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## Klamath Connection and Critical Histories/Activist Futures: The Role of Interdisciplinary Discourse in Addressing Racism and Inequity in STEM Education

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The Klamath River flows from Southern Oregon to the Pacific Ocean through some of the most wild lands of the continental United States. It is home to diverse communities including American Indian Tribes, farmers, fishermen, and the most remote and geographically isolated campus of the [California State University](#) (CSU) system, [Humboldt State University](#) (HSU). The call for submissions for the *Critical Histories and Activist Futures: Science, Medicine, and Racial Violence* presented an opportunity to showcase the Klamath Connection first-year learning community, a program designed to work towards achieving inclusive excellence in Science, Technology, Engineering and Mathematics (STEM) education by immediately fostering a sense of belonging in students from all cultures and backgrounds. The designers of the program also hope to assist the campus community in developing an awareness of indigenous environmental, scientific and cultural knowledge that can complement scientific endeavors.

Similar to the national trend in higher education, the number of HSU students who are from a cultural or economic background traditionally underrepresented on college campuses and/or are first in their family to attend college has been steadily increasing. These students, now referred to as the new majority by the American Association of Colleges and Universities, the Howard Hughes Medical Institute and others (Schneider, C.G. 2005), has increased from [19 percent](#) of the HSU 2009 student body ( $n = 7954$ ) to [42 percent](#) of the HSU 2016 student body ( $n = 8593$ ). Many arrive from distant urban centers in Southern California (40%, 700-800 miles away) and the San Francisco Bay Area (13%, 300-400 miles away), places that are environmentally, economically, and culturally quite different than Humboldt County, which is both predominantly non-Hispanic White, (~75%) ([U.S. Census Bureau 2010](#))<sup>[1]</sup> and home to nine federally recognized American Indian tribes. The campus itself sits on the ancestral lands of the Wiyot, who have called the Humboldt Bay region of Northern California home since time immemorial. As the only CSU campus situated amongst a large indigenous population, American Indian scholar Vine

Deloria, Jr. recognized HSU as “[absolutely unique within the California State University system](#)” (Deloria 1989).

HSU has a long tradition of providing support for new majority students, beginning in 1969 with the founding of the [Indian Tribal and Educational Personnel Program](#) (ITEPP). Just three years later, the Native American Career Education in Natural Resources (NACENR) was established to train indigenous students for professional resource management positions in American Indian communities, federal and state government agencies, and the private sector. In 1991, the mission and programming of NACENR expanded and evolved into the Indian Natural Resources, Science and Engineering Program (INRSEP), which is still in existence today. HSU expanded the model of providing academic support in a cultural context in 2012 with the establishment of the [Cultural Centers for Academic Excellence](#), designed to promote the individual and academic advancement of all students in a culturally welcoming environment. Despite these efforts, data from our campus suggests students from diverse backgrounds still have difficulty developing the self-efficacy, academic behaviors, and the sense of belonging necessary for academic achievement, particularly in the disciplines of science, technology, engineering and math (STEM). HSU’s 4-year graduation rate for incoming STEM freshmen is 10% overall, 4% for students from traditionally underrepresented ethnicities, and 8% for first-generation students. Though improved, the 6-year graduation rates are still unsatisfactory and achievement gaps persist (36% vs. 47% overall).

We have been exploring the role of place-based learning communities (PBLC) in helping students overcome barriers to academic success. The term ‘learning community’ is used for many different education strategies, but here we define it as a curricular approach that intentionally links a cluster of two or more courses around an interdisciplinary theme and enrolls a common cohort of students (Smith et al. 2009). Unlike the majority of the existing student support services on campus, our place-based learning communities are defined by commonality of academic discipline. The community is comprised of students, faculty, staff and off-campus communities participating in five strategies shown to be effective in increasing diversity in STEM: (1) a summer immersion experience, (2) a major-focused first year seminar, (3) STEM peer mentors, (4) block-scheduled courses and (5) integration of linked programming in the division of Housing and Residence Life. By designing the associated assignments and activities around scientific and social themes of our unique location, we believe we can foster a sense of community and belonging for first year students that will enable them to see how their own life experiences relate to new peoples and landscapes, and empower them to quickly self-identify as young scientists in their discipline (Grunewald and Smith 2014).

