

Native Universe: Inclusion of Indigenous Voice in Science Museums

Summary Report of Research and Evaluation

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# Authors’ Note

This document represents the story of Native Universe and how it has unfolded at the project level, the three case study museum sites, and through partnerships between Native and tribal communities and the three science museums. Modeled on the project itself, our research and evaluation team brings together Indigenous and conventional, western evaluation and research practices, through a collaborative partnership between the Lifelong Learning Group, based at COSI’s Center for Research and Evaluation (Columbus, OH) and Native Pathways (Laguna, NM). Our team worked collaboratively and holistically throughout the Native Universe project, following the project’s Diné Cosmic Model, developed by PIs Nancy Maryboy and David Begay (2006). Based on Diné cosmology and the natural order, this directional model grounds our research, provides guideposts for evaluation, and supports an ongoing reflective process.

In conventional, western social science, the results of research and the results of evaluation

would be separated, as they are asking different questions and serving different purposes. From a holistic indigenous perspective, these are part of the same process – one that is emergent, dynamic, and reflective. Our intention was to find balance between these approaches – not privileging one over the other, but honoring both. This document therefore reflects both the case study research and the summative evaluation. We ground both in story – describing the Native Universe pathway, the many journeys that have branched out from the project, and the outcomes and impacts that have occurred as a result, as well as the challenges and lessons learned. We then step back and interpret the data through the lenses of our research and evaluation questions. This way the story is kept whole and cohesive, while the analysis and interpretation of data stands on its own.

This summary report pulls out the higher-level findings from the technical, synthesis report (cite) which includes the findings with data. That report, in turn, was built using all reports and data gathered across the project.

# Introduction

*Native Universe: Indigenous Voice in Science Museums* is a full-scale development project funded by the National Science Foundation (NSF-DRL 1114467, 1114535, and 1114461) designed to build institutional capacity in leadership and practice among science museums. The goal is to increase public understanding of environmental change and the human relationship to nature from Indigenous and western science perspectives. Through a series of intensive residencies at three Case Study Museums, project investigators collaborated with museum staff and volunteers, Indigenous partners, and informal learning researchers to understand how cultural perspectives impact science learning about environmental change. The project documents the extent to which it is possible to transform institutional culture and museum learning opportunities to incorporate Indigenous voice in a deep and sustained way.

The Lifelong Learning Group (Columbus, OH) and Native Pathways (Laguna, NM) were engaged by the Native Universe team to provide research and evaluation for the project. The research and evaluation team worked collaboratively to ensure that measures of success, data analysis, and interpretation reflect rigor from both Indigenous and conventional evaluation perspectives. The three case study museums participating in Native Universe were: 1) Oregon Museum of Science and Industry (OMSI), in Portland, OR; 2) Arizona-Sonora Desert Museum (Desert Museum), in Tucson, AZ; and 3) the Powerhouse Science Center, in Durango, CO[[1]](#footnote-1). This document summarizes results and key findings from research and evaluation focused on the following questions:

## Evaluation questions

1. As a result of the residencies, to what extent and in what ways did change occur in the institution around the inclusion of Indigenous voice?
2. To what extent and in what ways did staff gain awareness of science learning as culturally-based and gain appreciation for the importance of integrating multiple belief systems in all aspects of the museum experience?
3. To what extent and in what ways did staff increase their ability to support cross-cultural learning?
4. What strategies or components best supported change and how could change have been deepened across the case study museums?

## Research questions

1. What are the components across and within institutions that facilitate engagement and inclusion of Indigenous voice of their community with respect to environmental change?
2. What is the process by which a museum moves through stages of readiness to change related to inclusion of Indigenous voice in respect to cycles of change?
3. Across the cases, does a model or models emerge that could inform how inclusion of Indigenous voice moves across and within a science museum?

# Methods

To answer the evaluation questions, and to support the project’s pathway around the four directional goal areas, multiple methods were used throughout the project. A combination of qualitative and quantitative measures were used in order to provide multiple lenses and diverse ways of understanding the project as it unfolded. Methods are described below, based on the phase of the project as follows: 1) ‘Imiloa Intensive; 2) Pre-Residencies; 3) Residencies; 4) Public Experiences; and 5) Post-Residencies.

For the ‘Imiloa Intensive, the project used 1) pre-workshop reflection (written questionnaire); 2) daily reflections (questions, drawing activities, group discussions); and 3) post-workshop interviews. For the Pre-residency, the evaluation team conducted site visits to each of the three case study museums prior to each institution’s residency to collect baseline data. Methods included 1) an online survey; 2) a written questionnaire; and 3) PhotoVoice/Focus group. The approaches used for the residencies included 1) daily reflections to capture ongoing feedback (3 open-ended prompts); and 2) semi-structured interviews with NU team members and community partners.

For public experiences related to Native Universe at each museum, data were collected using written questionnaires. Approximately six months after each 9-month residency was completed, a site visit to gather data was held at each museum to gather data through 1) staff focus groups; 2) online survey to museum staff and volunteers; and 3) semi-structured interviews with key community partners.

