

CULTURE

## Snake's alive! Salem man discovers new species of dwarf boa in the Amazon

The dwarf boa, *Tropidophis cacuangoae*, is just one of 15 previously unknown species that Alex Bentley and his colleagues have identified.

 by **Emily Hemphill**  
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Alex Bentley (center) and two other scientists from Sumak Kawsay in Situ extract the venom from a speckled forest pit viper that Renee Godard came across. Courtesy of Alex Bentley.

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Marco Sanchez never would have considered himself a “snake guy.”

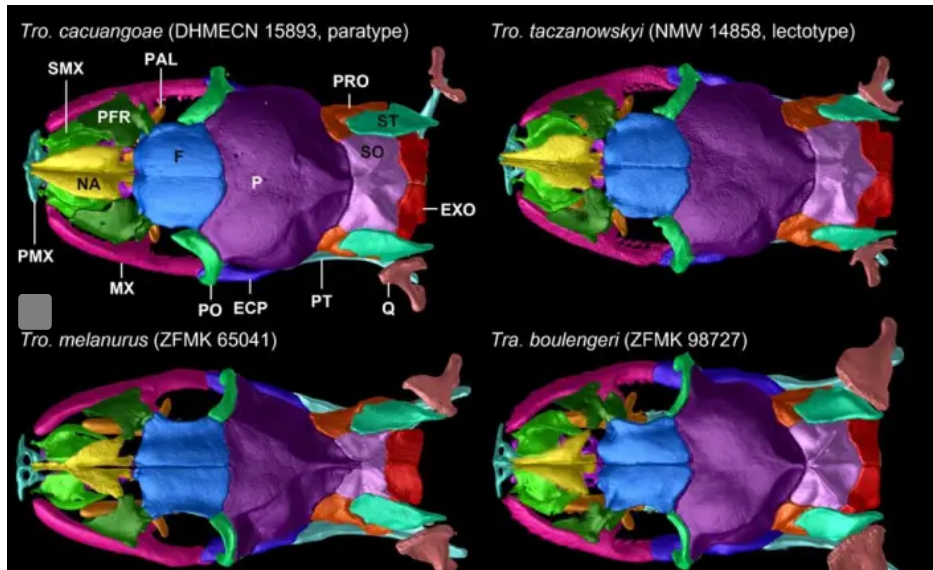
Spending the entirety of one’s life in the most biologically diverse place on Earth can dull one’s astonishment to every creature that crosses one’s path. It wouldn’t have been too long ago – just four years – when Sanchez would have glanced at the small, coiled snake and done what he always did when coming across these slithery reptiles: kill it. But not this time. After studying the unknown creature for a few moments, he knew exactly what to do.

Bring it to Alex.

Alex Bentley of Salem has been the research coordinator at Sumak Kawsay in Situ, located in Mera county of the Pastaza province of Ecuador, since he moved there in January 2019. The snake Sanchez found was, at first glance, just another in a long line of biological specimens he examines on a daily basis, except this dwarf boa didn’t match any previously known species.

Bentley sent out images of the snake to several local colleagues, and Omar Entiauspe-Neto, a graduate student at the Federal University of Rio Grande do Sul and Butantan Institute in Brazil, made the connection with an unidentified type of dwarf boa that was collected by the Ecuadorian Museum of Natural Sciences a few years prior, close to where the second one was found. The scientists quickly realized they now had male and female specimens of an undescribed snake on hand. However, determining and describing a completely new species in the scientific community is slightly more complex and tedious than simply crying “Eureka!”

Acquiring both sexes of the species is the first step. The next is to analyze the genetic material, specifically sequencing two or three genes, and compare this data to that of the most closely related known species. Months, even years, of very methodological testing from morphological comparisons (size, color pattern, other physical characteristics, bone shape), osteological comparison (examining the cranial structure through CT scans) as well as comparing the distribution and natural history with the most similar species, must take place.



The CT scans were done by Claudio Koch. Courtesy of Alex Bentley.



Tropidophis cacuangoae. Picture taken by Danilo Medina.

Finally in December 2022, the species of dwarf boa named *Tropidophis cacuangoae*, in honor of Indigenous Quechua activist Dolores Cacungo, was unveiled to the world in the European Journal of Taxonomy with Alex Bentley’s name once again on the byline of a scientific publication.

