

FINAL REPORT: WEAVING INDIGENOUS AND WESTERN KNOWLEDGE SYSTEMS

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Final Report: Weaving Indigenous and Western Knowledge Systems

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Abstract

The Weaving Indigenous and Western Knowledge Systems (WIWKS) Bibliography is an iterative list of publications and resources for students, researchers, teaching faculty, administrative staff, and others in a higher education context seeking to engage in integrating these knowledge systems, particularly to address the Grand Challenges of Climate Change in the STEM fields. Sources were collected in three ways: 1) sources shared in presentations or mentioned in conversations during and following the TBS gatherings, 2) sources collected from a follow up survey, 3) sources gathered through informal interviews. While initial emphasis was placed on integrating biocultural restoration in STEM courses and in increasing Native student success in higher education, the sources that emerged had a much broader and systemic focus. This report is a description of the research process and reflection on this project as an example of Weaving Indigenous and Western Knowledge Systems.

Keywords: STEM Education, Indigenous Knowledge, Indigenous Wisdom, Traditional Ecological Knowledge, Grand Challenges, higher education reform, student success

Final Report: Weaving Indigenous and Western Knowledge Systems

The purpose of the Weaving Indigenous and Western Knowledge Systems (WIWKS) Bibliography is to gather a list of publications and resources referenced and used by participants in the “Gatherings to Transcend Barriers to Success: For This Generation and Those to Come” (TBS Gatherings) held during Spring and Fall 2021. The Bibliography is meant to provide a foundation of knowledge, iteratively created, to aid students, researchers, teaching faculty, administrative staff, and others seeking to engage in or learn more about Indigenous research, knowledge systems, and education, particularly in STEM courses and to support Native student success.

In 2021, over 134 participants including students, faculty, staff, and community partners gathered over Zoom at three TBS Gatherings hosted by the University of Hawai‘i, University of Arkansas, and North American Native Research and Education Foundation (NANREF) (Idaho). Guiding questions for the TBS Gatherings included:

- 1) How can we connect Indigenous and western knowledge systems for biocultural restoration, sustainability, and resilience in the face of climate change?
- 2) How can this connecting lead to academic and career success for Native and non-Native students?"
- 3) How can this connecting be continued and sustained over generations through campus-community engagement and partnerships?

Publications by Native and non-Native scholars in the areas of Indigenous Knowledge, Indigenous Wisdom, and Traditional Ecological Knowledge are rapidly expanding, with wide

readership both in and outside of academia. *Braiding Sweetgrass* by Robin Wall Kimmerer is a frequently cited example. Multiple stakeholder groups (students, faculty, researchers) express acute interest in working with Indigenous communities and knowledge keepers, yet may be unsure how to begin. On the one hand, unintended harm may result without knowledge of decolonizing methodologies or Indigenous research, while on the other hand, researchers with this awareness may be paralyzed by fear of offense. Both conditions prevent relationship building, collaboration, and healing. This situation is compounded by the urgency of the climate crisis and Grand Challenges related to energy, land and water issues, food systems, food security, and agriculture. In addition to these challenges, there is institutional attention to increasing Native student success in higher education and addressing issues of decolonization, diversity, equity, inclusion, and justice.

Western academic literature reviews typically use approaches such as citation count, keyword searches, or content analysis. Indigenous research methodologies might begin with storytelling or visiting elders for guidance. The WIWKS Bibliography combines these approaches. The sources on the list were shared in presentations, or mentioned in conversations during and following the TBS Gatherings: these are the papers, books, videos, songs, chants, poems, and other media that have influenced the participants and guided their work.

Other outcomes and products of the TBS Gatherings included integration of new knowledge into faculty syllabi and pedagogical strategies including project-based learning, service-learning, community engagement, undergraduate research, and internships. In addition, the materials are meant to strengthen program, campus, tribal, and community partnerships, especially in relationship to a) Native student success, b) teaching and research related to climate change and related grand challenges, and c) emphasis on inclusion of both Indigenous and western science, knowledge, and wisdom.

A four-part model for “Transcending Barriers to Success” was offered at the Gatherings:

- 1) Connect Indigenous and Western knowledge systems for redesigned curriculum;
- 2) Tackle Grand Challenges such as ecological and biocultural restoration;
- 3) Support STEM success for NAAN-NHPI students;
- 4) Build authentic and durable campus-community partnerships for continuity and sustained positive impact on the environment and increasing the NAAN-NHPI students in STEM fields.

The Weaving Indigenous and Western Knowledge Systems (WIWKS) Bibliography was envisioned and realized by a team of researchers: Summer Wilkie, Youth Coordinator for the University of Arkansas Indigenous Food and Agriculture Initiative and citizen of the Cherokee Nation of Oklahoma, Miku Lenentine, Coordinator for the Center for Resilient Neighborhoods (CERENE) at Kapi‘olani Community College, and Krista Hiser, a faculty member at Kapi‘olani Community College. Robert Franco, also at Kapi‘olani, served as the Principal Investigator for the EPSCoR grant (#2104126), participated in the Gatherings, and supervised the research team.

Although situated in Western academic institutions, we approached the WIWKS Bibliography through an Indigenous research lens, beginning with relationship building and reciprocity for all involved in the project. This placed an emphasis on practical outcomes – how could such a bibliography serve the communities participating in the TBS Gatherings, and move beyond dialogue to action? Relationship building and reciprocity also meant that the process was slower, and included teachings and listening to elders within and outside of educational institutions.

Background and Existing Literature

Weaving Indigenous and western knowledge systems, or WIWKS as we came to refer to the task during the process, invites us to move beyond the English language into the felt-sense and visual worlds of relationship, symbol, and metaphor. Rather than just compiling a list of sources, we began from different metaphors that might be used to guide conversations about the papers and books mentioned by participants and presenters. First, we explored the metaphor of Two-Eyed Seeing as introduced by Bartlett et al. (2012) and utilized by Wright et al. (2019). “Two- Eyed Seeing adamantly, respectfully and passionately asks that we bring together our different ways of knowing to motivate people...to use all our understanding so we can leave the world a better place...” (Bartlett et al. 2012, p. 336).

While Two-Eyed Seeing provided a strong initial guiding framework, Indigenous perspectives are not limited to the physical senses, and include mind, body, and spirit (Smith, 2018). Furthermore, Indigenous Knowledges are multiplicitous. Native Hawaiian scholar Noelani Goodyear-Ka’ōpua (2013) points out the oversimplification of a similar metaphor in Indigenous education, thinking of students as “walk[ing] in two worlds”, and recognizing harm in this epistemological tension, stating that metaphor and multidisciplinary, cross-cultural inquiry are spaces best created “by placing living ‘āina at the center” of the educational endeavor (p. 134). Or, in this case, into our research endeavor.

A second metaphor that provided an important foundation for the project was the visualization of a Spider’s Web as developed by Lori Lambert in her 2015 book, *Research for Indigenous Survival: Indigenous Research Methodologies in the Behavioral Sciences*. This metaphor was shared at the Idaho TBS Gathering hosted by the American Indian Consortium GTBS Gathering, as a representation of the integration of knowledge systems.

Figure 1: Spider's Web, by Lori Lambert.

Indigenous Research Paradigm: A Conceptual Model



Note: This image is published at The American Indigenous Research Association website (iAIRA) and used with permission.

Lambert's image emphasizes relational and place-based knowledge as well as traditional protocols and respect for Indigenous people. Thus, this image informed our method. The visual image of a web is rich, and contains information beyond what we highlighted as preliminary

understanding necessary for integration of knowledge systems. However, this conceptual model focuses predominantly on Indigenous Research Methodology. In the end, after considering the metaphors of a web, and of two-eyed seeing or walking in two worlds, we selected a metaphor of *weaving* to guide the project because it resonated with the researchers, and was generally supported by the TBS Gathering participants.

The process of weaving maintains the integrity of both warp and weft, while creating new patterns and paradigms that can strengthen both Indigenous and Western Knowledge Systems. The weaving metaphor is also general enough to apply broadly across NAAN-NHPI cultures. In each Indigenous culture and community more specific metaphors may carry more meaning. An example is the metaphor of Osage ribbon work. Ribbon work is an Osage art form that integrated new materials (ribbon) from Europeans to be repurposed and reworked into patterns meaningful to the Osage. This metaphor is used in a thread of Osage scholarship from Jean Dennison as a framework for building a future for Osage people that includes their unique Indigenous perspective (Dennison 2012; Redcorn, 2013; Powell, 2014; Hayman, 2021).

