplinary river field studies.

The incubator will build human, institutional and network-level capacity for active learning pedagogy and comparative river biology. It will provide professional development for participating faculty. It will work to overcome barriers of entry for underrepresented minorities and students with disabilities. It will develop tools to support entry by new institutions. It will enhance the quality and capacity of current programs. This increased capacity translates into increased numbers and

diversity of students and faculty engaged in these high impact teaching practices on our rivers. We believe an undergraduate biology education embedded with active learning immersive river field studies in the very ecosystems that require attention is critical for students to be able to address the challenges that impact river ecosystems in the twenty first century.◆

(References available upon request.)

Table 1. Current and potential RCN-UBE RIVER FSN partners. TYPE indicates the basic Carnegie classification for academic institutions (BC = Baccalaureate College, MCU = Master's College or University, DU-R3 = Doctoral University - Moderate Research, DU-R2 = Doctoral University - Higher Research, DU-R1 = Doctoral University - Highest Research, PS = Professional Society). ENROL indicates the number of undergraduate students enrolled. %MIN indicates the percent of the undergraduate population that identify as non-white. FC indicates the number of river-focused field courses currently taught or planned (PL) at each institution. REGION indicates the watersheds or regions where these field courses are taught. ROLE indicates the institutions role in this RCN-UBE incubator (PI/Co-PI; STR = Steering Committee member, COL = Collaborating institution, POT = Potential partner. Schools labeled with the superscript § are members of the River Management Society's River Studies and Leadership Certificate Program. For video documenting River field course examples, see: UC Davis Ecogeo hydrology (<https://youtu.be/S9849JFyjPQ>), VCU's Footprints on the James (<https://youtu.be/v5sRgsRevoc>), and Augsburg College's Mississippi River Semester (<https://youtu.be/Zt2EkiVtUzI>).

PARTNER	TYPE	ENROL	%MIN	FC	REGION	ROLE	CONTACT
Virginia Commonwealth Univ [§]	DU-R1	24,058	50	4	Virginia, Idaho, South Africa	PI	J. Vonesh
Northern Arizona University [§]	DU-R2	27,086	40	3	Southwest U.S.	Co-PI	D. Perry
Sierra Nevada College, NV [§]	MCU	433	15	2	Rogue	Co-PI	A. Rost
Prescott College, AZ [§]	MCU	450	20	3	Southwest U.S.	STR	M. Brown
River Management Society	PS	423*	NA	NA	NA	STR	S. Storck
W. Washington University [§]	MCU	14,968	27	2	Elwha, Grande Ronde	STR	J. McLaughlin
U. California, Merced	DU-R2	8544	86	1	CA	STR	J. Viers
University of Georgia	DU-R1	28,848	29	PL	PL	STR	A. Rugenski
University of California, Davis	DU-R1	30,145	68	1	Western U.S.	COL	S. Yarnell
Humboldt State University	MCU	7774	50	PL	PL	COL	A. O'Dowd
International Society of River Science	PS	NA	NA	NA	NA	COL	P. Bukaveckas
Augsburg College, MN	MCU	2427	36	1	Mississippi	COL	J. Underhill
Amazon Dams Network	USGS	NA	NA	NA	Amazon	POT	T. Melis
Beloit College, WI	BC	1402	29	1	Yellow, China	POT	D. Youd
Brevard College, NC	BC	677	16	1	Southeast U.S.	POT	R. Dye
Evergreen State College	MCU	3610	29	1	Olympic P.	POT	K. Tabbutt
Heritage University, WA	MCU	861	67	1	Columbia	POT	J. Billy
Norwich University, VT	MCU	2649	20	1	Connecticut	POT	D. Westerman
Texas A&M University	DU-R1	50,036	37	1	Amazon	POT	K. Winemiller
U. Tennessee-Chattanooga [§]	DU-R3	10,176	21	PL	NA	POT	Jennifer Boyd
University of Utah [§]	DU-R1	24,635	27	PL	NA	POT	Kelly Bricker
Western Carolina University [§]	MCU	9171	19	1	Chattooga	POT	JP Gannon

Proposed panel for RMS 2020 Symposium: Linking academics and practitioners to train tomorrow's river professionals

Professional river management organizations often require staff to have college or university training. Universities are tasked with providing foundational knowledge and skills to enable students to identify careers and thrive professionally. Collaboration and partnerships between universities and the professional community have beneficial outcomes for students, universities, and the professional community. In this panel, we hope to bring together university educators participating in the RCN-UBE RIVER Field Studies Richmond, VA workshop with the RMS professional community to explore “win-win” collaborations between universities and the professional community and to better identify how such partnerships can enhance both university educational outcomes and advance river management objectives of agencies, non-profits, and private industry. If you have a success story to share or want to get involved in this panel, please email: James Vonesch (jrvonesh@vcu.edu).

A Chattooga River Encore

by Jack Henderson

The morning sun arrived early in Ocoee County. Rising from a sleeping pad lazily strewn across the floor in Don's Chattooga Ridge home, drowsy haze shifted to excitement as I recalled the agenda for the day. A dedicated crew of river lovers, including good friends and colleagues, were to gather shortly on Section IV of the Chattooga. Sure, I had spent the previous evening watching *Deliverance* and drinking cheap beer late into the night, but what better way to prepare for a day spent in Long Creek?

On May 10th, 1974, the Chattooga River was designated Wild & Scenic by U.S. Congress. Flowing through North Carolina, Georgia, and South Carolina, the Chattooga is one of the southeast's premier whitewater rivers. It begins in mountainous North Carolina as small rivulets, nourished by springs and abundant rainfall. High on the slopes of the Appalachian Mountains near Whiteside Mountain is the start of a long journey that ends at Lake Tugalo between South Carolina and Georgia, dropping almost

1/2-mile in elevation along the way. Flowing through three national forests, this river is one of the few remaining free-flowing streams in the southeast. It offers outstanding scenery, ranging from thundering falls and twisting rock-choked channels to narrow, cliff-enclosed deep pools. The setting is primitive, with dense forests and undeveloped shorelines characterizing the nature of the area.

