

Figure 1. Side-by-side comparison of Google Maps (2022) Street View (left) and Terrain360 virtual river tour (right). Virtual river tours are an emerging technology receiving little attention and have unexplored benefits. For obvious reasons, capturing 360° panoramic imagery on a river presents unique logistical challenges that street travel does not. (Source: Google Maps / Terrain360)

Virtual River Tours – An Emerging and Essential Technology for River Recreation, Management, and Research

“Technological change creates new tools, skills, and methods that can be used to expand or enliven outdoor recreation experiences, as well as to accomplish such management objectives as facilitating recreation participation, improving communications, and protecting the environment.” (Valenzuela, 2020, p. 101)

by Ben Fowler

Enter Google Street View

Fifteen years ago, within the months of May and June, the U.S. received a revolutionary double whammy of tech innovation with the release of both Google Street View and Apple's first-generation iPhone. Through continuous development and mob consumption, these technological tools, for better or worse, have now rooted themselves into the fabric of everyday life. For parks, waterways, and other protected areas, the social and

ecological impacts stemming from smart-phone technology are increasingly investigated (Blahna et al., 2020). Contrarily, with virtual tour technology, such as Google Street View, the uptake of this technology has been slow for the recreation management and outdoor industry. Remarkably, for rivers and other water-based resources, virtual tour initiatives have garnered little attention. Not even Google's Peg Man will venture onto the reportedly 3.5 million miles of rivers and streams within the U.S. (EPA). Fortunately, efforts are now underway within the U.S. to capture and document high-quality, 360° panoramic imagery along thousands of miles of American rivers and waterways to be used in virtual tours (Figure 1). River managers and recreationists could benefit from leveraging these spawning efforts and emerging virtual tour technologies, yet research on the applications of virtual tours and its value to the outdoor industry is also lacking. The information below aims to introduce and explore the use of virtual tours and the pioneering application of the technology for recreational river use, management, and research.

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Executive Director's Eddy



Risa Shimoda, RMS Executive Director

Channeled, Humbled, Nearly Stumbled, and Still Standing

The weekend after Veterans Day the summer-like weather in Maryland shifted abruptly. As thermometer readings took a serious nosedive, we scrambled for extra layers and puffy jackets and checked closets and drawers for beanies, scarves, and gloves.

Looking forward to a UPS delivery for which I knew I'd need to sign, I responded to a knock on the door by stepping excitedly into a 28-degree breeze, struck by the reminder of what 'cold' felt like. I was also struck by the delivery fellow's uniform, for he was wearing those brown shorts we're used to seeing on sizzling summer days.

When I challenged his choice of attire, he laughed as he responded, "I'm channeling last week: I think I'll keep these on for a few more days."

Now that is being intentional. Is it also being stubborn? Perhaps both. His intentionality and stubbornness was admirable as a corollary to the pursuit

of our mission, through uncertainty and despite missteps encountered through some experimentation. We continue to pursue what may be unconventional if the activities and outcomes are strategically sound and align with planned programs!

I hope you've had an opportunity to watch our 2022 [Year in Review](#). I have been overwhelmed at the impressive number of people who have shown up to allow us to meet, engage and serve in 2022.

I am humbled by our team:

- Angie Fuhrmann has established herself firmly as the captain and heartbeat of the River Training Center and River Studies and Leadership Certificate;
- Bekah Price has helped us establish ourselves as the go-to organization for programs that serve river professionals; and
- James Major has moved us closer to highlighting all floatable, boatable rivers in the US with diligence and patience.

We have grown as a team by meeting and learning from interns Karyna Kloude and Reyes Shendo, and look forward to continuing to work with and learn from project specialists Kara Campbell and Ben Fowler!

In addition to developing and delivering programs, the RMS team has been re-organizing our administrative platform and scheduling tools so we can share our work with less effort. While moving our River Training Center workshop videos to our YouTube, Angie mentioned that more people had viewed a few of them in a few short days than had viewed them all year on our former platform!

Staff planning skills represent half of the story: the complement is y'all who have shown up. You have volunteered to train, teach, pitch in as event leaders or simply attend a webinar, workshop, this year's awesome River Ranger Rendezvous or River Management Roundtable.

(continued on next page)

President's Corner



Judy Culver, RMS President

It is that time of year again: researching the vote, holiday plans, vacations and celebrations with friends. It is also the time of year that the River Management Society's national board and chapters meet to discuss our strategic plan and the 2023 workplan. It was exciting to see old friends and begin to build relationships with our new Northwest and Midwest chapter presidents.

This year the meeting was held in Coloma, California, exploring California rivers, after meeting for a few days of hard work. Always managing to tie in with long-lost co-workers who are enjoying retirement.

The four lessons learned:

- 1) How far our Executive Director, Risa Shimoda, has brought the vision of a diverse leadership into being to include the shift in the age structure of the board and chapter leaders to an average age of 34;
- 2) The importance of showcasing the many incubation ideas that provide waterway exploration for non-traditional and socio-economic challenged communities;
- 3) The vast range of river opportunities in Oklahoma that need to be explored;
- 4) Avoiding California since childhood is unjustified, and the trip has built a burning desire to return to explore Coloma as well as other communities and rivers in the very near future.

This year I reflect on not only how far my river and lake programs have come in improving user compliance, safety, and on-site conditions but also how far we have to go to educate users on the importance of wearing lifejackets while boating. Local lives lost swimming the Rio Grande this year and frequent near misses on Santa Cruz Lake doesn't seem to increase the use of life jackets by the city dwellers who drive up to spend the day fishing, boating and swimming. Socio-economics and language barriers are also a factor.

Launching bilingual and tribal messaging in Adventure Videos on river safety, using 508 compliant handouts, newsletters, new mapping apps, and other products created by state and federal agencies are necessary to expand universal access to our nation's waterways and ensure user safety. My hope is that with these products, life jacket citations, collaboration with partners, as well as other ideas I capture while attending the Symposium will improve compliance and safety in 2023.

November is also the time to tidy up river areas, review recreation.gov to ensure river lotteries are ready to go live, and finalize the budgets for the coming year. Work life balance is the buzz phrase of the past few years so don't forget it is also the time to cast your fly or spinning rod into the cold clear waters trying to catch that "big" one or paddle through frost-nipped waters one last time before you put your boat away for the winter.

May we all get great snowpack for those who enjoy winter sports as well as those looking forward to spring boating. ♦

Judy Culver
RMS President

[As I write this, members Judi Zuckert and Jenna Whitlock are making an 11-hour drive from Boise to the home of Matt Blocker in Salt Lake City. They plan to photograph, measure and draft descriptions of over two dozen works of art that were left to RMS by member Bunny Sterin. We will showcase these works of art during our upcoming online and in person Symposium auction, in February 2022. Thank you, Judi, Jenna, Matt ... and Bunny!]

Stumbled and Standing

We experienced what was likely the greatest level of controversy this summer related to the River Management Roundtable, "History of racism and the effect on black participation rates in water-based outdoor recreation." Session attendee Chris Geden (Thrive Outside, St. Louis) offered the following immediately after the session: "You've chosen to step into this DEI space. It is messy, so get used to it, and thank you." Chris rejoined us in October as a River Management Roundtable (RMR) guest, after having met Ed Sherman at a meeting of current and potential Thrive Outside partners. While we may have stumbled, we were glad to have created the opportunity to offer this RMR and sure learned a lot from the experience.

Looking Forward

New institutions and student enrollees have contributed to a revitalized River Studies and Leadership Certificate: we look forward to seeing y'all in San Antonio! Dozens (literally) of Bureau of Land Management colleagues have contributed as data partners to the National River Recreation Database. Members of the Pacific, Midwest and Southeast Chapters have new leaders who look forward to creating opportunities to learn, support, and share your river work.

We look forward to making some river management news, together! ♦

Risa Shimoda
Executive Director



Thank you 2023 Symposium Sponsors and Partners!

RMS is currently seeking 2023 Symposium sponsors and silent auction donors. Sponsoring the event directly supports river management professionals. Sponsor benefits include event registration, recognition on promotional materials, exhibitor space and RMS membership. Contributions may be made in cash or in-kind (as donations to the silent auction). We are immensely grateful for our sponsors thus far and look forward to partnering with others! See the [Symposium](#) webpage.

Registration Open

River professionals are invited to take a deep dive into the physical, economic, and social aspects of river access at the RMS Symposium (February 28 - March 2, 2023) in San Antonio, Texas. Single day and student rates are also available. We will accept registration up through the week of the Symposium itself, space permitting.

“For communities to thrive around rivers, visitors must feel welcome and must overcome physical and economic barriers, and this requires a great deal of planning, management and outreach from river managers and stewards,” said Shannon Bassista, 2023 Symposium Chair and Vice President of the River Management Society Board of Directors. “We hope the 2023 Symposium will inspire new solutions to shared river access issues and serve as a catalyst for innovation and partnerships nationwide.”

RMS hosts its Symposium every two years, bringing together hundreds of river managers, planners, rangers, scientists, stewards, and students to broaden their professional networks and discover solutions to challenges facing our rivers. With opportunities to attend dozens of presentations and discussions, attendees will leave with the knowledge and skills to more confidently navigate issues on their rivers.

The theme this year is *Reimagine River Access* and sessions will share innovative strategies, stories of success, and visions for the future of river access. In addition to presentations, posters, and panels, the event will include field trips, networking opportunities, and the back-by-popular-demand silent auction. Student members have been invited to join a free overnight camping and paddling excursion at Canyon Lake the Sunday before the event: this trip may be filled, so check with our trip coordinator Kara Campbell for the most up-to-date availability. View the program and register at <https://www.river-management.org/2023-symposium>. ♦

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Chocolate: a new way to support river management

Wild West Chocolate partners with RMS on shared mission for rivers

by BJ Howard

Wild waters have always been my happy place. Growing up and raising my own family in Montana, I’ve had the unique privilege of enjoying Northwest rivers, lakes and streams most of my life. They were an integral part of my upbringing — spoiling me and my family with endless recreation from rope swings and fishing to relaxing floats and whitewater thrills. Whether it was catching my first fish off Dad’s drift boat on the Smith, surviving my first trip through Wild Sheep on the Snake, flipping our boat in Chittam Falls on the Main Salmon, or pushing off for a multi-day float with my husband and kids (no service, cell phones or Xbox — just us), these precious waterways have given so much to me over the years. So, I thought, “I want to give back to them.”

