COURTESY THE OREGON MUSEUM OF SCIENCE AND INDUSTRY (OSHI)

Roots of Wisdom

Native Knowledge. Shared Science. And Collaboration with Integrity

Victoria Coats, Nancy Maryboy, David Begay

left

Tribal elders and community members introduce visitors to each Native culture in videos produced in collaboration with *Roots of Wisdom* partners.

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fig. 1.

Roots of Wisdom: Native Knowledge. Shared Science. was first shown at OMSI in summer 2014, then toured to tribal museum partners at Tamástslikt Cultural Institute in Pendleton, Oregon and Hibulb Cultural Center in Tulalip, Washington in 2015.

The Oregon Museum of Science & Industry (OMSI) and the Indigenous Education Institute (IEI) colored outside the lines to colead *Roots of Wisdom: Native Knowledge. Shared Science.* This traveling exhibition, part of a six-year project funded by the National Science Foundation, explores the value, relevance, and complementary nature of traditional ecological knowledge (TEK) and environmental science for understanding the natural world.[1] According to Charles Menzies and Caroline Butler, "Traditional Ecological Knowledge is the term used to describe the knowledge and beliefs that Indigenous peoples hold of their environments that is handed down through the generations...."[2] A growing number of people, including many non-Native scientists, view traditional knowledge and Western science as two "ways of knowing" that can be complementary rather than contradictory, especially when considering ecological systems.

Roots of Wisdom is a 2,000-square-foot exhibition that began touring in 2015 (fig. 1). It features vibrant images and stories that explore environmental restoration projects in four geographically and culturally diverse Indigenous communities in the Pacific Northwest, Hawaii, and North Carolina. We designed the exhibition to be collaborative and inclusive in many different ways. Our organizations shared leadership.

Both Native and non-Native evaluators led the project evaluation, which was designed to emerge from reciprocal collaboration with project partners. The exhibition was codeveloped with partners from each of the four Indigenous communities (intro image). And the intended audience is Native and non-Native visitors at both science and tribal museums across North America.

Unlike many museum exhibitions about Native American life and culture, the project is not built around a collection of objects or artworks, and does not present and interpret traditional lifeways. *Roots of Wisdom* is an interactive, science museum exhibition about contemporary ecological and cultural restoration. Collaboration between a completely non-Indigenous science center and many Indigenous communities and organizations continues to be a source of professional and personal growth for everyone involved. We find that as we learn about other cultures and respectful ways to work together, we are also learning deeply about ourselves and gaining insights into our own cultures, including our organizational cultures and the culture of science.

We wrote this article as a dialogue responding to questions. We did this because we feel it's important for readers to know who is speaking and to speak clearly from our different perspectives. Victoria Coats is the principal investigator for *Roots of Wisdom* and has over 30 years of experience at OMSI in informal science education, exhibit development, and project collaboration. Coprincipal investigators Nancy Maryboy

1 The NSF award (DRL–1010559) is titled *Generations of Knowledge: Traditional Ecological Knowledge and Environmental Science*. The exhibition is titled *Roots of Wisdom: Native Knowledge. Shared Science*.
2 Charles Menzies and Caroline Butler, "Understanding Ecological Knowledge," in *Traditional Ecological Knowledge and Natural Resource Management*, ed. Charles R. Menzies (Lincoln, Nebraska: University of Nebraska Press, 2006).

fig. 2. Dr. David Begay and Dr. Nancy Maryboy, coleaders of *Roots of Wisdom*, discuss traditional fishponds on O'ahu with Hawaiian elder Dr. VerlieAnn Malina-Wright (left).

(Cherokee/Diné [Navajo]) and David Begay (Diné [Navajo]) are the leaders and founders of the Indigenous Education Institute, a 21-year-old nonprofit organization created for the preservation and contemporary application of traditional Indigenous knowledge (fig. 2). In addition to our shared leadership of *Roots of Wisdom*, we have also worked together on IEI-led professional development projects, including *Cosmic Serpent: Bridging Native and Western Science Learning in Informal Settings* and *Native Universe: Indigenous Voice in Science Museums*.

A note on our choice of words. While style guides tend to disagree with us, we use the words "Indigenous" and "Native" more often than "Native American" or "Indian." Because the project includes Native Hawaiians, these words are more accurate and inclusive. We are in the practice of capitalizing "Native" and "Indigenous" just as you would capitalize "Western" or "Native American."

1 What did we learn about creating a deeply collaborative project that could encompass Western and Indigenous knowledge, educators, cultures, communities, partners, and audiences?