The Wild & Scenic Rivers Act, the federal legislation that protects rivers deemed with outstanding natural, cultural, and recreational values, was passed in October of 1968. The Act is notable for safeguarding the special character of now over 200 of these rivers, while also recognizing the potential for their appropriate use and development. It encourages river management that crosses political boundaries and promotes public participation in developing goals for river protection.

The original Wild and Scenic River Act of 1968 designated eight rivers as Wild and Scenic, with another 20

rivers identified as study rivers. The Chattooga River was selected as one of those early study rivers. In 1969, a Clemson University professor did the first extensive study on the Chattooga River to confirm that it matched the outstandingly remarkable values requirements for Wild & Scenic designation. In April 1971, a man named Jim Greiner, a friend of the afore-mentioned Clemson researcher, canoed the Chattooga and fell in love with its beauty. Following a subsequent rafting trip with experienced outfitter friends, Jim and his wife Jeannette decided to start Wildwater, the first rafting company on the Chattooga River. Wildwater, along with many other advocates, played an important role in the efforts to get the Chattooga River protected as a Wild & Scenic River.

River Management Society is a national non-profit professional organization whose mission is to support those who study, protect, and manage North America's rivers. Dedicated to holistic river management, RMS' membership includes federal, state,

and local agency employees, educators, researchers, consultants, organizations and citizens. Regional paddling trips are organized yearly to bring together those interested in river management, restoration and conservation. For two consecutive years, the Chattooga has been the southeast's paddle trip.

Given Wildwater's rich history in the Chattooga's Wild & Scenic designation and rafting origins, it was fitting for the nineteen of us to assemble there. The focus was on celebrating the river, learning about its history as Wild & Scenic, how it's managed and the issues it faces. We had staff and board members from River Management Society, American Whitewater, American Rivers, the U.S. Forest Service, MountainTrue, Congaree Riverkeeper, Hemlock Restoration Initiative, raft guides from Wildwater, along with other river enthusiasts and paddlers. Some people had been paddling the Chattooga for decades, and for others,

this was to be their first. Anna Alsbrook, MountainTrue's Watershed Outreach Coordinator, reflected how "everything about it felt significant. The group of folks who paddle it all the time mixed with those who have never been on whitewater before, made for a day of great experience sharing."

Jack Wise, Wildwater's Vice President and CEO, provided a welcome, telling us about the river's Wild & Scenic designation and Wildwater's involvement. He later recounted that "the opportunity to talk as a group and individually was invaluable to both understanding complex river issues and share fresh ideas to protect our watersheds." The Chattooga is no stranger to complex issues. Legacies of controversial decisions on paddling access, debated management of certain reaches pertaining to angling, and issues with forestry decisions, water quality and vehicular access, provide a rich basis for discussion. Cultural backgrounds and

differing opinions have created tension in this watershed, but this trip felt like much more of a reunion of friends, a celebration of work accomplished, than a platform for debate. A highlight for Tandy Wiseman, visiting from the U.S. Forest Service's Wild & Scenic Rivers Washington D.C. office, was that "even though I was a new face walking into a space with longstanding relationships between organizations, I felt welcomed by everyone. Meeting in person is the best way to uncover the context of partnerships, and I'm glad I know the faces of some of the people that work with the Wild & Scenic Rivers program now!"

The warm sunshine and late-summer water levels fostered a comfortable yet deliberate pace through Section IV of the Chattooga. We entered the river at Woodall Shoals and paddled downstream through notable rapids: Seven Foot Falls, Raven Chute, Entrance, Corkscrew, Crack-in-the-Rock, Jawbone and Soc-

Tandy Wiseman, Gail Lazaras, Erin McCombs, Crys April, and Wildwater's lead guide run Seven Foot Falls.

Mark Singleton, Executive Director of American Whitewater, runs Corkscrew Rapid. All photos by Jack Henderson.



Em-Dog. Section IV is famous for these final handful of rapids, known as “Five Falls.” While nowhere near the most challenging whitewater in the southeast, the Chattooga has earned significant respect due to its long history of river running, inherent dangers with undercut rocks, and its free-flowing ability to greatly vary in flow day-to-day. Along with the all-star group, interesting learnings, and high quality of whitewater, this river brings a feeling of solitude and wild seldom found elsewhere. Regan Norris, a Congaree Riverkeeper board member, noted that “the Chattooga inspires one to stop and take a minute to reflect on how such a special place has not been impeded on by the hands of man. After our amazing journey through the gorge, it is evident that the work of dedicated individuals has kept this natural beauty intact and raw as possible. I hope that we can follow in our predecessors’ footprints to inspire newer generations to continue the fight to keep these places wild and free.” Following safe passage through Five Falls, the crew arrived at the mouth of Lake Tugalo. Two miles of flat green water was all that remained between us and the bus to Wildwater, where dry clothes and cold beverages awaited.

We were soon on dry land, changing clothes and packing up at Wildwater’s outpost. Don Kinser, former board president for American Whitewater, invited everyone to his nearby home for pizza, salad and beverages. The discussions continued into the evening where folks had a chance to say more about the benefits of the day. Margot Wallston, director for the Hemlock Restoration Initiative – a non-profit dedicated to saving hemlock trees dying from the Hemlock Woolly Adelgid (HWA) – attended the trip to understand more about hemlocks on the Chattooga and opportunities to partner with the U.S. Forest Service and

paddlers. “I think there is real potential to protect many of [these trees] from further decline due to HWA... A partnership between the paddling community, local outfitters and national forest staff could be just the right recipe for successful stewardship of this important riparian resource.”

This sentiment of collaboration towards success, along with celebration of Wild & Scenic Rivers, were prominent themes of the day. Thank you to Wildwater and Sumter National Forest for their assistance in planning this special day on the river, and to everyone else (listed below) who attended! ♦

1. Jack Wise (Wildwater Rafting)
2. Amanda Walrod (US Forest Service - Sumter NF)
3. Robbie Sitzlar (US Forest Service - Sumter NF)
4. Tangy Wiseman (US Forest Service - WSRs, DC office)
5. Erin McCombs (American Rivers)
6. Gail Lazaras (American Rivers)
7. Don Kinser (American Whitewater)
8. Brian Jacobson (American Whitewater)
9. Maria Jacobson (Chattooga connoisseur)
10. Mark Singleton (American Whitewater)
11. Kevin Colburn (American Whitewater)
12. Jack Henderson (River Management Society)
13. Carrie Jensen (River specialist, former Chattooga raft guide)
14. Anna Alsobrook (MountainTrue)
15. Hartwell Carson (MountainTrue/French Broad Riverkeeper)
16. Margot Wallston (Hemlock Restoration Initiative)
17. Regan Norris (Congaree Riverkeeper)
18. Ashley Brennan (Chattooga paddler)
19. Crys April (friend of Gail Lazaras)

Carrie Jensen and Anna Alsobrook navigate rapids below Raven Cliff.