Yet this discovery never would have taken place if Sanchez had continued with his old practice. The new variable in the equation? The research and conservation education that Bentley has dedicated to this thriving stretch of the Amazon rainforest at the foothills of the Andes Mountains in the past four years, and likely the rest of his life.

“A big part of our mission is sharing the work that we do, doing research and sharing that with the people and involving them in it so they start to see that impact,” said Bentley, 28. “This is somebody [Marco Sanchez] who would’ve killed that snake, but after seeing the work that we do, decided ‘I should put it in a bottle and bring it to Alex.’”

And there is plenty to bring to Alex. Sumak Kawsay in Situ, which roughly translates to “good living in the natural/original place,” is a research, environmental education and ecological tourism center nestled in a remote region of the Amazon just south of the equator with precisely 12 hours of daylight at 70 degrees Fahrenheit right above the infectious disease boundary with rain on a daily basis. The same climate every day, all year long. The significance of “greatest biodiversity in the world” may not resonate at first, so a few quick facts to help hammer home that prestigious title:

- Mera county alone has 581 species of trees, 2.23 times that of the entire continent of Europe.
- The area around the headwaters of Río Anzu contains 68 different species of frogs.
- The ecological corridor around the river, the region in which Bentley conducts the majority of his research is called the Llanganates-Sangay Ecological Corridor, a 950 square kilometer stretch of rugged terrain that provides habitat and biological connectivity between two national park. Fifty-five different species of snakes, 24 of which are venomous, call this area home. The entire state of Virginia has 32 snake species, and only three are venomous.

All of the information on Mera County was taken from the field guide Bentley published in September 2021, “Guía Fotográfica Herpetofauna.”

### How many species has Bentley discovered?

Alex and colleagues at the Ecominga Foundation and the National Institute of Biodiversity have collected and identified approximately 15 undescribed species of reptiles and amphibians in the headwaters of the Anzu River. Of these 15 species, the majority are frogs, two are salamanders, one lizard and one snake.

Bentley says by email: “There’s a big difference between finding an undescribed species and describing a new species. The 15 species that we have ‘discovered’ are species not known to science. Ones that have not been formally described or pertain to species complexes that have yet to be divided taxonomically. Here it isn’t all that hard to find a ‘new species.’ It’s the formal description that really takes time and is required for the official ‘discovery’ of a new species.”

This comprehensive field guide examining and describing the reptiles and amphibians based in the headwaters of the Río Anzu was in partnership with the World Wildlife Fund. The organization has contracted him to produce another version of the field guide, but this time for the entire ecological corridor spanning roughly 260 square miles. Assembling such a catalog is no small feat; Bentley has dedicated the better part of a year to the project.

“It’s been quite the endeavor, a much bigger piece of work than I expected,” said Bentley. “I’m excited to put it out in the next month. [The field guide] is a really important piece of work in the reach it will have and the impact with local people to empower them to take better care of the area and take pride in what they have as the world’s most biodiverse place.”

As extraordinary as this research institute is, it was not always the center of scientific discovery and innovation that it is today.



A view from Sumak Kawsay in Situ. Courtesy of Alex Bentley.

### Sumak Kawsay in Situ

Henry Sanchez, the brother of reptile-killer-turned-explorer Marco Sanchez, is the director and founder of Sumak Kawsay in Situ. The property belonged to his family who had been farming the land for generations. In order to create space for agriculture and grazing, they would cut down swaths of the forest. Over time, Henry began to envision a greater purpose for the beauty he was surrounded by, though with only a high school diploma, he was unaware of the untapped scientific potential at his fingertips. It took some convincing, but his family agreed to his proposition of creating a reserve and completely shifting the trajectory of the land after years of destructive farming practices.

While lacking any formal training on running a business or navigating the tourism sector, Sanchez knew how to live and work in the jungle, so began Sumak Kawsay in Situ by building the main compound, “a three story, open sided structure that accommodates tent and hammock camping on the top two levels” that also contains several bathrooms, a kitchen and housing for the staff, as described on their [website](#). The lower level is dedicated to dining, educational courses, field training, work spaces and processing samples.



The main building of Sumak Kawsay in Situ. Courtesy of Sumak Kawsay.