Indigenous cultures all over the world use visual images, symbols, and metaphors to transfer and advance knowledge. Metaphors can also be used to invite the inquiry of paradigms. Cognitive science indicates that metaphors are powerful for advancing new ideas (Bratianu, 2015). However, as fields of study become saturated with metaphors they may lose their effectiveness as discussed by Kenneth Sørensen in the field of metaheuristics (Sørensen, 2015). As researchers, we were conscious of the need to avoid the common pitfall of introducing a new metaphor for every paradigm or process. It is important to focus on metaphor grounded in relationship with Indigenous knowledge and place.

There are several other bibliographies and collections of relevant articles, including the Global Council for Science and the Environment (GCSE) sources that were shared with

participants who attended the “Learning Series on Indigenous Knowledge & Western Science: Collaboration, Relationship, and Climate Solutions” also held in 2021. This conversation, parallel to the TBS Gatherings but unrelated, was hosted by Native scholars Darren Ranco and Sherri Mitchell, and generated a list of over 50 peer reviewed articles as well as media links, white papers, and other unpublished but very relevant work. In addition, Lori Lambert authored a bibliography for the Intercontinental American Research Association (iARA) containing over 144 sources. It is hosted alongside yet another bibliography written by Lynn Gehl containing 47 sources on the iARA website. Another repository of articles as well as presentations related to weaving work is the Institute for Integrative Science and Health which contains over 292 related sources from 2001 to 2012. In addition to all of these sources a new digital resource called *Journal of Native Sciences* (<https://www.nativesciences.com>) has been established by Cleve Davis and Dawn Davis, presenters at the NANREF Gathering, and may hold future sources.

Lists, in general, have many shortcomings: they can become out of date; they are often created by individuals rather than groups, and they may include articles that aren't approved of by Indigenous scholars and/or communities. The latter could be due to the researcher misrepresenting themselves as a member of a tribal community or due to a lack of respect of data sovereignty, poor relationship with the Indigenous community represented in their work, or Indigenous knowledge gained in unethical manners. The peer review process for publication relies on an Institutional Review Board (IRB), and in certain situations, Tribal IRB, to verify credentials and methods. Yet, Indigenous review over Indigenous content is often missing in the peer review process for publication. Therefore, published lists and bibliographies may unintentionally include work published without collective accountability, integrity, or good relations.

There is a temptation to add more layers of approvals, but this can add months to publication or sharing, and create a fraught situation or so many barriers that new researchers will be afraid to try a weaving approach. Some suggestions, by no means comprehensive, include: methods such as Participatory Action Research; co-authoring and reverse stacking; working with a cultural advisor or advisory council; working through the tribal IRB process if applicable; including letters of support from elders, tribal leadership or community members in an appendix; or adding an “intellectual genealogy” to describe relationships¹. Researchers who want to work with Indigenous communities should seek training in cultural competency, Indigenous studies, and in decolonizing research methods. Such courses should be integrated into undergraduate and graduate education, particularly in STEM.

So, while we studied many lists and repositories to situate this project, we ultimately did not include them, though of course there is overlap. Every strategy for listmaking will have limitations and biases. Part of the question the WIWKS Bibliography seeks to answer is *how best to make this work useful*; thus, for this project we tried to systematically identify the most referenced sources by practical practitioners.

Methods

The researchers were influenced by the Two-Eyed seeing model described by Bartlett et al., who assert that “Post-secondary institutions should be compelled to seek guidance from the Elders’ Council to develop appropriate curriculums related to Traditional Knowledge for relevant post-secondary programming. There is a need to recognize that Traditional Knowledge draws upon the community of elders, and other knowledge holders, as well as the collective

¹ In this project, we used co-authorship and reverse stacking, an advisory council, and intellectual genealogy.

consciousness of the people” (Bartlett, Marshall, and Marshall, 2012, p. 335). Input from multiple stakeholders was critical throughout this project.

Though written sources have been integral to deepening our knowledge, much of our knowledge for how to approach this work did not come from a book or article. Each of the researchers had been trained to seek an elders’ council as part of their cultural upbringing or life experience, rather than advised to do so by any written source. This is one example of the significance of sources that are not “peer reviewed” in an academic sense, as well as direct relational experience with peers and others in the human and non-human world. It is also an example of what we mean by “weaving”. As Bartlett et al. put it “We need to recognize that stories, songs, crafts, practices, family, community, language, ceremonies and connectivity with the land are important for the transmission of TK. It is not a book-based process of learning. Most importantly, TK is living knowledge” (2012, p. 337). Thus, weaving Indigenous Knowledge and Western Knowledge is a living process.

Beginning with the process of building relationship and exploring metaphor as a way of illuminating and integrating worldviews, we then approached the project in a way that would extend collaboration, iteration, and rapport. To emphasize relationship-building in our research method, we included informal interviews held on Zoom, that we called “tea talks” (The term “tea talk” follows advice to engage in conversations “over a cup of tea” which was offered by Lori Lambert during the TBS NANREF Gathering in Idaho.) We revisited the research questions of the TBS Gatherings – how to connect Indigenous and western knowledge systems? How to support academic and career success for Native and non-Native students? How to sustain campus-community engagement and partnerships? Each of us, as researchers, took some time to query our own “logic models” while writing reflective memos after and between meetings. These

practices helped to define the process of weaving as one of co-created meaning rather than compromise and negotiation.

These are the steps that we followed to create the Bibliography:

1. The bones of the Bibliography are references cited in NSF EPSCoR and INCLUDE grant proposals related to the TBS Gatherings. (89 sources)
2. To this, we added citations from presenters' materials, as well as reference lists shared by facilitators and/or distributed in powerpoint presentations from the Gatherings. (14 sources)
3. Then, we sent a Google Forms Survey to key participants (51 sources), followed up with:
4. Informal Interviews conducted over Zoom (7 sources) and then,
5. Review of the final bibliography list by an Advisory Council formed at the beginning of the research process, as well as other stakeholders.
6. Reflecting on the process and co-authoring this report.
7. Review of the report by Advisory Council

Again, what is unique about this Bibliography is that it is based on recommendations by active practitioners and researchers who are using decolonized methodologies and attempting to do integrative cross-cultural work in higher education.

Results

Through this iterative process we compiled 156 sources. **The three most frequently mentioned sources were:**

Bartlett, C., Marshall, M., & Marshall, A. (2012). Two-eyed seeing and other lessons learned within a co-learning journey of bringing together indigenous and mainstream knowledges and ways of knowing. *Journal of Environmental Studies and Sciences*, 2(4), 331-340.

Cajete, G., & Bear, L. L. (2000). *Native science: Natural laws of interdependence* (Vol. 315).

Santa Fe, NM: Clear Light Publishers.

Kimmerer, R. W. (2013). *Braiding sweetgrass: Indigenous wisdom, scientific knowledge and the teachings of plants*. Milkweed Editions.

Across all of the sources there were patterns that emerged for the most frequently cited works. There were 15 sources overall which had at least two or more mentions, listed here in alphabetical order:

Aluli - Meyer, Manu	Kimmerer, R. W.
Bartlett, C., Marshall, M., & Marshall, A.	Smith, L. T.
Bowman, N. R.,	Sze, J., ed.
Cajete, G., & Bear, L. L.	Treuer, A.
Deloria Jr, V.	Whyte, K.
Estrada, M.	Wildcat, D.R.
Johnson, M.D.	Windchief, S.,
Spowles, A.E.,	

Constellations, Iterations, and other Next Steps

Recommendations for future research in integrative cross-cultural work include: content analysis of the WIWKS Bibliography and the other lists mentioned above; inclusion and study of a wider range of sources such as YouTube videos, chants, prayers, books, and unpublished works; more dialogue in the form of tea talks or otherwise with more authors and researchers. While our original query for sources was open-ended, responses tended to emphasize peer reviewed sources and frequently referenced documents. In the less formal tea talk discussions,

other sources were mentioned. The results are also skewed by the extent of our network. More contributors would improve the thoroughness of the bibliography. In our tea talk conversations there was a call for a dynamic database including both academic and non-academic materials. We envisioned using or expanding a popular research management software to make a truly iterative and growing bibliography for the weaving of Indigenous and western knowledge systems.