River Trip

Gary G. Marsh
10/1/19

Each is different, unique, varied, one of a kind, never the same.
Brain spark. Where? When? Who will plan, organize, lead?
Let’s do it. We are all in. Start, initiate, commit. A hurricane won’t stop us.
The task monster arrived. Planning, checklists, food, gear, shuttle, weather, water level.
Canoe, kayak, squirt boat, raft, cataraft, shredder, dory, drift boat, paddle board.
Trailers, pumps, straps, dry boxes, propane, blaster, stoves, tarps, duct tape.
Hot shower, sleepless night, what have I forgotten? Nervous anticipation.
Hearty breakfast, Class 3 drive to the put-in. Secure those keys.
Meet and greet old and new acquaintances. Unload, lift/carry, muscle beach workout.
Sort, pack, organize, tighten, double-check, balance loads, re-organize, gear fuss.
Pre-river talk, think and practice safety, are we ready to launch?
Finally a late push off but we are now on our way. Sunny, blue sky, flatwater.
Turtles on a log. Clear shallow water, muddy water, black/green/blue water – gliding along.
It’s a collective gaggle of colleagues chatting in various clean costumes.
No Internet, all linked-in to one purpose. No YouTube, only hypalon tubes.
No Twitter, only tweety birds. No Google, only gurgle.
Rivers are like church – Shall we gather at the river? We all are baptized at some point.
All are welcome. All views, politics, lifestyles, religions, and races graced by the river.
Riffles begin. Round a bend, enter a canyon, first of many rapids to come. Check the map.
Big rocks, big holes, churning, frothing, rooster tails, gnarly, scary named rapids.
Big day, scout, no turning back, pick a lane and drive, successful run, high fives. Yahoo!
Respect the situation, paddle/row like mad, think and hold your breath, go with the flow.
Stir, shake, repeat. Relax, celebrate the journey, not the destination. Unload gear, make camp.
No slackers allowed, team effort. Scenic spot selected for the Groover.
Read a book, play cards, corn hole, botchi ball, ammo can rope pull, write in diary/logbook.
Sundown, hungry souls eat gourmet fixings. Dessert served, dishes drying, campfire roaring.
Seats in a circle, stories being told, music and songs sung, transference of lessons learned.
Star gazing and constellation lessons. Reflections on scope and scale.
Hot coals, weary but happy campers find their bedrolls with flashlights like fireflies.
Daybreak, the smell of coffee, first call breakfast.
Gather up, reload, shove off. Leave No Trace. Lunch at a scenic island beach.
Camp. Repeat. Solitude, only reminders of civilization are contrails against a blue sky.
Last day sadly comes. Soaking it in. Hit the take-out safe and sound.
Sort out gear and head to town for a hot shower and back to reality.
Hugs, goodbyes, journey home. Fragrant memories.
How was your river trip? You had to be there. Let’s do it again!

A Week in the Southwest

by Mary Crockett (with additions and edits by Judy Culver)

It all started with a live auction bid at the 2012 River Management Society Symposium in Asheville, North Carolina, when we decided to pool our funds to win a river trip down the Colorado River. We had so much fun and a grand time exploring the west in 2013 that we were ready for another adventure, so at the 2018 RMS Symposium in Vancouver, Washington, we decided to do it all over again.

A Texas duo is what we won — a river trip down the Guadalupe River and a two-night stay at the Lakehouse Bed & Breakfast! Mary also won a travel bag and other small auction items donated by Eagle Creek that she used on this trip to Texas.

Just a little about the state of Texas... it is BIG! So many acres of land and many rivers to explore! Mary flew from South Carolina to San Antonio on a Monday to meet up with Judy, who drove from Arizona. Our mission was two-fold, enjoy the rivers and park exploration while scoping out the town and area for a possible 2022 RMS Symposium. By the way, the Northeast and Southeast RMS Chapters are hosting the *Mountain Creeks to Metro Canals* Symposium in Richmond, Virginia, May 12-15, 2020. We hope to see you there!

Being river people, the first thing we did after arriving in San Antonio was head for the famous San Antonio Riverwalk and of course Mary had to visit her relative, Davy Crockett, at the Alamo. The Alamo is such a treasure — so much history and to Mary, a river geek, the informational signs showing the human manipulation of the river and creeks supplying water to this site through time was the most interesting. We strolled along the Riverwalk to have lunch beside the river and snap more pictures. The Alamo and the historic district of the Riverwalk would make a great field trip option for a future Symposium.

Leaving San Antonio behind, we drove to the Texas Hill

Country where we checked into the Lakehouse Bed & Breakfast, a Mediterranean villa on Canyon Lake hosted by owner Justin Robinson. Relaxing on the patio overlooking Canyon Lake with a glass of wine we watched the sun setting and deer munching while talking about what a symposium in 2022 could look like in this part of the world, which is just spectacular.

The next day we drove to the Rockin River Rides livery to see about our trip on the river, but due to high water that had taken out two local dams, all we could do was take pictures with Mary dipping her hands into the rolling river.