With the recent population boom not only in Montana, but in many other rural areas rich in natural resources, so much change is happening, and not all of it positive. I read an article about the COVID and post-COVID hordes of people at one of my favorite rivers in the Flathead: the Middle Fork, which borders Glacier Park. Residents of the area were fighting legal battles to protect and preserve the damaging impact of too many visitors occupying the river and its shores — polluting, defecating, destroying native fish habitat and generally disrespecting such a precious resource. Again, I thought, “I want to give back.” But how?

I was inspired to use my work and business as part of the solution, and that was how the mission for Wild West Chocolate was born. As a leader in a major better-for-you food company, I saw an opportunity to give back through the sale of a unique product we had recently developed: a breakthrough organic chocolate that was wildly delicious and sweetened only with fruit (no sugar added). I already knew Wild West was positioned to make waves in the confection industry, but then I realized it could also make a splash by helping preserve and protect our rivers, lakes and streams.

Today, I am both honored and humbled to donate a portion of our profits from every Wild West Chocolate sale to the River Management Society. I was thrilled to learn how their mission so perfectly flowed with my own, and I hold nothing but admiration for this incredible organization of professionals who make it their lives’ mission to uphold the health and beauty of North America’s wild waters.

Afterall, without clean water, we can’t grow clean, organic ingredients like the ones we use in our chocolate — and, we certainly can’t keep making so many wonderful memories these water resources provide. So, thank you, RMS. Keep up the good work and keep those rivers WILD just like they were in the WILD WEST.

On a mission to help preserve water with chocolate

We are Wild West™, and we are here to return chocolate to its raw and rustic roots — to simpler times when every food was organic and clean water was the only kind. We revere rivers, lakes and streams as the lifeblood of nature and an essential element of clean, plant-based ingredients like the ones in our chocolate. That’s why we donate a portion of our profits from every sale to the River Management Society to help support the passionate people who protect North America’s wild waters. ♦

Wild West Chocolate will launch online by March 2023 at wildwestchocolate.com with plans for retail distribution throughout the year.

BJ Howard is the CEO of Wild West Chocolate.



Photo: James Vonesh

Risa Shimoda Inducted into the Southern Appalachian Whitewater Hall of Fame

This past November, RMS Executive Director Risa Shimoda was inducted into the Southern Appalachian Whitewater Hall of Fame! She was recognized for her leadership in numerous whitewater organizations including American Whitewater, International Whitewater Hall Of Fame, Outdoor Alliance, and USA Freestyle Kayaking. She was an early company leader at Perception Kayaks, is a seven-time competitor in Freestyle World Championships, and completed a few first, early or first female whitewater river descents. Congratulations Risa!

Risa was inducted along with fellow Niagara Gorge paddler (in an open canoe!) Nolan Whitesell, Perception Kayaks boat designer Allen Stancil, Pigeon River champion Jeff Talman, river photographer and owner of many open boat first descents Robert Harrison and 40+ year leader of the Georgia Canoe Association Roger Nott.

Past inductees on hand included RMS members Kevin Colburn, recently-retired American Whitewater Executive Director Mark Singleton, among other whitewater legends: Liquidlogic designer Shane Benedict, Slalom Champion Lecky Haller, extreme and freestyle champion Adriene Levknecht, Silver Creek Paddles founder Homer King, early explorer and lifetime Nantahala

Photo: 2021 and 2022 Inductees

Front row (L to R, kneeling): Nolan Whitesell, Robert Harrison, Jeff Talman, Roger Nott

Standing: Adrienne Levknecht, Risa Shimoda, Allen Stancil, Payson Kennedy, Gordon Grant

Back row: Shane Benedict, Mark Singleton, Lecky Haller, Homer King, John Burton, Kevin Colburn

Outdoor Center instructor Jimmy Holcombe, slalom Olympian and outdoor industry leader John Burton, Dagger Paddles and Dagger Kayaks founder Steve Scarborough, Nantahala Outdoor Center founder Payson Kennedy, competitor and instruction innovator Gordon Grant, and Sunburst Adventures Co-founder, Ocoee restoration advocate, and historian Marc Hunt. ♦

Learn about each in a video montage produced by the Southern Appalachian Paddlesports Museum here: https://www.youtube.com/watch?v=X-wjl_mcSws

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360° Virtual Tours

A Virtual Tour (VT) is a digital simulation, often of an existing location, with the capability to move through a sequence of 360° panoramic imagery or videos. Commonly, VTs are experienced with the use of a computer and mouse or on a smartphone (El-said & Aziz, 2022). Additionally, multimedia elements can be incorporated into VTs with varying audio sources such as music, narrated content, or other sound effects (digitalintheround.com, 2021) to make the experience more immersive. The most well-known VT experience is Google Street View (GSV), which serves millions of Google users across the Globe with over 10 million miles of Street View imagery (CNET.com, 2019, Tech Industry section).

From an increasingly web-based, tech-savvy consumer perspective, digital resources such as GSV are becoming an expected and desired experience before visiting a place (i.e., *try-before-you-buy*). In fact, Millennials are 130% more prone to select a service or event if a virtual tour is an option (reimaginemainstreet.com, 2021). Naturally, use of VTs also drives up the amount of time spent on a particular website which is valuable to some marketers. One major benefit of VTs is that it allows a company or organization to offer an immersive, accessible experience of their resource for all visitors with a “high degree of realism” for relatively little effort and cost (Jones et al., 2022, p. 98).

While unfamiliar to the outdoor industry, virtual tours are a central element of many industries’ digital transformations from Real Estate and Construction to Health Care and Insurance. These industries use VTs for various purposes including marketing, training, and R&D. Notably within the tourism industry, the COVID-19 pandemic pushed virtual tours to the forefront of newly marketed experiences which expanded access to museums, national monuments, famous art galleries, and more for anyone at home during periods of shut-down (Jones et al., 2022). Recognizing virtual tours as a tool for other industries to expand access, Skibins (2021) wisely argued for increased outdoor industry and visitor use management attention by stating, “given the fact that visitors may now ‘virtually visit’ a site 24 hours a day, from anywhere in the world, managers must begin considering this portion of the experience, especially as it may become intertwined with the on-site visit (p.5).”

Although virtual tour technology is clearly making an impact across industry domains and changing traditional management thinking regarding visitor experience, the logistical challenges of capturing 360° panoramic imagery on rivers and trails as well as the unproven value of virtual tours for outdoor recreation and management remain a barrier. Regardless, independent efforts by Google Earth and some park-focused organizations, like the National Park Service (NPS), have launched efforts to explore virtual tours for [iconic parks](#). However, Ryan Abrahamsen, Owner of [Terrain360](#), a rare outfit which specializes in virtual tours for river and trail resources, believes there is a “tremendous

responsibility and opportunity in capturing these off-road recreation resources. Rivers especially, are increasingly front and center to climate change, access, conservation, and visitor use issues which make them highly valuable resources to visually document and preserve.” The virtual tours Ryan and his team create for various federal, state, and nonprofit organizations can potentially aid management goals and solutions regarding conservation and visitation, as well as marketing efforts in ways not traditionally considered. Virtual tours for rivers could also be used as essential tools to remove barriers, bolster access, and improve DEI programs, all factors which are now receiving heightened attention from most state and federal resource management agencies.

Enter 360° Virtual River Tours

A virtual tour of a river is similar in the form and function of Google Street View, yet the perspective simulates “floating” down the river with the ability to go up and down stream with the click of an arrow. With high-quality imagery, there is also the opportunity to zoom-in to see surrounding riparian environments (try it out: [here](#)). Ryan and his Terrain360 team have worked all over the country with a variety of organizations including contracts with the U.S. Forest Service, National Park Service, Bureau of Land Management, NOAA, and even university programs such as Virginia Commonwealth (VCU) (Figure 2) to create virtual river tours. However, very few organizations or individuals are engaged in the process of capturing river-based



Figure 2. The Terrain360 paddle rig with a mounted 360° camera array headed down the Middle James River alongside VCU students conducting Scenic Resource and Policy Assessments. (Source: Dr. James Vonesh)

imagery, the raw material of any virtual tour, because of how hard it is to obtain high resolution pictures on a dynamic, liquid path as opposed to static, solid terrain ... not to mention attempting to keep the cameras dry.

Terrain360 solved this logistical issue in 2012 by engineering a steel camera frame mounted to a specialized watercraft vessel. The set-up allows for an array of 5-6 DSLR cameras which are programmed from the watercraft to capture panoramic imagery at specified time intervals while on the river (e.g., every 15 seconds). With the ability to attach an outboard motor or cruise by paddle on the Terrain360 craft, it is possible to capture large distances of river (i.e., up to 120 miles in a day) depending



Figure 3, above. A Virtual River Access Demo Tour of the French Broad River's, Champions Park. Fowler's research hopes to improve the design and use of river access sites for better visitor experiential and management outcomes. (Source: Ben Fowler)

on environmental factors and project goals. The process often produces large tera to peta-byte size data files which are then streamlined into a navigable virtual tour experience hosted on the Terrain360 website. Terrain360 is also experimenting with management-oriented services such as Time Machine (i.e., resource photos taken over time to explore ecological changes) as well as Geospatially Referenced Species and Object Detection (i.e., machine learning software to pin-point and identify species and other attributes along the river). All virtual tours and services found on his website are free and public resources for all to benefit from.