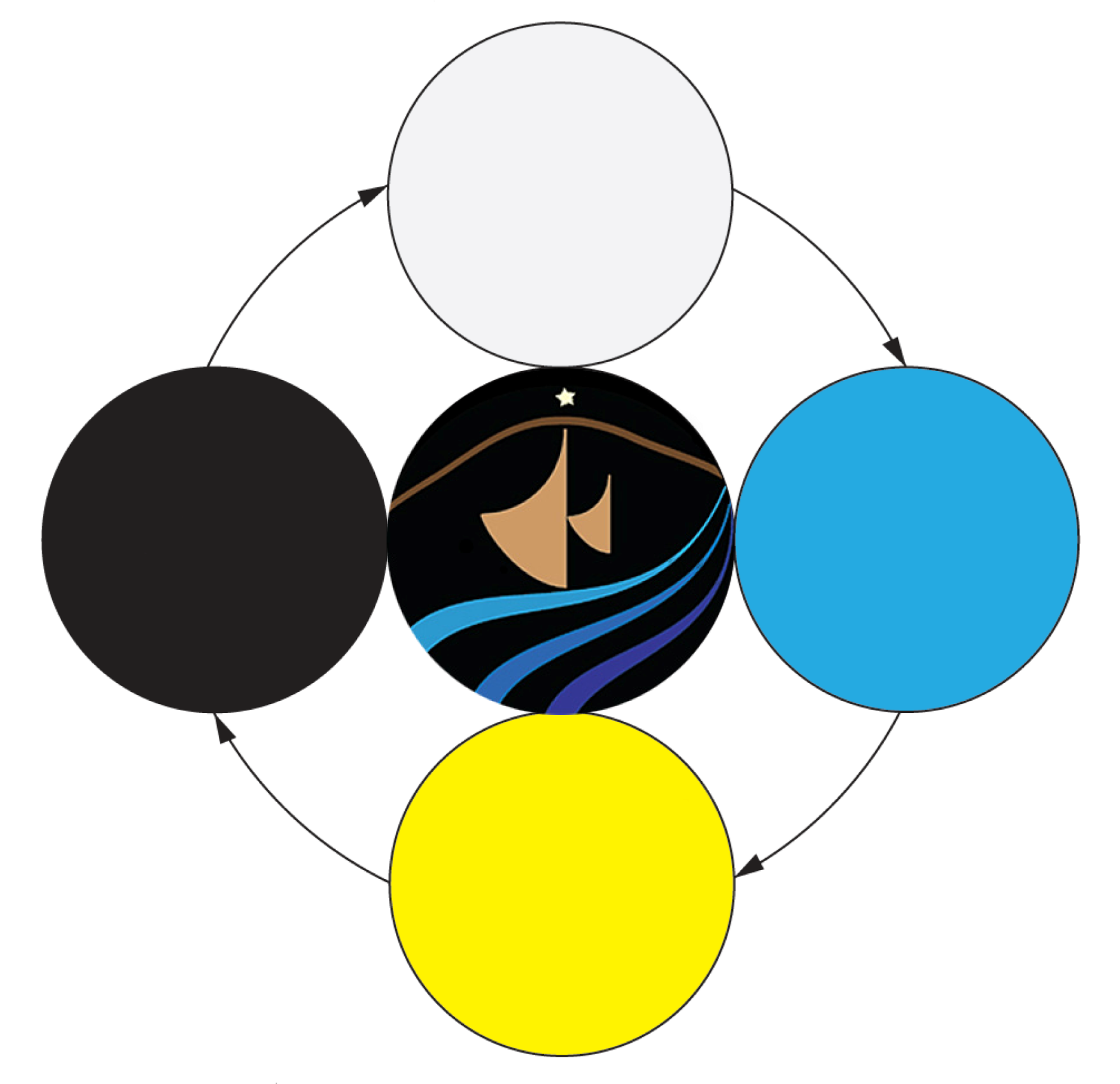
# Results

Rather than provide detailed findings from each of the evaluation studies, all are brought together with supporting evidence in the Full Report along with distinct studies within the appendices. This report is focused on reporting the higher level, integrated findings found in the Full Report. The Diné strategic planning model (Maryboy and Begay 2006) used for the project also provides a framework for summarizing the findings across the evaluation studies as follows: 1) **Ignitor** – the ‘Imiloa Intensive Workshop and Journey; 2) **East / *Nitsahakees* / A place of initiation**; 3) **South / *Nahat’a* / A place of organization and growth**; 4) West / ***Iina* / A place of activation**; and 5) **North / *Siihasin* / A place of evaluation, renewal, and transformation**.

Throughout the directional areas, we focus on four outcomes areas: 1) Awareness and understanding of Indigenous ways of knowing and local Native communities; 2) Readiness and capacity; 3) Relationships and partnerships; and 4) Inclusion of Indigenous Voice. As these are all interconnected areas, they weave within and around each other throughout the narrative to create a holistic understanding of how the Native Universe pathway unfolded at each museum site.

Maryboy and Begay, 2006

1. Overview of project based on Diné Cosmic Model



**South**:

*Nahat’a*: a place of organization and growth

**North**:

*Siihasin*: a place of evaluation, renewal, and transformation

**East**:

*Nitsahakees*: a place of initiation

**West**:

*Iina*: a place of activation and implementation

**Ignitor - ‘Imiloa Intensive**

How the team ignited Native Universe

## Ignitor – the ‘Imiloa Intensive Workshop and Journey

#### What we discovered

The model of the ‘Imiloa story and the way it unfolded throughout the week had a strong impact on participants and was deeply inspiring to many. The journey helped them to reflect on their own environments and the extent to which their museum is inclusive of multiple voices, or not very inclusive, and provided insight into what it means to collaborate with integrity in partnership with Native communities.

