

From campus to company: How research sparked a new water tech startup

Enrique Vivoni's startup Tributary helps groups measure the real water outcomes of forest restoration projects

By Faith Kearns, ASU News
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Wildfire seasons are getting longer and hotter, threatening forests and the [water supplies](#) they protect.

Forest restoration, especially thinning dense stands of trees, can reduce wildfire risk and improve water availability — but measuring the water benefits of forest management has been challenging.

That's why Arizona State University Professor [Enrique Vivoni](#) founded the startup company [Tributary](#). Its mission is to give utilities, governments, nonprofits and companies better tools to measure the real water outcomes of forest restoration projects.

The technical work is complex, but the outcomes are simple.

"Clients don't want to wade through equations," Vivoni says. "They want to know: How much water will this project save each year? That's the translation we provide."

As the ASU Fulton Professor of Hydrosystems Engineering in the School of Sustainable Engineering and the Built Environment, in the Ira A. Fulton Schools of Engineering, and director of the [Center for Hydrologic Innovations](#), Vivoni has built a career teaching, mentoring and conducting research in hydrology and water resources in arid regions like Arizona.

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Tributary grew out of decades of research and a desire to make his expertise useful beyond academia.

Vivoni teamed up with [Zhaocheng Wang](#), an expert in remote sensing and AI, and [Josh Cederstrom](#), an expert in technology development, and the trio is designing Tributary to bring this science to the market.

“This is a full-scale effort to make a real impact,” Cederstrom says. “We are taking rigorous science and making it usable for water managers and utilities.”

drying soils in northern Mexico can have on the southwestern U.S.

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Timing matters

Vivoni’s connection to water and forests began in Puerto Rico. As a scout leader, he camped near a human-made lake surrounded by protected forest.

“That was my entry point to conserving forests for water supply,” he says. “That formative experience led me to pursue college degrees in this field.”

As a graduate student at MIT in the early 2000s, Vivoni imagined starting an environmental tech company. But the dot-com bust convinced him the technology wasn’t quite ready.

Two decades later, new conditions — including generative AI, open-source software, advanced remote sensing and Arizona’s historic investment in water research through the [Arizona Water Innovation Initiative](#) that Vivoni is a part of — created a different, market-ready landscape.

“These pivots created the right moment for Tributary to emerge,” he says.

The launch of the Center for Hydrologic Innovations also helped, providing structure for collaboration and linking research to Arizona’s water challenges. Out of this foundation, the idea for Tributary began to take shape.

The push from concept to company came from real-world demand. Utilities like Salt River Project wanted better ways to measure the water benefits of forest thinning.

“That gave us the momentum to launch,” Vivoni says. “Our contribution is to translate peer-reviewed science into outcomes that water managers actually need.”

The focus on user needs is already paying off.

“The innovative work Enrique Vivoni, ASU and Tributary are doing helps SRP understand the watershed benefits of forest thinning,” says Elvy Barton, manager of water and forest sustainability at Salt River Project. “Tributary is providing key watershed metrics and data that allows SRP to clearly articulate the benefits of wildfire resilience and healthy forest projects to our partners.”

Why Tributary?

Healthy forests act like natural infrastructure: storing and releasing water and reducing wildfire risk. Restoration can improve water supplies, but measuring those benefits has relied on rough estimates that miss the complexity of Arizona's landscapes.

Tributary changes that. The company uses lidar scans to map forest structure, combining them with data on topography, soils and precipitation to model how thinning trees affects the water cycle.

"Commercial Earth observation has been advancing for decades," Wang says. "Advances in AI are pushing this further, enabling products like the first-ever global one-meter-resolution [forest maps](#). The combination of high resolution, low latency, high accuracy and low cost makes this ideal for monitoring changes like wildfire and thinning anywhere."

As innovation director for Tributary, Wang leads the development of new products and helps transfer ASU technology into practical tools by making university-developed research more accessible, faster and cheaper — but just as accurate — for customers.

"A huge part of my role is about tech transfer, and we are lucky to have a lot of support through ASU. I'm working with [Skysong](#), a technology accelerator, to patent methods developed at ASU and bring them into real-world engineering projects," Wang says.

For Cederstrom, who serves as technical director for Tributary, ASU's water startup ecosystem made the leap from industry and back to the university possible.

"Between the Arizona Water Innovation Initiative, the Center for Hydrologic Innovations and SkySong, there's a whole structure to help researchers move ideas into action," he says.

The name Tributary reflects both hydrology and history. In nature, a tributary is a small stream feeding a larger river, which is an apt metaphor for a startup contributing knowledge to bigger sustainability efforts.

It also nods to Vivoni's earlier work on the widely used [tRIBS](#) hydrologic model, refined by a global research community for more than 20 years and now used as a basis for Tributary's work.

Looking ahead

Though based in Arizona, Tributary's ambitions extend far beyond. The need for healthier forests and smarter water management is global.

"In Arizona," Vivoni says, "we're piloting solutions that can scale not only across the western U.S., but for the world."

That scaling depends on people as much as tools. Vivoni emphasizes the role of students who carry forward the science and skills honed at ASU. Tributary is one successful example of a [larger effort](#) at ASU to develop a water technology startup ecosystem in Arizona.

"This is about the human capital we're developing," he says. "I'm leading Tributary now, but over time I'll step back and serve more as an advisor as others take it forward."

Tributary represents more than a startup story. It's an example of how universities can export knowledge to the world. For Arizona, it means turning research into practical solutions for water and forest management.

"In a sense, what we're exporting is knowledge," Vivoni says. "It's taking what universities do best— long-term, rigorous science — and making it usable outside the campus walls."

Why this research matters

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This story originally appeared on [ASU News](#).

Main image



The results of recent tree-thinning efforts — aimed at restoring the forest to a density that can withstand occasional low- to medium-intensity fires — in the Baker Butte area near Payson, Arizona. An ASU professor's startup company helps measure the water benefits of forest management efforts like these. Photo by Wren Raming

Text image(s)



The 2019 Woodbury Fire in the Tonto National Forest near Roosevelt Lake. Healthy forests can reduce wildfire risk and restoration efforts can improve water supplies, but measuring those benefits has relied on rough estimates that miss the complexity of Arizona's landscapes. That's where Tributary comes in. Photo by the Arizona Department of Transportation