Vicki (OMSI): I learned, "It's not a do-it-yourself project." To cross boundaries into other cultures and worldviews appropriately and respectfully, you need collaborators and partners for all aspects of the project. When we began, we understood that we needed some kind of collaboration on the development and dissemination of the exhibition and other deliverables. We gathered an advisory group of Native scholars and experts in traditional ecological knowledge, asked tribal museums to collaborate with us in exhibition development and as tour venues, and looked for Indigenous partners that were actively applying TEK and environmental science in their communities.

However, this was not enough to create a viable project. We were still in our comfort zone within the familiar outlines of past projects. The project became viable when we partnered with Indigenous Education Institute as coleaders and asked Nancy and David to be coprincipal investigators for the proposal to NSF. The IEI, an all Native-led organization, advocated for a strong and shared partnership with OMSI, and brought essential leadership and wisdom to our collaboration with Indigenous communities across the nation. Through their existing relationships, they connected the project with key Native partners, including tribal museums, evaluators, knowledge holders, and Indigenous communities engaged in ecological and cultural restoration.

Nancy and David (IEI): This was an equally challenging project for us, too. Although we had many years of experience with cross-cultural collaboration, it was primarily in the area of professional development with projects like *Cosmic Serpent*, a series of workshops we created to increase the capacity of museum practitioners to bridge Native and Western science, and *Native Universe*, a project we established to deepen and institutionalize Native ways of knowing in science museums, both funded by the National Science Foundation. Each time we collaborate with a museum, science center, or tribal community, the project takes on its own unique qualities and process. In the case of *Roots of Wisdom*, this meant embracing different worldviews and perspectives among four Native communities, one large science center, and our Indigenous Education Institute.

There had been years of mistrust of Western institutions, so it helped that we could provide introductions to, and validation of, our OMSI colleagues.

To begin the project, it helped that IEI had existing relationships with many tribal communities; feelings of mutual trust had developed over the years. In addition, we had also worked with OMSI for many years. Several OMSI professionals were already *Cosmic Serpent* Fellows, which meant they had attended one to three workshops where they learned and practiced proper protocol to develop collaborative relationships with tribal communities. In addition, OMSI was later selected by IEI as one of three *Native Universe* case study museums. This selection was based on OMSI's participation in *Cosmic Serpent*, capacity for transformational change, support from leadership and staff, and willingness to reach out to Native people in local communities.

We also had prior relationships with the four communities featured in *Roots of Wisdom*. We had worked for years with the Native Hawaiians leading active restoration of traditional Hawaiian fishponds, one of them being the vice chairman of the IEI board of directors. We had long, lasting relationships with the Eastern Band of Cherokee in North Carolina, and had worked with the scientists and cultural specialists from the tribe who were leading river cane restoration. River cane, a North American bamboo, is important for river ecosystems, erosion control, and essential to create traditional baskets (fig. 3). We knew many people in the Tulalip Tribes in Washington State, and in the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) in Oregon, from previous projects. These long-standing relationships were key to building a sense of trust and viable collaboration with OMSI.

2 What was especially challenging about this project?

Nancy and David (IEI): One of the challenges was building a sense of trust among the four Native communities and OMSI. There had been years of mistrust of Western institutions, so it helped that we could provide introductions to, and validation of, our OMSI colleagues. Since we are a Native institution, the tribal communities were somewhat more willing to listen to our recommendations. That said, it was truly a learning experience for all involved.

It was also a challenge to work within the constraints of OMSI's specific timelines and deadlines. Tribal communities have their own unique (and often time-consuming) ways of making decisions, which can involve tribal politics and a need for consensus. As the years went on, a great deal of give and take was needed—and was delivered—on all sides. Other challenges included turnovers in the tribal museums and at OMSI, which required rebuilding relationships and a good deal of re-education. Just as we became comfortable with some staff members,

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fig. 3.

Sarah Thompson is one of a new generation of traditional river cane basket makers. Her tribe, the Eastern Band of Cherokee Indians, is working with local scientists to restore river cane to their homelands in western North Carolina and to revitalize the art of basket making.

COURTESY THE TAMÁSTSLIKT CULTURAL INSTITUTE

fig. 4.

Young visitors to the Confederated Tribes of the Umatilla Indian Reservation's Tamástslikt Cultural Institute learn about the ecological and cultural significance of the 450-million-year-old native Pacific lamprey.

they might be transferred or leave the institution. Fortunately, everyone involved had a commitment to the project, a sense of humor, and the willingness and flexibility to collaborate.

