STEM and water resource summer program with CSU WATER and CSUSB Institute for Watershed Resiliency

FINAL REPORT 2022

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Image 1-View of Wishtoyo Chumash Village

TO OUR FUNDER

Haku and hello. Thank you on behalf of the organizers, student participants and their families. This program has been a transformational experience for students as they immersed themselves into waterscapes, water politics in our modern society, and the important of cultural science to water stewardship.

PROJECT NAME

STEM and water resource summer program with CSUSB Water Resource Institute

PROPONENT

CSU San Bernardino historian Daisy Ocampo (Principal Investigator) worked within the Water Resource Institute and Geotribe to organize a Native youth Water based program. This program took place with the partnership of the Wishtoyo Chumash Village.

Geotribe is a collective of Indigenous scholars focused on learning about geology and all that intersects with the subject through the eyes of Indigenous peoples. Geotribe began as an idea in 2018 as a program to take Indigenous students on trips and piloted its first program in the Fall and Winter of 2022, hosting students at Wishtoyo Chumash Village. Geotribe's core principals include engaging indigenous students in tactile learning of geology with the aid of Indigenous scholars and communities, come to life. Geotribe is invested in youth outreach to begin strengthening a new generation of Native students in STEM.

Daisy Ocampo, PhD is the principal investigator for this grant. Daisy Ocampo (Caxcan, or Caz' Ahmo, Indigenous Nation of Zacatecas, Mexico) earned her PhD in History from the University of California, Riverside in 2019. Her research in Native and Public History informs her work with museum exhibits, historical preservation projects, and community-based archives. Her research integrates critical race theory, decolonial praxis of tribal sovereignty, and community traditions to create a new direction of inclusivity in Public History that visibilizes Indigenous people, voices and community narratives. Her work in Historic Preservation seeks to engage traditional ecological knowledge and stewardship.

Wishtoyo Chumash Village addresses the extraordinary need for the public, agencies, and environmental institutions to understand the vital role of Indigenous Traditional Knowledge and the interconnectedness of culture, history, and science. Wishtoyo's unique approach

integrates cultural preservation and ecological conservation through restoration projects, cultural and environmental education, scientific research; community organizing; sharing and utilizing Chumash values, Indigenous Traditional Knowledge; and using the standing and protections unique to Native Peoples in legal action and advocacy. Wishtoyo's Water Initiative protects restores California's environment and waters to ensure the state's residents, tribes, and species benefit from clean water, reliable water supplies, rivers with sufficient in-stream flows, and an unpolluted environment.

Type

Education

LOCATION

The youth program took place on the Wishtoyo Chumash Village in Malibu, CA. Wishtoyo's Chumash Village is a unique and authentic recreation of a working Native American village on a four- acre historical site at Nicholas Canyon County Beach in Malibu, on a bluff overlooking the Pacific Ocean.

Image 1-View of Wishtoyo Chumash Village

COST

Grant Expense- $95,000

CSUSB Expense- $15,000

Total Project Expense- $110,000

PROJECT ABSTRACT

This project implements a water-focused science, technology, engineering and mathematics (STEM) summer program for tribal youth, tribal communities, and other STEM under-represented minority groups in Southern California. Native students and cultural-community perspectives have historically been marginalized within academic STEM fields. As of 2019, Native students represent on average 0.2% of those who earn a Bachelors in a STEM field, revealing the urgent need for early STEM exposure. The program includes field studies and use of water quality testing kits in virtual and hybrid training sessions. This program will immerse students in Indigenous water science, Creation narratives, and water stewardship strategies which were supported by community ethics. We will discuss traditions tribal water use practices that remained sustainable and supported large populations in coastal environments.

PROJECT OUTCOMES

This project delivered a Native youth program in the Fall of 2022 and included fourteen participants. Due to schooling, the program took place on two different weekends: November 18-22 and December 17-18. Students also spent numerous hours with their assigned research mentor in early December. We successfully recruited students from Ventura County through tribal partnerships with Coastal Band of Chumash Nation, Colectivo Ce'eni, Acjachemen Nation, and Sacred Places Institute. We worked collaboratively with CSU Channel Islands to integrate a pathway to higher education. Our program worked extensively with the administrators, scientific personnel, and cultural bearers from Wishtoyo Chumash Village to develop curriculum, booking, and lodging logistics for this program.