To ensure the usefulness of a list of 156 sources (ideally, in the future, an ever-growing community-held, and iterative list) and to invite contributions of formal and non-formal sources from the community that might be engaging and interacting with the WIWKS Bibliography, we created the idea of Constellations. Constellations are mini-collections of sources including peer-reviewed journal articles, unpublished papers, poems, songs, stories, media and any resource deemed important for understanding some aspect of the universe of topics related to integrating Indigenous and Western knowledge systems, particularly in STEM fields.

Constellations can be compiled by anyone in the community in relationship to a particular project, task, event, or challenge. They would ideally fit on one page, including 10 to 20 sources starting from those in the Bibliography and enabling the addition of new sources including informal sources such as YouTube videos, chants, stories, or prayers included with permission of the author.

Constellations would be collaborative, “living” and constantly evolving to match the evolving and living state of integrative research. Constellations might be organized around a particular person (key author), place, or topic. What makes them unique however, is that they could be saved as their own “product” and others could “upvote” them so that certain constellations could rise to prominence. Constellations keep the process relational, and steeped in

the metaphors of the natural world (aka in relationship with our non-human kin and place-based). Future work might also include inviting top referenced authors in the field to contribute their Constellations. In the Appendix, we provide two examples of Constellations:

Wan's Constellation: Sources for a Newcomer to Hawai'i

STEM Faculty Constellation: Including both Indigenous and Western Knowledge in Courses

Conclusion

This report emphasizes the process behind the WIWKS Bibliography and concludes with our thoughts on how to continue iterating the Bibliography as a living document that is “owned” by community users. In this report, we emphasized our research process and made it visible because *the process is the weaving work*. When working with knowledge systems it is necessary to slow down, build relationships, and reflect on the process. Metaphors open a shared field or pattern of understanding that can help the weaving to occur.

We conclude with some thoughts on Albizia trees. Interestingly, this tree emerged independently for each of the researchers, not as a new metaphor (though it is) but rather, as if we had been weaving a blanket or shawl, following a pattern in the work, and the image that emerged was something like this:

Figure 2: Photo of a Native Koa tree (foreground) and non-Native Albizia tree (background)



Note: photo by Krista Hiser, taken at the Waiakeakua forest restoration project, Mānoa, O’ahu

In the foreground, a native Koa tree, planted on the island of O’ahu in an area where giant non-native albizia trees (seen in the background) are being carefully cleared to plant ‘ulu, kalo, and koa. This effort is an example of both decolonizing (removing invasive trees) and restoring (planting native trees). The Koa is a hardwood tree that can also grow to 100 feet, and can be used for carving a canoe. Thus, the efforts in this forest today plant an understory that will meet the needs of a future generation.

In her book *The Seeds We Planted: Portraits of a Native Hawaiian Charter School*, Noelani Goodyear-Ka'ōpua (2013) likened non-native albizia trees in Hawaii to the:

“...dominant disciplinary formations within education such as mathematics and English, destructive when the environmental context was organized around *it* as a fixed and rooted structure, drawing resources toward itself for its own survival. When the invasive tree was cut, decentered, and ordered around the central goal of caring for the Indigenous social and ecological landscape; however, its usefulness became apparent.” (148)

In this project, we learned that integrating Indigenous and Western knowledge systems requires a departure from one's known paradigm. Any integration of Indigenous Knowledge necessitates a decolonizing research stance, but then, as Kovach (2021) asks, “what is left of Western Knowledge systems?” What repurposing of existing knowledge systems, structures, and academic disciplinary formations is needed to elevate Indigenous Knowledge, improve Native Student Success, and increase presence of Indigenous faculty, administrators, and staff in the higher education context?

Albizia trees are magnificent in their way. Hundreds of thousands of these trees were brought intentionally to Hawai'i in order to hold the soil after native forests had been cleared for plantation agriculture. The trees accomplished this, but now are causing harm to the ecosystems around them. They are alive, and offer themselves as a lesson in meeting grand challenges. How do we “take them down” in a way that honors them, as kin, and finds purpose and utility for them as a more integrated forest grows?

###

About the Researchers: an intellectual genealogy

We would like to take a moment to honor our teachers and those who have come before us in this work. We also would like to honor the traditional territories where we are writing from and conducting our work respectively as well as take a moment to share our heritage and honor the people and places who have supported us.

Summer Wilkie acknowledges all her ancestors known and unknown, who are with her each moment. Each ancestral line having been displaced via various routes to the present state of Oklahoma, some in search of opportunity, others given no alternative. She is blessed with parents, grandparents, extended family and community within the foothills of the Ozark Mountains on the reservation of the Cherokee Nation of Oklahoma, land inhabited by the Wazhazhi people (Osage Nation), Caddo Nation, and Quapaw Nation prior to genocide and European and Cherokee encroachment and settlement. Summer currently resides in Fayetteville, AR, still in the Ozark foothills where she serves as the Youth Coordinator for the Indigenous Food and Agriculture Initiative. She also acknowledges and thanks Cherokee scholars Marty Matlock, Clint Carrol, and members of the IKE (Indigenous Knowledges and Experiences) Alliance for their mentorship.

Miku Lenentine was born in Seattle, WA, the traditional territory of the Co-Salish people, and she was raised in Anchorage Alaska, Dena'ina Elnena, the traditional homelands of the Dena'ina Athabaaan people. The bones of her ancestors on her Mother's side are buried with the First People of Sinaloa Mexico, though her family is not enrolled or has any tribal affiliation today. Her Mother's people are also from Northern and Southern Italy, with her Grandparents being

first generation Italian immigrants. Her Father's people are from Devils' Bit Canyon, in Tipperary Ireland and are buried with the Gaelic peoples of primarily Irish and Scottish ancestry. Miku has dedicated several years of study with traditional elders of the Saanich, Quaker, Saami and most recently, the Nahuatl lineage (her own ancestral lineage). Now living as a guest and settler on the island Oahu, Hawai'i. the traditional territory of the Kanaka'Ōiwi people, she works closely with Kumu Mālia Ko'i'ulaokawaolehua Helelā and is currently the coordinator of CERENE, the Center for Resilience Neighborhoods, housed at Kapi'olani Kula Nui Kaiāulu, Kapi'olani Community College, as the University of Hawai'i.

Krista Hiser is of Swedish and German descent, and grew up in Nebraska and Iowa, where her grandfather was a pioneer descendant and farmer on traditional lands of the Meskwaki. Krista's father left the farm and was the first to attend college, placing a family emphasis on higher education that led her to a doctoral degree in Educational Administration. She is grateful to Dr. Manulani Aluli-Meyer for core teachings of *'auamo kuleana* and holographic epistemology, and to the 19 Ways community held by Deena Metzger, who writes and teaches the Literature of Restoration. She strives to be a settler aloha 'āina, residing for over twenty years on the island of O'ahu in the ahupua'a of Waikiki in the valley of Mānoa, where she volunteers her time in native forest restoration at Waiakeakua. She is a faculty member in the Language, Linguistics, and Literature department at Kapi'olani Community College, and Senior Advisor for Sustainability Education at the Global Council for Science and the Environment.