Recently, I had the chance to collaborate with Ryan and the Terrain360 team to investigate creating tailored VTs specifically for river access sites (i.e., the park or launch point-of-entry for river users). As a Clemson University Doctoral Candidate in the Parks, Conservation, and Outdoor Recreation program, I believe VTs for river access sites are an equally important endeavor as capturing the river itself. On-site access to a river is fundamental to any river recreational opportunity and is often considered the “gateway” or “first touch-point” to all river experiences (O’Keefe and Sector, 2021, p.1). My research hopes to explore methods such as VTs to improve these important river access places and associated experiences as well as inform management actions. From a research angle, virtual tours of river access sites allow for various forms of experimentation with the ability to photo manipulate access setting qualities such as signage, water clarity, and landscape design to test how these factors may influence a variety of visitor perceptions such as safety or aesthetic quality, which are important to the potential visitation and sustainable use of these access environments (Figure 3). This type of empirical river research is heavily dwarfed by the number of river access projects currently in the planning or construction phase around the country. One would hope future river access planning projects will incorporate VTs as a tool to engage local river users and



Figure 4, below. An example of how photo manipulation within virtual river access tour changes the water quality or clarity. (Source: Ben Fowler)

managers as part of the planning process. Aside from research, there is also a host of benefits in using VTs for rivers and access sites including advanced trip planning (e.g., parking, carry-distance, real-time gauge info), educational campaigns (e.g., virtual field trips for schools), risk management plan development, marketing and promotion (e.g., water trail/riverkeeper websites), as well as ecological assessments. Exploring what’s around the bend with virtual tour technology for rivers and the implications it has for river resource management and recreational access is an exciting endeavor with a lifetime of research. The future of VTs for rivers is still unwritten. Further challenges lie ahead regarding wide-scale adoption by resource agencies as well as gathering the financial resources and capacity to support a virtual river tour effort even as the technology becomes cheaper and more widely available (e.g., commercial 360° cameras). Nevertheless, virtual tours for U.S. rivers and trails are an emerging and essential technology that should be researched, harnessed, and adopted to aid in the dynamic and increasingly complex challenges of river management and recreation. At the very least, a virtual tour allows managers to digitally preserve their resources in these times of volatile climate changes and provide an ecological impact-free form of access to all people, an obligation all outdoor recreation professionals should prioritize.

“It is the responsibility of outdoor recreation professionals and agencies to increase public access and visitor diversity and expand the types of visitor experiences, opportunities, and benefits that people obtain from public lands [and waters], while simultaneously protecting the natural environment (Keough and Blahna 2006; USDA FS 2016).” (Blahna et al., 2020, p. 14) ♦

To connect with Ben, please email: bffowle@clemson.edu



"This experience helped me feel part of the scientific community because it validated my scientific ideas and the people involved encouraged my growth as a scientist."
- RFSN Rendezvous participant

2022 River Rendezvous - Powhatan (James) River

Overview by James Vonesh, VCU

The flagship, annual, in-person event of the River Field Studies Network (RFSN) is the weeklong *River Rendezvous*. The *River Rendezvous* brings together our RFSN Scholars cohort, and mentors from across the country, to: 1) develop safety and risk management skills; 2) pilot field lessons they have been developing through a spring series virtual workshop in front of a "live audience" of students

and peers; and, 3) participate in a model overnight river camping trip. This past summer (May 27 - June 4), more than 30 participants came together for the *James River Rendezvous* hosted by Virginia Commonwealth University (VCU). Overall, the *Rendezvous* was a great success. Event assessment highlighted that for the RFSN Scholars, the swiftwater training made participants feel safer and more confident about overseeing

students in the field, that learning from peers and teaching in the field increased their confidence in putting together a river-based lesson, and that interacting with others at the *River Rendezvous* strengthened their sense of belonging to the river field studies community of practice. Similarly, the VCU student participants identified their three days with the "river professors" as the highlight of their 5-week field course.

The full James River Rendezvous participants from the River Field Studies Network and VCU *Footprints on the James*. (L to R, back row): Ahmed Awadalla#, Jabari Jones*, Sarah Gordon*, Richard Garrett#, Sarah Yarnell*, Danielle Hare*, Elise Chapman*, Aaron Koning*, Liz Waring*, Karl Schmidt*, Susan Washko*, Sarah Praskievicz*, Denielle Perry*, Luke Ward*, Zbigniew Grabowski*, Grace Lumsden-Cook#, (sitting) Oluwarotimi Johnson#, Kiki McDonell#, Jennoa Fleming#, Mackenzie Wessling#, Peyton Geiszler#, Anna Bon-Harper#, Joi Coleman#, Ella Buckwalter#, Isabelle Pillow#, Dagan Hunt#, Kaylynn Breland#, Maribeth Kniffen*, (front) Dan Carr*, Andy Rost*, (not pictured) James Vonesh*#.

All photos by James Vonesh.

Key: RFSN = *, VCU *Footprints on the James* = #



2022 River Rendezvous - Swiftwater Safety Training Practicum

Reported by Sarah Gordon, Colorado Mountain College, 2022 RFSN Scholar

The *River Rendezvous* provided participants the choice to take a 2-day basic ACA Level 3 Swiftwater Safety course on the front of the workshop. Led by the invaluable Karl Schmidt (Sierra Rescue SWS Instructor, VCU Outdoor Adventure Program staff, and RFSN member), this skill-building course was the ultimate team bonding experience for our small, yet eager river-loving crew. Combining hands-on classroom-style lessons with paddling 12' rafts on a very swollen James River gave me an opportunity to not only improve my whitewater skills, but also strengthen my ability to manage risk and appropriately respond to real danger. By the time we completed our "final test" late in the afternoon on our second day, the role-playing scenarios became intense enough that I

felt true adrenaline coursing through my muscles as I assisted in mock-rescuing our instructor from the middle of a turbulent stretch of rapids surrounded by strainers and deep holes. Working as a team, we accomplished these rescues using techniques I previously would have assumed too difficult or too dangerous for me to participate in – and I know

"The hands-on experiences associated with swiftwater rescue work gave me a baseline set of 'best practices' that I can build on to increase the safety of my courses in general and improve my responses to problems that may arise on the river."
- RFSN Rendezvous participant

from conversations that we all felt more empowered because of them. Swiftwater rescue is a skill I hope to never need but am grateful to have learned. And it was particularly rewarding to complete it with other River Scholars. Mr. Schmidt advised that we refresh our skills every couple of years. I'm already nervously looking forward to it.





“I was not familiar with the James or any large, coastal river before this experience. After spending a week exploring the James, I have grown as a River Scholar and will always treasure the memories and skills gained here. I now see issues facing large, Atlantic-coast rivers and want to solve them to conserve the James.”
- RFSN Rendezvous participant

2022 River Rendezvous - Piloting new lessons

Reported by James Vonesh, VCU

The River Field Studies Network (RFSN) objectives include building capacity for immersive river field studies through instructor professional development and creation of open source lesson content. Throughout the spring, our 2022 cohort of river field scholars have participated in pedagogy-focused virtual workshops and worked in small mentoring groups to develop skills and lessons. A major goal of the in-person *River Rendezvous* was to put these draft lessons to the test in the field in front of an audience of students and peers. On Sunday evening, RFSN instructors-in-training rendezvoused with the Virginia Commonwealth University summer field course *Footprints on the James*. Over the next three days the schedule fell into a pattern of communal breakfast, piloting two lessons, debriefing the lessons, communal lunch, piloting two more lessons, lesson debrief, then informal social time. In the evenings after dinner, students and instructors enjoyed fireside conversations with local experts who shared different perspectives on the history of the James River. Virginia Civil War Museum historian and educator, Ana Edwards, shared about the role of the river in the lives of enslaved Africans brought to the colonies and the role of the river in Gabriel’s Rebellion. Local waterman and fisheries biologist, Dr. Matt Balazik, shared about the recovery of Atlantic Sturgeon and efforts to manage invasive blue catfish. Chiefs, Stephan Adkins and Reggie Stewart, shared about the history of the Chickahominy Indian Tribe on the river.

We tested a diverse array of lessons over three days — topics ranged from the effects of groundwater hydrology on stream temperature and oxygen, measuring stream flow and metabolism, and characterizing allochthonous inputs as associated invertebrate communities to characterizing riparian land use at multiple spatial scales, sampling to detect micro-plastics, and thinking about rivers as coupled human-nature systems. Students were “hands on” and in the field for all of the lessons, whether using a custom built ESRI Survey123 application to quantify and map land use or using painting as a vehicle to think more in-depth about systems science and models.

Instructors will use their experience, and the feedback they received from peers and the VCU students, to refine their lessons through the fall and will share them through our open source RFSN QUBES hub page in the winter as they complete their year in the inaugural RFSN instructor training program. The VCU

students took what they learned from the RFSN instructors and used it to develop a field lesson of their own which they delivered later on their river course.

See this (7 min.) video highlighting RFSN field scholars practicing new lessons at the VCU Rice Rivers Center.
<https://www.youtube.com/watch?v=vJcgmC4a6UQ>

Overnight river trip: Scottsville to Bremono Bluff

Reported by Danielle Hare, University of Connecticut, 2022 RFSN Scholar

The James River trip provided a wonderful culmination of the *River Rendezvous* — it demonstrated how to lead and operate a multi-day field experience, and was an opportunity to visualize how our lessons would play out within the logistics of a river trip. What made our three-day Upper James trip particularly novel was the use of a *batteau*, a flat-bottom poling boat, operated by the two Wills of James River Batteau Co. Historically, these batteau boats were used to transport tobacco and other goods between the Piedmont and Richmond, largely operated by African-American slaves. The ability to use these boats gave us, as students, a deep physical connection to the James River — providing context into important river history that was largely erased, and active attempts to remember these lived experiences. This context was also powerful as it connected to an inspirational fire-side chat with historian Ana Edwards, an education coordinator at the American Civil War Museum and Black history advocate. As the batteau was able to hold eight passengers, time on the batteau allowed us to connect to each other personally and professionally, and share experiences. Evening river discussions centered on the logistics of field tripping, as well as observing the careful planning and execution conducted by our VCU Outdoor Adventure Program trip leader Karl Schmidt. Altogether, this experience was incredibly rich — filled with natural and human history — and inspirational, from an immersive educator perspective.

