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Students Visit the Maya Underworld through InHerit's Yucatec Cenotes Project

By Dylan Clark
and Khristin Landry-Montes

In December 2018, two middle school classes from Tikuch, Yucatán took a field trip to Cenote Suytun—a natural underground cavern of freshwater that now serves as a popular tourist destination. For people from this part of the world, cenotes have long been sacred places. Cenotes are one of the few sources of freshwater in the Yucatan Peninsula, which has very few surface rivers or lagoons, a fact that makes them vitally important. The ancient Maya also believed cenotes were the abode of deities and served as portals to Xibalba, the dark Maya underworld. As Tikuch middle school students arrived at this powerful place, they descended via a slippery rock stairway into a tunnel that is almost completely closed to the surface above, save for a few shafts of light illuminating the blue-green pool of water. Staring at rock layers millions of years old, and with every bit of excitement typical of middle schoolers on an end-of-semester field trip, they snapped dozens of photos with their smart phones.

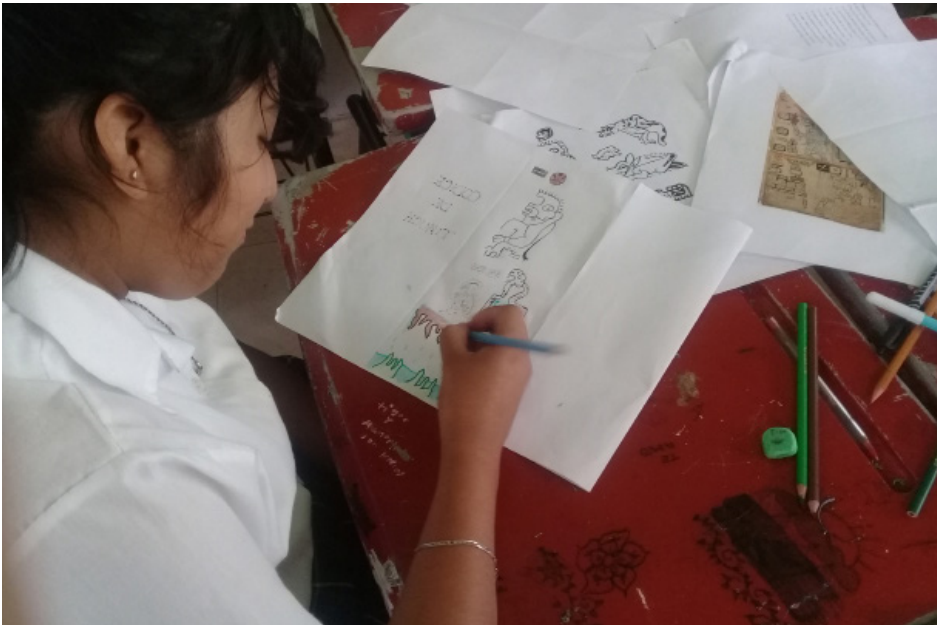
Trailing their teachers, two boys carried a heavy black pelican case



Cenote Suytun in Yucatán, Mexico. Photo: Dylan Clark

and a reel with 100 meters of yellow tether. They transported an OpenROV Trident—a submersible, remote controlled underwater drone—designed to explore marine environments. For some of the students participating in the Cultural Heritage, Ecology, and Conservation of Yucatec Cenotes program, navigating the Trident in a cenote was the most exciting of the science

education activities they had done so far. For others, just visiting the cenotes at Suytun, an expensive tourist cenote, is a novel experience despite its relative proximity. About the size of a large shoebox, the Tridents are connected to a long, buoyant tether and navigated using a JXD s192k gaming controller with a screen for viewing images captured by the camera beneath the



Student scribes draw images for a D.I.Y. Maya codex activity at Telesecundaria Delio Moreno Cantón in Tikuch, Yucatán. Photo: Yaremi T. Tuz May

surface. The OpenROV cockpit app allows us to control the drone wirelessly via a topside hotspot. With a grant from the National Geographic Society, we purchased two drones and a third was generously donated by OpenROV in support of our community partners.