Participants clearly deepened their awareness on a number of levels, particularly in relation to their understanding around the intersections between culture and science, and the importance of learning in one’s own cultural context. Additionally, most deepened their awareness of the human relationship and connection to nature and how cultural worldviews influence perspectives around science and nature.

#### What informs us

The ‘Imiloa intensive provided a non-threatening space for participants to reflect on the environments within their own museum and communities, and in most cases created a realization among participants that their museum space and culture did not represent the diversity of the communities around them, including the local Native communities. The space also allowed for participants to conceptualize what is needed to create a more inclusive environment.

During the intensive, participants were provided with an array of experiences to help them understand the Native Hawaiian story. A realization around the power of learning in context around one’s own culture significantly resonated among participants. Many participants were unaware of the layers of histories that surround Indigenous peoples, from their own creation stories to the impacts of federal and state policies that threatened their livelihood and the cultural ties to the land and environment. For this experience, it was critical that elders were provided a space for sharing stories that reveal these complexities.

## The East – *Nitsahakees*: a place of initiation

#### What we discovered

The data from the baseline phase paint a picture of the case study museums as having many opportunities, resources, and internal capacity to deepen inclusion of Indigenous voice, but with challenges around internal structures, budget/business models, support for doing the work, and limited awareness of local Native communities and understanding around how to connect to and build relationship with Native communities, outside of a few individuals on staff. There were also some key questions emerging across all the sites about what the intended outcomes or deliverables were for Native Universe, what it meant to include Indigenous voice in the museum, what it meant for the museum to focus on partnerships with Native communities given the diversity of Native cultures living in each of the regions, how the project would impact the strategic direction of the institution, and how the project would impact their own work. All sites also had concern around engaging too many communities or promising more than they could fulfill, suggesting an awareness that once they opened the doors to a community partnership that they needed to have the capacity and resources to maintain it.

#### What informs us

From an evaluation perspective, the East (*Nitsahakees*), or the place of initiation, was about where each museum began its journey around the inclusion of Indigenous voice. The evaluation team documented how the initiation of Native Universe unfolded for both the project leadership team and the museum sites, as summarized below.

### Project Leadership

In the initiation phase of Native Universe, the leadership team (Indigenous Education Institute, UC Berkeley Space Sciences Lab / Multiverse, and the ‘Imiloa Astronomy Center) worked closely with the core team at each of the three museum sites to assess readiness and help each site create Native Universe in the way that worked best within each environment. The team utilized principles of relationship building to guide the process, bringing in local partners who could serve as resource or “bridge” people for each museum, and faciliating frequent communication. The leadership team held an onsite meeting at each site in advance of the first weeklong site visit to deepen the leadership team’s knowledge and understanding of the museum and community contexts.

Through these initial meetings, and weekly conference calls, the leadership team provided guidance around relationships with local Native community partners; encouraged and provided guidance on developing and activating cultural and land-based experiences for staff development; encouraged ownership and leadership of the NU process in order to build leadership capacity for sustainability of the work at each site; and encouraged the teams at each site to find their own model and process for their NU pathway. Overall, the leadership team allowed each team to find their own internal leadership or change agents, while establishing themselves as guides and supports for growth.

### The Museums

After returning from the ‘Imiloa Intensive, the museums began the work of deepening engagement within their institutions and planning how their Native Universe residency should move forward. They met with existing Native partners in their area and connected to new “bridge people” shared through the Native Universe team. One of the initial museums faced significant opposition and lack of support for Native Universe from staff and other stakeholders, which ultimately led the director to take a position at a different museum. Without sufficient leadership support at this site, the Native Universe team invited a new museum on board, the Durango Discovery Museum (later changed to the Powerhouse Science Center), which was directed by a Cosmic Serpent Fellow and had an established partnership with the Southern Ute tribe.

The three Native Universe museums (OMSI, Arizona-Sonora Desert Museum, and the Powerhouse Science Center) shared some factors in common at this stage, including supportive leadership, at least 1-2 “early adopters” already working with Native partners, some existing relationship or partnership with local, land-based Native tribes, significant interest and openness to inclusion of Indigenous voice, and some element of opposition or resistance to change around the inclusion of Indigenous worldviews of science. It became evident during this phase that business models influenced an organization’s readiness and ability to build relationships with Native communities; for example, a model supporting community engagement work through soft-funded, project-based grants made it challenging for staff to maintain and sustain relationships, as there was little to no support for engaging communities outside of a specific project grant.

Across the three sites, awareness and understandingof Indigenous ways of knowing and local Native communities were limited; and there was a tendency to talk about Native communities in the past tense. Staff also tended to talk in terms of “Native American cultures” with few showing understanding of specific tribal nations and communities in the area. Staff and volunteers consistently felt that they had more knowledge and understanding of western science than Indigenous ways of knowing. In all cases, at least one individual, and sometimes several, felt they had significant awareness and understanding of local Indigenous communities and Indigenous worldviews, but these individuals were often the only connection between the institution and community*.*

**Readiness and capacity** were operationalized as: 1) openness to bridging Indigenous knowledge and western science; 2) perceptions of cultural inclusion in the science museum; and 3) perceptions of experience, interest, comfort, and commitment to collaborating with Native communities.

Across the sites, museum staff and volunteers tended to value the inclusion of Indigenous knowledge in the science museum, though all museums had some presence of “skeptics” who were not sure about or actively opposed this idea. The trend across the museums was for individuals to see themselves as more committed and interested in the concepts of Native Universe and the institution as more experienced and expert in how to implement the work.

