Kūʻula:

NURTURING A GENERATION OF INDIGENOUS LEADERSHIP FOR MARINE CONSERVATION IN HAWAIʻI

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SUMMARY

"Kūʻula: Integrated Science" was developed as an undergraduate–graduate dual-level course at the University of Hawaiʻi at Hilo. It aimed to provide research and service-learning opportunities in natural resource management that integrated Native Hawaiian and Western sciences. So far, it has served five cohorts of students, mostly Native Hawaiian. In this article, we offer summaries of how this course impacted participants while they were students and in their post-graduation careers. The participant voices illustrate the deep and long-lasting impacts of their experiences with Kūʻula, some by academic content but mostly because of experiential and peer-learning. Such impacts are lasting well beyond their graduation into their careers now. Kūʻula participants resoundingly advocate for University of Hawaiʻi campuses to offer place-based pedagogical frameworks that integrate Native Hawaiian knowledge and epistemologies.

BACKGROUND OF KŪʻULA

Since 2006, the Kīpuka Native Hawaiian Student Center at the University of Hawaiʻi at Hilo (UH Hilo), led by Gail Makuakāne-Lundin, has been providing a faculty development program called Uluākea. In this program, faculty are invited to experiential learning of Hawaiʻi epistemologies and incorporate their learning into the courses they teach. Uluākea involved many faculty at UH Hilo, including Takabayashi, who was then a professor in Marine Science Department. Together with Andrade, Pai, and numerous other experts in Native Hawaiian environmental sciences and resource management, Kūʻula was developed. Beginning in 2008, Kūʻula was offered as an elective course approved for the UH Hilo academic catalogue for both undergraduate and graduate students and has served five cohorts of students so far. UH Hiloʻs Title III grant through Kīpuka Native Hawaiian Student Center, National Oceanic and Atmospheric Administration (NOAA) Papahānaumokuākea Marine National Monument (PMNM), and students' fund-raising supported the course. PMNM, then led by ʻAulani Wilhelm, provided further support and participation for student research trips to Midway Atoll. This partnership provided PMNM with the ability to not only contribute to educating students about the importance of resource management and conservation in Hawaiʻi, but also to use these opportunities to help shape and prepare the next generation of natural resource managers and professionals who are knowledgeable in both Western and Native Hawaiian sciences.

ACADEMIC DESCRIPTION OF KŪʻULA

Academic objectives of Kūʻula were to: study how sciences of Hawaiian and Western origins are similar and different by exploring their context and methodologies; develop ways Western and Hawaiian sciences can be integrated to advance knowledge of natural systems of Hawaiʻi today; and learn how Traditional Knowledge is applied to today's conservation efforts by participating in service-learning projects. Students conducted one major research project in small groups integrating Native Hawaiian and Western sciences, and one individual service-learning project. Their final presentations were given publicly with funders and community members invited.

IMPACTS OF KŪʻULA ON NATIVE HAWAIIAN STUDENTS

Owing to its focus on integration of Native Hawaiian and Western sciences, the class attracted a lot of Native Hawaiian students who were majoring in marine science and other natural sciences. Seventy to

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ninety per cent of the class participants were Native Hawaiian in every cohort. As a result, Kūʻula was instrumental in positive impacts to these students' university academics and careers beyond. Many of these impacts were not intended or foreseen at the course's inception, but proved to be amplifying for years well beyond their university life. Below, we have summarized these impacts in the former students' own words, reflecting back to their experience as it relates to their lives now. These impacts are illustrated below though former Kūʻula students' direct voices with only personal information redacted to protect confidentiality, minor grammatical errors corrected, and with English translation (in italics in parentheses) added. Everyone whose statements are included here gave permission for inclusion in this paper.

In what ways did Kūʻula impact you while you were a student at UH Hilo?

Kūʻula made me realize that I wasn't alone in STEM. The faculty didn't look/talk/act like me, nor did nearly the entire student body. It was very intimidating. Having the opportunity to meet and bond with others who experienced that same isolation (at an institution, in my hometown) helped me to find who I was as a Hawaiian scientist. That "science" is not separate from my practice as a Hawaiian. I had just as much right to be there (now knowing better—more), than the rest of them regardless of the fact that I didn't talk/look or act like any of them. Kūʻula created a space for others like me to come together. Kūʻula deepened my knowledge and connection to place-based learning. And how we can integrate cultural knowledge with modern sciences. The connections and friendships I made are lifelong ones and that's not only from my cohort but also previous and future cohorts as well. It's also a really great course that brings local students together.