This portion of the *River Rendezvous* was also a clear reminder that it is about the moments. I find myself trying to explain this course to others, and always fall remarkably short — largely because these moments “in-between” are not well articulated, rather can only be experienced, and felt, in between the lessons that define a river course — creating moments to reflect, imagine and share. Funny, I think those who read this will know the sentiment. Offering these moments is invaluable, and nearly impossible to convey in any way other than sharing the experience. Thus, I think I can speak for the larger group when I say this James River experience has further inspired us and encouraged us, as educators, to create a place-based, immersive course within our own communities. ♦



Editor's Note:
These articles are housed online and contain many interesting hyperlinks, videos, and a full photo gallery of the river trip. We invite readers to enjoy more information (Chapters 1-4) [HERE](#).



International Canoe Federation (ICF)

2022 Freestyle World Cup – Recap

Shared by
Uptown Columbus
October 1-9, 2022
Columbus and Phenix City

Registered Countries: 16
Registered Athletes: 106
Medals Awarded: 60
Hours of Broadcast Video: 42+

For the first time ever, Columbus, Georgia, and Phenix City, Alabama, hosted an Olympic-caliber, international, freestyle kayaking event. The 2022 Freestyle World Cup consisted of two competitions at three different locations on the Chattahoochee River with categories for men, women, junior (15-18 years) men, and junior women. Competitions were in the disciplines of: Kayak, Decked Canoe, Open Canoe, and Squirt.

Stars of the World Cups

Ottillie Robinson Shaw - This 20-year old English woman won 4 Gold medals: World Cup #1 Woman’s Kayak, Women’s Canoe, Squirt Boat, and World Cup #2 Canoe. She also scored a Bronze in World Cup #2 Women’s Kayak.

Mason Hargrove - A rising superstar in the sport, this 19-year old from Phenix City stunned the #1 and #2 ranked men’s paddlers in the world by winning Kayak Gold at World Cup #1. This was just his second competition in the senior men’s division. Mason also won a Bronze in Kayak at World Cup #2.

Makinley Kate Hargrove - Competing in the Junior Women’s Kayak class for just the second time, this Phenix City 14-year old swept by winning Gold in World Cup #1 and World Cup #2.

Dane Jackson - The reigning Men’s Kayak Whitewater Freestyle World Champion did not disappoint by winning Gold at World Cup #2, and Gold in World Cup #1 Men’s Canoe. He received a Bronze in Men’s Kayak in World Cup #1 and a Bronze medal in Canoe.

Nanese Okazaki - This Japanese paddler swept the Junior Men’s Kayak division, winning Gold in both World Cup #1 and World Cup #2.

Great Sport

Hailing from Austria, Markus Mendy Swoboda competed in the Men’s Kayak division in both World Cups, a



Above: Anais O'Donovan (Ireland) on the World Cup bridge
Below: Mason Hargrove (USA) - World Cup B



Markus Mendy Swoboda (Austrian para-canoeist)

complete paddler thanks to the assistance of his two prosthetic legs. When a Canadian Squirt Boat competitor withdrew due to an injury, the event was going to lose international accreditation because not enough countries were involved — he quickly volunteered to participate, paddling a squirt boat for the very first time, and saving the day.

Hospitality Rating: A+++++

Almost all of the international paddlers had never been to Columbus and Phenix City, and many had no idea what to expect. As usual, our community stepped up in a big way. The Historic District Preservation Society held a cookout and social; Phenix City hosted a pasta dinner that wrapped up World Cup #1 and included a screening of the “[Wintering Grounds](#)” documentary; Whitewater Express owners welcomed paddlers and officials to Midtown for another dinner and social event; and the Host Committee held a closing event at the Powerhouse. These venues gave athletes the opportunity to see other neighborhoods in our community. Better yet, area residents were able to meet and mingle with world-class athletes.

Meanwhile, Dan Gilbert with Whitewater Express served as a one man welcome wagon by transporting athletes and officials to and from various airports. Uptown installed new street banners welcoming the ICF to

town and branding the RushSouth Whitewater Park area. The new banners were placed at Wave Shaper Island, the 14th Street Pedestrian Bridge, the Art Park, and the driveway to Ambush rapids. According to ICF Officials, Columbus and Phenix City offered the best hospitality they had ever seen for a World Cup.

Venues

Columbus and Phenix City had another first. ICF has never hosted a World Cup #1 and a World Cup #2 within the same week. And, never in the same city. They also have never judged a competition via remote screens. Through dogged determination and planning, our team and Competition Manager Richard Bishop seamlessly handled setting up at Ambush (for World Cup #1) a ‘hole’ feature, to include a wireless, high-speed internet, activating an inaccessible island across the channel for cameras and boat check-in, and running a bank of 14 computer stations. At the close of World Cup #1, the team transferred everything in less than one day to hold the squirt boat competition at Love Triangle and then World Cup #2 at Good Wave, a powerful wave with a curler at the top that lets experienced paddlers stay put and rack up points. Of course, water is the star attraction of any competition. Through a strong partnership with the Corps of Engineers and Georgia Power, we were able to provide the necessary water flows to host the event. Although this was made even trickier as Hurricane Ian loomed in the Gulf of Mexico, these utility providers had athletes raving about the river and its features. For the entire run of the competition, athletes, supporters, and viewers were treated to clear, sunny skies with highs in the 80s and low humidity. The river water was exceptionally clear as no rain had washed sediments into the river for over two weeks. The community looked great!

A bird’s eye view of the set up.



On the World Stage

Working in tandem with Columbus Tape and Video, the Host Committee livestreamed/broadcast World Cup #1 at Ambush and World Cup #2 at Good Wave, including the medal ceremonies. When breaks in the action occurred, we ran a video featuring local leaders welcoming the athletes to the region and thanking sponsors. These messages were streamed to a worldwide audience. On the final day, a few local leaders sat for on-air interviews to talk more about our community. ICF officials raved at the quality of the livestream picture and production. Locals were stunned by the quality of the huge video board erected at Wave Shaper Island.

RushSouth Outdoor Festival

Kicking off with a Beatles tribute band at Woodruff Park, a massive crowd enjoyed the free show on the lawn on Friday night. Saturday featured five local bands with two stages, a kid’s zone, and a car show. At one point in the morning, people could see world class kayak action, boats filled with rafters on Cutbait, zipliners flying across the river, and throngs of people walking along the riverwalk between the attractions. Although college football cut into attendance during the afternoon, we saw a strong start to this ambitious festival.

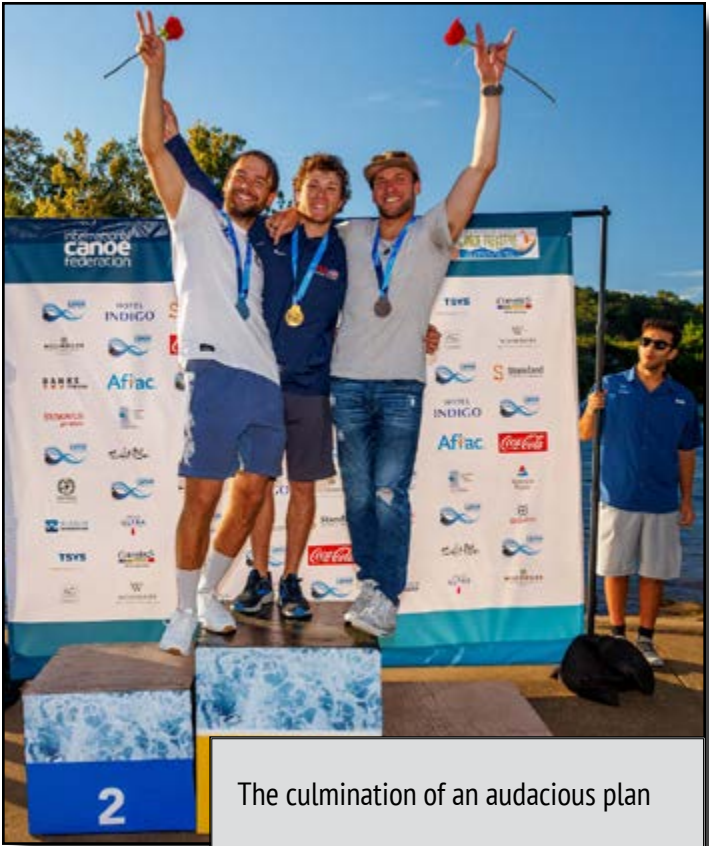
Community Involvement

We couldn’t have done it without the time, talent and generosity of the community. Our 32-member Host Committee included

civic leaders who worked for over a year to plan, organize, and fund the events with the aid of the crackerjack Uptown staff. Host Committee members represented businesses, community organizations, private foundations, contributors to the re-engineering of the river, and the paddling community. Nearly seventy donors provided both financial and in-kind contributions, and included manufacturers and service providers, families and foundations committed to the success of both Columbus and Phenix City’s success in 2023 and the long-term value and importance of their shared river. With the help of local businesses, civic clubs, church groups, school groups, and other organizations, we put out a call for volunteers far and wide.

- The community responded in a major way, and we thank our 241 volunteers who enabled us to run the events.
- The East Alabama Chamber of Commerce hosted a community clean up, during which 50 volunteers collected about 487 pounds of trash.
- A group of ten divers donned scuba gear to clean the riverbed at Love Triangle rapid in preparation for the squirt boat competition. They removed over 300 pounds of debris, including fishing lures and netting.
- The River Conservancy hosted a community clean up along the Riverwalk — 76 volunteers removed over 1,066 pounds of trash and garbage.
- Local government removed graffiti, updated signs, and repaired sidewalks.
- Phenix City added free Wi-Fi to their side of the riverwalk.