All museums had some initial **relationships and partnerships** with local Native communities, usually sustained by 1 or 2 individuals within the museum, rather than being an institution-wide practice. In one case, the partnership with a local, land-based community had been stronger in the past; in another, the relationship with a local, land-based tribal nation was beginning to be strengthened as a result of Cosmic Serpent; and in one case, the relationship with a local tribal nation was more “contractual” in nature, as the museum saw themselves as primarily providing science outreach and education services rather than participating in an authentic collaboration.

When asked to document how **Indigenous voice is currently included, honored, or respected throughout the museum**, there was a general sense at all three sites that it was limited – though all sites saw opportunities to deepen Indigenous voice, particularly around interpretations of the land and place. Examples of how Indigenous Voice was currently included in the museum were mostly brief and isolated, such as an object or label referencing Indigenous cultures or history, with few if any examples emerging from a collaborative process with tribal communities. Data from the pre-survey showed relative openness to the incorporation of cultural perspectives into the science museum, but less awareness around the relevance of Indigenous ways of knowing and how ones’ own cultural background effects their work in the museum.

## The South – *Nahat’a*: a place of growth and organization

#### What we discovered

During the beginning stages of the evaluation activities, the outcomes provided an important snapshot around the levels of awareness of the museum’s role in bringing in the native voice, and what that meant for creating environments and space for these areas to evolve. How the Native Universe leadership presented this concept was critical for the deeper understanding around authentic partnerships and relationship to unfold. During the first residency, the process was set in motion, and by the end of the residencies, most museums recognized the gaps and then it was a matter of choosing whether to address them or not. Each museum was unique in terms of understanding the idea of authentic partnerships built on relationship and trust.

#### What informs us

### Project Leadership

One of the activities that has also been a critical learning portal is the importance of coming together face to face. The leadership team was diligent in providing opportunities and made this a priority when they started the residencies, visiting each museum early in the process.

The leadership team focused on building relationships and helping the teams identify community resource people, while being careful not to position themselves at the center of the relationship. Each museum developed a unique residency. While there were staff changes at each museum during the timeline of Native Universe, a focus on working with leadership to nurture the idea of *why* the journey was important was critical.

### Museums

Through the residency journey, the museums began unearthing a richer understanding of relationships, starting with the realization that their relationships with the Indigenous communities were not as deep as they assumed. The museums became more aware of how to engage in authentic understanding of community partnership as opposed to ‘servicing’ and/or ‘project driven’ models. This paradigm shift also included changing from a perspective of being paid to conduct services, to creating a collaborative space for working alongside Native communities.

All three museums created portals within their internal calendar system for Native focused programming, inviting in Native groups to plan and implement programs that were of value to them. Over time, all three museums showed some understanding of what partnership means from a Native perspective, and that they take time and personal commitment to build. Across all museums the highlight of the residencies were the activities that lent themselves to the connection to the land and the environment which heightened understanding of Indigenous worldviews.

#### Relationships

At OMSI, relationships were developed and strengthened primarily through the seed grant process, and were successful at engaging both Indigenous land-based communities around the Portland area and the urban Indian population. Staff also deepened their learning around the histories of federal policies that impacted the urban Indian populations in and around Portland (Relocation Act). Through the seed grant process, the OMSI team learned that it was much easier to walk into a situation where people already had existing relationships and knew how to work together; they were able to foster a deeper understanding of relationship, yet were inhibited by the business model where all time is documented against a revenue stream/funding source. The OMSI seed grants focused on the following efforts: 1) seeking partnerships to help galvanize their learning around evaluation that was inclusive of indigenous worldviews, which included the University of Washington and the Indigenous Wellness Research Institute (IWRI); 2) developing a digital version of the Legend of Lalooska, based on the life of Chief Lalooska and the Lalooska tribal community, located around the Portland area; 3) supporting the development of an inter-tribal urban garden through designing signage; 4) implementing staff professional development around the Richfield Wildlife Refuge and the Cathlapotle Plankhouse to support learning around which tribal groups inhabited the area where OMSI is located prior to European contact; and 5) developing three tribal programs based on hands=on, immersive activities around science, indigenous arts and culture.

ASDM took an approach of deepening relationship with the Tohono O’odham Cultural Museum, while expanding relationships within the same community with a few new partners, such as the Tohono O’odham Community Action (TOCA) group, and the TOCC (Tohono O’odham Community College). They primarily focused on the one tribal nation, as well as some efforts with the Yaqui/Yoeme nation. The team felt they needed to focus efforts on a few important relationships in order to deepen and strengthen them. The team ended to talk about and work in terms of projects, such as the Native American Cultural Night and the Native Foods and Basketry Festival, but their process was built on co-developing and co-planning from the beginning. The first site visit served an important role in getting staff and docents out into communities, building awareness of local, land-based tribal nations. The second site visit was then able to go deeper into the conversations and how to collaborate and do the work, as they continued to deepen relationships between the two site visits. Although more staff and volunteers were engaged, relationships with tribal communities primarily continued to be built by a few key individuals, rather than spreading across the whole institution.