Plan “B” kicked in with a short drive north to the San Marcos River where we met up with a friend, Kimberly Meitzen, who happens to be a river geomorphology/hydrology/geology professor at Texas State University. She introduced us to the headwaters of the San Marcos River and the reclamation project going on there, which would be such a great story to tell at a Symposium! A glass-bottomed boat ride over the springs that form the headwaters of the river was a snorkel experience without the snorkel. After touring the museum/nature center she took us swimming down the San Marcos River. Yes swimming, not walking, tubing, kayaking, canoeing, or stand up paddle boarding, but swimming! What an experience! San Marcos originates on the Texas State University campus and flows through town traversing natural riparian areas — lush but narrow and developed spaces that use giant limestone boulders to create steps and a river walk on both sides of the river that winds through small public parks. Rare river rice rubs your legs as you float through crystal clear cool spring water ranging from three to ten feet deep with both sand and rocks substrates. Naturally, Judy, a Pine Barrens girl, couldn’t stop thinking about leeches but alas, there were none to be found in the rice grass. We swam the entire length running through the campus, folks’ backyards and city

Kayak shoot and flood control in the San Antonio River along the southern portion of the walk. Photos: Mary Crockett



Above: Flood control structure along the San Antonio River. Right: Mary, Judy, and Kimberly in glass-bottom boat on the San Marcos headwater area at Texas State University.



businesses, then a shorter portion at least three times. After all that swimming, we dined at a headwaters restaurant with a great view of the river.

The next day, we met Michael Gramley of the San Antonio River Authority who is among those in charge of managing the San Antonio River and Riverwalk along the southern most section of the river. We also met with RMS member Mike Dussere from WORD (Water Oriented Recreation District) of Comal County. The flood mitigation/riparian and river restoration work that has taken place along this river is most impressive! One of the most amazing engineering feats that we have ever seen along an urban river is the city runoff filter structure, which looks like some European structure out of the past or out of a book. Just seeing it along the path, most people admire the Romanesque structure but would never know what its function is. The year after it was built, this new structure saved the downtown area from millions of dollars of flood damage by diverting the water underground through the system and into the San Antonio River. We also admired the man-made shoals and the kayak chutes that allow safe access along a river segment that was previously unnavigable. The people we met were quite receptive of the idea of a future symposium and the stories the area could tell the world of river managers.

We then headed west towards Prescott, Arizona. We stopped to admire a river here and there, plus locate geocaches in cemeteries, along riverways, on federal and state managed lands.

(continued page 33)



by Lisa Bryant

Recently, the BLM participated in the 2019 River Ranger Rendezvous. The successful event involved one river, two states, six organizations, and nine rafts. The Moab Field Office, with cooperation from the Grand Junction Field Office and Holiday River Expeditions, was proud to host this year's event.

River management professionals from across the nation joined together to learn about improving river recreation opportunities, riparian habitat, and customer service. The nearly 30 participants included river specialists from the BLM, National Park Service, U.S. Forest Service, Colorado State Parks, Rim to Rim Restoration, and the River Management Society.

The three-day journey down the Colorado River began with a gentle float through Ruby-Horsethief Canyon in the BLM-managed McInnis Canyons National Conservation Area. Later in the trip, participants tested their skills on challenging whitewater rapids like Skull and Sock-It-To-Me in Westwater Canyon. Throughout the trip, they took "learning breaks" to share knowledge about managing invasive species, riparian restoration techniques, building

BLM Participates in the 2019 River Ranger Rendezvous



Kara Dohrenwend of Rim to Rim Restoration talks about invasive species and revegetation.

stronger relationships with outfitter guides, successfully navigating difficult conversations, and improving interpretive programs with information about geology and the cultural history of our rivers. The event was sponsored by the River Management Society's Southwest Chapter and is a great example of sharing information and learning through public/private partnerships. ♦

Lisa Bryant is a Public Affairs Specialist. Photos: Reed Kennard, Supervisory Park Ranger



First Night in Camp:
Black Rocks Five



Rogue River Ranger Crew Enjoys a Training Trip with Tim Palmer

Bill Sedivy, BLM's lead river ranger on the Rogue River, prepares to row the 'Mother of all Tires' out of the Wild & Scenic Rogue corridor. The tire flushed down from a population center above the W&S section. Photo: Tim Palmer

by Bill Sedivy

River author, photographer, and Wild & Scenic River expert Tim Palmer joined the Bureau of Land Management's Rogue River rangers for a three-day educational and training float on the Wild & Scenic Rogue River, July 9 through 11.

Camp conversations covered topics like the history of the Wild & Scenic Rivers Act, management issues facing river managers across the nation today, and other river conservation topics. During the day, the BLM river crew, Palmer and his wife, author Ann Vileisis, explored several Rogue tributaries protected earlier this year under the Wild & Scenic Rivers Act. Rangers also learned about the Rogue's rich plant life from Ann.

Of course, no Tim Palmer trip would be complete without doing a little good work for the river. So, much trash was removed from the corridor, including the 'Mother of all Tires' and an old safe!

The trip was organized by BLM's lead river ranger on the Rogue, Bill Sedivy. ♦

River author and photographer Tim Palmer examines an old safe spotted and hauled out of the Rogue River corridor by rangers. Photo: Bill Sedivy



Tim Palmer and Ann Vileisis talk WSR history and values with BLM's Rogue River Rangers during a recent training float.



Tim Palmer with the Rogue River's BLM river ranger crew. Photo: Ann Vileisis



The National Rivers Project and Joan Harn

by Risa Shimoda and Jack Henderson

The National Rivers Project has been a marquee project of the River Management Society since its conception in 2011. Joan Harn, RMS lifetime member who has recently retired from the National Park Service working on river partnerships, hydropower projects, access and recreation endeavors, supported the project since the beginning, and we are grateful for her guidance and leadership. The following narrative describes Joan's involvement with the project.

River Management Society, with support from agency and non-profit partners, has offered a searchable public resource and reference for floatable rivers since the early 2000s. Through the years, our database management champions have been many, and we appreciate the care, time and effort they have provided.

In 2011, the Bureau of Land Management (BLM) began to collect geospatial data intended for land-based recreation, and they indicated interest in transforming their database to take advantage of evolving geospatial information systems (GIS) technology. RMS offered use of the previously-created 'Floatable Boatable' database, which provided a guide to management-oriented attributes of rivers managed by the BLM. We provided a web-based tour of the site for our colleagues at the BLM, US Fish & Wildlife Service, US Forest Service, and the National Park Service (NPS), suggesting there was an opportunity to reboot the database using a geospatial format as a resource for both river managers and their customers among the recreating public.

