# *Generations of Knowledge*:
# Front-End Evaluation Report

Prepared for

OMSI
Everyday Encounters with Science

**by**

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## OVERALL INTRODUCTION

This report presents findings from two front-end evaluation studies related to the public and professional audience impacts of *Generations of Knowledge: Traditional Ecological Knowledge and Environmental Science,* a project under development by the Oregon Museum of Science and Industry (OMSI) and supported by a grant from the National Science Foundation (NSF). The museum is developing *Generations of Knowledge* in collaboration with:

- Indigenous Education Institute (IEI)
- Smithsonian Institution's National Museum of the American Indian (NMAI)
- Tamástslikt Cultural Institute (Confederated Tribes of the Umatilla Indian Reservation)
- Hibulb Cultural Center and Natural History Preserve (Tulalip Tribes)

The project's proposed 2,000 square foot traveling exhibition, banner exhibition, website, and youth activity kit will focus on stories of collaboration between Native American tribes and scientists who are using traditional ecological knowledge and Western science to solve local environmental issues. This project aims to bring awareness to visitors of the big idea that Native American traditional ecological knowledge (TEK) and Western science are valuable and relevant to society and offer complementary ways of understanding the natural world. The target audience includes Native and non-Native American youth age 11 to 14 and their families.

These educational products are being developed and evaluated through reciprocal collaboration between the partner institutions. The opportunities and resources for this collaboration between the informal science education institution and Native American partners is another key deliverable of this project. The intended impact on the professionals of the project team is to increase their skills and capacity to do this type of cross-cultural collaborative work to bring TEK and Western science together in an informal learning environment. The project also aims to document the strategies used and lessons learned through a legacy document to share with other educators and museum professionals.

A front-end study is typically conducted early on in a project to better understand the audiences involved or targeted, in this case both public and professional, to inform the project's development. This front-end report is divided into three parts: a summary of the evaluation activities and main findings followed by in-depth individual reports about each audience. Liz Rosino with Jenna LeComte-Hinely of OMSI led the study of the public audience, and Jane Grover of RMC Research Corporation led the study of the professional audience.

# FRONT-END EVALUATION SUMMARY

Front-end evaluation for the *Generations of Knowledge* project focused on both the public and professional audience impacts and resulted in two individual research reports, included in the sections following this summary. For each impact area of the project, front-end research objectives were identified and various data collection methods were used. The approach of the front-end evaluation was collaborative and involved forming an Evaluation Input Committee (EIC) with members of the partner organizations to give input on all aspects of the evaluation process.

## PROJECT IMPACT 1: PUBLIC AUDIENCE

*Promote awareness that Native American traditional ecological knowledge (TEK) and Western science are valuable and relevant to society and offer complementary ways of understanding the natural world.*

The objective during the front-end evaluation for this impact was to learn more about potential visitors, with a particular focus on Native and non-Native American youth age 11–14. Key topics identified for exploration included:

- Familiarity and awareness of TEK
- Perceptions of the relationship between TEK and science
- Reactions to this topic being presented in a museum
- Interests related to stories about traditional knowledge and science working together
- Environmental issues from their community that Native youth would be interested in sharing

A total of 122 in-depth interviews were conducted during the month of July 2011 at OMSI and on two Indian reservations. About 70% were conducted with youth age 11–14 and about half self-identified as American Indian or Alaskan Native. Adults at OMSI made up the rest of the sample and the majority of these participants self-identified as white.

### *Highlights of the Findings*

The front-end evaluation study of the public audience impact indicates that:

- Most participants were aware that TEK includes knowledge of how things work but fewer seemed to understand it also as a guide to action related to the environment.
- Most participants described the benefits for Native communities and scientists to work together or focused in particular on how the communities' traditional knowledge would benefit or complement science.
- An overwhelming majority of participants had a positive reaction to the idea of stories about Native communities and scientists working together being shown in a museum setting.
- Out of six potential stories, participants found stories about returning to traditional healthy foods, researching medicinal plants, and restoring Hawaiian fish ponds most interesting.

## PROJECT IMPACT 2: PROFESSIONAL AUDIENCE

*Increase the project team's capacity to facilitate reciprocal collaborations that bring traditional ecological knowledge (TEK) and Western science together in informal learning environments.*

The objective during the front-end evaluation for this impact was to learn more about the project team, which includes members of each of the partner institutions:

- How confident do stakeholders feel in their knowledge of TEK?
- How confident do stakeholders feel in their knowledge of Western science?
- What experiences have stakeholders had in collaborating with partners from cultures other than their own?
- What training or experience have stakeholders had in group process?
- In what areas do stakeholders feel they need training or education to become effective at reciprocal collaboration in their planning and educational material development processes?

Telephone interviews and an online survey were used to explore these questions and other emergent themes with the professional audience.

### *Highlights of the Findings*

The front-end evaluation study of the professional audience impact indicates that the group:

- Shares a common vision for an exhibit that will demonstrate complements between indigenous knowledge and Western science.
- Would like more knowledge of Western science and in some cases is mistrustful of Western scientific studies.
- Aspires to have tribal perspectives on ecological issues and TEK strongly reflected in the resulting exhibits and educational materials.
- Breaks new ground in collaboration across cultures with few members having prior experience in such collaborations.
- Seeks to document a model for collaborations between science museums and tribal museums.