The PHSC staff included a young core staff that were essentially new to the ideas around the goals of the Native Universe project, so in the initial phase, they were struggling but also had open minds, enthusiasm and interest in deepening their learning, particularly among the education staff. The new director of the museum brought a wealth of strength, understanding and background in working with Native cultures; and involvement of board members also heightened a positive environment in the initial stages of the program. Initially, for this museum there seemed to be minimal bureaucracy and more flexibility to adapt to and implement new ideas fairly quickly, especially as compared to the larger museums. The residency provided a clearer connection to the goals of the Native Universe project, and the team saw that much more work was needed to engage PHSC staff with Indigenous ways of knowing. For the residencies, the PHSC focus was on strengthening the existing partnership with the Southern Ute Montessori schools, along with engaging a few more partners from the local area. These included Fort Lewis College’s American Indian Science & Engineering (AISES) Chapter, the Fort Lewis Navajo Club, Southern Ute Cultural Center, and various programs from the Navajo Nation. The second site visit deepened the focus on environmental change and the human relationship to nature from indigenous and western science perspectives.

## The West – *Iina*: a place of activation and implementation

From an evaluation perspective, the West (*Iina*), or the place of activation and implementation, was about the strengthening of partnerships through the implementation of public experiences. The evaluation team documented public feedback on programs implemented as part of the Native Universe project. A variety of public experiences were implemented as a result of Native Universe.Evaluation selected one key event from each museum site for documenting public outcomes related to awareness and understanding of Indigenous ways of knowing.

#### What we discovered

The programs selected for documenting public outcomes related to awareness and understanding of Indigenous ways of knowing were successful at all three museums. Based on the positive comments of those who attended the OMSI Family Science Night, and the increase in awareness and interest of both western science and Indigenous knowledge, the OMSI Family Science Night achieved its goals. Based on the positive comments of those who attended the Native American Cultural Night at ASDM, and the increase in awareness and interest of both Indigenous knowledge and western science, the Native American Cultural Night at ASDM achieved its goals. Based on the positive comments of those who attended the Navajo Sheep Harvest at PHSC, and the increase in awareness and interest of both Indigenous knowledge and western science, the Navajo Sheep Harvest at PHSC achieved its goals. Through all of these events, the museums deepened relationship and trust with partners, planning *with* them and not *for* them; as a result, partners felt a sense of ownership of and comfort within the museum space.

#### What informs us

### OMSI Family Science Night

In partnership with the Portland Public Schools Title VII Indian Education Program, OMSI hosted a Native American Family Science Night in March of 2014. A total of 54 participants completed an exit survey following their participation in the event. The majority of respondents (63%) identified themselves as American Indian. The majority of respondents (76%) had visited OMSI before but a relatively small number of participants were members of OMSI (4%).

The PPS Native American Family Science Night at OMSI was highly effective in creating an enjoyable, comfortable, and family-friendly event for Native American families in the Portland area. Asked to rate six statements, respondents overwhelmingly indicated (with mean scores greater than 9 on a 10-point scale) that they enjoy OMSI, feel comfortable at OMSI, feel a sense of belonging at OMSI, and come to OMSI to learn more about science and spend time together as a family.

While they primarily learned something new about western science, participants also learned something new about Indigenous knowledge. Ratings for these four statements were moderately high but are at least 1-2 points lower than similar ratings for enjoyment, fun, sense of comfort, and social opportunities suggesting content learning and interest play a secondary role. Ratings for western science learning and interest were higher than for Indigenous learning and interest, likely because visitors felt they already had high interest and knowledge related to Indigenous ways of knowing. When asked in an open-ended question what they had learned or realized at the event, the majority of participants (46%) shared that they learned or realized something about science.

### ASDM Native American Cultural Night

In partnership with the Hopi Foundation, Tucson Museum of Art, Tohono O’odham Cultural Center & Yoeme tribal members, the Arizona-Sonora Desert Museum hosted a Native American Cultural Night in June 2014.A total of 52 participants completed an exit survey. About one-third (35%) of participants identified as Native American.

The Native American Cultural Night at the Desert Museum was highly effective in creating an enjoyable, comfortable, and family-friendly event for Native American families and others in the Tucson area. Asked to rate six statements, respondents overwhelmingly indicated (with mean scores greater than 9 on a 10-point scale) that they enjoy the Desert Museum, feel comfortable and a sense of belonging at the museum, and come to the museum to learn more about science and spend time together as a family.

Open-ended data suggested that participants valued the various program offerings that the museum arranged for the event. It was evident from the comments that the program offerings were valued by the participants (35%) with the majority of comments coded to this theme referring to specific activities. Participants also valued the connection to Native cultures (23%) at this event.

Overall, participants indicated they learned something new about and/or gained interest in western science and Indigenous knowledge. While ratings for these statements were moderately high (greater than 7 on a 10-point scale, where 1 represented “not at all” and 10 represented “a lot”), they are at least 1-2 points lower than similar ratings for enjoyment, fun, sense of comfort, and social opportunities. The ratings for Indigenous learning and interest were higher than for western science learning and interest; likely because the nature of the event was focusing on Native cultures and ways of knowing.

### Powerhouse Science Center – Navajo Sheep Harvest

The Navajo Sheep Harvest and Cultural Event was highly effective in creating an engaging and valuable learning experience for its audience at the Powerhouse Science Center. In addition to demonstrating the practical skills associated with the sheep harvest, it appears to have helped build awareness and interest in Indigenous knowledge systems, as well as western science.

In partnership with the Diné Cultural Club at Ft. Lewis College, the PHSC served as the host site for a traditional Navajo Sheep Harvest and Cultural Event in October 2014. A total of 26 participants completed an exit survey. The majority of respondents (58%) identified themselves as American Indian.