Report References

- Bartlett, C., Marshall, M., & Marshall, A. (2012). Two-eyed seeing and other lessons learned within a co-learning journey of bringing together indigenous and mainstream knowledges and ways of knowing. *Journal of Environmental Studies and Sciences*, 2(4), 331-340.
- Bratianu, C. (2015). Knowledge Metaphors. In *Organizational Knowledge Dynamics: Managing Knowledge Creation, Acquisition, Sharing and Transformation* (pp. 1–26).
<https://doi.org/10.4018/978-1-4666-8318-1.ch001>
- Dennison, J. (2012). *Colonial Entanglement: Constituting a Twenty-First-Century Osage Nation*. University of North Carolina Press.
- Gehl, L. *Indigenous Knowledge Scholars Bibliography*. Intercontinental American Indigenous Research Association. <https://www.americanindigenousresearchassociation.org/wp-content/uploads/2013/02/Gehl-Bibliography.pdf>
- Global Council on Science and the Environment. (2021). “*Learning Series on Indigenous Knowledge & Western Science: Collaboration, Relationship, and Climate Solutions Resources*.” <https://www.gcseglobal.org/indigenous-knowledge-western-science-learning-series>
- Goodyear-Ka’ōpua, N. (2013). *The Seeds We Planted: Portraits of a Native Hawaiian Charter School*. University of Minnesota Press.
- Hayman, J. S. (2005). Exploring Indigenous entanglements in extension, land, and agriculture: An Oklahoma case study. In *M.Ag. AN ABSTRACT OF A DISSERTATION*.
- Kovach, M. (2021). *Indigenous methodologies: Characteristics, conversations, and contexts*. University of Toronto press.
- Lambert, L. *iARA Bibliography*. Intercontinental American Indigenous Research Association.

<https://www.americanindigenousresearchassociation.org/wp-content/uploads/2016/05/Research-15.pdf>

- Lambert, L. (2014). *Research for indigenous survival: indigenous research methodologies in the behavioral sciences*. University of Nebraska Press / Salish Kootenai College Press.
- Powell, J. C., Dennison, J., Lambert, V., & Tone-Pah-Hote, J. (2014). Osage ribbon work and the expression of Osage nationalism: re-imagining approaches to material culture and nationhood.
- Redcorn, S. A. (2005). *Set the prairie on fire: an autoethnographic confrontation of colonial entanglements*. (Dissertation Abstract).
- Smith, C. F. (2018). *Stand As One: Spiritual Teachings of the Keetoowah*. Dog Soldier Press.
- Sörensen, K. (2015). Metaheuristics-the metaphor exposed. *International Transactions in Operational Research*, 22(1), 3–18. <https://doi.org/10.1111/itor.12001>
- Wright, A. L., Gabel, C., Ballantyne, M., Jack, S. M., & Wahoush, O. (2019). Using two-eyed seeing in research with indigenous people: an integrative review. *International Journal of Qualitative Methods*, 18, pp. 1–19.

Appendix 1: Constellations

Note: Constellations are mini-collections of sources including peer-reviewed journal articles, unpublished papers, poems, songs, stories, media and any resource deemed important for understanding some aspect of the universe of topics related to integrating Indigenous and Western knowledge systems, particularly in STEM fields.



Example 1:

STEM Faculty Constellation: Including both Indigenous and Western Knowledge in Courses

This Constellation is organized as a reading list for a faculty cohort who might be interested in Traditional Ecological Knowledge or have been directed to increase Native student success and representation in STEM programs in higher education. These ten books and articles would provide a foundation for a collaborative course redesign workshop that would ideally also include local community partners, indigenous elders, and Native/Indigenous faculty colleagues.

We begin a month before the workshop, assigning **Braiding Sweetgrass** to establish a model and build on a widely read and well-embraced example, read alongside the Gewin article from *Nature*, a peer-reviewed publication. A deeper dive would be provided by the Medin and Bang (2014) book, which explores case studies to address “separation from nature” characteristic in Western sciences.

Kimmerer, R. W. (2013). *Braiding sweetgrass: Indigenous wisdom, scientific knowledge and the teachings of plants*. Milkweed Editions.

Gewin, V. (2021). How to Include Indigenous Researchers and their Knowledge. *Nature*. Jan; 589(7841) 315-317. doi:10.1038/d41586-021-00022-1. PMID: 33437060.

Medin, D., and Bang, M. (2014). *Who’s Asking: Native Science, Western Science, and Science Education*. M.I.T Press.

From here, educators could take a step back and consider the broader metaphors of two-eyed seeing and weaving, as well as the broader issues of decolonization, and situating education in an era of climate change that increases the urgency of transformative change.

Bartlett, C., Marshall, M., & Marshall, A. (2012). Two-eyed seeing and other lessons learned within a co-learning journey of bringing together indigenous and mainstream knowledges and ways of knowing. *Journal of Environmental Studies and Sciences*, 2(4), 331-340.

de Sousa Santos, B. (2018). *Decolonizing the university: The challenge of deep cognitive justice*. Cambridge Scholars Publishing.

Franco, R. (2010). From Service to Science in the Energy-Climate Era. *Diversity & Democracy*, AAC&U (Association of American Colleges and Universities). 13:3.

Lastly, four practical examples of course redesign or strategies would be offered, perhaps read in a Jigsaw format, with small groups reading and presenting summaries of the articles and discussing how and if the described strategy would work in their own course. Estrada uses co-curricular examples; Alkholy et al is an example of an elder co-led online science course; the “Portal into the Science of Aloha” invites a place-based spiritual perspective on conservation; Sprowles et al explore place-based learning communities.

Estrada, M. (2014). Ingredients for improving the culture of STEM degree attainment with co-curricular supports for underrepresented minority students. National Academies of Sciences White Paper.

Alkholy, S.O., Gendron, F., McKenna, B., Dahms, T., & Pontes Ferreira, M. (2017). Convergence of Indigenous Science and Western Science Impacts Students’ Interest in STEM and Identity as a Scientist. *Ubiquitous Learning: An International Journal* 10(1), 1-13. doi: 10.18848/1835-9795/CGP/v10i01/1-13 Available at: <http://digitalcommons.wayne.edu/nfsfrp/16>

Kealiikanakaoleohaililani, K., Kurashima, N., Francisco, K. S., Giardina, C. P., Louis, R. P., McMillen, H., Yogi, D. (2018). Ritual + sustainability science? A portal into the science of Aloha. *Sustainability* (Switzerland), 10(10), 1–17.

Johnson, M.D., Sprowles, A.E., Goldenberg, K., Margell, S., and Castellino, L. (2020). Effect of a Place-Based Learning Community on Belonging, Persistence, and Equity Gaps for First-Year STEM Students. *Innovative Higher Education* <https://doi.org/10.1007/s10755-020-09519-5>



Example 2:

Wan's Constellation: Sources for a Newcomer to Hawai'i

About This Constellation

This compilation of articles and sources was designed for a researcher interested in engaging in the connection of Indigenous and Western Knowledge systems in Hawaii for a research project specifically focused on working with Native Hawaiian community members. The resources listed here are intended to provide a background for someone who may have been raised as part of the dominant culture from another country who has little to no experience working in Indigenous contexts and has been raised within the Western Science research tradition.

In addition to this reading list Wan would be encouraged to sign up for 'Ōlelo Hawaiian classes, volunteer at community events and take part in as many classes which teach traditional Hawaiian culture as possible. It is critical that the readings are accompanied by direct experience with the land of Hawaii and mentorship with an experienced teacher familiar with cultural practices of this place and ideally who grew up in Hawaii. Even better, would be to study with a living "wisdom-keeper" or traditional teacher (call Kahuna) carrying Hawaiian knowledge if it is possible to do so in a responsible and respectful manner.

From Database:

CREA-HI. (2019). Evaluation with Aloha: A Framework for working in Native Hawaiian Contexts. Lili'uokalani Trust. URL: <https://www.creahawaii.com/aloha>

Gullion, J. S., & Tilton, A. (2020). *Researching with: A decolonizing approach to community-based action research*. Brill.

Osorio, Jonathan Kay Kamakawiwo'ole and Craig Howes, Eds. *The Value of Hawaii: Knowing the Past, Shaping the Future*. University of Hawai'i Press, 2010. Project MUSE muse.jhu.edu/book/1585.

Paglinawan, L., Richard P., Dennis K., & Valli, K.K. (2021). *Nānā I Ke Kumu: Look to the Source*. Vol 3. Lili'uokalani Trust.

Kimmerer, R. W. (2013). *Braiding sweetgrass: Indigenous wisdom, scientific knowledge and the teachings of plants*. Milkweed Editions.

Kovach, M. (2021). *Indigenous methodologies: Characteristics, conversations, and contexts*. University of Toronto press.