Our first place-based learning community focuses on the Klamath River Basin, an area strongly associated with our region. Called the [Klamath Connection](#)<sup>[2]</sup>, the program weaves complex scientific, environmental, political, societal, and cultural issues of the region throughout all components of the learning community. Students are block scheduled into basic science and math courses, as well as general education classes in Native American Studies (NAS) and critical thinking to broaden their understanding of how research in STEM disciplines impact indigenous people and the places they call home. Participating faculty, tribal scientists, and cultural experts collaborate on the development of curriculum that builds cultural awareness in the next generation of STEM professionals. At the start of the Klamath Connection summer immersion program, students visit the Yurok Reservation, where they meet with cultural experts who share with them their worldview based in the place of their creation through oral tradition and contemporary examples of stewardship. They are also introduced to the work of Yurok tribal wildlife and fisheries staff to gain an understanding of how western science and cultural knowledge intersect in tribal management practices. To gain a better understanding of how their chosen fields of study interact with tribal communities, the students participate in an interdisciplinary experiment developed through a collaboration between the water quality scientists from the Karuk Tribe and HSU faculty on the annual toxic algal blooms of *Microcystis aeruginosa* in Klamath River<sup>[3]</sup>. This exercise begins with Klamath River water sampling during the summer immersion, continues with a laboratory work designed to test the conditions that support algal growth, and is revisited in many of their first-year courses to illustrate how foundational science and math classes are necessary but not sufficient to address scientific and environmental issues of concern to many different communities. These interactions also introduce students to scientists and professionals from diverse cultural backgrounds.

Another goal for the program is to reduce the cultural blindness that can cause harm at all university levels. Over the past few years, there has been an increase in student activism around racism and equity on college campuses across the country, with those occurring at [Yale University in 2015](#) being some of the first to receive national attention (Cobb 2015; Waldman 2015). In October 2014, HSU witnessed some of the largest student protests since the Vietnam War era when long time INRSEP Director and highly regarded mentor Dr. [Jacquelyn Bolman was terminated](#) (Rose 2014). After three months of protests, the student group Unified Students of Humboldt [occupied the Native American Forum](#)<sup>[4]</sup> and presented a list of demands to HSU administrators (Burns 2015).<sup>[5]</sup> *Klamath Connection* was in the planning phases during the height of these tensions and launched fall 2015 with a commitment to supporting activities that promote cultural inclusivity both in and out of the classroom. The Klamath Connections program collaborated with the HSU Department of

Theater to sponsor a staged reading of *Salmon Are Everything*, a play that was developed by tribal and non-tribal community members in response to the 2002 Klamath River fish kill, which devastated tribal fisheries. Klamath Connection students had the opportunity to meet many of the individuals involved in the creation of the play and to read the text as part of their critical thinking and NAS course work. To orientate students to an understanding of how place influence language a special guest lecture was given by a Hupa/Yurok Linguist from University of California, Berkeley who demonstrated the non-cardinal direction system of the indigenous people of the river – to the river, away from the river, up river and down river – and the relationship of those directions to where a person was standing in relation to the river. These activities exposed students to how tribal and non-tribal communities can work together to address pressing social and culture dilemmas and the role that worldview plays in understanding place.

There were many aspects to the [Critical Histories and Activist Futures: Science, Medicine and Racial Violence](#) call for papers that suggested participants might benefit from learning about our program. In the written announcement, the organizers highlighted their disappointment "...when Yale Dean Lynn Cooley suggested that teaching future scientists about subjects such as race and ethnicity would not only be impractical but also unnecessary, dismissively stating, 'How would you teach race and ethnicity studies in a science course?' " The *Klamath Connection* is an excellent example of how to do exactly that. In addition, our experience partnering with our local tribal communities suggested we could provide valuable insights to discussions exploring tactics for building alliances and partnerships outside of the academy. Of equal importance was the disproportionate representation of traditional students at the host institution. At the time of our abstract submission, the [72 percent](#) white Yale University student body was engaged in efforts to confront its past and complicity with slavery through the discussions and final renaming of [Calhoun College](#) to [Grace Hopper College](#). This was a significant consideration, as it was our intent to demonstrate that learning communities such as *Klamath Connection* could be replicated on majority white campuses as a means to inform curriculum designed to address racial inequities in STEM fields. We focused our presentation on survey data that suggests 1.) collaborations among *Klamath Connection*, the HSU NAS Department, and experts from the local tribal nations had a significant impact on increasing the students' awareness of environmental, social, and cultural issues of concern to Native American cultures and 2.) engaging in discussions on current issues such as the Klamath dam removal and the Dakota Access Pipeline helped students recognize that they will interact with indigenous people and communities wherever their professional careers lead them. Further, we described how important engagement of *Klamath Connection* faculty in culturally diverse

cross-disciplinary discourse was for increasing their understanding of the broad range of issues facing our students and their receptivity to adopting new pedagogical techniques.<sup>[6]</sup>