This is the scene Bentley arrived on as a college student at Wofford University on a study abroad trip to Ecuador when he selected Mera as the location for an independent study project primarily because he was excited about continuing a rare study on snakes they were conducting. The interest and imagination of the biology and Spanish double major was piqued, so he returned in 2018 with three other herpetological enthusiasts.

“During those three months, we had a great connection with Henry and just absolutely loved the place,” said Bentley. “Henry had a lot of vision and ideas and I saw a lot of potential for Sumak.”

While the 10 species of venomous snake in a confined geographic span may deter most, it was the unusually high concentration of deadly reptiles that drew Bentley in the first place. Though this would not have come as a shock for those who knew him, as he has been snake-charmed since the age of five.



7-year-old Alex holds a python. Courtesy of Michael Bentley.



Alex at the age of 10 in Harpers Ferry, West Virginia. Courtesy of Michael Bentley.

## Hobby turned herpetology

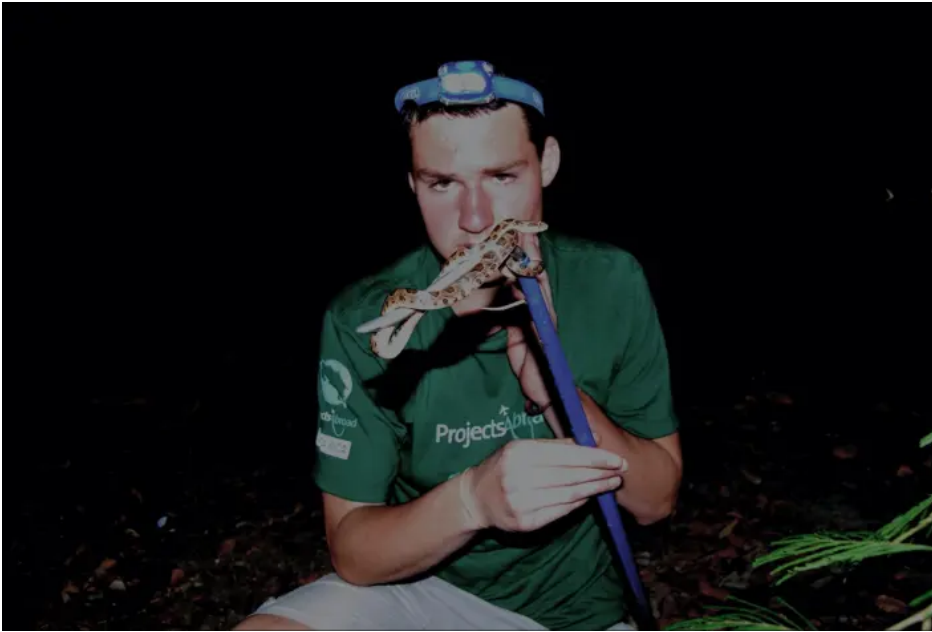
The hobbies and obsessions of young Alex Bentley always varied from the typical interests of children his age. He asked for incubators to nurture snake eggs in the basement, which began to look like the lab of a mad scientist over the years with African clawed frogs, tarantulas, lizards and rattlesnakes. Preferring prime snake-hunting locations to Disney World, the Bentleys would spend school breaks traveling to the Everglades or coastal parks in the Carolinas or Georgia. Proud father Michael Bentley, a retired professor of science and environmental education as well as author of “Connecting Children with Nature,” was more than happy to oblige.

“I think I had something to do with it for sure, but I can’t take all of the credit,” said Michael Bentley. “I give my wife a lot of credit because she’s scared to death of snakes but she allowed all of this to happen in our house.”

His mother, Susan Bentley, a pastor at St. James Episcopal Church in Roanoke, put aside her ophidiophobia for love of her son and his passion, but boundaries needed to be set after she went into her pantry one time searching for a cookbook and found runaway snakelets instead.

When the aspiring herpetologist was around 8 or 9 years old, Susan Bentley was involved in a pulpit exchange with a church in Giggleswick of North Yorkshire, England, so the family relocated to the British countryside for about a year. The first thing Alex wanted to do was peruse the local library to absorb as much information as possible about the new creatures he could track down. Upon discovering the measly three species of snakes, only one of which is venomous, that called the island country home, Alex was ready to return Stateside.

“There just weren’t enough snakes in England for him,” recalled his father.



Alex on a study abroad trip to Costa Rica during his gap year in February of 2013. Courtesy of Michael Bentley.