Additional Sources:

- Beckwith, M. W. (2000). *The kumulipo: a Hawaiian creation chant*. University of Hawaii Press.
- Eyers, P. (2016). *Ancient spirit rising: Reclaiming your roots & restoring earth community*. Stone Circle Press.
- Fetterman, D. M. (1994). Empowerment evaluation. *Evaluation practice*, 15(1), 1-15.
- Meyer, M. A. (2001). Our own liberation: Reflections on Hawaiian epistemology. *The Contemporary Pacific*, 124-148.
- Meyer, M. A. (2007, February 5). Aloha Is Our Intelligence - A Visit With Manu Aluli Meyer. [Video]. YouTube. <https://www.youtube.com/watch?v=8xNBxVGBEF0>
- Meyer, M. A. (2018, October 6). Ep. 37: Manulani Aluli Meyer - Hawaiian Epistemology [Video]. YouTube. https://www.youtube.com/watch?v=vFoM9IGyfp0&ab_channel=AlohaAuthentic
- Meyer, M. A. (2021, October 14). Ho`opono: Mutual Self Becoming by Dr. Manulani Meyer. [Video]. YouTube. https://www.youtube.com/watch?v=riGUhRrVNs4&ab_channel=mhaofhawaii
- Kapi`olani Community College. *Ka Wehena Kaiao: The breaking of dawn*. (2021). Barbara Pope Book Design.
- University of Hawai'i at Mānoa. Land Acknowledgement: Ka nui e 'auamo ai i ka hue wai. Native Hawaiian Place of Learning Advancement Office. <https://manoa.hawaii.edu/nhpol/auamo/land-acknowledgment/>
- Wright, A. L., Gabel, C., Ballantyne, M., Jack, S. M., & Wahoush, O. (2019). Using two-eyed seeing in research with indigenous people: an integrative review. *International Journal of Qualitative Methods*, 18, pp. 1–19.

Weaving Indigenous and Western Knowledge Bibliography v002 011023

- Albert, T. F. (2001). The influence of Harry Brower, Sr., an Iñupiaq Eskimo hunter, on the bowhead whale research program conducted at the UIC-NARL facility by the North Slope Borough. *Fifty More Years Below Zero*, 265-278.
- Alkholly, S.O., Gendron, F., McKenna, B., Dahms, T., & Pontes Ferreira, M. (2017). Convergence of Indigenous Science and Western Science Impacts Students' Interest in STEM and Identity as a Scientist. *Ubiquitous Learning: An International Journal* 10(1), 1-13. doi: 10.18848/1835-9795/CGP/v10i01/1-13 Available at: <http://digitalcommons.wayne.edu/nfsfrp/16>
- Altman, H. M., & Belt, T. N. (2008). Reading history: Cherokee history through a Cherokee lens. *Native South*, 1(1), 90-98.
- Anthony-Stevens, V., & Matsaw Jr, S. L. (2020). The productive uncertainty of indigenous and decolonizing methodologies in the preparation of interdisciplinary STEM researchers. *Cultural Studies of Science Education*, 15(2), 595-613.
- Bartlett, C., Marshall, M., & Marshall, A. (2012). Two-eyed seeing and other lessons learned within a co-learning journey of bringing together indigenous and mainstream knowledges and ways of knowing. *Journal of Environmental Studies and Sciences*, 2(4), 331-340.
- Baumflek, M., DeGloria, S., & Kassam, K. A. (2015). Habitat modeling for health sovereignty: Increasing indigenous access to medicinal plants in northern Maine, USA. *Applied Geography*, 56, 83-94.
- Baynes, C. (2001). *Iching*. Grange.
- Berkes, F. (2000). Rediscovery of Traditional Ecological Knowledge As Adaptive Management. *Ecological Applications*, 10(5), 1251-1262.
- Borrego, M. & Henderson, C. (2014) Increasing the Use of Evidence-Based Teaching in STEM Higher Education: A comparison of eight change strategies. Special Issue of The Research *Journal for Engineering Education: The Complexities of Transforming Engineering Higher Education* 103(2), 220-252. doi.org/10.1002/jee.20040
- Bowman, N. R., Dodge Francis, C., & Tyndall, M. (2015). Culturally Responsive Indigenous Evaluation: A practical approach for evaluating Indigenous projects in tribal reservation contexts. In Hood, S., Hopson, R., & Frierson, H. (eds.) *Continuing the Journey to Reposition Culture and Cultural Content in Evaluation Theory* (pp. 335-360). Charlotte, NC: Information Age.
- Bowman, N. R. (2018). Looking Backward but Moving Forward: Honoring the sacred and asserting the sovereign in Indigenous evaluation. *American Journal of Evaluation*, Fall.
- Bowman, N.R. (2020). Nation-to-Nation in Evaluation: Utilizing an Indigenous Evaluation Model to Frame Systems and Government Evaluation. *New Directions for Evaluation*, Summer (166), 101-118.
- Burkhard, S., and Kant, J, eds. (2018). *The PEEC Experiment: Native Hawaiian and Native American Engineering Education*.
- Cajete, G., & Bear, L. L. (2000). *Native science: Natural laws of interdependence* (Vol. 315). Santa Fe, NM: Clear Light Publishers.

- Carroll, C. (2015). *Roots of our renewal: Ethnobotany and Cherokee environmental governance*. U of Minnesota Press.
- Chang, K., Winter, K. B., & Lincoln, N. K. (2019). *Hawai'i in Focus : Navigating Pathways in Global Biocultural Leadership*. 1–9.
- Chilisa, B. (2019). *Indigenous Research Methodologies*. Sage Publications.
- Carroll, C. (2015). *Roots of our renewal: Ethnobotany and Cherokee environmental governance*. U of Minnesota Press.
- Confederated Salish Kootenai Tribes of the Flathead Nation (2013). *Climate Change Strategic Plan*.
- Corntassel, J. (2012). Re-envisioning resurgence: Indigenous pathways to decolonization and sustainable self-determination. *Decolonization: Indigeneity, Education & Society*, 1(1).
<https://jps.library.utoronto.ca/index.php/des/article/view/18627/15550>
- Couture, J. E. (2013). *A metaphoric mind: Selected writings of Joseph Couture*. Athabasca University Press.
- de Sousa Santos, B. (2018). *Decolonizing the university: The challenge of deep cognitive justice*. Cambridge Scholars Publishing.
- Deloria Jr, V. (1991). Higher Education and Self-Determination. *Winds of Change*, 6(1), 12-18.
- Deloria, V., Deloria Jr, V., & Wildcat, D. (2001). *Power and place: Indian education in America*. Fulcrum Publishing.
- Dennison, J. (2012). *Colonial entanglement: Constituting a twenty-first-century Osage Nation*. UNC Press Books.
- Donn, D. (1980). *Ethnic Plants of the Early Salish and Kootenai People*. Salish Kootenai Community College.
- Dowie, M. (2011). *Conservation refugees: the hundred-year conflict between global conservation and native peoples*. MIT press.
- Dunbar-Ortiz, R. (2014). *An indigenous peoples' history of the United States* (Vol. 3). Beacon Press.
- Dweck, C. S., & Leggett, E. L. (1988). A Social-Cognitive Approach to Motivation and Personality. *Psychological review*, 95(2), 256.
- Estes, N. (2019). *Our history is the future: Standing Rock versus the Dakota Access Pipeline, and the long tradition of Indigenous resistance*. Verso.
- Estrada, M. (2014). Ingredients for improving the culture of STEM degree attainment with co-curricular supports for underrepresented minority students. National Academies of Sciences White Paper.
- Estrada, M., Burnett, M., Campbell, A.G., Campbell, P.B., Denetclaw, W.F., Gutiérrez, C.G., ... & Zavala, M. (2016). Improving Underrepresented Minority Student Persistence in STEM. *CBE-Life Sciences Education*, 15(3), es5.
- Figueroa, RM (2011). Indigenous People and Cultural Loss. In: Dryzek JS, Nirgaard, RB, Schlosberg, D. (eds), *The Oxford handbook of climate change and society*. Oxford University Press. Oxford.
- Forbes, Jack. (2008). *Columbus and Other Cannibals: The Wétiko Disease of Exploitation, Imperialism and Terrorism*. New York: Seven Stories Press.