Participants strongly agreed that they enjoyed the event, would like to attend similar events, and would recommend it to family and friends, rating a number of satisfaction statements at 9.5 out of 10 or higher, on average (see Table 3). Open-ended data suggest that the event was not only successful at communicating the processes of butchering, but also at generating interest in Native cultural traditions and, to a slight extent, at encouraging participants to reflect on their own roles in food systems and in their communities. Two dominant themes were learning about foodways, and learning about Navajo cultural traditions and community.

Overall, respondents indicated that they learned something new about and/or gained interest in both Indigenous knowledge and western science. Agreement ratings for these four statements were all moderately high (greater than 7 on a 10-point scale), they were notably lower for the statements about western science than those related to Indigenous knowledge. This difference in ratings likely relates to the structure and focus of the event, which was intended to highlight Native cultures and ways of knowing.

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## The North – *Siihasin*: a place of evaluation, transformation, and sustainability

From an evaluation perspective, the North (*Siihasin*), or the place of evaluation, transformation, and sustainability, was about supporting and documenting sustainable change at each of the museum sites. The evaluation team returned to each case study museum to conduct a series of focus groups and interviews with museum staff, volunteers, and community partners, and an online survey was disseminated[[2]](#footnote-2) to provide quantitative data on how Native Universe impacted individuals and the institution as a whole around the inclusion of Indigenous Voice.

#### What we discovered

Relationships with local Native partners were strengthened and deepended as a result of Native Universe. Staff gained awareness and understanding of local, land-based Indigenous communities and urban Indian populations, and Native partners gained a sense of trust and commitment on the part of the museums. All museum sites showed signs of building a reflective practice around the inclusion of Indigenous voice, with conversations around bringing in Indigenous perspectives becoming more prevalent during planning for exhibitions, program, and other community engagement. Two of the sites added positions to support the inclusion of Indigenous voice, including a rotating community liaison for the local AISES chapter, a community advisory board, and a board member. All sites shifted to a “planning with” vs. a “planning for” community engagement model, and some permanent changes were made to the interpretive framework at one of the sites through exhibits and signage.

#### What informs us

### Awareness and engagement

To understand the extent to which Native Universe had permeated throughout each museum site, the evaluation team gathered data on the extent to which staff and volunteers were aware of and involved in various efforts. At both OMSI and ASDM, there was greater awareness than involvement in the museum’s efforts to engage with Indigenous peoples and ways of knowing. On the seven-point scale, awareness ranged from slightly positive to moderately positive (4.63 to 5.98). This suggests both museums were successful in broadly communicating about the Native Universe goals and initiatives. Involvement of staff and volunteers was slightly to moderately negative at both museums, suggesting that only a small core of staff and volunteers was involved in the Native Universe efforts.

At both museums, respondents reported a clear positive gain in their own awareness of Native communities, both land-based and urban, practices for the inclusion of Indigenous voice, and local tribal history. On average, a 1.21 point gain (on a 7-point scale a 20% gain) was reported by OMSI participants and a similar 1.26 point gain (21% gain) was reported by ASDM participants.

### Relationships and Partnerships

Quantitative data were gathered around staff perceptions of the museum’s relationships with and inclusion of Native communities. Both museums had positive gain scores across the board. Overall, OMSI respondents had a positive gain score of .52 on the 7-point scale; ASDM respondents had a smaller but still positive gain score of .24. These data are supported by qualitative feedback gathered in focus group discussions and interviews with staff and community partners.

Qualitative data suggested that both OMSI and ASDM had strengthened and deepened relationship with local Native partners as a result of Native Universe. A key finding from qualitative data across the museum sites was that relationship can have a significantly different meaning depending on one’s cultural perspective. While museum staff tended to talk in terms of relationships already existing between the museum and the tribal communities, partners from the tribal communities tended to be more cautious, seeing the collaboration process as the beginning of a relationship. Relationship has profound cultural significance from an Indigenous perspective, while western institutions may have a less rigorous definition of what defines a relationship. Another key finding around relationship is that they need to be mutually beneficial; in some cases, tribal partners saw themselves as helping the museum by sharing their knowledge, while it was less clear at times how the tribal communities were benefiting.

### Institutional Change

To understand the extent to which Native Universe impacted individual and institutional perspectives around Indigenous ways of knowing and western science, survey data included a series of seven-point scales. The strongest agreement for both institutions was around the concept that Western science and Indigenous ways of knowing each contribute something valuable to our understanding of the world. This was followed by the statements about adding or complementing the “other” way of knowing, suggesting that individuals at both museums increased their openness to representing and bridging Indigenous knowledge and western science in the museum.

Survey data also suggest that the museums as a whole reflected openness to engaging multiple worldviews of science at the institutional level. Similar to individual perspectives, the strongest agreement was around Indigenous knowledge and western science each contributing something valuable to the way we understand the world, as well as each worldview being able to complement or add to the other.

Qualitative data showed some level of change at the institutional level for both museums, particularly around awareness and reflective practice. While OMSI participants struggled to find clear, visible indicators for change, many talked about “intangible” changes around the fact that Indigenous voice is talked about, considered in dialogues and decision-making, and that more individuals are engaged in relationship building with tribal communities. However, there was also a sense that the broader museum staff were not deeply aware of the purpose and goals of Native Universe.