It gave me a hui (*alliance*) and a safe space to connect with science as a Hawaiian. In my earlier UH courses, it seemed like we had to put our beliefs and culture on the side while learning about science, but Kūʻula recognized Indigenous ways of knowing and we had the opportunity to dive into that way and then support it with science. Kūʻula highlighted the place that we live in and care for, always putting the collective before the individual.

Kūʻula was the lifeline I needed to begin to explore the currents of what being a Hawaiian scientist really means to me, not to the world and what people expect of you. We were encouraged to dive deeper into concepts, application, and reflections of defining what integration of science and culture is. I was a freshman undergraduate trying to decide if double majoring in Marine Science and Hawaiian Studies was a good idea. It was hard to see many local and Hawaiian classmates of mine drop out of the entry-level courses and switch majors. To this day, I felt alone within the department as more and more people in my classes were not from Hawaiʻi. Without Kūʻula, Hawaiian students would exist as the minorities of the Marine Science Department, but the course truly created a community to approach research through a different lens. It was the first Kūʻula course and as a young-eyed freshman, I felt encouraged to develop inquiry with intuition and in service of our communities and lāhui. Kūʻula was the pewa, that connector, to who I was as a Hawaiian woman, how I choose to weave knowledge systems, and that most importantly, doing it to build meaningful pilina (*close connections*) in service and support of our communities. It was the beginning of a journey with kānaka (*Native Hawaiian*) who I continue to learn from and cross paths to this day. Being in the first Kūʻula was a privilege for me to have met a hui of friends and mentors before I was even ready. It brought me into a

solid ʻōiwi (*Indigenous*) support system that grew from Kūʻula and the Keaholoa Program in the years that followed.

This was one of my favorite classes. It gave me a sense of community at UH Hilo. It broadened my horizons as a scientist and I got to build relationships with a lot of different people within the Hawaiian Islands. It also taught me how to execute science with values.

I came into Kūʻula in between my undergraduate and graduate academic journey, so I think my Kūʻula experience was really influenced by that. I had a very Western-based higher education experience as an undergrad and in the totality of that experience there were ways that my connection to who I was and the personal and professional kuleana (*responsibility, privilege*) that I carry were fortified, but unfortunately … my Western-based experience (not always in content, but definitely in structure and format) also had very real negative side effects of creating some areas of disconnect. So coming into Kūʻula there was an excitement around a new pedagogy that would have some influence and ability for me to redefine what my learning could look like, what benefit it would have for me, and what trajectory it would support. The learning experience within Kūʻula was truly a Kipuka (*the name of the Native Hawaiian Student Center at UH Hilo; the word means a patch of native vegetation that evaded destruction by lava flows*) experience for me. Throughout my undergrad, I wasn't a Kipuka student and I only joined Keaholoa in my last semester at UHH … so I had an experience at UHH that really wasn't tied into the support networks and opportunities offered within its Native Hawaiʻi student support infrastructure. This was both by happenstance but also by subconscious choice in a way … so when Kūʻula came into my world, I made the conscious choice to view it as an opportunity that was being given to me to take part in learning content and an experience that better represented the kind of higher education that I found most valuable.

I established pilina with other people, really a community, who are passionately advancing culturally integrated marine science and conservation. It helped me to complete my marine science degree and fellowship programs that involved integrated marine science projects.

The course work project and content were very interesting and provided me with an opportunity to reconnect and re-invigorate the way I looked at science. It was one way that I started to decolonize my mind and ways that I viewed how resource management in Hawaiʻi should look like. These were cornerstones in how I would infuse aspects into my graduate research, studies and interactions.

Although the content was awesome, it was the discussions amongst my fellow student peers, kumu, mentors, and guest speakers that I felt were invaluable. Like the kūʻula stone, this course had attracted many students who had come with so much talent, experience, and knowledge. Although we were each unique, each one of us alone would have a hard time navigating the waters. We together, like a school of iʻa (*fish*), could outsmart some of

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the largest and most voracious "predators" (kaona [*metaphor*] for the concerns and challenges we face when decolonizing science and conservation). While at UH Hilo, Kūʻula also really acted like a safe and comfortable class and space that we could trust one another and feel supported.

Kūʻula provided me with a new (new to me at the time) perspective on science, resource management, and relationships to place. Prior to Kūʻula, I never thought that cultural knowledge could accompany contemporary research/science. Kūʻula encouraged me to seek out cultural knowledge and think in more interdisciplinary ways.