- Fox, S. L., & Altman, H. M. (2009). *Under the Rattlesnake: Cherokee health and resiliency*. University of Alabama Press.
- Cardwell, K. (2007, February). Aloha is Our Intelligence – A Visit with Manu Aluli Meyer [YouTube Video]. Retrieved from https://www.youtube.com/watch?v=8xNBxVGBEF0&list=PLuKUcmg_jf0GoS1ItAewxGIOMY8ocqLFI&ab_channel=VoicesOfTruth-One-On-OneWithHawai%60i%CA%BBsFuture
- Franco, R. (1995). *Water: Its Meaning and Management in Pre-Contact Hawaii*. Water Resource Research Center, Project Report 96-02. University of Hawaii at Manoa.
- Franco, R. (2010). Faculty Engagement in the Community Colleges: Constructing a New Ecology of Learning. in *Handbook of Engaged Scholarship: Contemporary Landscapes, Future Directions*. East Lansing. Michigan State University Press.
- Franco, R. (2010). From Service to Science in the Energy-Climate Era. *Diversity & Democracy*, AAC&U (Association of American Colleges and Universities). 13(3).
- Franco, R., Poblete, J., & Severance, C. (2023). *Seafood Solidarity and Sovereignty in the Samoan Bioregion: Finding Balance in the Spaces Between*. Paper presented at "Food Sovereignty" session at annual Association for Social Anthropology in Oceania Conference, Kona, HI. 2023.
- Galindo, E. (2021) *Gatherings to Transcend Barriers to Success Oral Essay*. https://youtu.be/-Yn_KEcZiOw
- Galindo, E., Lambert, L., & Shockey, T. (2022). Gatherings to Transcend Barriers: For this Generation and Those to Come. *Journal of Native Sciences*, 2(1), 1-19.
- Garrett, M.T. (1998a, January). Donelawega. Workshop presented to the Association for Specialists in Group Work 1998 National Conference, Tucson, AZ.
- Garrett, M.T. (1998b). *Walking on the Wind*. Santa Fe, NM: Bear & Co.
- Gavin, M. C., McCarter, J., Mead, A., Berkes, F., Stepp, J. R., Peterson, D., & Tang, R. (2015). Defining biocultural approaches to conservation. *Trends in Ecology and Evolution*, 30(3), 140–145.
- Gewin, V. (2021). How to Include Indigenous Researchers and their Knowledge. *Nature*. Jan; 589(7841) 315-317. doi:10.1038/d41586-021-00022-1. PMID: 33437060.
- Gilio-Whitaker, D. (2019). *As Long as Grass Grows: The Indigenous Fight for Environmental Justice from Colonization to Standing Rock*. Boston: Beacon Press.
<https://search.ebscohost.com/login.aspx?direct=true&scope=site&db=nlebk&db=nlabk&AN=1844249>.
- Goodyear-Ka‘ōpua, Noelani, Craig Howes, Jonathan Kay Kamakawiwo‘ole Osorio, and Aiko Yamashiro, Eds. (2021). *The Value of Hawai‘i 3: Huluhia, the Great Turning*. Honolulu: UH Press.
- Gullion, J. S., & Tilton, A. (2020). *Researching with: A decolonizing approach to community-based action research*. Brill.
- Hale, D. K. (1991). *Researching and writing tribal histories*. Michigan Indian Press.
- Harjo, L. (2019). *Spiral to the stars: Mvskoke tools of futurity*. University of Arizona Press.
- Hasager, U. and Kirkpatrick, J. (2013). Partnership for Learning and Community at Pālolo Valley Homes. *Diversity & Democracy*, AAC&U (Association of American Colleges and Universities). 16:1.

- Hau'Ofa, E. (2008). *We are the ocean*. University of Hawaii Press.
- Hayman, J. (2021). *Exploring Indigenous entanglements in extension, land, and agriculture: An Oklahoma case study* (Doctoral dissertation).
- Hazel, T. (2022). *Social Forestry Handbook*. [Book submitted for publication].
- Hiser, K., Kuntz, W. & Davis, H. (2017). *Ho'omaou Kapi'olani* (Kapi'olani Community College Sustainability and Climate Action plan).
- Hood, S., Hopson, R.K., & Kirkhart, K.E. (2015). Culturally Responsive Evaluation. In Newcomer, K.E. Hatry, H.P., Wholly, J.S.: *Handbook of Practical Program Evaluation* (pp. 281-317). Available at: <https://nasaa-arts.org/wp-content/uploads/2017/11/CRE-Reading-1-Culturally-Responsive-Evaluation.pdf>
- Hosmer, B.C., O'Neill, C., Fixico, D.L., (2004). *Native Pathways: American Indian Culture and Economic Development in the 20th Century*. University Press of Colorado. Boulder.
- Hughes, Joanne (2018) Why Indigenous Studies Matters for Natural Science Students.
- Hultrantz, A. (1980). *The Religions of the American Indians*. Berkeley: Univ. of California Press.
- Hunt, J.C. (2021). *The Neutral Ground* [Documentary]. USA: American Documentary/POV.
- Isaacson, W. (2014). *The Innovators: How a group of inventors, hackers, geniuses and geeks created the digital revolution*. Simon and Schuster.
- Johnson, J. T., Howitt, R., Cajete, G., Berkes, F., Louis, R. P., & Kliskey, A. (2016). *Weaving Indigenous and sustainability sciences to diversify our methods*. *Sustainability Science*, 11(1), 1-11.
- Johnson, M.D., Sprowles, A.E., Goldenberg, K., Margell, S., and Castellino, L. (2020). Effect of a Place-Based Learning Community on Belonging, Persistence, and Equity Gaps for First-Year STEM Students. *Innovative Higher Education* <https://doi.org/10.1007/s10755-020-09519-5>
- Johnson, M.D., Sprowles, A.E., Overeem, K.M., Rich, A. (2017). A Place-based Learning Community: Klamath Connection at Humboldt State University. *Learning Communities Research and Practice* (5)2, Article 4. <https://washingtoncenter.evergreen.edu/lcrjournal/vol5/iss2/4>
- Karuk Tribal Council. (2014). Protocol on Karuk Tribe's Intellectual Property Rights Research, Publication and Recordings: https://sipnuuk.karuk.us/system/files/atoms/file/ATALM17_KTRResearchProtocol.pdf
- Kealiikanakaoleohaililani, K., Kurashima, N., Francisco, K. S., Giardina, C. P., Louis, R. P., McMillen, H., Yogi, D. (2018). Ritual + sustainability science? A portal into the science of Aloha. *Sustainability* (Switzerland), 10(10), 1–17.
- Kezar, A., and Gehrke, S. (2015). *Communities of Transformation and Their Work Scaling STEM Reform*. Pullias Center for Higher Education. <https://eric.ed.gov/?id=ED574632>
- Kimmerer, R. W. (2013). *Braiding sweetgrass: Indigenous wisdom, scientific knowledge and the teachings of plants*. Milkweed Editions.
- Kovach, M. (2021). *Indigenous methodologies: Characteristics, conversations, and contexts*. University of Toronto press.