Throughout his years at Community School and later Salem High School, his passion turned into research papers, projects, publications and awards. At 12 years old, he won a national essay contest with the Nature Conservancy, securing a trip for two to Key West, Florida, with a personalized tour of Key Largo. At 14 years old, he won the National Geographic photo essay contest, winning a trip for two to Australia. It was no surprise when it came time for Alex to begin his college search that his decision came down to universities with herpetology professors, leading him to Wofford College in Spartanburg, South Carolina, and Charles Smith.

Smith's first memory of Alex was as a freshman coming into the lab asking if there was a place on campus where he could keep his boa constrictor. Their connection only grew from there.

"I remember he came in with a really strong interest in herpetology," said Smith. "My goal was more on how do we go from someone who likes to keep snakes to someone who can make a career out of it?"

He helped Bentley secure a summer position in the Francis Marion National Forest, where he searched for Eastern diamondback rattlesnakes in order to tag them and study their movements. Smith brought him along to international scientific conferences, providing the herpetologist-in-training the chance to even moderate a few.

"Working with him was just trying to facilitate opportunities and trying to open a few doors to give him a chance to make contacts," said Smith. "He's done it himself, he's a go-getter and very driven. I just tried to help turn his dreams into reality."

While seeing all of the accomplishments and publications of his former pupil does evoke a sense of pride for the professor, there may be some other emotions mixed in there as well.

"I am envious," admitted Smith with a laugh. "He's living in a research station in the jungle in Ecuador. He's living my childhood dreams."

Graduating from Wofford with a bachelor's degree in both biology and Spanish in 2017 – as well as several snake bites at this point (from non-venomous species) – the young scientist was well-prepared to take on life in the Amazon jungle.

Bentley moved there permanently as the research coordinator at Sumak Kawsay in Situ in 2019 and hit the ground running. Or slithering? Due to the lack of on-site scientists and business experience, "there wasn't a lot moving when I got there," explained Bentley. However, he and Sanchez – whom he describes as a "total work machine with big ideas" – readily threw themselves into transforming the operation.

"We started bringing groups down, getting grants," said Bentley. "We never had much money and still don't, but that's just a testament to how much you can do with little money when you have that passion and dedication to make something work. Just him [Sanchez] and I up there making trails and building little by little."

However, it can be slightly challenging to engage in in-depth experiments and biological investigations without the proper equipment. The even greater challenge is that surprisingly, Amazon.com does not include the Amazon rainforest in its coverage. Founder Jeff Bezos has somehow managed to make it to space before the jungle. Items cannot be shipped to Sumak Kawsay in Situ, so Alex directs most of his orders to his parents' home in Salem and then enlists contacts traveling to Ecuador, or "mules," as his father Michael Bentley described them, to deliver the packages.

When he was visiting his family over Christmas, Alex excitedly purchased roughly 45 to 50 pounds of gear to take back with him in four bags. However, when his mother dropped him off at an airport in Greensboro, they were told of a new embargo in Ecuador allowing only two pieces of luggage. His mother had to haul the hefty bags back to Salem until Alex tracked down a student from Hollins and a researcher from Oklahoma to add a carry-on to their trip down south.

Back in the jungle, the team of two had set up a field laboratory while Alex brought in geneticist friend Zane Libke, who was proficient in working with Oxford nanopore technologies, a branch off from the University of Oxford that has been developing revolutionary genetic sequencing instruments that generate real-time results. Together they were able to form Ecuador's first portable sequencing lab in the field and offer intensive genetic field courses, not just for visiting professionals in the global scientific community but even college students studying abroad, especially from Bentley's hometown.



Alex Bentley. Courtesy of Michael Bentley.



Alex Bentley and Zane Libke offer lessons on conducting DNA analysis in the jungle. They show how they sequence genomes. Courtesy of Renee Godard.

### From Hollins to Mera

Professor Renee Godard, the director and chair of the environmental studies department at Hollins University, usually leads a January term abroad trip to a marine exploration site in the Caribbean, but had to seek another destination after a harsh hurricane season all but wiped out the facility. All hope was not lost, though. A certain person she watched as a young boy picking up various critters at Carvins Cove and who attended the same high school as her own son had approached her a couple years previously inquiring about an Ecuador experience for her students. Godard spent 10 days in March on a scouting trip with Bentley, planning out the two-and-a-half-week trip she, two adult companions and 13 Hollins undergraduates in the biology field took this January.