# PUBLIC AUDIENCE FRONT-END REPORT

By Liz Rosino and Jenna LeComte-Hinely, OMSI

## EXECUTIVE SUMMARY

### OVERVIEW

This report presents findings from a front-end evaluation related to the public audience impact of *Generations of Knowledge: Traditional Ecological Knowledge and Environmental Science,* a project under development by the Oregon Museum of Science and Industry (OMSI) and supported by a grant from the National Science Foundation (NSF). The museum is developing *Generations of Knowledge* in collaboration with the Indigenous Education Institute (IEI), the Smithsonian Institution's National Museum of the American Indian (NMAI), the Tamástslikt Cultural Institute (Confederated Tribes of the Umatilla Indian Reservation), and the Hibulb Cultural Center and Natural History Preserve (Tulalip Tribes).

The deliverables of the project, including a 2,000 square foot traveling exhibition, banner exhibition, website, and activity kit, aim to bring awareness to people of the big idea that Native American traditional ecological knowledge (TEK) and Western science are valuable and relevant to society and offer complementary ways of understanding the natural world. The target audience includes Native and non-Native American youth age 11 to 14 and their families. The purpose of this front-end evaluation study was to investigate the target audience's familiarity, perceptions, and interests surrounding this big idea to inform project development.

### METHODOLOGY

The approach of this study was participatory and collaborative, involving the formation of an Evaluation Input Committee (EIC) with members of the partner organizations to give input on all aspects of the evaluation process. A total of 122 in-depth interviews were conducted during the month of July 2011 at OMSI and on two Indian reservations. About 70% were conducted with youth age 11–14 and about half self-identified as Native American. Adults at OMSI made up the rest of the sample and the majority of these participants self-identified as white.

### SUMMARY OF FINDINGS

#### *Familiarity and awareness of traditional ecological knowledge (TEK)*

- Half of adults and about one-third of youth at each location were able to demonstrate an awareness of TEK after hearing a definition of Native American TEK. Following up the definition of TEK with a second simplified prompt that focused more on the experience of the participant allowed them to significantly increase their ability to offer examples of long-term and place-based environmental knowledge.
- Most examples of traditional or local ecological knowledge offered by participants were about factual or rational knowledge of the environment, such as weather patterns or animal behavior. Youth at the locations on the reservations were likely to also mention knowledge of culturally based values about how to behave with respect to animals and the environment.

### *Perceptions of the relationship between traditional knowledge and science*

- The majority of participants described the benefits for both Native communities and scientists to work together or focused in particular on how the traditional knowledge would benefit or complement science.
- Participants related the term "science" most often with a wide range of fields of study, the scientific process, and technology. They also related it with intelligence and as a way to understand the world.
- To describe traditional knowledge, participants most often used words or phrases related to it having a historical perspective, being sensitive to the environment, and based on observation and experience. They also described it as sustainable, important, special, and effective.

### *Reactions to this topic being presented in a museum*

- There was an overwhelmingly positive reaction to the idea of the stories about Native communities and scientists working together being displayed in a museum setting.
- Youth at the locations on the reservations often also expressed surprise in a positive way.

### *Interests related to stories about traditional knowledge and science working together*

- Overall, the most popular stories chosen were about returning to healthy traditional foods, researching medicinal plants, and restoring Hawaiian fish ponds.
- Adults at OMSI were attracted to stories that could offer a more personal or widespread relevance. They wanted to learn more about how to use the TEK found in the story in their own life and also how the knowledge could be shared more widely.
- Youth were attracted by elements of the stories. They were also interested in learning more about the restoration or resolution of the environmental issue in the story.

### *Native youth sharing local environmental issues*

- Youth on the Tulalip Indian Reservation were interested in sharing stories about their culture and the activities of their tribes. They also mentioned wanting to share about both salmon and eagles through traditional storytelling and also about the importance of the presence of these animals in their community today.
- Youth on the Umatilla Indian Reservation were most interested in sharing the issue of pollution in their community. Health issues were also of concern.

### *Suggestions related to the exhibit experience and content*

- Participants suggested that the exhibit should be interactive, hands-on, and tangible. They also suggested using videos, real objects, and artifacts.

## INTRODUCTION

This report presents findings from a front-end evaluation study related to the public audience impact of *Generations of Knowledge*, a project under development by the Oregon Museum of Science and Industry (OMSI) and supported by a grant from the National Science Foundation (NSF). The museum is developing *Generations of Knowledge* in collaboration with the Indigenous Education Institute (IEI), the Smithsonian Institution's National Museum of the American Indian (NMAI), the Tamástslikt Cultural Institute (Confederated Tribes of the Umatilla Indian Reservation), and the Hibulb Cultural Center and Natural History Preserve (Tulalip Tribes).

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The purpose of this front-end evaluation study of the public audience impact was to investigate the target audience's familiarity, perceptions, and interests surrounding this big idea to inform project development. Key topics identified for exploration with the public audience in this phase of evaluation include:

- Familiarity and awareness of traditional ecological knowledge (TEK)
- Perceptions of the relationship between traditional knowledge and science
- Reactions to this topic being presented in a museum
- Interests related to stories about traditional knowledge and science working together
- Environmental issues from their community that Native youth would be interested in sharing

The study was not designed as a comparative study between different audience groups (such as Native and non-Native or youth and adult), instead its intent was to find the common relevance to help guide the development of inclusive educational experiences. Some of the trends found within the different audience groups interviewed are highlighted in the report for the purposes of making sure minority voices are heard and to increase the project team's cultural competency related to these audiences.