After an introduction and brief instruction led by the teachers from Tikuch and InHerit Program Director Dr. Dylan Clark and Project

Facilitator Dr. Khristin Landry-Montes, the students submerged the drone. They worked in teams of four at Cenote Suytun, rotating tasks throughout the process of each dive. The Trident has a strong light and camera to [record digital footage](#) in high definition of the subsurface scenes. The students huddled closely together and eagerly peered down at the tablet screen. What would appear

next out of the depths? In one instance they saw multicolored rock walls and long stalagmites, in other moments they caught glimpses of smooth white sand marking the cenote's lowest point. Marine life in the cenotes, including turtles and fish, also swam across the screen. They saw all of this and more for the first time from the perspective of the drone as it moved through the water, ascending and descending.

In addition to the student navigator, two observers documented the water conditions recorded by the drone, including instrument depth, pressure, and water temperature, in addition to any notable organic or inorganic material visible in the cenote. A key job for a fourth student is making sure the tether connected to the Trident is unreeled in a controlled manner and remains free of tangles, obstacles, or any impediment that could affect the success of the dive. Despite our teams' best efforts, the occasional entanglement does occur. In these cases, it helps to have a Project Facilitator willing to dive in and swim out with a knife clenched in her teeth to free the Trident ensnared by a discarded fishing net!

OpenROV drone demos represent just one kind of interactive, experiential learning activity designed to explore the geomorphology, oral history, cultural and archaeological heritage of cenotes. As part of the Yucatec Cenotes project, InHerit implemented a host of activities with middle school students. As outlined previously in [Volume 8, Issue 1](#) of this newsletter, our goal is to harness the interest and energy of youth ages 11-14 and motivate them to take action in their com-



Dylan Clark, Khristin Landry-Montes, and Daniela Garrido Durán assist students from Yalcobá in setting up an OpenROV Trident dive in a cenote. Photo: Khristin Landry-Montes

munities to conserve Yucatan's vital, yet fragile, subterranean aquifer.

As part of the project, we also conducted three teaching workshops during the summer months of 2018 with teachers from secondary schools in the communities of Tahcabo, Calotmul, Hunukú, Yalcobá, Cuncunul, Tixhualactún, Tikuch, Kaua, and Xocén. The workshops laid the groundwork for educational activities implemented with students during the school year. Teaching workshops pivoted around three, broad cenotes-related themes: oral history and folklore, science and safety, and archaeology and cultural heritage. Workshops featured experts in these topics from Mexico and the U.S., secondary school teachers and administrators, and undergraduate public administration students from the Universidad de Oriente (UNO) in Valladolid who would later assist teachers in implementing activities. Building on the content and conversations from the workshops, the InHerit team joined forces with core teachers from our Yucatecan advisory board to produce a series of educational curriculum resources and experiential learning activities implemented between October and December 2018, including the OpenROV drone demos.

Dr. Iván Batún Alpuche, Dr. Khristin Landry-Montes, and Dr. Dylan Clark from UNO and UNC coordinated implementation both in the schools and at nearby cenotes for all nine communities during this period. Many of the middle school students who participated are bilingual in Spanish and Yucatec Maya and have varied experiences with cenotes as central landscape

features of their towns, tourist attractions, and/or sacred spaces for seasonal religious ceremonies. The educational activities we developed with their teachers combine two or more STEAM skills--that is, those incorporating Science, Technology, Engineering, the Arts, and Mathematics--to delve into one or more aspects of cenotes. For example, the students studied full color replicas of ancient Maya painted books, called codices, which were created in Yucatán and feature depictions of cenotes and caves, along with almanacs containing mathematical notations, astronomical and calendrical information. In one activity, students created their own painted manuscripts in the prehispanic Maya tradition with historical information about their town cenotes, life events, and communities.

As part of another project, students conducted oral histories with elders in their communities. They recorded and analyzed the traditional legends that have been passed down through generations. Students also

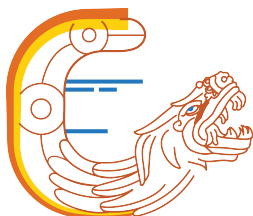
studied biology and chemistry through water quality testing of cenotes, uploading the results of their tests to an international online database. Classes participated in the [EarthEcho Water Challenge](#), a program sponsored by the non-profit organization EarthEcho International, which seeks to promote the monitoring and protection of water sources worldwide through educational programs. These are just a few examples of the cenotes-related activities that teachers in these Maya communities implemented and can continue to refine and build upon for the future. Among the participating schools, some students have already been motivated to organize extracurricular cenotes clubs with activities extending beyond their classes, such as community cenote clean-ups and oral history interviews that were incorporated into their town's Day of the Dead celebrations.