Though ours was the only presentation focused on resolving inequity in higher education, each of the sessions had relevance to our work. The oration of scholarly papers on racism and violence in medicine increased our understanding of how the Western medical system has threatened minority communities and broadened our perspectives on scholarship as activism. The panel discussion on *Building Alliances with Communities of Activists Outside the Academy* resonated with us, as we have also struggled to honor the objectives of our community stakeholders while serving the needs of *Klamath Connection* students and faculty. In the student-led lunch discussion on *Deploying Scholarship as Activism*, the stories recounted by Yale medical students were reminiscent of conversations with HSU indigenous students training to be career professionals in disciplines traditionally dominated by non-Hispanic white western culture and struggling to balance their academic aspirations with student activism. The conversation provided an important reminder that all students, regardless of university or discipline, experience conflict when trying to fulfill the values, responsibilities and expectations of their multiple individual identities. These sentiments were echoed in our session by Dr. Chanda Prescod-Weinstein, a Research Associate in Theoretical Physics at the University of Washington-Seattle and a former mentee of Dr. Bolman through the Society for Advancement of Chicanos/Hispanics and Native Americans in Science ([SACNAS](#)).

Other stated intentions of the conference were to “build bridges with activists, organizers, and the communities beyond our campuses” and “begin conversations and help build alliances and strategies for addressing systematic violence and inequality, inside and outside of academia.” In our professional experiences, it is rare that an academic conference supports both the presentation of scholarly works and a venue for brainstorming solutions to the issues they illuminate. The discourse that occurred at *Critical Histories and Activist Futures* inspired us to consider new ways to work across disciplines, redefine professional identities and cultural boundaries, and sparked deeper conversations on how engaging our students in these topics could improve our training of the next generation of scientists. We applaud the organizers for their ability to realize this vision, but we should not be surprised at their success. For in many ways they have achieved exactly what we have worked towards on our campus—an engaged community within the academy comprised of stakeholders from multiple backgrounds and disciplines dedicated to eliminating racism and resolving injustice in the university system.

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[“Critical Histories, Activist Futures”](#) is a series edited by Tess Lanzarotta and Sarah M. Pickman.

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## Notes

[1] All campus analytics come from the HSU [Office of Institutional Effectiveness](#)

[2] *Klamath Connection* was launched with a CSU STEM Collaboratives grant made possible with funding from the Helmsley Charitable Trust (#X0085, PI M. Johnson, co-PI A. Sprowles). A U.S. Department of Education HSI STEM and Articulation program award (#P031C160193, PI /Program Director M. Johnson, co-PI A. Sprowles) will allow for expansion of our place-based learning communities to serve 80% of all entering STEM freshman by 2021.

[3] The timing of the *Microcystis* blooms coincide with World Renewal ceremonial practices that require the *fatavénaan* (priest of the world renewal ceremony) to bathe in the river. Water quality scientists from the Karuk Department of Natural Resources actively monitor the watershed. Their science is used to advocate for management practices that would reduce or eliminate this issue, including Klamath Dam renewal.

[4] The HSU Native American Forum is a classroom space designed in the traditional style of local Native American Redwood plank houses.

<sup>[5]</sup> In keeping with the campus's [history of promoting dialogues on race](#), the HSU President initiated [discussions](#) that not only led to agreements to end the occupation, but began a series of public discussions on discrimination experienced both on and off campus by HSU students of multiple identities that continue to this day.

<sup>[6]</sup> Through newly received Howard Hughes Medical Institute 2017 Inclusive Excellence Award (#52008703, PI M. Johnson, co-PI/ Program Director A. Spowles) we are assessing these practices and providing training in inclusive pedagogy.

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