Shortly after, Joan Harn joined RMS in a meeting with Esri (GIS software company), the US Geological Survey, and the National Geographic Maps team to discuss the feasibility of

Paddlers brave the Clackamas River, one of the 2018 RMS Symposium field trips. L to R: Joni Gore, unknown, unknown, Joan Harn, and Dan Haas. Photo: Tom O'Keefe

creating a nationwide river recreation database. Joan suggested that she would like to be able to look at a map of the United States and search for paddling trips by location: at the time it was infeasible without being familiar with a region's geography, resources and amenities. In 2012, Joan suggested several projects to jumpstart the newly-called National River Recreation Database (NRRD). First, identify current river recreation directories and maps to make sure we would not duplicate an existing resource. Second, ask interested planners and river managers for what they would want to know about a river when searching for a recreation destination. Third, create a vision for the National River Recreation Database.

From 2013 through 2014, Joan continued to provide support for sharing the NRRD project idea with partners, during which time we continually heard that the resource was a valuable asset to create. We dug back into the original 'tabular (non-geospatial)' data with a returning effort by Sera Jansen Zegre and input from Susan Rosebrough, who was leading a parallel effort to map Wild and Scenic Rivers at www.rivers.gov. With enthusiastic support from Caitlin Scopel at Esri, Michael Tinker at USGS and NPS intern Peter Bonsall, the NPS supported RMS' endeavor to create the first nationwide geospatial database of recreation rivers.

Between 2015 and 2016, Marina Metes, nearing the completion of her GIS certificate when she met Joan at the 2014 RMS Symposium, inaugurated the NRRD by creating GIS data for the Wild & Scenic Rivers managed or co-managed

by the National Park Service. Marina also created and added data for National Park Service-endorsed National Water Trails. Following that inventory and analysis of some of the country's most scenic and well-managed rivers, RMS debuted www.NationalRiversProject.com in 2016. This official launch of a functional website was a milestone for the project Joan was helping guide, support and steward. There was now a tool available for the public to shop for rivers around the country when searching for rivers to paddle based on location, character or status as a water trail or Wild and Scenic River.

In 2017, Joan's support allowed us to add several National Rivers and National River & Recreation Areas to the NRRD. Partnering with park units around the country, including the New River Gorge National River, Gauley River National Recreation Area, Mississippi National River and Recreation Area and others, Joan guided RMS and local park managers to bring high-quality information on accessing these rivers to the public. These rivers, though not designated federally Wild & Scenic are managed for sustainable recreation and are popular resources for river runners around the country. Having consistent information available on their location in context to other recreational rivers around the country shines a light on the variety of types of paddling and access available.

In 2018, RMS obtained a grant from the National Park Foundation to enhance the National Rivers Project website by easing searchability, creating a guiding video tour and adding directory structures organizing NRRD rivers by state and management entity. Joan helped RMS craft an application that addressed the National Park Foundation's goals, while also enhancing the quality and user-friendliness of the National Rivers Project, benefitting river recreationalists nationwide.

Supporting RMS and the National Rivers Project beyond her retirement, Joan's ability to identify a good 'fit' between projects supports the addition of information on hydropower flow releases for certain rivers in the NRRD. In late 2018, Joan worked with RMS and members of the National Park Service's Hydropower Assistance and Rivers, Trails & Conservation Assistance programs to inventory sections of rivers whose flow is influenced by hydropower licenses or settlements in order to provide their

(Mary and Judy, continued from page 27)

We stopped at the Bureau of Land Management headquarters for the Prehistoric Trackways National Monument established in 2009 near Las Cruces, New Mexico. There we rested, talked to the volunteer staffing the desk and got Mary's logbook of national places stamped. In Lordsburg, after another short rest, we decided to head up US 70 in Arizona, stopping to admire the many species of cacti flowering in the desert and of course, located another geocache. Traveling through Franklin, Duncan and Safford, we admired the Gila River, but will have to wait for another time to float its waters. US 70 turned into US 60 and we headed to the high ground on Arizona Route 188. We traveled through Tonto National Forest and stopped to visit Tonto National Monument where we admired some very old structures, got Mary's book stamped again, found a geocache, and admired Theodore Roosevelt Lake and the Salt River. We then headed up to 5,800 feet toward Camp Verde, seeing snow after being in 100 degrees earlier in the day. What a treat! Mary took lots of pictures during the drive. In Prescott, Mary admired the mountains and cooler temperatures.

release schedules and current-flow information on the National Rivers Project to the paddling public. Before departing, Joan initiated continued support for RMS to add other rivers, managed by the National Park Service within individual park units, to the National Rivers Project through September 2020.

A sincere thank you is extended to Joan from everyone at the River Management Society. Her interest in innovation, creativity, strong-will and dedication to enhancing river recreation, conservation and partnerships provided tinder and has subsequent infusions of fuel for National Rivers Project's success. The NRRD has grown from fewer than 100 rivers in 2015 to over 1,000 rivers today. Thanks to support and guidance from the National Park Service and Joan Harn, we've partnered with over 40 organizations, including federal agencies, state recreation and natural resource programs, municipal water trail programs and non-profits. The database is continually growing thanks to the partnerships, systems and ideas that Joan helped develop over the last eight years. Check our progress on www.NationalRiversProject.com. ♦

Joan Harn and Risa Shimoda pictured at the National Park Service hydro meeting, October 2018. Photo: Angie Tornes



Mary and Judy hope to win another trip in Richmond in 2020 to continue our journey of exploration and learning about all things rivers and Mary's continued introduction to the west.

On Mary's last day, she discovered that she was missing her South Carolina driver's license! Yes, somewhere along the way she managed to lose it. However, river running comes first, so on the way to the Verde River put in, she called a few folks, got a picture ID, and spent a lovely day on the river thanks to Judy and Linda Jalbert's hospitality.