## METHODOLOGY

### COLLABORATIVE EVALUATION PROCESS

This front-end evaluation study was led by internal evaluation staff at OMSI and developed through a collaborative process with the Evaluation Input Committee (EIC), which includes members of the OMSI project team, partner organizations, and internal and external project evaluators.

The EIC contributed to the creation of the study's purpose and research focus through group brainstorming sessions and individual worksheets. Data collection instruments were created by the OMSI evaluators in conjunction with feedback from the EIC. Community members and tribal staff also reviewed the interview protocol, helped plan data collection logistics including parental consent of youth participation, and conducted some of the interviews. OMSI evaluators completed the initial

analysis and report draft that was then distributed and presented to the OMSI project team and EIC. This final report was based on the resulting discussions and input from these various groups.

## DATA COLLECTION

The primary data collection method for this study was in-depth interviews. These semi-structured interviews allowed researchers to focus on specific topics while still allowing exploration of unanticipated issues. The one-on-one interviews took about 10 minutes each and used cards (with text and images) to supplement the verbal descriptions included in many of the interview questions. At the end of each interview, participants were asked to complete a brief demographic sheet. See Appendix A for a copy of the interview instrument, including the cards. The method of recording responses to the interview varied based on the needs of the participants. In some situations, one evaluator conducted the interview while another took notes. In situations with a large number of participants and the need for rapid interviewing, a single evaluator both conducted the interview and took notes on participant responses.

A total of 122 interviews were conducted in three different locations during the month of July 2011. These locations included on the museum floor at OMSI, at the Tulalip Tribes' Boys and Girls Club on the Tulalip Indian Reservation in Washington, and at the Summer Recreation Program of the Confederated Tribes of the Umatilla Indian Reservation in eastern Oregon. This study used purposive sampling in selecting interview respondents based on criteria that best met the specific goals of the project. These individuals were sampled to focus on Native and non-Native youth between the ages of 11 and 14, as well as parents with children between the ages of 11 and 14.

In order to best understand the target audience, the majority of participants (70%) selected were youth rather than adults. The youth were about evenly split between the OMSI location and the two tribal locations (51% at OMSI and 49% at the two tribal locations) in order to gain a better understanding of Native and non-Native youth perspectives on the topics. The adults in the sample all came from the OMSI location, due to logistical restraints for additional off-site data collection. While not ideal, the sampling strategy reflected the desire to focus on the youth portion of the target audience. Future research could examine the perspectives from adults at tribal locations as well.

### *Locations*

Two groups were sampled at OMSI: adults and children. A total of 37 adults and 43 youth between the ages of 11 and 14 were interviewed. The youth and adults sampled were not from the same visiting group and adults were approached if they appeared to be a parent with a youth in the 11 to 14 age range. Three trained data collectors conducted these interviews over a period of 11 days. More than half of the interviews at OMSI were conducted on the weekend days of Friday, Saturday, and Sunday and took place after 2:00 p.m. The remainder were conducted Monday through Thursday. Interviews were conducted in a variety of locations within the museum and most often in the hallway outside of the Life Sciences exhibit hall. Locations for interviews in the museum were chosen based upon the flow of visitor traffic and the ability of the data collectors to find a quiet spot with fewer distractions to conduct the interview. This interview process allowed participants to feel at ease (as they were not separated from their family) and enabled them to focus on the interview questions.

Data collection at the Boys and Girls Club on the Tulalip Indian Reservation focused on youth between the ages of 11 and 14. The majority of data collection at this site took place on a Thursday afternoon, as pre-arranged with local contacts (17 out of the 18 interviews). Three data collectors, one of whom was a community contact from the Tulalip Tribes' Hibulb Cultural Center, conducted these interviews. Interviews were conducted in the lunchroom of the Boys and Girls Club. The data collectors conducted interviews at one end of a long table while the remainder of the room was used for the youth's engagement in OMSI brainteaser tabletop exhibits. These were brought to provide entertainment while participants were waiting in line for their turn to interview. This setup enabled the youth to feel more comfortable in a familiar setting near their peers, but also contributed to some degree of distraction in the participants during the interview. Thus, the data collectors slightly altered data collection procedures at the next location.

Data collection at the Summer Recreation Program of the Confederated Tribes of the Umatilla Indian Reservation was also focused solely on youth between the ages of 11 and 14. All 24 interviews took place over the course of two days, evenly distributed across a Tuesday afternoon and a Wednesday morning, as pre-arranged with the program staff. These interviews were conducted by two data collectors and facilitated by a community contact from the tribes' Tamástslikt Cultural Institute. Interviews were conducted in a classroom space adjacent to the main lobby of the facility. Summer Recreation Program staff and the community contact from the Tamástslikt Cultural Institute managed the flow of participants by sending in one at a time according to the pace of the interviews. This process reduced the amount of distraction in participants, but the one-on-one more private method of questioning may have lead participants to feel "on the spot" or as if they were being tested.