- Kretzmann, J., McKnight, R. (1993). *Mapping Communities from the Inside Out: A Path Toward Finding and Mobilizing a Community's Assets*. Center for Urban Affairs and Policy Research, Northwestern University, ACTA Publications, Chicago, Illinois.
- Lambert, L. *Conceptual Model of Indigenous Research Paradigm*. iAIRA.
<https://www.americanindigenousresearchassociation.org/mission/spider-conceptual-framework/>
- Lewis, M., Myhra, L., Vieaux, L. E., Sly, G., Anderson, A., Marshall, K. E., & Marshall, E. J. (2019). Evaluation of a native youth leadership program grounded in Cherokee culture: The remember the removal program. *American Indian and Alaska native mental health research* (Online), 26(1), 1-32.
- Lili'uokalani Trust. (2019). *Aloha Evaluation: A Framework for Working in Native Hawaiian Contexts*. CREA-HI. <https://www.creahawaii.com/aloha>
- La Valle, F. F., Camvel, D. A. K., Thomas, F. I. M., Aikau, H. K., and Lemus, J. D. (2019). Interdisciplinary Research through a Shared Lexicon: Merging 'Ike Kupuna and Western Science to Examine Characteristics of Water. *Hulili: Multidisciplinary Research on Hawaiian Well-Being* 11(8), 167–85.
- Malcom-Piqueux, L. (2020). *Transformation in the U.S. Higher Education System: Implications for racial Equity*. Commissioned paper for Symposium on Imagining the Future of Undergraduate STEM Education. The Symposium was convened virtually by the Board on Science Education on November 12, 13, and 19 with support from the National Science Foundation. MS 24pp.
- Manning, B. R. M. (2011). *Trust in the land: new directions in tribal conservation*. University of Arizona Press.
- Maryboy, N.C., Begay, D., & Peticolas, L. (2012). *The Cosmic Serpent: Collaboration with Integrity. Bridging Native Ways of Knowing and Western Science in Museums Settings*. (Teren, C.S., Hauck, K., Paglierani, R. & Frapier, R. Ed.s). Indigenous Education Institute.
- McCleary, T. P. (2011). *The Stars We Know: Crow Indian Astronomy and Lifeways*. Waveland Press.
- McClellan, G.S. (2018). *Beyond Access: Indigenizing programs for Native American student success*. Stylus Publishing, LLC.
- McConnell, M., Montplaisir, L., & Offerdah, E. (2019). Meeting the conditions for diffusion of teaching innovations in a university STEM department. *Journal for STEM Education Research*
<https://doi.org/10.1007/s41979-019-00023-w>
- McGee, E., & Bentley, L. (2017). The Equity Ethic: Black and Latinx college students reengineering their STEM careers toward justice. *American Journal of Education*, 124(1), 1-36.
- Meador, A. (2018). Examining Recruitment and Retention Factors for Minority STEM Majors through a Stereotype Threat Lens. *School Science and Mathematics*, 118(1-2), 61-69.
- Medin, D., and Bang, M. (2014). *Who's Asking: Native Science, Western Science, and Science Education*. M.I.T Press.
- Merculieff, Ilarion and Libby Roderick. (2013). *Stop talking: Indigenous Ways of Teaching and Learning and Difficult Dialogues in Higher Education*. University of Alaska Anchorage.
- Meyer, M. A. (2001). *Our own liberation: Reflections on Hawaiian epistemology*. *The Contemporary Pacific*, 124-148.
- Meyer, M. A. (2013). *Holographic Epistemology: Native Common Sense*. *China Media Research* 9(2), 94-101.

- Meyer, M. A. (2018). *Ho'oulu Our Time of Becoming*. Native Books; 1st edition.
- Mihesuah, D. A., & Hoover, E. (Eds.). (2019). *Indigenous food sovereignty in the United States: Restoring cultural knowledge, protecting environments, and regaining health*. University of Oklahoma Press.
- Molnár, Z., & Berkes, F. (2018). Role of traditional ecological knowledge in linking cultural landscapes. In C. Paracchini, M.L., Zingari, P.C., Blasi (Ed.), *Reconnecting Natural and Cultural Capital: Contributions from Science and Policy* (pp. 183–193).
- Morgart, T. (n.d.). Protocol for Research, Publication and Recordings: Motion, Visual, Sound, Multimedia and other Mechanical Devices. Hopi Cultural Preservation Office. Kykotsmovi, AZ.
- Mooney, J. (1982). *Myths of the Cherokee and Sacred Formulas of the Cherokee*. Nashville: Charles and Randy Elder.
- Moore, G.A. (2006) *Crossing the Chasm: Marketing and Selling High-Tech Products to Mainstream Customers*. Harper Business.
- Morishige, K., Andrade, P., Pascua, P., Steward, K., Cadiz, E., Kapono, L., & Chong, U. (2018). Nā Kilo 'Āina: Visions of Biocultural Restoration through Indigenous Relationships between People and Place. *Sustainability*, 10(10), 3368. <https://doi.org/10.3390/su1010336>.
- Mosholder, R.S., Waite, B., Larsen, C.A. and Goslin, C. (2016). Promoting Native American College Student Recruitment & Retention in Higher Education. *Multicultural Education*, 23, 27-36.
- Nicholls, J.G. (1984). Achievement Motivation: conceptions of ability, subjective experience, task choice, and performance. *Psychological Review*, 91(3), 328.
- NSF (1997). User-Friendly Handbook for Mixed Method Evaluations. Directorate for Education and Human Resources, Division of Research, *Evaluation and Communication*. Available at <https://www.nsf.gov/pubs/1997/nsf97153/start.htm>
- NSF (2001). Introduction to Mixed Method Evaluations. Directorate for Education and Human Resources, Division of Research, Evaluation and Communication. Available at <https://www.unco.edu/research/pdf/grant-writing-websites-docs/mixed-method-evaluations.pdf>
- Osorio, Jonathan Kay Kamakawiwo'ole and Craig Howes, Eds. *The Value of Hawaii: Knowing the Past, Shaping the Future*. University of Hawai'i Press, 2010. Project MUSE muse.jhu.edu/book/1585.
- Paglinawan, L., Richard P., Dennis K., & Valli, K.K.(2021). Nānā I Ke Kumu: Look to the Source, Vol 3. Lili'uokalani Trust. <https://onipaa.org/pages/nana-i-ke-kumu>
- Pascua, P., McMillen, H., Ticktin, T., Vaughan, M., & Winter, K. B. (2017). Beyond services: A process And framework to incorporate cultural, genealogical, place-based, and indigenous relationships in ecosystem service assessments. *Ecosystem Services*, 26, 465–475.
- Pascual, U., Balvanera, P., Díaz, S., Pataki, G., Roth, E., Stenseke, M., ... Yagi, N. (2017). Valuing nature's contributions to people: the IPBES approach. *Current Opinion in Environmental Sustainability*, 26–27, 7–16.
- Perez, Craig Santos. (2016). *Water is Life*. <http://craigsantosperez.wordpress.com>.
- Powell, J. C. (2014). *Osage ribbon work and the expression of Osage nationalism: Re-imagining approaches to material culture and nationhood* (Doctoral dissertation, The University of North Carolina at Chapel Hill).

- Raymond A. Dixon, Karla Eitel, Yudi Zhu. (2019) Developing STEM Identity of Nez Perce Students: Identifying Entry-Level Competencies for Forestry and Fire Management University of Idaho.
- Raymond, C. M., Fazey, I., Reed, M. S., Stringer, L. C., Robinson, G. M., & Evely, A. C. (2010). Integrating local and scientific knowledge for environmental management. *Journal of Environmental Management*, 91(8), 1766–1777.
- RedCorn, S. A. (2017). *Set the prairie on fire: An autoethnographic confrontation of colonial entanglements*. Kansas State University.
- Robertson, J.C. (2018). The Impact of Data Sovereignty on American Indian Self-Determination: A Framework Proof of Concept Using Data Science. Electronic Theses and Dissertations. 2485. <https://openprairie.sdstate.edu/etd/2485>
- Rogers, A. (2020) Mary and the Trail of Tears: A Cherokee Removal Survival Story. https://www.cherokeephoenix.org/news/chokeee-author-releases-mary-and-the-trail-of-tears/article_25b73ceb-d944-5914-9d02-0d505711c8e5.html
- Rogers, E.M. (2003). *Diffusion of Innovations*. Simon and Schuster.
- Saltmarsh, J. and Zlotkowski, E. (2010). “*Epistemology and Engagement*,” in *Higher Education and Democracy: Service-Learning and Civic Engagement*. Temple University Press.
- Schreck, J. (2021). We Are Still Here! Native American Truths Everyone Should Know. *The Catholic Library World*, 92(1), 73-73.
- Shachter, A. & Barnett, J.J. (2012). Chapter 15 in Sheardy, R.D. & Burns D. (eds.) *Science Education and Civic Engagement: The Next Level*. ACS Division of Chemical Education. DOI: 10.1021/bk-2012-1121
- Shirt-Shaw, M.R. (2020). Beyond the land acknowledgment: College ‘LAND BACK’ or free tuition for Native students. *Policy and Practice Brief (Hack the Gates, 2020)*, https://hackthegates.org/wp-content/uploads/2020/08/Redshirt-Shaw_Landback_HTGreport.pdf.
- Smith, C. F. (2018). *Stand As One: Spiritual Teachings of the Keetoowah*. Dog Soldier Press.
- Smith, J. L., Cech, E., Metz, A., Huntoon, M., & Moyer, C. (2014). Giving back or giving up: Native American student experiences in science and engineering. *Cultural Diversity and Ethnic Minority Psychology*, 20(3), 413.
- Smith, L. T. (2019). *Decolonizing research: Indigenous storywork as methodology*. Bloomsbury Publishing.
- Smith, L. T. (2021). *Decolonizing methodologies: Research and indigenous peoples*. Zed Books Ltd.
- Snyder, T.D., & Dillow, S.A. (2015). Digest of Education Statistics 2013. NCES 2015-011. National Center for Education Statistics.
- Sörensen, K. (2015). Metaheuristics-the metaphor exposed. *International Transactions in Operational Research*, 22(1), 3–18. <https://doi.org/10.1111/itor.12001>
- Sprowles, A.E., Goldenberg, K. , Goley, P.D., Ladwig, S., Shaughnessy, F.J., Malloy, K.J., Baldy, C.R., Mola, M.M., Smith, J.R. (2019). Place-Based Learning Communities on a Rural Campus: Turning Challenges into Assets. *Learning Communities Research and Practice* 7(1), Article 6. Available at: <https://washingtoncenter.evergreen.edu/lcrjournal/vol7/iss1/6>