Volunteers were critical to the success of our event!



Men’s K1 Podium

The culmination of an audacious plan

Around 2001, civic leaders began dreaming of removing two 1800s-era dams to restore and reopen a 2.5-mile section of the mighty Chattahoochee River in Uptown Columbus. This dream became a reality in 2013, transforming Uptown Columbus into a mecca for outdoor recreation, including paddlesports, ziplining, biking, and other activities. Having secured the role of hosting the 2022 and 2023 ICF Freestyle World Cups is a capstone for this bold and visionary project.

What’s Next

The 2023 Freestyle World Championship will be October 4-14, 2023. We are expecting two to three times as many athletes. Our team treated the World Cups as a trial run for 2023. We have already completed a detailed debriefing to identify ways to make this competition even better next year. The 30+ member Host Committee focused on making this the best World Championship the ICF has ever seen. Make plans to be part of the action! We will again have many volunteer opportunities before and during the event. We will still accept vendors and sponsors. For more information, contact Uptown Columbus at 706.596.0111. ♦

This article was prepared based on a recap of the 2022 Freestyle World Cup Events orchestrated by Uptown Columbus, as shared by President and CEO Ed Wolverton. The images in this article represent the time and talent of photographer Chris Funk. RMS salutes Ed, together with his inspiringly dedicated team of staff and volunteers, for their commitment to professional excellence in delivering unrivaled southern hospitality as they welcomed the world to Columbus and Phenix City!

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TheRiverisMyOffice ▶ Play all
#TheRiverisMyOffice shares a day in the life of those of us who work on, in, and for rivers.

Boo-yah!

by Risa Shimoda

When does “Boo!” represent a celebration of colleagues and friends, and an annual coming together of our national leaders? ... when the River Management Society Board of Directors and Pacific Chapter meets, learns, and paddles over Halloween weekend — specifically, when an impressive group of RMS staff and board members, including two Fall ‘22 interns, met along the South Fork American River, in California, October 27-31, 2022.

Our organization’s Bylaws require that the Board of Directors meet in person one time per year. This was tossed out of the realm of practicality during the fall of 2020, and we regrouped in a hybridized manner in 2021. This past fall, the board met physically with the intention of ‘being’ together, learning with and from each other, and spending quality time discussing challenges that face us individually and on behalf of our members, in support of the rivers we strive to support as professionals.

The meeting also celebrated a historic year for the organization! We have reached an all-time high membership (590) as a result of an all-time level of activities and opportunities to connect with new and long-time colleagues alike. In addition, we have welcomed new chapter officers in the Pacific, Midwest, and Southeast Chapters to round out our national chapter leadership roster for the first time in nearly a decade! RMS President Judy Culver led us gavel-to-gavel through the business of the board. We reviewed the year’s work accomplishments (as well as speed bumps we encountered along the way) and received unanimous approval for a 2023 program of work and a budget. We also reviewed the draft 2023-2027 RMS Strategic Plan, which we will finalize for approval by the board in January 2023. We appreciate the commitment of thoughtfulness that board members and all RMS staff have contributed to this through the year. Once approved, we look forward to sharing it online.

We engaged in an admittedly weighty conversation about the qualitatively important and programmatically non-prescriptive topic of increasing diversity among members of the river management community. We discussed this with commitment, if not conclusion, and Judy has shared this about the discussion and what we need to keep in view:

The RMS Board consists of National officers and Chapter Presidents. (L to R) Front: Shannon Bassista - National Vice President, Lisa Byers - NW Chapter President, Matt Blocker - SW Chapter President. Back row: Ed Fite - MW Chapter President, Judy Culver - National President, Kristina Rylands - PC Chapter President, Rob White - National Treasurer, Risa Shimoda - Executive Director. Not pictured: Helen Clough, National Secretary, Emma Lord - NE Chapter President, Dave Schade - AK Chapter President, Matt Moses - SE Chapter President.



“Many nonprofit and for-profit boards are grappling with the concepts of diversity and inclusion, and RMS is no different. During our meeting, the diversity of the board and attendees was enlightening. We identified methods to increase diversity within the RMS membership, and we encourage the confidence of our members to lead in ways that will hopefully result in further diversifying our board.”

Once the formal meeting concluded, we headed to the nearby Cosumnes River, one of the few remaining undammed rivers in California. We visited expedition paddler and videographer Scott Lindgren, whose story is told in Rush Sturges’ [The River Runner Ranch](#). We hiked and learned about the river and the destination that he and his partner Rachel manage, including the two cabins and less than a dozen campsites that are designed to reinforce a feeling of remoteness.

As departures commenced, farewells were shared among those who may have just met for the first time. An evolving River Management Society Board and staff left excited about the opportunities we are creating for current and future river managers and partners, scientists, and students alike. ♦



Noah Triplett and his skilled team running Troublemaker on the SF American, CA. Photo: James Major

Inset: We walked the Hwy 49 “Pumpkin Bridge” adorned with hundreds of carved pumpkins — a local Halloween tradition marking the end of the Lotus-Coloma community’s river season. Photo: Bekah Price

Scott Lindgren shares the history, current management, and vision for the Cosumnes Ranch. Photo: Lisa Byers



RMS Chapter News



RMS Leadership Rekindled in the Southeast Chapter

Thanks to a wonderful outreach effort by outgoing Southeast Chapter President Jane Polansky, this RMS chapter has a brilliant future! You'll see elsewhere in this issue an article about the first in-person meeting of the new officers that took place barely one month after the polls closed! Here's a bit about them:

President Matt Moses

Matt hopes to help Southeastern river professionals connect, collaborate and better support one another as President of the Southeast Chapter. He is a managing partner of USA Raft Adventure Resort on the Nolichucky River in Tennessee. His business began as a whitewater rafting outfitter and has grown over the last decade to include riverfront lodging and other guided outdoor recreation activities. He is very familiar with the issues many outfitters and river managers are navigating such as access, outreach, and developing partnerships to better address environmental and economic issues.

Matt has served as the President of the Board of Trustees for the Southern Appalachian Highlands Conservancy (SAHC) as well as chairing its Equity, Diversity and Inclusion Committee. He's shared, "It's extremely important to me that both my business and regional recreation spaces are welcoming and accessible to all, regardless of background or experience. I hope to continue this work in the broader Southeast region with RMS. River professionals in rural areas know that community and economic partnerships are critical for success, and we're no different."

Founder of regional events Nolifest and co-founder of Sol Slam Mountain Jam, Matt has also served in leadership roles with numerous community events and organizations to help strengthen regional partnerships and to get people outside and on the water. These include serving on the Unicoi County Chamber of Commerce Board, Northeast Tennessee Tourism Association Board and Outdoor Taskforce, and the Meet the Mountains Festival Organizing Committee.



Matt

Vice President James Vonesh

James Vonesh is a freshwater ecologist, professor, and Assistant Director of Virginia Commonwealth University's Center for Environmental Studies in Richmond, Virginia. He has conducted research in the Southeastern USA, East and Southern Africa, and Central America, and is the author of more than 60 scientific papers focused on organisms with complex life cycles that connect freshwater and terrestrial habitats. During his 15 years at VCU he has built bridges across university programs, national professional societies, state government, and international partners to develop innovative educational programming in environmental STEM fields. These include a NOAA grant with the VCU School of Education to build capacity in regional watershed science for area middle school STEM teachers; leading a collaboration with VCU Recreation Sports to develop and get state approval for a new Outdoor Leadership Baccalaureate Certificate; establishing an MOU between the Virginia Department of Conservation and Recreation and VCU Environmental Studies to use a graduate course in scenic natural resource management to support the state scenic river program; and bringing the RMS River Studies and Leadership Program to VCU. As the RSLC program coordinator at VCU, he served as co-chair for the Richmond RMS Symposium in Spring 2021. He is also the principal investigator of a National Science Foundation funded project "The River Field Studies Network: Connecting rivers, people, and science through immersive field-based education" that supports a community of practice in river-based field education with >100 members across 30 states that shares



James

expertise, imparts specialized skills, and cultivates the next generation of leaders. As RMS Southeast Chapter VP, James will work to further strengthen the connections between students, academics, and river managers in our region.

Secretary Elise Chapman

Dr. Elise Chapman was branded a water baby before she was two and has since kept her feet wet in both her work and free time. When she was in college she would be on the Ocoee River when the water made it down to her favorite hole any morning she could, and just pull herself out in time to make class on Mondays — sometimes as a guide but preferring to be in her kayak. While playing, she couldn't slake her thirst for understanding what was living in the rivers she played on and how the whole system was working, so she kept at the school thing with a master's in bottomland hardwood forest dynamics in Louisiana swamps while at Tulane. Next, she went upstream to study fluvial biogeochemistry at the University of Alabama.



Elise

Although she has always loved asking questions, she has found her true passion in engaging with other people interested in the sciences, so she currently focuses on teaching. She hopes to have the opportunity to apply her passions to RMS. Elise is well suited to serve the Southeast chapter as she currently resides and works in Chattanooga, TN. Specifically, she teaches at the University of Tennessee at Chattanooga and leads the RMS River Studies and Leadership Certification Program there. Her background as a river recreationist and river researcher has prepared her well to help RMS connect the diverse people and groups that work on and for rivers.



Jack

Events Coordinator Jack Henderson

Jack has been a member of the River Management Society for seven years, and currently helps manage the French Broad River Paddle Trail from Asheville, North Carolina. His time with RMS began in 2015 when he completed an internship focused on creating guidance for private landowners considering facilitating public access to adjoining waterways. His research investigated the responsibility and related liability for these landowners based on existing law, academic research, case studies, and real-life examples. He then joined the RMS staff to lead the National River Recreation Database and National Rivers Project, a geospatial database and accompanying web platform dedicated to synthesizing and promoting water trails, Wild & Scenic Rivers, and whitewater reaches. This position, which he developed through 2020, sparked his passion for combining GIS/mapping with recreation and conservation work, and led to positions with local and national nonprofits, along with private companies.