## DATA ANALYSIS

Responses to the interview questions, along with the interviewer's observations, were noted on interview forms in real time, either by the interviewer themselves or a separate note taker. The individuals who conducted the interviews entered the data from the interview forms into a spreadsheet. A second evaluator, who was present at the time of the interviews, checked the entered data for accuracy.

Quantitative data was analyzed using descriptive statistics, including frequencies and means. For qualitative data, evaluators studied the data and looked for meaningful patterns. As trends emerged, similar responses were grouped together. Descriptive statistics were then used to analyze the response categories. With all methods, at least one additional evaluator reviewed or double checked the analysis. Quotations are also presented throughout this report to illustrate interviewees' thoughts and ideas as fully as possible.

This study was not designed as a comparative study between different audience groups, as the sampling process or interviewing conditions were not similar at the various locations, nor was this the intent of the study. While notable trends found at a particular location may be highlighted, the purpose of the analysis and resulting report of findings was to find the common relevance across all participants while also making sure minority voices were heard.

## FINDINGS

### PARTICIPANT DEMOGRAPHICS

In the overall sample of 122 participants, there were slightly more females (53%) than males. About 35% identified as Native American, including seven of the 11 that indicated more than one race. Overall there was membership or heritage represented from 23 different tribes or nations (Table 2). Those who identified as non-Native were predominately white and a small percentage identified as Asian, Black or African-American, or as more than one race.

Table 1. Participant demographics

| | OMSI | | Indian Reservations | | |
|---|---|---|---|---|---|
| | Adults | Youth | Tulalip (Youth) | Umatilla (Youth) | Total |
| **Gender** | | | | | |
| Female | 21 | 21 | 8 | 15 | 65 |
| Male | 16 | 22 | 10 | 9 | 57 |
| **Race** | | | | | |
| Native American | 0 | 1 | 13 | 22 | 36 |
| White | 25 | 30 | 2 | 1 | 58 |
| Asian | 6 | 2 | 0 | 0 | 8 |
| Black or African American | 0 | 1 | 0 | 0 | 1 |
| Native Hawaiian or other Pacific Islander | 0 | 0 | 0 | 0 | 0 |
| More than one race | 5 | 4 | 1 | 1 | 11 |
| Prefer not to answer | 0 | 1 | 0 | 0 | 1 |
| Not sure | 1 | 4 | 2 | 0 | 7 |
| **Total** | 37 | 43 | 18 | 24 | 122 |

All youth selected were in the 11–14 age range and they made up approximately 70% of the total sample. Of these youth, about 49% identified as Native American, including six who indicated more than one race. Adults made up the remaining 30% of the sample and were selected by appearing to be a parent with a youth in the target age range. All adult data was collected at the OMSI location and were mostly in the 30–49 age range and the majority (68%) identified as white.

Table 2. Self-reported tribe/nation membership or heritages

| **OMSI Adults** | **Umatilla Reservation** |
|---|---|
| Cherokee | Cayuse |
| Klamath | Chippewa |
| Navajo | Cree |
| Nez Perce | Hupa |
| Plains Indians | Klamath |
| Sioux | Modoc |
| **OMSI Youth** | Navajo |
| Quileute | Nez Perce |
| Sioux | Northern Cheyenne |
| **Tulalip Reservation** | Opata |
| Cherokee | Papago |
| Skokomish | Pima |
| Spokane | Umatilla |
| Tulalip | Walla Walla |
| Yakama | Warm Springs |
| | Yakama |

## FAMILIARITY AND AWARENESS OF TRADITIONAL ECOLOGICAL KNOWLEDGE (TEK)

Near the beginning of the interview, participants were given the following definition, presented on a card and also read aloud, to investigate their level of familiarity and awareness of traditional ecological knowledge (TEK) as presented in this way.

> *This is an idea we are thinking about presenting in a new exhibit:*
> *Native American communities have been living in the same place for a very long time.*
> *They pass information down through generations by storytelling and traditions.*
> *Because of this, they have learned a lot about the environment where they live.*
> *Can you think of any examples [of what they would know about their environment]?*

About half of adults and about one-third of youth demonstrated they had an awareness of TEK by giving an example or describing how the knowledge is built or shared after this first prompt.

Table 3. Awareness of TEK after Native American TEK definition

| OMSI Adults (n=37) | OMSI Youth (n=43) | Tulalip Reservation Youth (n=18) | Umatilla Reservation Youth (n=24) |
|---|---|---|---|
| 51% | 33% | 33% | 29% |

Participants who could not give an example or gave an unrelated response were then given the following prompt related to local ecological knowledge (LEK):

> *If you lived in the same place for a long time, what would you know about the environment where you live?*

After given one or both prompts related to traditional or local ecological knowledge, on average about 87% of all participants demonstrated awareness by providing an example.

Table 4. Awareness overall after TEK and/or LEK prompt

| OMSI Adults (n=37) | OMSI Youth (n=43) | Tulalip Reservation Youth (n=18) | Umatilla Reservation Youth (n=24) | Overall Mean |
|---|---|---|---|---|
| 95% | 91% | 83% | 71% | 87% |

The responses to both prompts were analyzed and grouped according to categories of information developed by Usher (2000) to classify TEK, distinguishable on both substantive and epistemological grounds. Many responses were grouped into multiple categories and the table below shows how the responses were categorized and distributed.