This trip just reaffirmed the need for RMS to continue its many good works and services! We would never have been able to discuss rivers, vegetation along riparian areas, shoals / rapids, woody debris, capacity, development and conservation across many states and different environments without RMS. Our leaders such as Caroline, Risa and our Board make sure we all have a chance to meet each other and talk about all things river related every other year. We hope to see most of you again soon at our next RMS Symposium 2020 in Richmond, Virginia. And who knows ... maybe in the Southwest in 2022. ♦

RMS Chapters

Northeast by Emma Lord

The Northeast Chapter of RMS hosted a 3-day fall paddle (September 6-8) along a portion of the Northern Forest Canoe Trail (NFCT) in the Adirondacks of upstate New York. The group of nine set out from the Long Lake boat launch under bright and sunny skies. It was a quintessential early fall day in the Adirondacks with temperatures in the 60s and a light headwind blowing down the lake. The group paddled past many rocky islands, sandy beaches, and picturesque camping spots along the lake on our way to the Raquette River. For the most part, the Raquette is very sinuous and slow moving with numerous side channels, oxbows, and adjacent wetlands. As the group rounded the final meander for the day, we heard the telltale sound of rapids ahead and knew we had reached the challenging Raquette Falls portage. In the waning hours of daylight, the group successfully maneuvered our canoes and gear across the 1.3 mile hilly and rocky portage, and enjoyed a well-earned dinner at our campsite. Kerrie Thomas, Executive Director of the NFCT, joined us for campfire discussions about river management and access to wrap up our first day.

Our campsite at Raquette Falls, adjacent to New York State designated Wilderness Area and roughly six miles to the nearest road access, was not the place you would expect to see a few hundred people on a Saturday in September, but this was no ordinary weekend. This was the weekend of the 37th annual 90-miler Adirondack Canoe Classic. Averaging 30 miles a day, the 90-mile race starts in Old Forge, NY, on Friday and ends in Saranac Lake on Sunday. On Saturday, the RMS group provided water, Gatorade, and snacks to ~600 appreciative racers in 235 boats as they finished the Raquette Falls portage and got back on the river. It was quite the scene as racers in all manner of craft (solo and tandem canoes and kayaks, 4-person canoes, Adirondack guide boats, 8-person war canoes, and even a couple of stand up paddleboards) consumed what refreshments they could and jockeyed for position in the race. Once all the racers passed through, the group took advantage of some down time to explore upper and lower Raquette Falls before the rain moved in for the evening.

Before hitting the river again on Sunday morning, the group heard from New York State Department of Environmental Conservation Outpost Caretaker Gary Valentine and Assistant Forest Ranger Brendan Jackson. The two discussed and answered questions about management challenges that they face on the Raquette River, in state Wilderness Areas, and in the broader Adirondack region. Then under cool, overcast skies, the group paddled the remaining stretch of Raquette River to the take out near Tupper Lake. The trip was a great success, and the group was glad to be able to help out with the 90-mile race and learn about river management in the Adirondacks.

Thank you to all who joined the trip and a big thank you to Walter Opuszynski, Northeast Chapter Trip Coordinator, for handling trip logistics and making the trip a great success! ♦



A perfect lunch spot on Long Lake. Photo: Emma Lord



Racers in the 90-miler Adirondack Canoe Classic hit the water again after a 1.3 mile portage. Photo: Jim MacCartney



All smiles after portaging Raquette Falls. Photo: Walter Opuszynski

RMS Chapters

Alaska by Dave Schade

The Alaska Chapter is pleased to announce the new officers from the 2019 election. The Chapter voted to eliminate the treasurer's position, and move Chapter funds into the National RMS treasury. Thanks to everyone who voted!

David W. Schade, MPA - President is Director of the Division of Agriculture in the Alaska Department of Natural Resources. In this role, Dave supervises the Division's programs around the state, including the Northern Latitude Plant Materials Center and offices in Palmer and Fairbanks. Dave is a life-long Alaskan who was raised on the family homestead east of Homer, graduating from Homer High School in 1977. Dave has a B.S. in Agricultural Economics from the University of Idaho (1982) and a Master of Public Administration from the University of Alaska, Anchorage (1994). Prior to taking the position of Director, Dave was Chief of the Water Resources Section in the Division of Mining, Land and Water (2012-2019), and was Navigability Subunit Manager in the Public Access Assertion and Defense Unit (PAAD) where he had served since returning to State service in 2008. Dave is currently an Alaska representative on the Western States Water Council, on the Association of Western States Engineers (President in 2016), President of the Alaska Chapter of the River Management Society, President of the Alaska Farmers Union, and President of the Eagle River Valley Community Council. Dave continues to participate in running the family's ranch, and boating and flying when time allows.



Cassie Thomas - Vice President has been a member of RMS since its creation after the merger of two pre-existing national river management organizations in the early 1990s, a Lifetime member since 2003, and has previously served in Northeast and Alaska chapter officer positions. With an educational background in oceanography and environmental law, her focus turned to freshwater systems when she found herself working on a river protection plan (Westport River, MA) in 1984. She has experience on staff at two river conservation organizations, numerous state conservation agencies, and worked at the National Park Service for 27 years until she retired in spring 2018. She lives in Anchorage with her pilot-turned-teacher husband Russ, and two dogs.



Sharon Seim - Secretary is currently the Wilderness and Trails Program Manager for the Alaska Region of the U.S. Forest Service. A wildlife biologist by training, Sharon has worked for a variety of agencies on diverse public land management concerns including wildlife management, subsistence resources, realty issues, wetlands, wilderness, wild and scenic rivers, and land management planning. Sharon has spent more than 20 years of her career in Alaska, but has also lived and worked throughout the western U.S. including California, Washington, Arizona, Idaho, and Utah.





Get Outside at the 2020 RMS Symposium

Rafters take a break between rapids to enjoy the view of Richmond's skyline from the James River. Photo: James Vonesch

by Dan Carr and Joey Parent

The host committee for the RMS 2020 Symposium has been hard at work planning very engaging and fun field workshops and trips that will be part of the many great experiences waiting in Richmond! We've got a great lineup of both unique, river-based skill-building opportunities and exciting adventures to show off our wonderful community and magnificent James River. We have also brought together experts in the region to share their experiences and knowledge of the area.

The City of Richmond is located on the banks of the James, located at the eastern end of the Atlantic Coast Fall Line. This hard ridge of rock, stretching from Georgia to New Jersey, separates the Eastern Seaboard into the Tidewater and Piedmont regions and presents a barrier to deep water navigation further west along the river. From the earliest Native American fisheries to the beginnings of European settlement on the continent and critical battles during the U.S. Civil War, the Fall Line on the James River has been central to the human and natural histories of this region. Today, it provides some of the most exhilarating and accessible urban whitewater paddling in the nation. This river section is called the Historic Falls of the James and is a designated Virginia Scenic River (since 1972). Come explore the James River and its watershed with us in May 2020!