Recently, Jack began a new job leading stewardship of the French Broad River Paddle Trail as a partnership through RiverLink and MountainTrue, two of the watershed's environmental nonprofits. He continues to take on GIS/mapping projects focused on outdoor recreation and conservation as time allows. Jack shared, "I am excited to bring my diverse background, skills, passions, and connections back to RMS as the Chapter's Events Coordinator. I truly enjoy bringing river professionals together to talk about regional issues and opportunities, and feel prepared to help grow RMS here in the Southeast." ♦

RMS Chapter News

Southeast by Elise Chapman

November is a beautiful time to be on any river here in the Southeast! The newly elected RMS Southeast chapter board was hosted by new President Matt Moses at USA Raft Adventure Resort on the Nolichucky this past November — it was a great weekend of orientation, collaboration, and paddling. Matt was joined by new Vice President James Vonesh, new Events Coordinator Jack Henderson, new secretary Elise Chapman, and RMS Executive Director Risa Shimoda. We know we have big shoes to fill (or a big boat to fill) following all the great work Jane Polansky did for the Southeast chapter over her many years of tireless service.

Despite heavy rain conditions earlier in the week, we hit the ground running (or the river paddling) on Friday night as everyone trickled in from the road. As temperatures fell overnight, Crocket Cabin kept us nice and toasty. The staff fueled us with a great breakfast, and we started our meeting with Risa providing some great information on the history and organizational structure of RMS, inspiring thoughts as to the role we can play in serving our river community. After making

Clockwise from bottom left: James Vonesh, Elise Chapman, Carlisle Glover, Matt Moses, Risa Shimoda, Jack Henderson

Newly Elected Officers Meet on the Nolichucky River

strides brainstorming the work we can do in the coming years, we got on the water to float a section of the lower Nolichucky. It was a great way to connect and solidify a fantastic team ready to serve. If that wasn't enough, we were able to join Risa and the other 2022 inductees into the Southern Appalachian Whitewater Hall of Fame on their special night. It was an honor to celebrate with them and a joy to get to see the Southern Appalachian Paddlesports Museum.

We look forward to serving this community of river people and carrying on the great work being done. We can't wait to see you on the river! ♦



RMS Chapter News

Midwest



O'Fallon Park swim team on the Mississippi with River City Outdoors and Big Muddy Adventures. Courtesy: River City Outdoors

Wow – we have great new RMS Midwest Chapter members!

by Ed Sherman

River City Outdoors and the Kinni Corridor Collaborative (KinniCC) are the newest group memberships within the RMS Midwest Chapter — welcome!

River City Outdoors collaborates with outdoor retail and recreation providers throughout St. Louis to remove barriers to outdoor recreation and connect people and organizations. The Thrive Outside St. Louis Community, led by River City Outdoors, and managed by Chris Geden, is developing “a network of nonprofits, schools, health organizations, recreation providers, and corporate and governmental partners to build a coalition to engage the community in repeat and reinforcing outdoor experiences. With an emphasis on youth and underserved populations, its goal is to foster outdoor experiences to create passionate outdoor enthusiasts.” One of the focus areas of Thrive Outside is river-based activities in Missouri and on the Mississippi River which include a St. Louis Public School Paddling Program, development of the Missouri River Recreational Water Trail, and other programs with an emphasis on youth and underserved populations.

The Kinni Corridor Collaborative is a community-led, non-profit organization currently working with the City of River Falls, WI, to file for demolition and removal of the Powell Dam and complete Lower Kinni Restoration projects. These projects include restoration and stabilization of the riverbed, riverbank stabilization, and non-native invasive species eradication. KinniCC strives to restore the ecology, recreational features, and free-flow of the Kinnickinnic River. Their mission — “to work collaboratively with public and private organizations and individuals to assemble the technical and financial resources needed to implement the current Kinnickinnic River Corridor Plan” — is definitely a drive that the River Management Society can get on board with! ♦

To learn more, visit:

[River City Outdoors](#)

[Thrive Outside St. Louis Community](#)

[Kinni Corridor Collaborative](#)

Southeast by Jack Henderson

Celebrating & Stewarding the French Broad River Paddle Trail

Winding between two of the most diverse and storied states in the Southern Appalachians, the French Broad River flows for 219 miles between western North Carolina and eastern Tennessee. Born beneath the fir-covered highlands of Pisgah National Forest, this river – one of the oldest in the world – spans eight counties before its wide and gentle confluence with the Holston River, where the Tennessee River is born.

The French Broad passes through thousands of acres of public lands, crosses under countless bridges, is greeted by dozens of public launches, and hosts several paddle-in campsites. However, it has not always been this welcoming — “too thick to drink and too thin to plow” is how local author and historian Wilma Dykeman described this river in her 1955 book *The French Broad*. Alluding to symptoms of poor land management practices and industrial pollution, Dykeman was concerned for the river’s health and for all inhabitants of the watershed – those that lived beneath the surface, and those that lived upon land.

Now, due to the tireless work of countless advocates, stewards, government officials, and business leaders, the French Broad is a different place than it was in the 1950s. Much of the deforestation previously rampant in the surrounding mountainsides, and industrial sites along the river in Asheville — the watershed’s largest city — have been replaced by protected lands, public parks, greenways, outfitters, and breweries. The environmental, recreational, and economic benefits of a healthy river are now known and promoted across the watershed, and there are vast opportunities to explore the river that runs through it all.

In 2012, the French Broad River Paddle Trail was formally initiated by RiverLink, an Asheville-based nonprofit organization promoting the environmental and economic vitality of the French Broad River and its watershed. This designation and branding sought to comprehensively communicate information on the currently existing access sites, outfitters, riverside businesses, etc. to the general public looking for information on day-trips. As those resources became more readily available, RiverLink and other partners worked to secure and construct campsites along the river that could be used by paddlers desiring multi-day experiences.



The author’s mother enjoying one of the river’s calmer sections.
Photos: Jack Henderson

Ten years later, the French Broad River Paddle Trail is managed by MountainTrue’s French Broad Riverkeeper program, along with a variety of partners, and is comprised of over eight campsites connecting 140 miles of river between Rosman, North Carolina, and the Tennessee state line. Due to the high quality signage, information, accessibility, and stewardship, the Paddle Trail has been designated a State Trail by the State of North Carolina, which allows it to be highlighted by the NC State Parks program, and makes it eligible for additional funding opportunities allocated through the State legislature.

Speaking of the State legislature, the North Carolina General Assembly just designated 2023 as the “Year of the Trail in North Carolina — to promote and celebrate the state’s extensive network of trails that showcase our state’s beauty, vibrancy and culture.” Dozens of organizations, agencies, and municipalities are gearing up to promote, grow, and steward their terrestrial and aquatic trails this coming year, and for the years to come. On the French Broad, we look forward to refreshing our posted signage, mapping resources, online information, campsite experiences, access site amenities, events, and partnerships for residents and visitors alike.

If you haven’t already, we invite you to come dip a paddle in the French Broad. From tranquil angling in the headwaters, to the canoe-friendly pastoral floodplains... from urban sections through Asheville, well-suited for tubing and brewery-hopping, to the whitewater rapids further downstream... there is something for everyone here, and we’d love to have you along for the ride. ♦



Gary Marsh and Rudy Mehner prepare to set off on a rainy but wonderful trip.



Enjoying the magic of Chimney Rocks near Weaver’s Bend.



The Next Generation of River Professionals – River Studies and Leadership Certificate Alumni

*Ethan Duvall surveys eagles on the Nooksack River, WA.
Photo: Lucas Gibbons*

by Bekah Price

The folks at RMS, and likely the staff in your office, believe a new generation of young leaders is essential to create a brighter future for our rivers. So what’s being done to inspire and prepare the next generation of river managers?

RMS launched the River Studies and Leadership Certificate program in 2015 to help undergraduate and graduate students build a foundation of knowledge, skills and experience in river-based science, policy, conservation, education, and recreation. Since then, 36 students have graduated with the certificate, and most have gone on to pursue careers in river management and stewardship.

“The RSLC program provided me an opportunity to get unique hands-on learning experiences that I was seeking during my college career,” said Brian Dagliano, a 2021 RSLC recipient and graduate of Virginia Commonwealth University. “I was

able to learn about many river related topics ranging from river safety to macro-invertebrate sampling. I also was able to build relationships with fellow students who have interests in river studies and was able to work with them on several projects. Overall, I am very pleased with my experience with the RSLC program and will remember it as a highlight of my time at VCU.”

So what are these graduates doing now? Here are just a few of their job titles: Aquatic Education Coordinator, Fish Ecologist and Artist, River Guide, Environmental Technician, Hydrologic Technical, PhD student, Land Steward, and Conservation Diversity Fellow.

We’d like to showcase their success through periodic features in the RMS Journal so that our members can celebrate their success and learn more about what the pathway from student to river professional looks like today.

Where are they now?

Ethan Duvall, PhD Student
at Cornell University

My name is Ethan Duvall (he/him). I am now a PhD student at Cornell University in the Department of Ecology and Evolutionary Biology. I study wildlife ecology and conservation and have continued working in river systems, both in Washington State and here in New York. At Cornell, I am involved in a River Connectivity Working Group which brings together academics and managers to understand the impact of dam implementation and removal on river biodiversity. We recently published a research article in the *Journal of Environmental Management* which highlights the use of machine learning to identify un-inventoried dams. We found that existing dam inventories in the northeast underestimate the true number of dams by about 80–94 percent. Back in Washington State, I recently published a research article in *Northwest Science* which highlights bald eagle responses to declining salmon carcass availability on Pacific Northwest rivers. I love the opportunity to conduct river research and look forward to more in the future! ♦

A bald eagle feeds on chum salmon carcass on the Nooksack River, WA. Photo: Ethan Duvall



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RMS Chapter News

Pacific by Kristina Rylands

On November 17th, the Federal Energy Regulatory Commission (FERC) gave final approval to open hundreds of miles of fish passage along the Klamath River, an event that was anticipated and heralded during a 3-day event hosted by the RMS Pacific Chapter in June. Throughout the three days, participants learned about the sweeping scope and history of this project from the many individuals who not only contributed to the planning of the restoration effort, but who live, work, play, and make their homes on or near the river.