"It was an amazingly rich experience for the kids," said Godard. "Every day was worth five days. All of it was possible because Alex Bentley has really come to know and understand Ecuador and Ecuador's diversity."



Renee Godard showing off some biceps ... with a tarantula hanging on her arm. The group visited a museum in Mera where they got to handle some hairy arachnids and Hercules beetles. Courtesy of Renee Godard.



Alex Bentley and Dione Fiallos. Courtesy of Alex Bentley.

Bentley and his girlfriend, Dione Fiallos, led the crew on tours through the Amazon jungle, along the Río Anzu, 13,700 feet up on top of Mt. Pichincha, down into the ancient limestone caverns running underneath the reserve, into the towns of Quito and Puyo and swimming in the hot springs of Banos. Students conducted research projects during their time on a variety of subjects from hummingbird behavior, leaf cutter ants and characteristics of the understory plants of polylepis forests – which in English means the small plants that receive little sunlight in forests located in the higher elevation of the Andes Mountains.

The group was even able to acquire firsthand knowledge of the cultural aspects of the area, spending a couple nights with an indigenous Kichwa community, Guayusa Runa, who Bentley and Fiallos have fostered a close relationship with. They spent two days on the river in dugout canoes, hiking in the jungle, learning how to blow darts, throwing spears, playing soccer with the children and creating beadwork. Guayusa Runa welcomed the outsiders into their village with a tea ceremony and told them stories of the history of their people as well as giving each member of the group a Quichua name.

“It was an amazing experience that helps us recognize that the world is so much bigger than our little lives,” said Godard. “There are so many different ways of being in the world.”

All of the adventures and memories of the entire trip were undoubtedly life-changing for the students, Godard felt certain, and she is eager to continue the partnership for many Januarys to come. But one of the most inspiring aspects for the college group was Bentley himself – witnessing him “actively living his passion and dream,” Godard explained.

“I do think that he really did energize some of the students,” she said. “Some of the students were trying to figure out how to go volunteer at Sumak [Kawsay in Situ]. The experience itself empowered them to realize their potential is at some level, limitless. Alex’s story helped show them that.”



The Hollins group spent two nights with Guayusa Runa, a Quechua community, where they slept in thatched houses and immersed themselves in the culture and history of the indigenous people. Courtesy of Renee Godard.



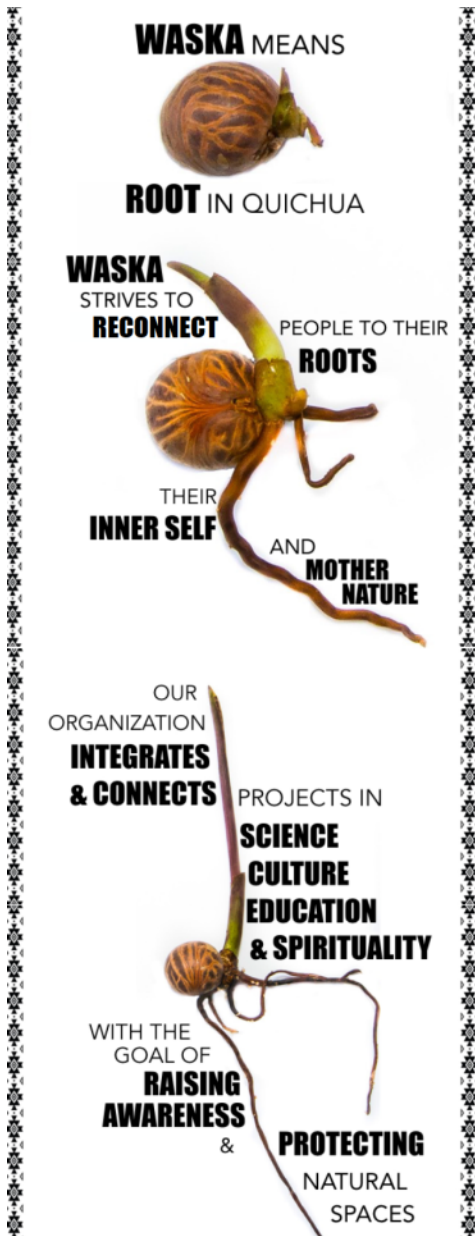
The students received the full Ecuador experience by spending two days building a bridge, lands and constructing a stage for Waska ... all in the rain. Courtesy of Renee Godard.