I think Kūʻula also shaped my interests to a certain degree. Our huakaʻi (*field trip*) to Kauaʻi exposed me to a variety of management styles and perspectives on natural resources, and I became more interested in community-based management.

Kūʻula impacted me in ways no real other course did. It was the first of its kind. It was the first upper-level science class with mostly Hawaiians and a mixture of bachelor and master students. Students were pursuing different and double majors in either marine science, environmental science, biology, Hawaiian studies, and/or Hawaiian language. So the composition of students was unique and unheard of at the time. Every student was filled with so much aspiration to better Hawaii and to be part of the decision-making on natural resource management. Everyone wanted to see change and wanted to be at the table with federal and state agencies that govern our Papahānaumokuākea. Kūʻula was also the first science course to use a traditional Hawaiian akua (*spiritual, dieties*) practice and ritual as the actual course name and course goals and was led by a non-Hawaiian within the UH system. Like finally UHH was taking more steps towards their own goal of making "UH a Hawaiian place of learning" outside of Hawaiian studies. In Kūʻula, we were allowed to do projects that were community-driven or based on traditional practices like naming. But it was challenging for a lot of us to combine Hawaiian and Western knowledge systems at first. It took a lot to break down the difference of incorporating supportive Hawaiian knowledge to having a Hawaiian-focused science research project. It was a foreign way of doing things in the science fields but it was something all students and faculty of Kūʻula had been wanting for a long time. So there were a lot of growing pains with it. Through the course we met different community leaders, higher officials, and superintendents of government and state agencies. Some of us learned how to better engage and be present in our communities, with our landscapes, and with our written Hawaiian literature (oli, *chants*; mele, *poetry, songs*; moʻolelo, *stories*; kaʻao, *myths*). And of course being able to touch and experience Papahānaumokuākea is just life changing. Papahānaumokuākea was a place that I dreamed of going to from high school. But definitely didn't expect the expanse of things. The explosion of sensory overload was immediate from the massive number and size of birds, sharks, and colors from sunrise to sunset. Just amazing.

Kūʻula impacted my life in many unexpected ways, first by realizing that I have a kuleana to Papahānaumokuākea and helping others understand the value and significance of this wahi pana (*secret place*). I also realized I was one of few people to actually view the sunrise at Kumukahi—in Puna where I was raised—and watch it set in Haʻehaʻe, which helped me realize I had come far from where I started my path in life and that I should be

more confident in my abilities and potential. The first presentation I ever gave at a professional conference was focused on native plants at Pihemanu which forced me to push through nervousness and trust in my perspectives and understanding of integrating knowledge systems while speaking in front of hundreds of people. After the first Kūʻula class, I was invited to participate on the 2009 RAMP [Reef Assessment and Monitoring Program] cruise where I visited every location in Papahānaumokuākea except Pearl and Hermes Atoll. I had many life-changing experiences on that trip that shaped my understanding of the realm of Kanaloa. I met Hiʻilei Kawelo and her dad Uncle Gabby on the cruise and collected data on intertidal and reef resource species. I remember being surrounded by around 100 sharks with Paula Ayotte at Ka Moku O Kamohoaliʻi and not feeling scared. I also became friends with Yumi Yasutake who encouraged me to apply for his position at Mokupāpapa. Yumi became an important friend and mentor who supported me throughout the entire time I was employed by NOAA. On the RAMP cruise I also met Chris Bird who convinced me that I was smart enough to pursue a PhD, he provided support for me when I applied to the NSF GRFP [National Science Foundation Graduate Research Fellowships] program, which I am currently funded through. I was also involved with the World Heritage inscription events that exposed me to conservation at the international scale. After Kūʻula, I supported research projects with communities on the big island (Kalapana, Kaʻupulehu, Kīholo, Miloliʻi) to ensure community voices are heard.

In what ways did Kūʻula affect your careers after graduation?

Kūʻula taught me that the possibilities of being a kānaka scientist are boundless and that we shouldn't second-guess ourselves when applying for jobs or graduate school. Rather than feeling like a minority assimilating into the Marine Science Department, Kūʻula taught me that we are supported as valuable assets to the management agencies we've only always heard of. The major support from the Native Hawaiian leaders of PMNM really put a face to the name and that belief in ourselves has led to being grounded in who I am as an ʻōiwi and letting that guide my research and commitment to supporting and serving communities.

It showed me the plethora of opportunities that are available for us to pursue, especially in conservation. It also helped shaped my perspective of place-based conservation.