With characteristic California weather of sunshine-filled days – and even a few welcomed sprinkles – over 50 participants camped at the Curly Jack Campground along the river and gathered at the Happy Camp River Park community pavilion to hear a number of speakers describe the ground-breaking nature of this project. The group also had the opportunity to get on the river and experience three vital segments – Hell’s Corner, Wingate, and Tree of Heaven runs. This, combined with some driving tours to dam removal sites, provided a tremendous overview of what COULD be. With FERC approval, demolition of the dams (the first being Copco Dam) could begin as early as this summer.

The Klamath event was classic RMS with many opportunities for fun, connection, learning, and collaboration during presentations, at ample and hearty meals, and around the glow of campfires. With the presence of so many important players gathered, video footage captured the voices of river professionals and their reflections on this historic river restoration project. (Look for its debut at the RMS Symposium in San Antonio.) The three days also served as a celebration of the re-emergence of our chapter. Here are some highlights.

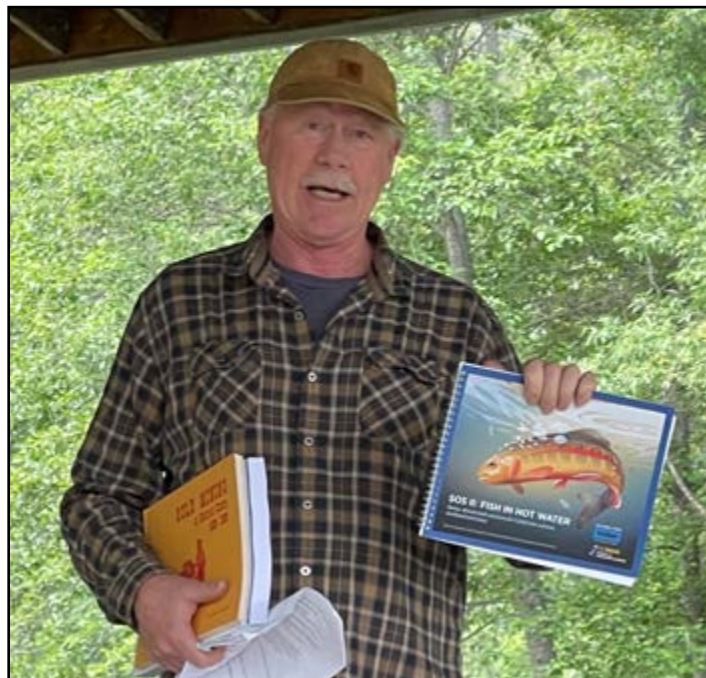


Celebrating a Soon-To-Be Free-Flowing Klamath River

DAN SHELBY (Confluence Research & Consulting) – with Class V flip charts! – discussed the studies and planning that went into considering the recreation benefits of dam removal.



JOHN GRUNBAUM (USFS) gave a presentation on the fish species that would flourish with a free-flowing Klamath River.



PAUL WILSON (Klamath Tribe) shared his experience growing up on the river while noting how algae blooms continually choke waterways. He introduced us to *Rios to Rivers*, an international organization connecting tribal youth to the waters of their homelands. The vision is for local tribal youth to be the first to boat down the free-flowing Klamath after the dams come out.

REGINA CHICHIZOLA (Save California Salmon) spoke passionately about the importance of tribal rights and healthy fisheries as environmental justice issues.



COLLABORATION. The event was a tremendous success thanks to help from the Klamath, Yurok, and Karuk Tribes, Modoc Nation, Bureau of Land Management, U.S. Forest Service, National Park Service, American Whitewater, Friends of the River, OARS, Confluence Research & Consulting, Resource Environmental Solutions (RES), Save California Salmon, and Momentum River Expeditions.



TEAMWORK MAKES THE DREAM WORK. Pacific Chapter VP Leigh Karp, President Kristina Rylands, and Planning MVP Kirstin Heins – along with legions of others – spent countless weeks with a solid team planning this event ... which went from a simple chapter river trip to an historic occasion!

(continued on next page)

Collectively, our trip participants have worked 925 years in the field of river management!



GIANTS AROUND THE CAMPFIRE. Ron Stork (Friends of the River) and event co-organizer Bob Stanley (USFS) contemplate dam removal on the Klamath and keep the flame of river protection alive.

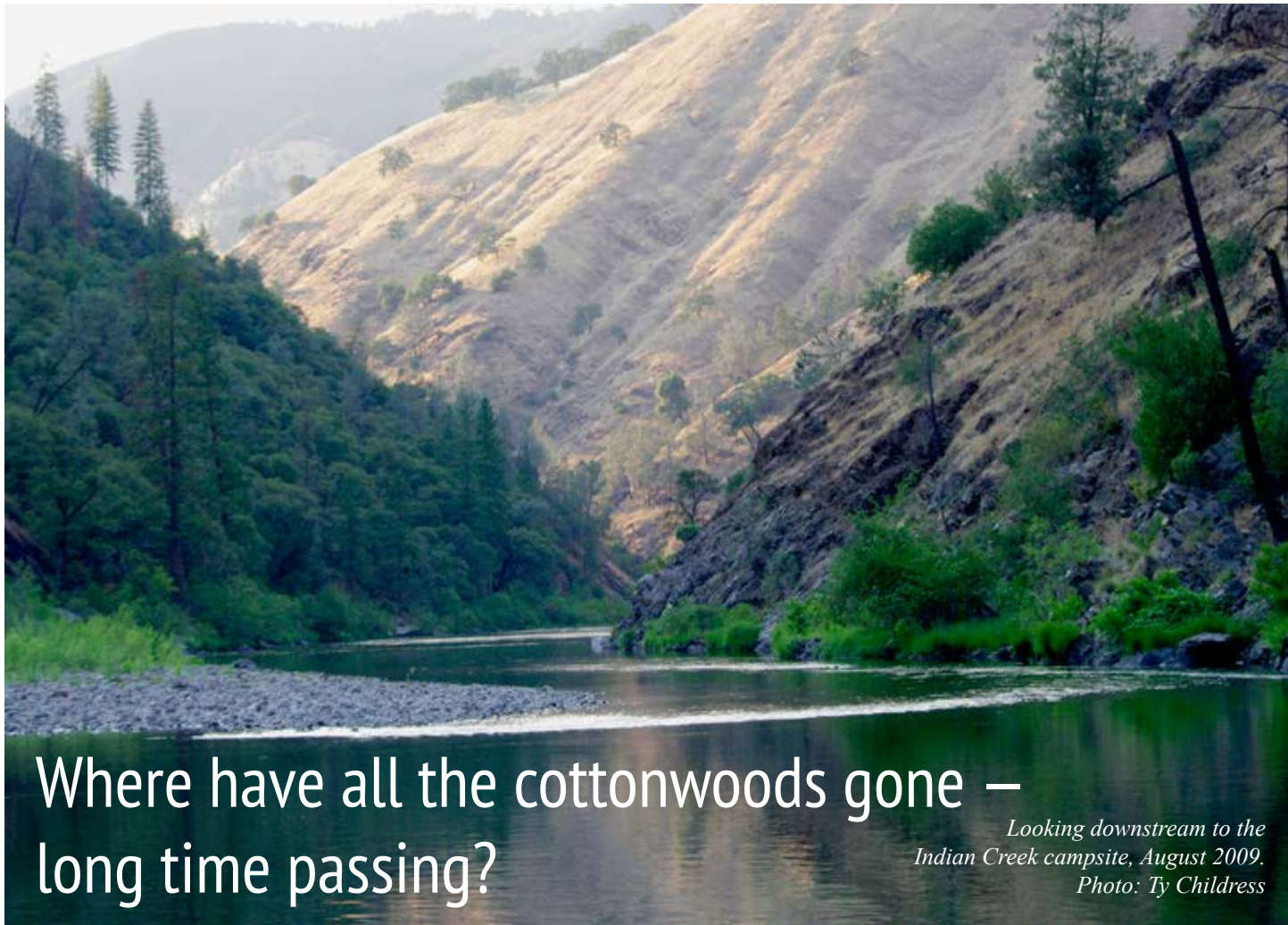
NATURE MOMENTS were plentiful. Here, event co-organizer Dave Payne (USFS) shows off a California King Snake while Mason London (Cal Poly Humboldt) shows off a California Giant Stonefly.



BIG THANKS to Clavey Wendt at OARS for helping to make river trips like this one on the Wingate Reach possible.



The Klamath Basin watershed covers more than 14,500 square miles, and the Klamath itself was once the third-largest salmon-producing river on the West Coast. But a series of dams – constructed between 1918 and 1962 – cut the river in half, preventing salmon from reaching spawning grounds upstream. Consequently, salmon runs have been dwindling for years. The removal of four hydroelectric dams (JC Boyle, Copco 1 & 2, and Iron Gate) will be the crucial first step to restoring habitat and reopening over 400 historic free-flowing river miles to anadromous fish. ♦



Where have all the cottonwoods gone – long time passing?

*Looking downstream to the
Indian Creek campsite, August 2009.
Photo: Ty Childress*

by Bob Stanley

Cottonwoods (*Populus fremontii* S. Wats.) have been stalwart residents of Sierra Nevada streams for many thousands of years, longer than memories and oral histories of humans, for sure. They are a major overstory tree in riparian zones of the western United States, including California, and usually the tallest tree in their habitat.