- Stanton, G. (n.d.) Persecution: Karankawas, Our Land In *The Ten Stages of Genocide Graphic Novel Series*. Dallas Holocaust and Human Right's Museum. https://www.dhhrm.org/graphic_novels/
- Sterling, E. J., Filardi, C., Toomey, A., Sigouin, A., Betley, E., Gazit, N., Jupiter, S. D. (2017). Biocultural approaches to well-being and sustainability indicators across scales. *Nature, Ecology and Evolution*, 1(12),1798–1806.
- Sze, J., ed. (2018). *Sustainability: Approaches to Environmental Justice and Social Power*. New York: New York University Press.
- Talbot, M. (1991). *The holographic universe*. Harper Perennial Press.
- Tecun, A., Hafoka, 'I., 'Ulu'ave, L., 'Ulu'ave-Hafoka, M. (2018). Talanoa: Tongan epistemology and Indigenous research method. *AlterNative*, 14(2), 156-63.
- Thoman, D.B., Arizaga, J.A., Smith, J.L., Story, T.S., & Soncuya, G. (2014). The Grass is Greener in Non-Science, Technology, Engineering, and Math Classes: Examining the role of competing belonging to undergraduate women's vulnerability to being pulled away from science. *Psychology of Women Quarterly*, 38(2), 246-258.
- Thompson, I. (2019). *Choctaw Food: Remembering the Land, Rekindling Ancient Knowledge*. Choctaw Nation of Oklahoma.
- Ticktin, T., Quazi, S., Dacks, R., Tora, M., McGuigan, A., Hastings, Z., & Naikatini, A. (2018). Linkages between measures of biodiversity and community resilience in Pacific Island agroforests. *Conservation Biology*, 32(5), 1085–1095.
- Treuer, A. (2021). *Everything You Wanted to Know about Indians But Were Afraid to Ask: Young Readers Edition*. Chronicle Books.
- Treuer, A. (2021). *The Cultural Toolbox: Traditional Ojibwe Living in the Modern World*. Minnesota Historical Society Press.
- Treuer, D. (2019). *The heartbeat of Wounded Knee: Native America from 1890 to the present*. Riverhead Books.
- Tuck, E. & Guishard, M. (2013). *Uncollapsing Ethics: Racialized Sciencism, Settler Coloniality, and Ethical Framework of Decolonial Participatory Action Research*. In *Challenging Status Quo Retrenchment* (pp. 3-27). Information Age Publishing.
- Van Tilburg, H., Watson, T. K., Faria, K., Hoomanawanui, K., Ho-Lastiama, I., Ritte, W., ... & Ball, D. (2017). A guidance document for characterizing native Hawaiian cultural landscapes. US Department of the Interior, Bureau of Ocean Energy Management, Pacific OCS Region, Camarillo, CA. OCS Study BOEM 2017-023.
- Voyageur, C.J., Calliou, B., & Brearley L., (eds.) (2015). *Restorying Indigenous Leadership: Wise practices in community development*. Banff, Alberta, Canada: Banff Centre Press.
- Ward, C., Demetropoulos, J., Horan, H., Rainock, M., Tatham, L., & Wixom, J. (2019). Native College Student STEM Experiences. *On Indian Ground: The Northwest*, 179.
- Waters, F. (1977). *Book of the Hopi*. N.Y.: Penguin Books.

- Wehipeihana, N. (2019). Increasing Cultural Competence in Support of Indigenous-Led Evaluation: A necessary step toward indigenous-led evaluation. *The Canadian Journal of Program Evaluation* 34(2). DOI: <https://doi.org/10.3138/cjpe.68444>
- Whyte, K. (2018). What Do Indigenous Knowledges Do for Indigenous Peoples? Nelson M.K. & Shilling, D. (eds.) *Traditional Ecological Knowledge: Learning from Indigenous practices for environmental sustainability* (pp. 57-81). New York: Cambridge University Press.
- Whyte, KP (2013). Justice Forward: Tribes, climate adaptation and responsibility. *Climate Change*, 120 (3), 117-130.
- Whyte, KP (2017). Indigenizing Climate Change Studies: Futures and Decolonizing the Anthropocene. *English Language Notes*, 55 (1), 153-162, Project Muse.
- Wilber, K. (1995). *Sex, Ecology and Spirituality: The Spirit of Evolution*. Shambhala Press.
- Wilbur, J.R., Wilbur, M., Garrett, M.T., & Yuhas, M. (2001). Talking circles: Listen, or your tongue will make you deaf. *Journal for Specialists in Group Work*, 26 (4), 368-384.
- Wildcat, DR (2009). *Red alert! Saving the planet with indigenous knowledge*. Fulcrum Publishing.
- Wildcat, M., McDonald, M., Irlbacher-Fox, S., & Coulthard, G. (2014). Learning from the land: Indigenous land based pedagogy and decolonization. *Decolonization: Indigeneity, Education & Society*, 3(3).
- Wilkins, D. E., & Lomawaima, K. T. (2001). *Uneven ground: American Indian sovereignty and federal law*. University of Oklahoma Press.
- Williamson, R.A. (1989). *Living the Sky. The Cosmos of the American Indian*. Norman: Univ. of Oklahoma Press.
- Wilson, D.H. (2011). *Robopocalypse*. Doubleday.
- Wilson, N., Mutter, E., Inkster, J., and Sutterfield, T. (2018). Community-Based Monitoring as the practice of Indigenous Governance: A case study of indigenous-led water quality monitoring in the Yukon River Basin. *Journal of Environmental Management*, Vol. 201, pp. 290-298.
- Wilson, S. (2008). Research is ceremony. *Indigenous research methods*. Winnipeg: Fernwood.
- Windchief, S., & Brown, B. (2017). Conceptualizing a Mentoring Program for American Indian/Alaska Native Students in the STEM Fields: A review of the literature. *Mentoring & Tutoring: Partnership in Learning*, 25(3), 329-345.
- Windchief, S., & San Pedro, T. (eds.). (2019). *Applying Indigenous research methods: Storying with peoples and communities*. Routledge.
- Winter, K., Chang, K., Lincoln, N., (2019). Biocultural Restoration in Hawai'i. *Special Issue of Sustainability*.
- Wolf, P.R., & Rickard, J.A. (2003). Talking circles: A Native American approach to experiential learning. *Journal of Multicultural Counseling and Development*, 31(1), 39-43.
- Wright, A. L., Gabel, C., Ballantyne, M., Jack, S. M., & Wahoush, O. (2019). Using two-eyed seeing in research with indigenous people: an integrative review. *International Journal of Qualitative Methods*, 18, pp. 1–19.
- Ybarra, P. S. (2016). *Writing the Goodlife: Mexican American literature and the environment*. University of Arizona Press.