At ASDM, institutional change also took the form of awareness and reflective practice, with Indigenous voice being a regular part of discussions around exhibition and program development; as well as through several physical indicators, such as Tohono O’odham signage in the Orientation Ramada and mountain overlook. Focus group data suggested that reflecting on inclusion and diversity of perspectives had become “part of the fabric” of the institution at many levels, while not codified in any formal statement or structure. Examples were provided around co-developing rather than trying to “tell the story” of a culture for them, as well as shifting their interpretive framework to include indigenous perspectives.

### Inclusion of Indigenous Voice

Qualitative data from the PhotoVoice and focus group activities suggest that deepening inclusion of Indigenous Voice at OMSI occurred primarily “behind the scenes,” through relationship building, special projects, and champions who continue to remind others about inclusion of voice and integration into museum culture. While many of the same images were shared pre- to post (e.g., totem pole, salmon walk), OMSI staff talked about “intangible changes,” such as the ways in which reflective practice around diversity and inclusion had become part of the institutional culture, and “a bigger commitment and awareness.”

Others talked about the awareness and practice of “more of a mutual relationship, co-development, and not just using partners as checking off a box).” This awareness existed even for those not directly involved in partnerships. Data also suggest that the core of early adopters had grown over the course of the Native Universe project, and that the whole NU team at OMSI (7-8 individuals) were seen as mentors around inclusion of Indigenous Voice.

Qualitative data from the PhotoVoice and focus group activities at ASDMsuggest that the museum/zoo had significantly deepened inclusion of Indigenous Voice, largely through building relationship and shifting practice around interpretation. Similar to OMSI, actual images shared from pre- to post were similar but the language used around process and relationship was quite different, focusing on co-development, interpretation, and including and honoring authentic voice.

While there was evidence that the inclusion of Indigenous Voice had been deepened, there was recognition at both OMSI and ASDM there was much more work to be done. This included wanting to see more people from tribal communities visiting the museum, finding more tangible evidence for Indigenous voice and perspectives throughout the museum, reaching out to more tribal communities, and having more direction for how to incorporate voice.

### Powerhouse Science Center

#### What we discovered

Because of institutional changes, the residency was aborted at the Powerhouse Science Center. Moving into this period, however, PHSC was making strong progress toward inclusion of Indigenous Voice.

#### What informed us

### Awareness and Engagement

In respect to the NU goals and initiatives, the PHSC staff gained awareness of how their programs were conceptually ‘servicing’ programming. As a result of engaging in the NU programming, the staff unearthed a new way of thinking and willingness to deepen their understanding and creating ways to change their conceptual approach to collaboration. Staff also became more aware of the local college’s (Fort Lewis College) Native organizations and opened engagement with them.

Unfortunately, the engagement was mainly among the education department with a few administrative staff and one board member.

### Relationship and Partnership

The PHSC staff focused their efforts on existing partnerships with the Southern Ute tribe, with outreach efforts to a few more local partners, including Fort Lewis College Native student programs (AISES, Navajo Club), Southern Ute Cultural Center, and selective Navajo Nation programs. Through their involvement in the NU programming, the PHSC staff expanded their understanding around the deeper sense of authentic partnerships and what relationships mean from a Native worldview.

#### Institutional Change

PHSC struggled in this area. While the new director supported the NU program and had extensive background in authentic collaboration and partnerships with Native communities, a number of administrative staff and board members struggled with this idea. Along with one board member, the new director tried effortlessly to build internal capacity around this area, but a few staff members were ‘constricted with their paradigms of ‘’revenue driven’ mentality. This created some internal challenges to the point that the director ended up resigning, and leaving those staff members who had the buy-in isolated and unsure of where to go with the NU programming.

#### Inclusion of Indigenous Voice

At the onset of the NU program, PHSC had little to minimal inclusion of indigenous voice within the museum’s environment. By the end of the NU program, there was a paradigm shift evident from the service model to an inclusion model and the Southern Ute partnership included providing space for indigenous voice to resonate among the programming. Programs and materials were made more inclusive of Southern Ute worldviews and included language.

After the first residency, there seemed more of a willingness among the PHSC education department to bridge this relationship and they were excited about the possibilities. These efforts were met with some internal staff members’ attempts to derail the process. In the end, administrative challenges at the science center resulted in staff turnover. There was also a brief closure of the PHSC that occurred during the Native Universe project.

## Circle of Relationships / Community of Practice

#### What we discovered

While not directly a focus of the evaluation questions, the development of a Circle of Relationships (Community of Practice) fits within the North directional goal, as a part of the sustainability of the work. This Circle of Relationships was supported in part through staff and community partners attending the residencies of other case study museums. For example, an OMSI staff and community partner attended the second ASDM site visit; and an OMSI staff and community partner attended the second site visit in Durango. Another significant part of supporting a broader community of practice around the inclusion of Indigenous Voice in science museums was the Native Universe Mid-Winter Virtual Conference, a 2-day online event which brought together staff and community partners from all three case study museums, as well as others in the field who have expertise and/or significant interest in supporting this work. What follows is a summary of findings from a post-survey disseminated about one week following the conference.

#### What informs us

While the sample size was relatively small (n=16, or 29% of the total), participants were fairly representative of the pre-conference registration survey in terms of their prior experience and engagement with the Native Universe community. The majority of participants (69%; n=11) had not participated in a Native Universe event before the conference, suggesting that the webinar drew in new participants into the community. Respondents came from a wide variety of backgrounds, including science centers, universities, non-profits, and tribal museums, and generally reflected the larger pool of conference participants.