I think Kūʻula provided me with confidence as a Native Hawaiian scientist which allowed me to thrive in my education and scientific projects. I am often working with other students of Kūʻula or people I met during this class. These relationships mean a lot to me because we are all working towards the same goal or our goals overlap with our careers.

Kūʻula is/was learning space that better reflected how we as ʻōiwi engage with our natural world. From a higher education perspective the intent might have been one thing, but from a personal (individual and collective) development perspective it was about how to influence changes in ʻāina (*environmental*) systems outside the university. From working towards policy change to transforming education systems … Kūʻula (for me) was about how to think about the values and processes of our kupuna and either integrate them into *or* completely huli (*overhaul*) the current ʻāina systems in place. I take that approach to everything I do as a "professional" in the mālama ʻāina (*resource management/care-taking*) sector.

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Kū'ula has definitely shaped my career and pathways after graduation. I currently work closely with at least eight former Kū'ula students/kumu (*teachers*) through projects and collaborations at my current job at Conservation International Hawai'i. We also remain close friends and, like mentioned earlier, we are able to "cover more ground" and have a more impactful reach than if we were to navigate this alone.

It expanded what I thought I wanted to do, which was marine resource management with NOAA focusing on coral. But after the class and after getting my degree in 2013, I didn't want to pursue anything outside lower Puna, Hawai'i. Puna really grew in my heart and flesh so that I didn't want to leave. So I starting teaching 'āina-based science and Nā Kilo 'Āina at Kua O Ka Lā Public Charter School. After two years of teaching I was hungry again for research science, so I took a job with the US Geological Survey collecting data on water-soil infiltration rates/groundwater recharge between different land-use areas. That job was my first-ever forest research project and it really fed my love of learning because it was new and unfamiliar. From that job, I met a lot of different land owners/managers, including at Hawai'i Volcanoes National Park. I am now a botanical field/data technician for the native plant restoration crew at the natural resource management division. I never would have thought I would be working with plants since my life, degree, and college career was heavily focused on the ocean, corals, and marine science. But this job offered so much learning and challenges that my curiosity was filled. And I still get to work in Puna-Ka'ū mauka-makai every day. But I do question myself often about this job: (1) Why work for the federal government that stole land from Hawaiians? (2) Why work under and with haoles (*people, especially white people, not native to Hawai'i*)? (3) Why be the only Hawaiian in the crew? (4) Why work outside my college degree and years of work that my mentors have sacrificed for me?? It is hard. But I have learned how to build my own personal Kū'ula and 'Ai'ai practice to be comfortable in what I am doing with my career, my community, and now family. Kū'ula the course is like Kū'ula the akua in that it feeds, challenges, and empowers you.

Kū'ula has had the greatest impact in my career with PIPES (UH's Pacific Internship Programs for Exploring Science). I've been able to build on many of the lessons and ideas from Kū'ula in my position as a PIPES coordinator. I think Kū'ula also helped me to get the job, as PIPES is all about incorporating Hawaiian cultural values and facilitating students' connection to the place.

Kū'ula introduced me to important mentors who eventually became my employers right after I graduated with my bachelor's degree. I worked at the Mokupāpapa Discovery Center for five years and during that time I built relationships with many conservation professionals, while learning how to be an educator and community liaison. I made a lot of mistakes and had a lot of failures in my time at NOAA but I also gained professional work experience and built a foundation for my career, along with experience in outreach education, aquarium husbandry, fabricating exhibits, and facilities maintenance.

This, I am still learning. But if I were to try to articulate what I have learned thus far, it would have to be to educate the "outsiders" of how things work here in Hawai'i. Trust, respect is not built overnight. There is a way to carry yourself and 'ano (*character quality*) is by far one of the most important aspects of it all. I find that I am often the "different" voice in the room, in work settings and conversations, but I don't find

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it all that different at all. For a local from Hawai'i, it is common sense. I am learning to read the water in conversations and knowing when to speak up/step up and when not to. It is a difficult line at times. And if not for my community/family/friend relationships, I don't know that I would be able to do it.

Having Kū'ula on my resume and the huaka'i (*journeys, field trips*) experience enabled me to be more competitive with applying for internships and job applications. Not to mention that Kū'ula is a well-known course across the islands.