Riparian zones are perhaps the most productive wildlife habitat in the west, and the Fremont cottonwood is one of the most important plant species in riparian habitats for western wildlife. Rabbits, deer, and beaver feed on the tree’s shoots, stems, and bark. Many insects thrive in the linear cottonwood groves, while birds and other predators feed on them. Several species of birds use live cottonwoods for nest sites. Once cottonwoods start to die, cavities in the trees are used by over 40 animal species for nesting or roosting. They are very important in stabilizing stream banks, producing debris that provide habitat for fish, as well as providing erosion control and shade for fish, wildlife, and humans. Native Americans used cottonwoods in basket making and for medicines.

Cottonwoods are most abundant in low gradient zones on rivers, below transient (climatic) snowlines. Groves of cottonwood often dominate riparian mountain forest terrace deposits, stabilize gravel bars, and provide capture areas for sediment. Reports from early trappers (e.g. Fremont) and pioneers reported they often provided abundant forage for pack stock while traveling along or across rivers. Later, it was

recognized that they provide critical habitat for migrating species of birds, mammals, and arthropods, across both latitude and elevation gradients.

In Sierra Nevada pool/drop rivers such as the Tuolumne, cottonwoods are found on the banks of pools and class 1-2 whitewater sections of river in the transient deposition zone (where sediments cyclically build and subside), from the mixed coniferous forests all the way down to the central valley grasslands and delta sediment accumulation zones. Optimal conditions for cottonwood grove development occur in depositional environments where fine to medium grained, young, alluvial deposits are present.

Structurally complex riparian forest communities provide different habitats in the layers of vegetation and support a diverse array of animal species. This cool, humid multistory arrangement is often present nowhere else in the arid landscapes adjacent to cottonwood groves.

Arroyo Bush Willow (*Salix lasiolepis*) usually colonizes sediment deposits first or co-mingles and inhabits the understory. Buttonwillow (*Cephalanthus occidentalis*) is also found here. Plant diversity in these habitats is low. Natural propagation of larger overstory trees relies on sediment replenishment and flood patterns without excessive scouring.

Cottonwoods are often found sharing habitat with Black Willow (*Salix gooddingii*) and White Alder (*Alnus rhombifolia*). These trees often grow intermixed in linear bands of sediments

on the banks of the river (Black Willow slightly closer to surface water). Bigleaf Maple (*Acer macrophyllum*) inhabits the upper edge of riparian banks.

Since European settlement, bird populations have severely declined through human modification of riparian forest habitat. Double-crested cormorants, great blue heron, great egret, Cooper’s hawk, bald eagle, osprey, yellow-billed cuckoo, willow flycatcher, bell’s vireo, warbling vireo, yellow warbler, and common yellow throat have all been impacted. Otters, mink, bears, beavers, ringtails, deer and other mammals have similarly been affected. The situation with Yellow Legged Frogs is well documented. The Tuolumne has a low game fish (dependent on insect populations) density.

Little attention has been paid to the trees of the Tuolumne river’s sediment transition zone. We know anecdotally that river runners remember more cottonwoods on the riverbanks when the river began to be populated with visitors in the 1960s and 70s. We also know that large scale flood years like those we experienced in ‘83, ‘93, ‘95, ‘97, 2011 and 2017 depleted sediment areas which never returned to former levels. While sediment loss documentation is not complete, we know from aerial photography that sandbars have declined dramatically (by at least half) post World War II.

In 2009, UC Davis students made an observational study between the S.F. Tuolumne and N.F. Tuolumne, finding nine locations with cottonwoods and a total of 11 individuals. In 2011, the USFS river patrol counted 9 cottonwoods in the same section that UC Davis had surveyed.

The year 2014 brought large scale sediment deposition. The Forest Service saw numerous small cottonwoods and a wide variety of other riparian species sprouting up everywhere in carbon laden sediments developing on lower riverbanks after the Rim fire.

By 2016, the Forest Service counted at least 120 individual cottonwoods in the Meral’s Pool-to-North Fork Tuolumne stretch. During that spring, aquatic insect populations exploded. River runners were boating through clouds of mayflies while observing caddis in the air and on the cattails that had colonized the banks, stoneflies also in the air, and many husks on the rocks. Many of the post-Rim fire cottonwoods had grown over 30 feet in just three years. It was a remarkable time, unprecedented in living memory — as if traveling through a magic miracle.

In 2017, two very large flood events (25,000+ cubic feet per second) washed away most of the sediments laid down post 2013 and took almost all the cottonwoods with them.

March 2018 brought a narrowband cold front (thunderburst) raging though the Tuolumne Canyon, wiping out approximately 90% of the sediments that comprised the former Grapevine camp and also removed all the remaining small volume of sediments at the former Wheelbarrow camp. Other large sediment deposition areas (e.g., Hell’s Kitchen camp at the mouth of Big Creek) were similarly affected. Moving forward to 2022, about 20 cottonwoods remain in the sediment transition zone of the river.

Four plausible hypotheses can be offered to explain the decline of Tuolumne riparian trees in the sediment transition zone (where sediments cyclically accrete/deplete).

1) Large-scale glacial sediment creation is no longer a source of river sediments in the watershed.

2) The largest streams — mainstem Tuolumne and Cherry Creek — have dams that capture sediments still being created

along the crest of the Sierra Nevada.

3) Clear water scouring occurring during routine utility power generation/irrigation releases and especially during large releases near the end of major storms or intense periods of warm weather snowmelt.

4) The arrival of increasingly intense narrow and wideband storm fronts.

For more than eight decades, the Tuolumne (in the sedimentary transition zone of the WSR) has been gradually shifting towards being simply an industrial conduit for water and power, with a whitewater adventure asterisk.

Sediments and riparian communities gained from tributary sedimentary deposits are overwhelmed by the downwards stepping losses of sediment through industrial clear water reservoir release scouring. Both “normal” release patterns and acute storm event releases play a part. Sediment losses appear to be accelerating due to increasing intensity of storm fronts. The result is most easily seen by laypeople in the loss of more than half of sand beach camping capacity on the Tuolumne from clear water scouring over the last 80 years. Where there used to be sand, we pretty much now see cobbles. A wide range of resident and migratory species are losing habitat here and elsewhere in sediment transition zones of the Sierra Nevada.

When put all together, these observations could lead concerned investigators to research hydrologic conditions and vegetation, documenting the basis of losses of biomass and diversity to this riparian ecosystem. Then, by testing management strategies, establishing mitigation efforts to control the current situation, we could begin rehabilitation of the riparian zone in this section of the Wild and Scenic Tuolumne River.

Recently, there has been renewed interest in the status of health of the Tuolumne River. In 2006, the city of San Francisco PUC started implementing a 1980s agreement to study downstream effects from the Hetch Hetchy Reservoir, only from O’Shaughnessy Dam to Kirkwood power house, and are reporting their results through the Upper Tuolumne River Ecosystem Program, in cooperation with Yosemite National Park. Yet, the entire watershed below all three reservoirs is affected and amplified as the streams merge. In order to more fully understand the effects of the HHWP (Hetch Hetchy Water and Power) system, studies will have to be undertaken on all the downstream ecosystems below HHWP reservoirs.

In 2022, the Tuolumne River Trust, with assistance from Columbia College, started a fledgling program to plant riparian vegetation and is seeking grants to continue this work. Riparian zone species (yes, humans too) on the Tuolumne and elsewhere can be helped immensely by restoring ecosystem services provided by successful vegetation recovery programs focused on multi-layered riparian forest groves. And, cottonwoods are illuminati of Sierra Nevada riparian ecosystems! ♦

Bob Stanley is the Lead River Ranger for Stanislaus National Forest and Pacific Chapter Events Coordinator.

References
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National Wildlife Federation
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UC Davis Center for Watershed Sciences
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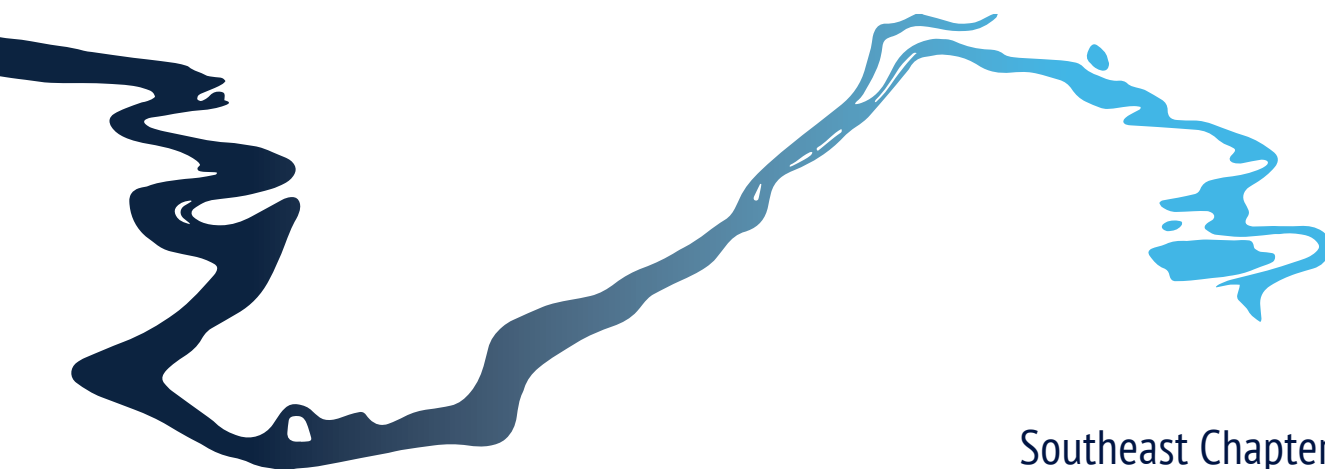


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