Program Learning Outcomes

1. Understand Indigenous and Hegemonic STEM (science, technology, engineering and mathematics) principles for solving complex problems.

Traditional indigenous science operates on an intimate understanding of regional geology, and how working in tandem with waterways and accompanying geologic structures can establish non-destructive relationships. This required a tactile demonstration of rocks and mineralogy, and climate trends through the fossil record, with a hands-on activity of recreating Mayan aqueduct systems.

2. Engage in community building with indigenous partners in a way that fosters self-determination.

Student participants worked closely with Chumash elders Mati Waiya, Luhui Isha, Uncle Johnny Moreno. Students listened attentively to Creation narratives to understand how storytelling guides water management practices. These stories revealed why specific sacred sites were protected, such as the Wishtoyo Chumash Village. Chumash leaders exposed students to the legal, financial, and cultural effort to protect the Wishtoyo Chumash Village. The battle to protect this village was a decades long legal battle which resulted in the Chumash being victorious. These narratives allowed students to integrate the spiritual, cultural, scientific elements into understandings of sovereignty.

3. Empower, sense of belonging/building confidence in community and higher education.

The program combined traditional knowledge and narratives, shared by Chumash and Ventura County Native community members and elders, with expert scientists and science demonstrations, with meaningful input and perspectives from professors from the CSU system. The students got to experiment with microscopes, water quality testing equipment provided by Wishtoyo environmental scientists, and observe fossils and geologic minerals and materials. Additionally, activities that included abalone and sea urchin shucking, and creating and testing Mayan water filters tangibly showed the importance of water, water food resources, and Indigenous water technology not only for the environment, but for the benefit of people and communities as well. By engaging in these activities, self-directed, mentored research and learning from mentors who have achieved degrees in higher ed ranging from Bachelor's and Doctoral-professorship, students can see viable pathways through higher education and STEM careers.

4. Knowledge of historical and contemporary issues in Water conservation

Develop a water-based research project in one or more STEAM (STEM+art) areas

The Water Web Project involved students working individually or in a small team to develop a water-based research project. We created an open-ended prompt where students identified a topic of interest, created a research question/ thesis that drove their entire projects, and incorporated community perspectives. Students met with research members (Daisy, Nicholas, Anisah) four times through Zoom to assist in development of project ideas and access to research database. Their projects culminated in a presentation with their peers and family members on the last day of the program.

Some of the topics included:

-Colonialism & water dispossession-Damming and effect on native communities
-Water-related extinction events

-Language revitalization and reclamation of water place-names.
-Mixtec Community Water Management Negotiations in Oaxaca.

PROJECT PICTURES

Image 2: Image of the Selik learning grounds

Image 3- *'ap 'ap* (traditional Chumash dwellings)

Image 4-Students Learning to shuck abalone

Image 5-Nicholas conducting plant and rock identification

Image 6- Learning with freshly gathered sea urchins

Image 7- CSUCI Professor Jennie Luna explains college pathways

Image 8- Students learning a Chumash gourd rattle game

Image 9- Anisah conducting an interactive activity on geology

Image 10- Water testing on Wishtoyo creek

Image 11- Students identifying beach sand species with environmental scientist Tevin and DeLanyi.

Image 12- Uncle Johnny Moreno opening student presentations with a blessing

Image 13- Student Presentation of Water Web Project


Image 14- Project team (Mati Waiya, Daisy Ocampo, Anisah Kabbara, Nicholas Rajen and Johnny Moreno

SELECT COMMUNITY/ PARTICIPANT TESTIMONIAL

"My five nights here were really interesting and I learned a lot more from here than at school. I learned about Chumash culture and how they live. There were so many things we learned and there is so many new things that there is to learn. Hopefully I will be coming back and seeing everybody again and have lots of fun." - Aaliyah

"I learned that we could make gourds. I also learned that we could make necklaces. I really enjoyed learning about the Chumash tradition, language, and about their past. In the Wishtoyo Chumash village, I made new friends, got to learn a lot about the Chumash and how people had to figure out how to live. I learned how much they struggled. In Wishtoyo I also learned how to make gourds and necklaces." - Esmeralda