Table 5. Participants' examples of traditional or local ecological knowledge

| Response category | OMSI Adults (n=35) | OMSI Youth (n=39) | Tulalip and Umatilla Reservation Youth (n=32) | Total (n=106) |
|---|---|---|---|---|
| **Types of environmental knowledge** | | | | |
| Factual/rational knowledge | 89% | 87% | 88% | 88% |
| Knowledge of past or current uses | 20% | 15% | 9% | 15% |
| Knowledge of culturally based values about how things should be | 11% | 3% | 25% | 12% |
| **Methods** | | | | |
| Methods of building or sharing knowledge | 23% | 5% | 22% | 16% |

Most participants' responses, about 88%, were related to factual or rational observable knowledge about the environment.

> *"Flowers, when the rains come, when the snows come, what plants are safe to eat."* —adult at OMSI
>
> *"Know about animals, what they do and how they do it."* —youth at OMSI
>
> *"The medicines…and where the good water is. My dad knows where the good water is, like where the spring water comes fresh from the mountains. I'd know where the roots are, where the flowers are for Memorial Day, where the deer are, where the other animals are, what time the animals come out like at night, when the winter is coming, when the other seasons are coming."*–youth on the Umatilla Reservation

Fewer participants, primarily adults and youth at OMSI, mentioned factual knowledge about past or current uses of the environment.

> "*How the environment has changed, what happened, what they did before, lifestyle."* —adult at OMSI
>
> *"Resource management. They [Native Americans] did a lot more resource management than we actually realize; burning and damming."* —adult at OMSI

Some participants, primarily youth on the Tulalip and Umatilla Reservations, also mentioned knowledge of culturally based values about how things should be and how to behave in regards to the environment.

> *"They [Native Americans] respect their animals. Really respectful."* —youth on the Tulalip Reservation
>
> *"We need to keep it [the environment] clean and restore stuff. My mom is doing a restoration project of mussels. They are getting lost."* —youth on the Umatilla Reservation
>
> *"To respect it [the environment], take care of it, and not destroy it."* —youth on the Umatilla Reservation

Lastly, some participants also mentioned methods of building or sharing the environmental knowledge.

> *"This is how the elders teach us."* —youth on the Tulalip Reservation
>
> *"The stories come from animals and trees, they can explain something by telling a story."* —adult at OMSI

## PERCEPTIONS OF THE RELATIONSHIP BETWEEN TRADITIONAL KNOWLEDGE AND SCIENCE

### *Connotations of the word "science"*

Participants were asked what words or phrases come to mind when they hear the word "science." Most gave more than one word or phrase and each was considered a separate response. Similar responses were grouped within categories and Table 6 shows the percentage of participants who gave responses related to each.

Table 6. Science connotations by percent of participants

| Response category | OMSI Adults (n=37) | OMSI Youth (n=43) | Tulalip and Umatilla Reservation Youth (n=42) | Total (n=122) |
|---|---|---|---|---|
| **STEM fields** (science, technology, engineering, and math) | 81% | 65% | 40% | 62% |
| **Scientific process** (e.g., research, experiments, innovation) | 49% | 30% | 40% | 39% |
| **Knowledge** (e.g., intelligence, logic, facts, theory) | 19% | 14% | 12% | 15% |
| **Affect/emotion** (e.g., engaging, interesting, boring) | 19% | 14% | 10% | 14% |
| **Equipment** (e.g., test tubes, chemicals, microscope) | 8% | 14% | 12% | 11% |
| **Place or location** (e.g., lab, museum, school) | 11% | 12% | 2% | 8% |
| **Science concepts** (e.g., energy, systems, magnetism) | 5% | 7% | 5% | 6% |
| **People/careers** (e.g., scientists, teachers) | 0% | 12% | 2% | 5% |
| **No response** | 3% | 2% | 5% | 2% |

Responses related to different fields of science were mentioned by more than half of the participants, particularly at OMSI. The fields of biology and chemistry were most common.

Words or phrases related to the process of science were also very common, and the word "experiment" was in 40% of those responses. Other examples of responses in this category include: "research and results you replicate," "studying your environment," "explosions," "dissecting," and "trying to find new cures."

Words or phrases in the knowledge category were mentioned by about 15% of participants. This included science facts or theories and that science explains how the world works, as well as concepts related to the idea of intelligence.

> *"Science is logic, deeper thinking, experiments, data, facts and hypothesis."* —adult at OMSI
>
> *"Everything in the world and how it works."* —youth at OMSI
>
> *"Well, it teaches you to be smart…it teaches you to go to college."* —youth on the Tulalip Reservation

### *Perceptions of traditional ecological knowledge and science*

To understand how participants perceive traditional ecological knowledge and science, responses to a question about the value of collaboration between Native communities and scientists were analyzed to find common ways that traditional knowledge and science were described in this context.

Traditional ecological knowledge

The most common phrases used were about the historical aspect of traditional knowledge, such as "been here longer," "past knowledge," or "ancient wisdom." The second most common phrases used were related to a close relationship with the environment, such as "sensitive to the environment," "respect for the environment," or "knowledge about the outside world." The knowledge was also described as being "effective," "sustainable," and "eco-friendly" as well as "special" and "important."