These efforts provided numerous hands-on learning activities for students, and the fun will continue!



Yucatec Cenotes team members with teachers, a facsimile of the Codex Dresden, and water test kits at Telesecundaria Delio Moreno Cantón in Tikuch, Yucatán. From left: Ana Laura Nahuat Tamay, Dr. Iván Batún, Mstra. Derli Xiomara López, Dr. Khristin Landry-Montes, Mstro. Juan Pablo Mena Rosado, and Yaremi Yaquelin Tuz May

As part of the next phase of the project, the InHerit team and our core teachers in Yucatán are collaborating on designing a workbook that compiles interactive cenotes activities and curriculum resources about the geology, history, archaeology, science, and ecology of cenotes. This information can be easily integrated into secondary school lesson plans. Upon publication in 2019, this workbook will also be considered for inclusion in the statewide curriculum by Yucatán's secretary of education (SEGEY) and made available to a much larger network of schools and educators. Additional curriculum resources will be accessible to teachers in Mexico through the InHerit website, currently under renovation, that will also house an archive of educational resources. Ultimately, we hope the Cultural Heritage, Ecology, and Conservation of Yucatec Cenotes project serves as an example of how heritage, archaeology, and education intersect and may be applied to tackling global challenges, such as aquifer contamination, that we face today. Like our brave middle school students from Tikuch who journeyed into the Maya underworld, we believe all indigenous youth deserve the opportunity to connect with and advocate for these precious elements of their cultural and natural heritage. To see and learn more about our project and the activities of our participating students this year, follow our online National Geographic Open Explorer Expedition [here](#).



#CENOTES



From left: Project co-coordinator Dr. Dylan Clark with UNC global investigators Sofia McCarthy and Leslie Crisostomo-Morales and project director Dr. Patricia McNany in Valladolid, Yucatán. Photo: Patricia McNany

Perspectives of a UNC Global Investigator

By Leslie Crisostomo-Morales

In the month of June 2018, I was one of two undergraduate students from UNC-Chapel Hill who had the opportunity to live in Valladolid, Mexico and work with InHerit

on a participatory research and education project through the Global Investigator's summer program within the Global Studies Curriculum. I am a sophomore majoring in Global Studies and Public Policy, and Sofia McCarthy is a senior majoring in Information Science and Geography. We were both awarded grants that covered summer travel and living expenses while partici-



Students from Secundaria Humberto Cantón Moller in Kaua participate in a photovoice activity at their local cenote called Yax Ek', or Green Star. Photo: Dylan Clark



View from inside a cave within the cenote at Tixhualactún, Yucatán. Photo: Dylan Clark

pating in the Cultural Heritage, Ecology, and Conservation of Yucatec Cenotes project sponsored by National Geographic. During our month abroad, we also were able to visit local museums, markets, restaurants, and become more immersed in the culture of Yucatán.

As Global Investigators, our main task was to assist in the first project assessment activity called photovoice. We visited selected secondary schools in different Maya communities, including Tahcabo, Tixhualactún, Yalcobá, and Kaua. At each school, we provided GoPro cameras to students to photograph the cenotes in their communities and anything that captured their attention or they felt was important. After a group discussion, there was a second photoshoot, where they took pictures connected to a specific theme of their choosing from a selection of themes identified after the first photoshoot. These pictures and the follow-up discussion meetings helped us get an idea of what the students and other people in the communities think about ce-

notes and what they mean to them. We also conducted surveys with secondary school students to collect baseline data on their current knowledge and experience with cenotes, prior to participating in the new learning activities we were preparing. During this process, being bilingual was beneficial, as we were able to communicate efficiently and were able to help with translating documents and transcribing photovoice meetings. In addition, we were able to talk to the kids and connect with them. When we first arrived in Mexico, our Spanish was not the best, but over the course of the month it improved significantly.