The Mid-Winter Virtual Conference was well-received overall with six respondents (40%) saying the conference met their expectations, and one-third (n=5) indicating the conference exceeded expectations. The remaining 4 respondents indicated that the conference met *some* of their expectations. Ninety-three percent (n=14) rated the conference as excellent or good. Only one respondent rated the conference as “average.” Data suggested participants generally felt comfortable with the online format and that both in-person and virtual (webinar) strategies are effective means of engaging participants in the Native Universe community.

Respondents were asked to reflect on what they learned or realized as a result of the Native Universe virtual conference. These were open-ended responses that were analyzed and coded for emergent themes. The themes that emerged from these responses were 1) need for change in practice; 2) what it takes to do this work; and 3) the importance of this work.

Respondents were asked to reflect on what they were most excited about during the conference. Two themes emerged from these responses:

* Youth panel and perspectives – About one-third of respondents mentioned the youth panel as something they were particularly excited about during the conference.
* Stories of change – About one-third of respondents were most excited about the stories shared by the project partners and case study museums, particularly ASDM and ‘Imiloa Astronomy Center.

Respondents were also asked to rate themselves on a number of quantitative outcomes. Overall, data suggests that outcomes were moderate to strong across all areas. The strongest outcome was that respondents felt they would continue to build relationships with others in the Native Universe community (= 6.14), with the second strongest outcome being that they realized or learned something new about collaborating with integrity across multiple worldviews (= 5.67). Third strongest was a sense of feeling connected to a community of people and organizations committed to bridging IK and WS (= 5.60). These findings suggest that the virtual conference’s primary role may be in increasing the sense of community among participants and increasing understanding around what it means to collaborate with integrity, but may have played a lesser role in providing specific, tangible strategies for doing so.

# Conclusions

1. As a result of the residencies, to what extent and in what ways did change occur in the institutions around the inclusion of Indigenous voice?

Across the case study museums, the Native Universe residencies deepened awareness, learning, and reflective practice around the inclusion of Indigenous Voice. In many cases, language around Indigenous voice shifted from a “product” or “project” to a process of relationship building and co-creating, and supporting communities in telling their own story in their own voices, rather than the museum representing or interpreting stories for others. All the museums showed signs of a more reflective practice around inclusion of Indigenous voice. Native Universe also resulted in increasing the number of advocates or allies at each museum site; so instead of there being 1 or 2 primary stewards of Indigenous Voice, there was instead a small core group of individuals who began building relationships with Native partners and advocating for the inclusion of indigenous perspectives throughout the museum. This also took the form of additional positions related to the inclusion of Indigenous voice, such as a board position, a rotating AISES liaison position, and a cultural consultant.

That said, all museum sites faced challenges in truly institutionalizing and sustaining the inclusion of Indigenous voice. While certain practices have shifted, and the number of individuals advocating for Indigenous voice increased at each site, it was hard to detect many visible, lasting changes. All of the museum sites talked about changes being mostly “behind the scenes” and not formalized.

1. To what extent and in what ways did staff gain awareness of science learning as culturally-based and gain appreciation for the importance of integrating multiple belief systems in all aspects of the museum experience?

Staff and volunteers from the three case study museums increased their awareness and shifted attitudes around the role of culture in science learning and the importance of integrating multiple belief systems throughout the museum experience. All the museum sites experienced staff and/or volunteers who were skeptical of integrating multiple belief systems in what they saw as a western science museum, and disagreed with the idea that Indigenous knowledge contributed to the museum’s work and mission. There was also a debate at all the sites around the extent to which Indigenous ways of knowing should be integrated into all aspects of the museum experience, as some still saw it as serving a specific audience of Native Americans rather than enriching the museum experience as a whole.

1. To what extent and in what ways did staff increase their ability to support cross-cultural learning?

As a result of participating in Native Universe, each museum increased its capacity to engage audiences in cross-cultural learning around Indigenous ways of knowing and western science. This was evidenced through an increased number of staff and/or volunteers engaged in the work of bridging worldviews, and increased sense of comfort, experience, and expertise in doing so. From an indigenous perspective, the deepening and strengthening of relationship with tribal community partners also contributed to an increased ability to support cross-cultural learning.

1. What strategies or components best supported change and how could change have been deepened across the case study museums?

Change around the inclusion of Indigenous voice was best supported through immersive, place-based experiences based on authentic local Indigenous voice and relationship building. Also important was framing experiences through Indigenous ways of knowing, and then highlighting the science embedded within Indigenous knowledge, rather than the other way around. Other successful strategies included: having multiple onsite visits, engaging staff and volunteers from diverse departments and levels within each museum, engaging Native youth in project activities, and building off existing relationships and connections rather than forging entirely new relationships.

Multiple ideas emerged around deepening change across the museums. Many participants suggested a clearer articulation of the Native Universe goals and how museum leadership envisioned implementing the goals. Others wanted to see Native Universe as even more of a priority within and throughout the museum, rather than a more isolated initiative. Finally, creating a sustainability plan at each museum, in partnership with tribal community partners, could support more sustainable change.

1. The Powerhouse Science Center (formally known as the Durango Discovery Museum) joined the Native Universe project in Year 2, after one of the original museums had to withdraw from the project. [↑](#footnote-ref-1)
2. The online survey was not disseminated at Powerhouse Science Center as the museum had temporarily closed under new leadership. The evaluation team conducted individual and group interviews with staff and community partners who had been involved in Native Universe to assess the impacts of the project. [↑](#footnote-ref-2)