Some participants described that the knowledge is gathered through "trial and error," "observation and experience," or "different techniques than science." Other responses include that it has a long-term view, is local, and relates to a tribe's survival.

Science

Participants described science, often in comparison, as current, modern, or futuristic and that it used technology. It was also mentioned that it had a short-term view, was knowledge about a variety of "stuff," and offered solutions that were more "chemical" than natural. Participants did seem to think that it was a good way to preserve and share knowledge and often cited how the stories they were shown earlier in the interview were about how traditional knowledge was being lost. They also mentioned how scientists typically did not understand cultural differences.

## VALUE OF COLLABORATION

Participants were asked why they think it might be valuable for Native communities and scientists to work together. This question was asked shortly after participants were given the six different stories that illustrated Native communities and scientists working together to solve an environmental issue.

Table 7. Value of Native communities and scientists working together

| Response category | OMSI Adults (n=37) | OMSI Youth (n=43) | Tulalip and Umatilla Reservation Youth (n=42) | Total (n=122) |
|---|---|---|---|---|
| Described the benefits for both groups or the benefit for people with different perspectives to work together | 35% | 47% | 44% | 43% |
| Focused on how the traditional knowledge would benefit science and the rest of the world | 51% | 21% | 14% | 28% |
| Focused on how the scientists involvement would benefit the Native communities | 11% | 21% | 10% | 14% |
| Unrelated response | 3% | 5% | 5% | 4% |
| "I don't know" | 0% | 7% | 26% | 11% |

Overall, the largest percentage of participants (43%) described benefits for both groups or recognized the benefit for people with different perspectives to work together.

> *"The scientists maybe have a bigger knowledge of what's going on with the ash tree. And the Natives offer another side to the same story. So that they can be combined and so that everyone else can see both sides. So we have a bigger knowledge range."* —youth at OMSI
>
> *"The more information. It's unfortunate to separate one way of knowing from another. I think that Western medicine is starting to realize that."* —adult at OMSI
>
> *"'Cause Natives and scientists know things and when they're together they know even more than what they did before."* —youth on the Tulalip Reservation

The second most common response (28%) for all participants was focused on how the traditional knowledge would benefit science and the rest of the world. About half of the adults interviewed at OMSI in particular were focused on this aspect of the collaboration.

> *"Because Natives have long experience in this land and area. They know a lot of special things that will be valuable for scientists to know."* —adult at OMSI
>
> *"Another source of input for scientists and information on where to collect information."* —youth at OMSI
>
> *"Natives love nature and mother earth and they'll know how to care for it better. Natives will come up with a way that is more eco-friendly than scientists."* —youth on the Tulalip Reservation

About 14% focused on how the scientists' involvement would benefit the Native communities.

> *"Scientists can help them. When you have scientists or science something is more believable."* —adult at OMSI
>
> *"They [Native communities] could probably find out important things about their foods and help learn to sustain their tribes."* —youth at OMSI
>
> *"Because someday if you don't take care of the environment it'll go bad. If you treat it good, it can go good. You talk to a scientist to learn how to treat it well. The scientist can tell you how to take care of it."* —youth on the Umatilla Reservation

About a quarter of participants on the reservations responded with "I don't know" to this question. This trend was especially high at the location on the Tulalip Reservation. As mentioned previously, the interview process used at both Tribal locations may have been less than optimal. In order to better understand the motivation behind this response, the interviewers' observational notes for this portion of the interview were reviewed. The observational notes indicated that by this late point in the interview, these participants were observed to be distracted or fatigued. These observations suggest that the high rate of "I don't know" responses may not necessarily indicate that the participants did not value the collaboration, but rather they were disengaging from the interview process.

## REACTIONS TO THIS TOPIC BEING PRESENTED IN A MUSEUM

### *Previous museum visitation*

Most participants were found to be familiar with museums. About 86% of all participants were currently at or had visited a science museum previously. More than half, about 56%, of both adult and youth visitors interviewed at OMSI had visited the museum previously. More than half (57%) of youth on both Tulalip and Umatilla Reservations had previously visited a science center or museum.

Youth at the locations on the reservations were also asked if they were familiar with the tribal museum in their community as the exhibit will eventually be on display at these two museums. All but two of the 24 youth interviewed on the Umatilla Reservation reported they had visited the Tamástslikt Cultural Institute previously. They typically visited with family or the Recreation Program and, some also mentioned, through their school. Twelve of the 18 youth interviewed on the Tulalip Reservation were aware of the Hibulb Cultural Center, which was preparing to open about a month later. They typically heard about the cultural center through their family, who were usually involved in the museum in some way, or due to the museum's location and signage by the road.

### *Connotations of the word "museum"*

Participants were asked what words or phrases come to mind when they hear the word "museum." Most gave more than one word or phrase and each was considered a separate response. Similar responses were grouped within categories and Table 8 shows the percentage of participants who gave responses related to each category.