The first time I went to Valladolid, Mexico was in April 2017 during my senior year of high school in Morganton, NC when I participated in the [Museum's Connect](#), "Maya From the Margins" exchange program. It was my first time traveling outside of the U.S. and, actually, the first time I had ever set foot on an airplane. We got the chance to go to Ek' Balam, a Maya archaeological site in Yucatán, and that

was where I first had the opportunity to see and swim in a cenote. In that moment, I knew cenotes were one of the most beautiful things I had ever laid eyes on, and I was amazed. After that trip, I did not think that I would get the chance to see another cenote for years to come until I applied to work on this project, which focuses on cenotes. I recently changed my major to Global Studies and Public Policy because I am interested in studying environmental policies in developing countries. Working on this project was an unforgettable learning experience, which I was more than happy to be a part of. Sofia and I worked alongside students from the Universidad de Oriente (UNO), some of whom I knew from the last time I had been in Yucatán. Even though I had recently been to Mexico, this experience was even more culturally enriching because I was there for a longer period and was able to interact with more people and students. While I got to see new places, meet new people, and reunite with old friends, the most important thing I got from this trip was learning about the important role that cenotes play in the everyday lives of people in Yucatán. While we may think they are only for recreational and tourist activities, cenotes also serve as the freshwater source for many citizens of Mexico. They are also interconnected, so if one gets polluted or contaminated; it can affect the quality of not only that cenote, but others too. It's crucial to maintain the well-being of these beautiful natural wonders for the benefit of the people in the communities, as well as the plants and animals that depend on them.



Project Facilitator Dr. Khristin Landry-Montes

Khristin Landry-Montes Dives into #Cenotes as Project Facilitator!

By Dylan Clark

Dr. Khristin Landry-Montes joined the InHerit team in 2018 as Project Facilitator for the Cultural Heritage, Ecology, and Conservation of Yucatec Cenotes project. During her 8-month stay, she and her cats, Chiste and Ares, became popular temporary residents of Colonia San Juan in Valladolid. Khristin has been instrumental in coordinating our close collaborative relationship with secondary school teachers and several Maya communities. Along with Co-Director, Dr. Iván Batún-Alpuche, Khristin led activities on the ground, which included organizing experiential education activities in the schools, advisory board meetings, and photovoice in five secondary schools. She also helped coordinate the undergraduate UNO Student Ambassadors and UNC Global Investigators who assisted with educator workshops and with programs in schools and community cenotes. No stranger to the Maya world or education, Khristin specializes in Indigenous American art history and she recently received her Ph.D. from

the University of Illinois-Chicago. Her research focuses on ancient Maya art and architecture and the materialization of social memory and identity in urban environments. Her dissertation, “The Sacred Landscape of Mayapán, a Postclassic Maya Center,” explores the interrelationships among architecture, decorative art, and the geological and celestial worlds. Prior to joining this project, Khristin was a visiting professor at Elon University and an advocate for reducing barriers to access to museums and museum collections for indigenous peoples. We are grateful for her tireless dedication to the teachers, students, and cenotes of eastern Yucatán!

Back on Tour, Maya from the Margins Receives Diversity Award

By Gabrielle Vail

Maya from the Margins was a 2016-17 “Museums Connect” project

directed by InHerit and featured in [Volume 7, Issue 1](#) of this newsletter. Participants from that program, Raina Enrique (UNC student mentor), Dr. Bryan Giemza (Project co-Principal Investigator), and Dr. Gabrielle Vail (Program Coordinator) presented a panel at the Association of College and Research Libraries’ Rare Book and Manuscript Conference in New Orleans, LA on June 21, 2018.

With funding from the Department of State’s “Museums Connect” program, *Maya from the Margins* was developed as a collaboration between the University of North Carolina (UNC) at Chapel Hill and the State Archives in Yucatán (AGEY). At UNC, the project was conceived by InHerit and supported by the Anthropology Department and the Wilson Library’s Southern Historical Collection (SHC). Project members included Drs. Bryan Giemza, Patricia A. McAnany, and Gabrielle Vail (UNC), Dr. Iván Batún-Alpuche (Universidad del Oriente, Valladolid, Yucatán), and Douglas “Biff” Hollingsworth (UNC). Maya



From left: Dr. Bryan Giemza, Dr. Gabrielle Vail, Raina Enrique, and Elizabeth Ott discuss the Museums Connect project at the Association of College and Research Libraries’ Rare Book and Manuscript Conference in New Orleans, LA on June 21, 2018.

from the Margins engaged high school youth with Latinx and indigenous roots in North Carolina and Yucatán, Mexico, exploring their complex identity and heritage by focusing on the topics of language, history, and migration. Participants visited the SHC and AGEY and collaboratively curated a travelling exhibit displayed at both sites and at libraries and community venues. The project modeled public engagement through its humanities framework, pursued civically engaged scholarship, and connected with the community directly through participatory archival research.