New for this year's RMS Symposium, we have organized a special pre-meeting overnight canoeing trip on a remarkable coastal plain section of the Roanoke River in North Carolina (<https://www.roanokeriverpartners.org/Default.aspx>) for our RMS River Studies and Leadership Certificate students and other

early career members. We'll paddle through flooded cypress forest and camp on platforms accessible only by boat. In spring these ecosystems are exploding with life. The trip will leave on the Saturday before the meeting and return Sunday evening (May 9-10). The goal is for students and early career members to have a chance to spend some time on the river exploring and networking before the meeting and to learn about the development and management of this regional gem of a paddle trail (<https://www.adventuresportsnetwork.com/sport/paddle-sports/canoe-kayak/destination-roanoke-river-paddle-trail/>).

On Wednesday of the symposium, we have a variety of trips available for attendees. For those that are excited about getting into the river, the Virginia Commonwealth University Outdoor Program (<https://recsports.vcu.edu/programs/outdoor-adventure-program/>) will be offering guided rafting trips through the Fall Line in Richmond. Participants will paddle five miles of outstanding urban whitewater without ever leaving city limits. The trip will introduce the beauty of Richmond's crown jewel, the James River Park System, while floating numerous class II and III rapids separated by some great flatwater sections for swimming and the always popular Class IV Hollywood Rapid!

If you'd like to see more of the Piedmont, consider joining us for a day on a *batteau* — large, flat-bottomed wooden boats, unique to the James River, that were critical in the river trade prior to the Civil War. Our trip will explore about eight miles of the Hardware and James rivers, from the Hardware State Management Area down to Bremono Bluff. This beautiful section

contains historic structures from the batteau and canal era, observable from the river. Swimsuits a must for this one!

Below the city you can explore the tidal reach of the James River with experts from the [James River Association](#), our regional nonprofit education and advocacy group. This organization has promoted conservation and responsible stewardship of the natural resources in the James River watershed since 1976. Join them on their 40-foot education and water monitoring vessel as they travel from Rockett's Landing, east of Richmond, toward the Chesapeake Bay. This voyage through time will pass areas from the last four hundred years of our nation's history and also of major contemporary policy interest. This trip will provide some great wildlife viewing, with healthy populations of bald eagles, osprey, and perhaps the Atlantic sturgeon!

Come and enjoy a lovely bike ride through the Tidewater region on our Virginia Capital Trail! This 51-mile, multi-use walking and bike path was completed in 2015 and connects the modern capital of Richmond with the colonial capital of Williamsburg. We will be riding a 12-mile section that ends at the historic Shirley Plantation, the oldest continuously family-operated business in the US.

Many of our mid-week activities will be workshops demonstrating a variety of river-based assessment skills and techniques used on and along rivers to support policy and monitoring goals.

Please take a look at our Visual Resource Assessment and Management Training, our Universal Access /Water Trail Workshop, the GIS/ Drone Mapping Course and the Virginia Scenic River Evaluation.

The Scenic River Evaluation will be going through the process Virginia uses to designate its rivers as scenic. Discussion will include the difference between Virginia's program and the federal program. Participants will get to paddle on the Chickahominy River, an ancient coastal river, and go through a complete evaluation procedure while experiencing huge cypress and peaceful wetlands.

In Hopewell, VA, the Water & Riverine Trail Development Workshop will give folks a half day to see how riverine and water trails can help revitalize a community distressed by industry outfalls. The work done by volunteers and partnerships for years saw hundreds of thousands of dollars invested in the future of the Appomattox River. Participants will end the day with happy hour at The Boathouse Restaurant overlooking the Appomattox River.

This collection of events and experiences include some of the best activities that our river city has to offer. ♦



Visitors ferry to Presquile National Wildlife Refuge aboard the James River Association's *Spirit of the James*, a 40-foot covered pontoon boat. Photo: James Vonesch



Cyclists explore a section of Virginia Capital Trail which links Richmond and Williamsburg with 55 miles of dedicated bike path. Photo: Joey Parent



VCU Life Science faculty Will Shuart teaches VCU students and faculty about collecting LiDAR data using an Unmanned Aerial Vehicle (UAV).



River carves a path through the ice.
(NPS Photo / Gordon Warrick, 1/19/2018)

creating a larger jam. Over time, water and ice accumulate and can lead to some major flooding. Historically, floods like this washed out bridges, damaged farms, and flooded towns. In 1916, an ice jam destroyed all but one bridge in the scenic river section of the Niobrara.

In March of 2019, Nebraska was hit by major flooding especially on the eastern side of the state. The Niobrara River made headlines when Spencer Dam failed on March 14. The circumstances leading up to the dam's failure included: the winter storm that dropped snow over north central Nebraska, the shift to rain, followed by rapid snow melt while the ground was still frozen, leading to devastating flooding from which some areas of the state are still reeling. In Valentine, 1.35 inches of rain fell on melting snow March 13; however, the ground was still frozen, creating conditions similar to Karst geology, where the water had no place to go except into the rivers. By the afternoon, the rain turned to snow, which continued into the next day. This would contribute to the eastern side of the state's flooding. Over the next few weeks, as temperatures increased, additional runoff would add to the river, exacerbating the flooding.

Luckily, the Niobrara National Scenic River did not see the same level of impact as the eastern side of the state. It did see record highs. On March 13, the river peaked at 5,610 cubic feet per second (cfs). The USGS Sparks Gauge recorded the highest reading the Niobrara had since Merritt Dam's construction in 1964. Merritt Dam was placed on the Snake River, a tributary of the Niobrara. By March 25, that record was broken when a little before midnight the flow hit 6040 cfs. It washed out roads, left water and ice on fields, washed out the road leading to Carns Bridge, and damaged the bridge abutment where, up until that day, we used to have a canoe landing at the end of the scenic river boundary.

Some of the outfitters on the river lost riverbank and sandbars, landings suffered from washouts, and visitation

dropped. Additional rainfall events kept spiking the floatable section of the river up above the 2,000 cfs mark at various times in May and June, which was two to three times normal flows. While normally rare, this year the high flows created numerous hazardous strainers (trees) in the river. Fortunately, park rangers did a great job of addressing these to keep our visitors safe.