"The last five days I had the privilege to be in Chumash land, learn about Wishtoyo and Chumash people. It inspired me to learn more about my ancestors and my background, where I come from, what was our kind of living as Mixtecos. I not only learned about culture but also, I connected with nature in Wishtoyo. I had the opportunity to meet amazing people like Mathie, Nicholas, Carlos, uncle Johnny. I take knowledge and teachings with me. Thank you. Shi Ta'vi Ini to'o" -Aurelia

"I want to learn more about geology and how it makes humans and the earth a better place. One thing I learned about is the three different rocks. There's sedimentary, igneous, and metamorphic. These past few days were amazing. They taught me things I never knew about my culture and how they had so many traditions. One thing I loved about this trip was the hands-on activities we did and how opening they were to us. Just everything was beautiful." - Jazmin

"I would like to learn more about math because it is interesting and everywhere. What these past days were like was we did much projects like for example looking at so many rocks and learning about them, testing water, and looking closely at water. Making cord necklaces. We also got to know more about each other. I made new friends and had so much fun. If I had another opportunity to come here again, I would." - Anahi

"Something that I did was learn about rocks and water and where they come from. All these days were fun and there were different activities every day and every hour. Learning different things is better for our life and also going forward to our future. This place was beautiful for me." - Jose

“These last few days I had an amazing time here meeting new people and doing different things throughout the days. Sleeping in a tent as well was interesting. While some nights were really windy and some nights were cold. I really enjoyed my time here and I will come back. I also loved hearing about the Chumash culture listening to the stories and hearing the songs as well. I want to keep learning about how water travels. I also want to thank this camp for allowing us to come here as a family. This place felt like home but better.” - Alexis

“What I really love about the camp was learning things that I never knew before and how they were teaching us was amazing. I am just glad that I came here. Even if at first I didn’t want to.” -Maya

“When we came at first it was all dark and we went inside some kind of place and I saw four people. They showed me how to get in to the Selik and we all introduced eachother. We were next to the beach but we couldn’t see it since it was dark. After we all went to set up our tent and went to sleep. We woke up the next day and saw the ocean. It was breathtaking.” -Yeudiel

“As one of the coordinators, I have taken away the importance of connection and shared dreams. Geotribe’s and Wishtoyo’s shared dreams of land and water stewardship blossomed into this program. Through the youth, we have been able to develop a curriculum that carefully and lovingly reintroduces those values, management practices, and community. Participants leave knowing they are active stewards of the land and water ways, and more importantly that they have a community of peers to reimagine their future with.” -Daisy Ocampo

“Geology can be taught by anyone anywhere in the world, but at the meeting of land and sea, under the eyes of mountains learning happens just by existing, and is taught by teachers far older than us. Wishtoyo preserves those teachers and I am intensely gratefully for the opportunity to have met some of Wishtoyo’s stewards, and an awesome group of indigenous students. Together we learned first from rocks that belong far away and then from rocks that came from beneath our feet. Now because of our time at Wishtoyo these are students who pick up the pebbles and stones others walk by, learning from what they see in the grains, some of which are as old as the stars.” -Anisah Kabbara

“My time at Wishtoyo has impacted me on levels of beauty, knowledge, and ancestral connection and spirit that transcends the more than 9000 years of stories and life that exist at the village, and I am

proud and grateful to have collaborated with Wishtoyo and the Chumash community to share in this experience with the youth and my colleagues of Geotribe and this particular Water program.

I feel blessed and only hope I shared a little of what I received as I partook in the native medicines and foods of the land; sage, sage brush, mugwort, toyon, and humming bird sage potent through regenerated soil; waking with the sun, the fire and the magnificent ocean and the mighty mountains... The shells and disillusionment of technology (technology that doesn't honor the sacredness of the earthly elements that form the devices that is) and oftentimes ill-informed schooling clearly dissolved off of the kids day after day while taking in knowledge, and clean air throughout the program.

Maati and all the elders and members of the Chumash community welcomed me and the students and other educators with warmth and passion that inspires me to pursue understanding, education, and research pursuits of natural resources, rooted in the knowledge of the land and language of the ancestors. Luhui, Teven, Delany, and Bryan also made the experience all that more incredible. I eagerly look forward to continue working together and collaborating into the future, as a member of Geotribe with Anisah and Daisy, and in my role at the Intertribal Ag Council along with my wife (she and Lucia were blown away as well! Our little one just loved the village, smelling the plants, and could not leave the ocean's edge!).”

-Nicholas Rajen