### Waska and beyond

In addition to the herpetofauna studies and indigenous immersion, the group from Hollins volunteered some time constructing a bridge, garden, fire pit and stage at the community center for Waska.

Meaning “root” in Quichua, the organization Waska was envisioned and brought into reality by Fiallos and Bentley in the past several years focused on the intersection of nature, people, education and spirituality in conjunction with environmental and social activism. If that brief attempt at trying to describe all that Waska encompasses was insufficient, a Waska guide and Bentley may prove to be more helpful.





Waska field guide. Courtesy of Alex Bentley.



*A new organization  
bringing big vision  
to Ecuador's upper  
Amazon*

### Objectives

- Connect people to their inner self and environment
- 
- Coordinate and implement conservation, protecting natural spaces around the world
- 
- Educate in innovative ways
- 
- Investigate and generate sustainable alternatives to destructive practices
- 
- Empower and support indigenous communities and women
- 
- Study and preserve ancestral traditions
- 
- Create and innovate ecological systems and products
- 
- Build a platform to connect organizations and institutes of science, education, and conservation

“[Waska] bridges the scientific, social gap in trying to connect the ecology of the area with the locals and indigenous,” Bentley said. “Trying to inspire the people to take better care of the places where they live, help establish alternatives to destructive farming practices, educate people and bring them out and show them other ways of living – natural values. It’s kind of a combination of scientific, education conservation. Connecting people to nature is the most fundamental part of this work.”

The couple has spent the last year laying the groundwork for the nonprofit, which closely collaborates with Sumak Kawsay in Situ, by establishing a meeting house outside of the town of Mera and designated their first ecological reserve called “Waska Wild” – more than 150 acres of land in the headwaters of the Puyo River. Bentley leads “scientific camping” trips while Fiallos guides people through meditations, yoga and other energy-focused and spiritual practices.

Waska’s essential mission came under threat in 2015 when the Ecuadorian government awarded Bloque 28 to a consortium of oil industries: Petroamazonas EP (Ecuador), Enap Sipetrol (Chile) and Belorusneft (Belarus). Ecuador is divided into multiple sections that can be auctioned off to oil and gas corporations for the right to drill, and Bloque 28 included Mera county.

Consorcio Bloque 28, the group of companies with access to Mera county, made attempts to erect two exploratory platforms and one advanced drilling platform on the property next to Sumak Kawsay in Situ beginning in 2019.

Bentley and Fiallos took the helm for the outreach of Aguanta Pastaza, a conservation movement focused on obstructing such exploits of oil industries in the area. They launched a social media campaign that reached close to one million online viewers, led groups of young locals out to the places that would potentially be impacted, held a radio trivia program that provided facts on biodiversity in the area, and hosted a conservation festival, Aguanta Fest, with workshops, excursions, live “environmental music,” local businesses and activist speakers.

Due to the collective action of the community as well as some legal obstacles, the oil company was forced to withdraw from Mera in 2021. However, Waska’s work has only just begun. With Guayusa Runa, they have initiated a vanilla farming project in association with the Amazonia Vanilla Company to encourage a sustainable alternative to logging and other harmful agricultural practices for the indigenous group. They have their eyes set on developing “Waska Community” that will entail a 12-acre ecological community including gardens, camping sites, work spaces, even an AirBnB. All of which will be “environmentally friendly structures,” similar to the native bamboo home Bentley and Fiallos recently finished for themselves.



Some visuals of Waska’s proposed projects as well as the meeting house they have completed construction on (bottom left). Courtesy of Alex Bentley.

In only four years, Bentley has made an enduring impact on this “gift to the Earth,” as the [World Wildlife Fund](#) described this beautiful wilderness. And despite missing friends and family, and ultimate frisbee of course, Bentley hasn’t looked back. Not that he’s really had the time to.

“I was just very passionate about doing this and very fulfilled in many ways with work, relationships, and these places,” Bentley said. “I love life here. I’m really fulfilled by the life I have here. As I continue working on projects, I’m working to find a better balance personally. There’s just an endless amount of scientific work here I’ll surely be working on more or less for the rest of my life.”