It also caused additional washouts on the roads leading to the river. Visitors would call with the same series of questions:

- *Is the river floatable?*
- *Will we be able to float in May, June, and July?*
- *I've never floated before, is it safe?*
- *What's in the water?*

In a normal year, the cfs stays around 800-900 cfs in the spring before dropping to around 400-500 cfs by the end of the summer. It is a great river for beginners. When answering visitors' questions about the flooding, it really depends on the visitors' comfort level and experience. At 2,000 cfs, tubes are harder to manage and inexperienced paddlers could wind up in dangerous positions.

In addition, we suffered from mistaken identity with Niobrara State Park on the eastern side of the state, which was closed and inaccessible. There were also concerns that the Niobrara NSR would be dealing with bacteria problems like the Elkhorn, Missouri, and Platte. Fortunately, our river did not see a significant increase in bacteria during the floods.

As the summer progressed, the cfs dropped to conditions that were closer to "normal," albeit still high for that time of year. Then in September, additional rains came, bringing flows back up to over 1,000 cfs. However, normal is relative. One important thing to note is that rivers are capricious. The Niobrara NSR has changed perceptibly since I arrived in 2014. Most of the changes stem from the ice jams and high water levels.

The continued precipitation throughout spring and summer led to continued issues in the Valentine area and on the Niobrara NSR. South of Valentine, on Highway 83, near the Valentine National Wildlife Refuge, a pool of standing water still covers the highway. Due to the potential danger, the state placed a stoplight and hazard signs. Other surrounding towns and roads became impacted and the questions began to change:

- *Can we get to your location?*
- *Why did this happen?*
- *Does this happen every year?*
- *Why was this year so different?*

There are a variety of factors as to why the flooding this year was so much worse than previous years. The combination of snow, then rain, then snow melting on frozen ground started the flooding that continued precipitation would build on. The failure of Spencer Dam is another piece of the puzzle. Finally, climate is changing, which alters weather patterns.

Going into this winter, we still have standing water in places that we normally wouldn't see in the Nebraska Sandhills. I wonder how that will affect the region when spring comes around next year. According to the Farmer's Almanac, we are suspecting snow at the end of October. When next spring rolls around, will we experience higher flows than what we saw this year? ♦

Chapter Officers

ALASKA

David W. Schade, MPA, President
Alaska Department of Natural Resources
550 West 7th Avenue, Suite 1020
Anchorage, AK 99501-3577
(907) 269-8645 / cell (907) 230-6061
david.w.schade@alaska.gov

Cassie Thomas, Vice President
National Park Service, Retired
11081 Glazanof Dr
Anchorage, AK 99507
(907) 677-9191 / cassieinak@gmail.com

Sharon Seim, Secretary
US Forest Service
PO Box 21628, Juneau, AK 99801
(907) 586-8804 / sharonseim@fs.fed.us

NORTHWEST

Lisa Byers, President
Salmon River Ranger District
304 Slate Creek Road, White Bird, ID 83554
(208) 839-2146 / lmbyers4@gmail.com

Joe O'Neill, Vice President
Bureau of Land Management
2 Butte Drive, Cottonwood, ID 83522
joneill@blm.gov

Martin Hudson, Secretary
Bureau of Land Management, Retired
P.O. Box 92, Pinedale, WY 82941
(307) 367-5315 / 53silvercreek@gmail.com

Joni Gore, Events Coordinator
National Park Service
909 1st Street, Seattle, WA 98104
(206) 220-4006 / gore.joni@gmail.com

SOUTHWEST

Rob White, President
Colorado Parks and Wildlife, AHRA
307 W Sackett Ave, Salida CO 81201
(719) 539-7289 / cell (719) 207-2050
rob.white@state.co.us

Matt Blocker, Vice President
Bureau of Land Management
125 S 600 W, Price UT 84501
(435) 636-3631 / mblocker@blm.gov

Greg Trainor, Secretary
2514 Snowmass Ct, Grand Junction CO 81507
(970) 260-4670 / ptrainor7@msn.com

Stuart Schneider, Trip Coordinator
Bureau of Land Management
906 Sunny Slope Dr, Gunnison, CO 81230
(970) 642-4964 / swschneider@blm.gov

NORTHEAST

Emma Lord, President
National Park Service
54 Portsmouth St, Concord, NH 03301
(603) 224-0091 / emma_lord@nps.gov

John Field, Vice President
Field Geology Services
P.O. Box 985, Farmington, ME 04938
(207) 645-9773 / fieldgeology@gmail.com

Walter Opuszynski, Trip Coordinator
Vermont Dept of Forestry, Parks and Recreation
5 Perry Street, Suite 20, Barre, VT 05641
(802) 522-6022 / wopuszynski@gmail.com

SOUTHEAST

Jane Polansky, President
Tennessee State Parks
Wm. R. Snodgrass TN Tower, 2nd Floor
213 Rosa Parks Ave, Nashville TN 37243
(615) 456-3843 / jane.polansky@tn.gov

PACIFIC

(vacant)

MIDWEST

(vacant)

Canadian River Management Society (CRMS)
Contact: Max Finkelstein
tel (613) 729-4004 / dowfink@gmail.com

The RMS is fueled by the amazing energy of its members, and we are looking for energy we know is out there among both new and seasoned members. The Pacific, Midwest and Southeast Chapters are looking for members who care about the management of their rivers to lead them forward. Potential leaders are team players who love working with others and believe a regional dialogue among members and a presence among peers in other parts of the country would help chapter members and the organization as a whole!

A membership in RMS makes a great gift for a colleague or friend!



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RMS Journal

**Care to share?
Submission deadlines:**

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Spring 2020	Vol. 33, No. 1	Northwest	Feb 1
Summer 2020	Vol. 33, No. 2	Northeast	May 1
Fall 2020	Vol. 33, No. 3	Pacific	Jul 1
Winter 2020	Vol. 33, No. 4	Alaska	Dec 1
Spring 2021	Vol. 34, No. 1	Southeast	Feb 1
Summer 2021	Vol. 34, No. 2	Midwest	May 1
Fall 2021	Vol. 34, No. 3	Southwest	Jul 1
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