In addition, we were working with four very different communities, which required a great amount of time and constant communication. We were impressed by the way OMSI used the project advisors from different tribes in a significant way, with several face-to-face meetings during the six years of the project. The advisory board, comprised of scholars and experts from tribal museums, science museums, universities, and tribal colleges, as well as knowledge holders and educators from each Indigenous community, served as a sounding board for all aspects of the exhibition, and helped set the agendas and content for the project.

Vicki (**OMSI**)**:** Generally, we exercise final editorial control over OMSI deliverables, and project advisors review and comment on prototypes, concepts, and drafts. However, this project was different because the goal was to share Native ways of knowing the natural world—not a Western interpretation of Native ways of knowing. We asked partners to edit and approve the content and design of all the project deliverables. These were not our stories to tell or our knowledge to share, so in each case, the featured community had final approval of their story. For example, out of many possible examples of ecological and cultural restoration, it was the CTUIR's choice to focus on tribal efforts to restore declining populations of Pacific lamprey, a prehistoric fish species that is a sacred traditional food source (fig. 4). They decided how the story would be told and selected the exhibit ideas that were developed. They reviewed and approved all the images, text, graphics, scripts, and videos that featured their story. Members of the OMSI project team were not always in agreement about our process, or comfortable with letting go of creative control. We struggled and learned as we went along.

We were also challenged by the complexity of the collaborations. With an optimism grounded in our lack of experience, we envisioned an exhibition project based on one, big collaboration with diverse national partners. Midway through the project, we realized that the reality was more like *many* interconnected and overlapping collaborations. Each of the four, featured communities had its own

collaborative relationship with the project team to codevelop their story for the exhibition. The leadership team at IEI and OMSI shared project oversight and review of all the deliverables. The evaluation team collaborated with all of the partner communities to develop the questions, design the methods, and collect information. We all came together at OMSI for advisory group meetings, but smaller groups did much of the real collaborative work to create the exhibitions and other deliverables. In hindsight, collaboration with one or two nearby Native communities would have been more sensible.

3 What mistakes did we make and how did we correct them?

Vicki (**OMSI**)**:** We started the project seeking national partners, because we believed that was the best way to increase the traveling exhibition's appeal to venues throughout the United States—one of our goals. At our first advisory group meeting, though, the advisors and partners strongly encouraged us to collaborate with the local Native community.

This had not been part of our plan, since we were focused on reaching a national audience. However, we did plan for the exhibition to open at OMSI, and realized that inviting the local Native community after the exhibition was complete could easily feel as if we had intentionally excluded them. In addition, we learned that from an Indigenous perspective, honoring the people whose traditional homeland the museum occupies is of great importance. We needed a strategy for including the local community in the project. There was no simple answer to this challenge. The Portland area has a very diverse Indigenous population, there are many different groups who merited inclusion, and we had not allocated any resources for this work in the grant budget. Fortunately, we had local elders to consult who advised us to address this issue by reaching out to local, Native youth. This led to a serendipitous and very fruitful partnership with the Portland Public Schools' (PPS) Title VII Indian Education Program to create the Native Youth Advisory Board. Together, we invited local, Native middle-school students to advise and evaluate the exhibition and programs over three school years. The students came from many different schools and many different tribes. This unexpected addition to the project has become one of its strongest legacies (fig. 5). *Roots of Wisdom*, the Title VII program, and the students were all enriched by the Native Youth Advisory Board. And the PPS Indian Education Program and the Oregon Museum of Science and Industry continue to collaborate frequently on projects.

Nancy and David (**IEI**)**:** More opportunities emerged through synergy with the *Native Universe* project, including public outreach events that engaged the interest of Native communities in the Portland area. These events brought in tribal historians from local tribes and provided an authentic and most interesting way to learn more about the peoples on whose land OMSI was built. These had not been planned as part of *Roots of Wisdom* in the original proposal, but greatly enriched the scope of the project. The Native Youth Advisory Board was another unplanned but effective piece of the project. By the time the exhibition opened, these students had spent several years as advisory members, and their ideas were taken seriously and contributed to the final exhibition. We had not anticipated this outcome but we advocated for it, and did what we could to accommodate and support

the outreach to local tribal communities. In conversations with OMSI personnel, IEI often advocated, "now that OMSI has opened the door to allow Native voices to be part of the museum, OMSI must take this responsibility seriously and not allow the door to slam shut." We are very encouraged to see OMSI continue to take on more projects giving voice to Indigenous peoples in the museum, such as the NASA-funded *Lenses on the Sky*, which explores the night sky through many different cultural lenses. We are also encouraged by their presence at the NSF-funded IWISE (Indigenous Wisdom in Informal Science Education) workshops, which are developing a research agenda for federally funded projects for Indigenous communities. The most recent OMSI event to encourage Native participation was a showing of IEI's *Navajo Sky* planetarium show, and a kickoff for *Imagine Mars Through Native Eyes*—a curriculum developed for Native youth about the MAVEN Mars mission (both funded by NASA). Over the past 10 years, NASA has been an active supporter of projects involving Native Astronomy and Western Space Science. Over 200 participants from the urban Indian community in Portland attended, including a target audience of Title VII students and families from Portland's public schools.