FUTURE

The above comments were provided by former students 6–12 years after they participated in Kū'ula, depending on the cohort. It is clear that their impressions of Kū'ula resonate to this day. Our assessment estimates that over 90% of Kū'ula participants are either working in natural resource management jobs or pursuing graduate degrees that are integral to the growth and evolution of how we care for and manage our natural environment; a few of them were hired by PMNM or currently employed within NOAA. This love for Hawaii's environment extends beyond careers into personal and familial practices. Kū'ula's contribution to current and future Indigenous leadership in resource management has taken on a snowball effect throughout Hawai'i. Beginning with a very small population of students at UH Hilo, who were somewhat lost and disoriented in their academic journeys, we have been creating a safe space to explore and discover a new conversation on science and the application of science within existing systems, strengthening a network of Native Hawaiians within the sciences and natural resource management world, and being the catalyst for many to pass these lessons forward into communities, schools, partnerships and agencies they work for. Every community program here in Hawai'i has been touched by a Kū'ula alum. Every natural resource management agency and organization here in Hawai'i has had or currently has Kū'ula alumni working within their ranks, affecting change and infusing their initiatives with lessons and conversations Kū'ula nurtured. Many are also in positions of sharing Native Hawaiian relationships to Hawaii's environment as a teacher, parent, and/or community advocate. Therefore, what our former Kū'ula students learned—to found conservation practices firmly on Indigenous epistemology while taking advantage of cutting-edge sciences—will likely perpetuate more widely in the future.

Federal, state, and non-governmental natural resource management agencies operating in Hawai'i have increasingly adopted practices and views based on Indigenous, and sustainable, relationships with the land and ocean. Higher education needs to align with this shift in order to prepare graduates for careers in sustainability sciences and management. When asked if University of Hawai'i campuses should offer courses such as Kū'ula, the former students unanimously responded with a resounding "yes." In particular, immersive experiences with community-based natural resource management and internships with agencies are what our former students list as priority for Indigenous students pursuing sciences. As public universities tasked to serve our communities by preparing our graduates to contribute to sustainable life of island communities, University of Hawai'i campuses have critical roles to play. Students of UH chose Hawai'i as a place of their learning, whether they are from Hawai'i or not. UH campuses, therefore, must prioritize place-based pedagogical frameworks and prepare our students for their future professional and personal lives that can authentically integrate all knowledge that is available to us. Kū'ula was but one course. Imagine what we could achieve if we offered more courses that integrated Native Hawaiian knowledge across all disciplines.

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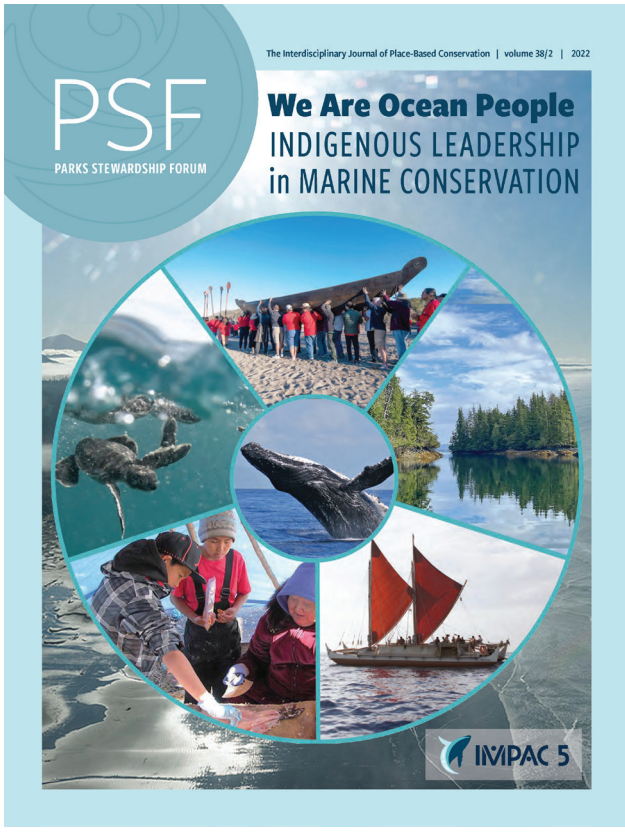

On the cover of this issue

CIRCLE DESIGN, clockwise from top:
- Northern Chumash ceremony | ROBERT SCHWEMMER
- Haida Gwaii | CINDY BOYKO
- The Polynesian Voyaging Society's voyaging canoe Hōkūleʻa | NOAA
- Elder teaching youths, northern Alaska | US FISH AND WILDLIFE SERVICE
- Baby Honu (sea turtles), Papahānaumokuākea Marine National Monument | NOAA
- Center: Humpback whale, Papahānaumokuākea Marine National Monument | NOAA

Background: Pacific Rim National Park Reserve | PARKS CANADA