At the conference session, organized by Elizabeth Ott (Rare Book Curator, Wilson Library UNC), panel members spoke about developing and implementing the project; shared photos, videos, and stories with the attendees; discussed the impact the experience had on the student participants in both North Carolina and Yucatán; and displayed the exhibit panels created by the students from Morganton, NC. Audience members responded very positively to the presentations, and many expressed an interest in finding ways to implement similar projects at their home institutions.

Maya from the Margins also received a 2018 Diversity Award from the Society of American Archivists (SAA). The award was presented at a ceremony during the Joint Annual Meeting of the Council of State Archivists, National Association of Government Archives and Records Administrators, and the SAA in Washington, DC, from August 12–18. The award recognizes outstanding contributions in advancing diversity within the archives profession or the archival

record. Present to receive the award were project members Dr. Bryan Giemza and Dr. Gabrielle Vail. One supporter noted that “*Maya from the Margins* has prompted archives colleagues to think differently about how we might work together; it has inspired students to embrace the value of archives and even seek work in archive settings.”

The Alliance Welcomes its Newest Board Members

By Dylan Clark

The Alliance for Heritage Conservation recently elected two new members. James Charton has been a volunteer with InHerit since February 2018 and provided invaluable support in developing science-based curriculum materials for the Yucatec Cenotes project. He will begin a term as Board Treasurer in 2019. Prior to moving to Chapel Hill, Jim worked for 32 years as a chemical engineer for a major food company before retiring and enrolling in graduate school. He received an M.A. in Archaeological Studies from Yale and was mentored by Dr. Marcello Canuto, a Maya archaeologist now at Tulane University. He has participated in archaeological excavations at the sites of El Cafetal and El Paraiso in Honduras conducting soil analysis to interpret cultural activities undertaken within plazas. His research interests include the application of archeometry methods to support the interpretation of cultural activities. He has worked on several CRM projects in New England and recently assisted Dr. Joe Carter at UNC-



Dr. Bryan Giemza of Texas Tech University was recently elected to the Alliance Board.



Jim Charton is the new Alliance For Heritage Conservation Treasurer.

Chapel Hill in the reassembly of “Alison,” a pre-dinosaur (Postosuchus Alisonae) that is currently exhibited at a satellite North Carolina Museum of Natural History.

The Alliance also welcomes board member, Dr. Bryan Giemza, Professor of Humanities and Literature in the Honor’s College at Texas Tech University in Lubbock, Texas. Prior to his current position, Bryan served as Director of the Southern Historical Collection at the Wilson Library at UNC-Chapel Hill. Bryan has worked intensively with anthropology faculty on several grants and projects, including the *Maya from the Margins* project in

2017. Bryan is author or an editor of six academic books on American literary and cultural history, including *Irish Catholic Writers and the Invention of the American South* and *Images of Depression-Era Louisiana: The FSA Photographs* of Ben Shahn, Russell Lee, and Marion Post Wolcott. He is principal investigator of grants from the Andrew W. Mellon Foundation and National Endowment for the Humanities, among others, for a variety of public humanities projects concerning the history and culture of the U.S. South and community-driven archives. Bryan has served as a humanities advocate for the National Humanities Alliance and serves on a number of related boards and committees, including the Center for the Study of the American South, Humanities for the Public Good, and the Southern Futures initiative. He is a native North Carolinian and graduate of the “school” of the Appalachian Trail. Welcome Jim and Bryan!

Interested in Supporting InHerit’s Projects and Mission?

There are many ways to get involved! We welcome contributions of any amount to support our current project: *Cultural Heritage, Ecology, and Conservation of Yucatec Cenotes* and the InHerit program’s operating costs. Even a small contribution will help make this project sustainable and boost the quality of teaching materials that we can provide for participating schools in the future. Regardless of the amount, 100% of your contribution will go towards supporting our mission to collaborate with local communities to unearth hidden histories, document and share untold or silenced stories, and conserve the material remains of the past to empower people to reshape cultural narratives and affect positive social change. Simply send us an email at inherit.p2p.email@gmail.com and let us know what you would like to support or click on one of our donation buttons at <http://in-herit.org> or on our Facebook [page](#). Remember that your generous donation to our 501(c)3 partner, the Alliance for Heritage Conservation is tax-deductible. You can also support InHerit by doing your Amazon shopping through AmazonSmile. The AmazonSmile Foundation donates 0.5% of the purchase price to the customer’s selected charity. All you have to do is follow [this link](#) and our organization will be selected when you log in. Thank you for your continued support!

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