4 Equal collaboration is something quite different than simply "inviting X community to the table," which communicates that it is still the museum's table and those invited are outsiders. What are some guidelines for those who want to do this kind of deeply collaborative work?

Nancy and David (IEI) and Vicki (OMSI): We learned so much from this project about collaboration, it is difficult to summarize in a few guidelines, but we will try. As a starting point we recommend:

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fig. 5.
Middle-school student advisors review *Roots of Wisdom* exhibits under construction during a meeting of the Native Youth Advisory Board at OMSI's production shop.

Take sufficient time for relationship building, deep listening, and shared decision-making....

- Look for "bridge people" who have experience in and knowledge of both cultures, and who can provide guidance and support to connect you with other partners.
- Co-create your project with your partners from the very beginning and work together to design a project that serves and benefits all of the partners.
- Use a collaborative evaluation model—the evaluation questions and methods should be shaped by all the partners, not just the lead organization.
- Take sufficient time for relationship building, deep listening, and shared decision-making—building trust and understanding each other's communication styles is critical.

For a deeper understanding, please see the *Roots of Wisdom* legacy document, which shares ideas and reflections on collaboration with integrity from the full project team and partners. This document will be available on the project website (http://www.omsi.edu/exhibitions/row) in fall 2016.

Conclusion

Our external evaluators conducted a formal summative evaluation of the professional audience impacts that focused on the collaboration between the project partners. In the executive summary, the evaluators concluded:

> Finally, needing to build a deep, collaborative process with four very different, geographically dispersed communities was challenging, lessened the ability to collaborate in person, and also led to a fairly rapid-paced, timeline focused process. Within these limitations, all partners gave considerably extra time, energy, and openness toward creating a respectful process and relationship. Intentions were viewed positively, and the final products have been well received by all partners.[3]

In addition to the summative report, our favorite source of evidence for how OMSI and IEI succeeded in building this collaborative exhibition is a comment from a tribal community member and elder, who began four years ago with some suspicion of the project. During the opening event at her tribal museum, she and other members of the tribe referred to *Roots of Wisdom* not as "an OMSI exhibition," but as "our exhibition."

3 Jill Stein and Shelly Valdez, *Roots of Wisdom Summative Evaluation: Professional Audience Impacts Report* (unpublished technical report, Columbus, OH: Lifelong Learning Group, COSI, and Laguna, NM: Native Pathways, 2015), http://omsi.edu/partnerships#evaluation-reports.

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Resources

These resources are a sampling from authors whose work encompasses TEK and Western science, and from *Roots of Wisdom* and related collaborative projects.

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Joffrion, Elizabeth and Natalia Fernandez. "Collaborations between Tribal and Nontribal Organizations: Suggested Best Practices for Sharing Expertise, Cultural Resources, and Knowledge." *The American Archivist:* Spring/Summer 2015, vol. 78, no. 1: 192–237.

Kimmerer, Robin W. *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge and the Teachings of Plants*. Canada: Milkweed Editions, 2013.

Menzies, Charles and Caroline Butler, Understanding Ecological Knowledge, in *Traditional Ecological Knowledge and Natural Resource Management*, ed. Charles R. Menzies. Lincoln, Nebraska: University of Nebraska Press, 2006.

Roots of Wisdom website: http://www.omsi.edu/exhibitions/row. The website contains the Staff Guide, Legacy Document, and activities for Native youth in PDF format, as well as videos and games produced for the exhibitions.

Stein, Jill and Shelly Valdez, *Roots of Wisdom Summative Evaluation: Professional Audience Impacts Report* (unpublished technical report). Columbus, OH: Lifelong Learning Group, COSI, and Laguna, NM: Native Pathways, 2015, http://omsi.edu/partnerships#evaluation-reports.

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United States Fish and Wildlife Service. *Traditional Ecological Knowledge: For Application by Service Scientists*, 2011, http://www.fws.gov/nativeamerican/pdf/tek-fact-sheet.pdf.