Table 8. Museum connotations by percent of participants

| Response category | OMSI Adult (n=37) | OMSI Youth (n=43) | Tulalip and Umatilla Reservation Youth (n=42) | Total (n=122) |
|---|---|---|---|---|
| **History** (e.g., history, artifacts, dinosaurs, old, dusty) | 41% | 58% | 64% | 55% |
| **Experience** (e.g., exhibits, exploring, tangible, learning, hands-on, interactive, reading) | 62% | 28% | 17% | 34% |
| **Affective/emotion** (e.g., boring, fun, interesting) | 30% | 9% | 10% | 16% |
| **Creativity/art** (e.g., art, music, paintings) | 19% | 9% | 19% | 16% |
| **Innovation/science** (e.g., science, technology, space) | 11% | 23% | 12% | 16% |
| **Knowledge stored/displayed** | 22% | 2% | 2% | 8% |
| **Place/location** (e.g., waterfront, OMSI, PSC, gift shop, school) | 5% | 12% | 2% | 7% |
| **Audience** (e.g., family, children) | 14% | 5% | 0% | 6% |
| **Other** | 0% | 0% | 2% | 1% |
| **I don't know** | 0% | 0% | 2% | 1% |

The most common words or phrases mentioned by all participants were related to history (55%) or the museum experience (34%). An affective or emotional response was also heard from 16% of participants, especially OMSI adults. They were predominately positive associations, such as "interesting" or "fun." Five out of the 19 responses in this category were negative, such as "boring."

The connotation of museums as a place where knowledge is stored or displayed was mentioned by only 8% of participants overall, primarily by OMSI adults.

> *"Place where they collect knowledge that is gathered that needs to be stored."* —adult at OMSI

### *Reactions to stories being displayed in a museum*

Shortly after being given the six different stories that illustrated how both traditional knowledge and science were being used together, participants were asked what their reaction would be if they were to see stories like those featured in a museum.

These reactions were analyzed into four different categories, based on the initial response: positive, surprised, mixed, and negative. As shown in Table 9, the majority of participants, about 89%, had a positive reaction, including those who were surprised but in a positive way.

Table 9. Initial reaction to the stories being featured in a museum

| Response category | OMSI Adults (n=37) | OMSI Youth (n=43) | Tulalip and Umatilla Reservation Youth (n=42) | Total (n=122) |
|---|---|---|---|---|
| Positive | 81% | 77% | 57% | 71% |
| Surprised and positive | 3% | 7% | 21% | 12% |
| Surprised and neutral | 0% | 5% | 7% | 2% |
| Mixed | 8% | 2% | 2% | 4% |
| Negative | 0% | 0% | 2% | 1% |
| Unrelated | 5% | 5% | 0% | 3% |
| "I don't know" | 3% | 5% | 10% | 6% |

Most participants had a general positive reaction.

> *"Happy that they [Native Americans] are getting the word out about how they're living now."* —adult at OMSI

> *"I'd be happy to see something that shows Western science is exploring traditional knowledge and challenging its foundations."* —adult at OMSI

> *"I would totally check it out. This sounds pretty cool. I'm a science guy, I don't know if I mentioned that, and I would totally check it out."* —youth at OMSI

> *"Happy. [Interviewer: what would you be happy about?] I mean, Native culture getting shown."* —youth on the Tulalip Reservation

> *"I would feel like seeing the stories. We'd be learning more. Then we can pass it on down through the generations to others."* —youth on the Umatilla Reservation

The initial reaction of surprise was also common for some participants, particularly youth on the Tulalip and Umatilla Reservations. Most of those responses also indicated that they were surprised or amazed in a positive way.

> *"I would be interested in reading the stories. Also surprised, I thought OMSI was mostly like CSI or space stuff. [Interviewer: surprised in what way?] Surprised in a good way."* —youth on the Umatilla Reservation

> *"I would be amazed that they have them in the museum. Different facts that no one thinks is good enough to read, once you do read you realize it is important."* —youth on the Tulalip Reservation

> *"My reaction would be, why haven't they begun working on this sooner? Why didn't we learn about it before this?"* —youth at OMSI

There were a small number of participants who had mixed emotions, primarily adult participants. The majority of these comments indicated that the participant's reaction would depend on how the topic was presented in the exhibit, including factors like what perspective the exhibit took or what the exhibit included.

> *"Depends on if it was authentic and what perspective it was from. As long as it's from a more accurate historical perspective without politics or emotions. More black and white so that it lets the audience interpret the facts and doesn't sway them, then I'd appreciate it."* —adult at OMSI

Only one participant had a negative reaction to the idea of seeing the stories in a museum.

> *"I don't know, um…I probably wouldn't be very entertained."* —youth on the Tulalip Reservation

## INTERESTS RELATED TO STORIES ABOUT TRADITIONAL KNOWLEDGE AND SCIENCE WORKING TOGETHER

Participants were read and shown each of the six stories found in Appendix A. They were then asked a series of follow-up questions about which one was most interesting to them, why it was interesting, and what they would want to learn more about in the story.

### *Most interesting story*

Overall, most participants (72%) were most interested in stories about returning to healthy traditional foods, researching medicinal plants, and restoring Hawaiian fish ponds.

Table 10. Story chosen as most interesting

| Story | OMSI Adults (n=37) | OMSI Youth (n=43) | Tulalip Reservation Youth (n=18) | Umatilla Reservation Youth (n=24) | Total (n=122) |
|---|---|---|---|---|---|
| Healthy traditional foods | 43% | 30% | 17% | 21% | 30% |
| Researching medicinal plants | 38% | 14% | 11% | 17% | 22% |
| Restoring Hawaiian fish ponds | 3% | 33% | 33% | 17% | 20% |
| Beetle destroying ash tree | 9% | 16% | 17% | 17% | 14% |
| Restoring wild rice | 8% | 5% | 11% | 21% | 10% |
| Restoring sweetgrass | 0% | 2% | 11% | 8% | 4% |

Adults at OMSI had a strong interest in both the healthy traditional foods and medicinal plant stories and very little interest in the others. About 30% of youth at OMSI were also interested in healthy traditional foods and another 33% were also interested in the Hawaiian fish pond story.

Youth on the two reservations chose stories in a slightly more even distribution, although the Hawaiian fish pond story was still very popular with Tulalip youth.

### *Why the story is interesting*

The responses to why a participant found their selected story most interesting fell into two large groups. Many responses were grouped into more than one response category. About half of responses indicated an interest in aspects of the story, such as mentioning the restoration being done, the traditional knowledge being used, or other elements of the story. The other half of responses indicated an interest in the relevance of the story, for example when the participant is explaining how the story is relevant to either them or to the rest of the world.

Table 11. Why is the story interesting to participants

| Response Category | | OMSI Adults (n=37) | OMSI Youth (n=43) | Tulalip and Umatilla Reservation Youth (n=40) | Total (N=120) |
|---|---|---|---|---|---|
| ***Story Aspects*** | Restoration | 11% | 14% | 30% | 18% |
| | Knowledge | 22% | 16% | 13% | 17% |
| | Other aspects | 24% | 60% | 53% | 47% |
| ***Relevance*** | Personal | 35% | 7% | 20% | 20% |
| | Widespread | 38% | 14% | 5% | 18% |
| | Learning | 8% | 2% | 15% | 8% |
| ***Nonresponse*** | "I don't know" | 0% | 2% | 3% | 2% |

Overall, almost half of all participants were interested in the general content of the story. This was found to be an especially strong trend with the youth.

> Medicinal plants story: *"I just think that because they've been doing it for thousands of years…I chose that one."* —youth at OMSI
>
> Fish ponds story: *"Well…I like fish. I wanted to learn more about fish, like what they eat. I know that fish eat fish food, but other types, different types."* —youth on the Tulalip Reservation
>
> Ash tree story: *"Not many things I know can kill trees that are very small compared to the tree."* —youth on the Umatilla Reservation

Youth on the reservations were especially interested in the restoration aspect of the story.

> Wild rice story: *"Because they're building stuff and they [the tribes] care about what's happening to the land."* —youth on the Umatilla Reservation
>
> Healthy foods story: "*People need to bring back healthy foods. You can get really sick from diabetes; it can cause death or infections."* —youth on the Umatilla Reservation

Relevance of the story at the personal and societal level was another aspect of interest, especially for adults at OMSI.

> Medicinal plants story: *"My grandmother in Mexico often uses traditional medicine and it works. Scientists and doctors often don't use this knowledge."* —adult at OMSI
>
> Healthy foods story: *"They're all good stories but I think that this is a big problem in general in the US and that this exhibit would be helpful for them and us."* —adult at OMSI

### *Wanting to learn more*

Table 12 shows the aspect of the story participants would like to learn more about. Many responses were grouped into multiple response categories.

Table 12. What participants want to learn more about in the story

| Response Category | OMSI Adults (n=37) | OMSI Youth (n=43) | Tulalip and Umatilla Reservation Youth (n=42) | Total (n=122) |
|---|---|---|---|---|
| Traditional knowledge | 65% | 49% | 52% | 55% |
| Restoration/Resolution | 22% | 33% | 14% | 23% |
| Environmental issue | 19% | 19% | 17% | 18% |
| Other | 5% | 7% | 14% | 9% |
| Sharing the TEK | 16% | 0% | 0% | 5% |
| "I don't know" | 3% | 9% | 14% | 9% |

About half of all participants were interested in learning more about the traditional ecological knowledge being used in the story.

Medicinal plants story: "*Everything. Examples of specific plants, some of the main things that they use for common health conditions."* —adult at OMSI

Healthy foods story: *"What foods to help control blood sugar."* —youth at OMSI

Wild rice story: *"Where the rice came from, where it was first found, how to grow it so I can grow it at my house."* —youth on the Umatilla Reservation

Five youth and adults interviewed at OMSI also expressed wanting to learn if the traditional knowledge was "proven." These responses were all related to the medicinal plants and healthy foods stories.

Medicinal plants story: *"Highlights on things that have been proven to work."* —adult at OMSI

"*What exactly are these supposed to cure and if they actually do."* —youth at OMSI

About a quarter of all participants were interested in learning more about the restoration or resolution work in the story.

Fish ponds story: *"If they actually reached their goal. How long it took, what was used."* —youth at OMSI

Sweetgrass story: *"How they're going to bring it back, and the types of medicine they make with it."* —youth at OMSI

Youth on the reservations were also interested in learning about other aspects of the story, in particular the baskets.

Sweetgrass story: *"The baskets. How to make them."* —youth on the Tulalip Reservation

Ash tree story: "*Why baskets are so important."* —youth on the Tulalip Reservation

Only adults at OMSI mentioned wanting to know more about how the knowledge could be shared to a larger audience. This relates to their interest in personal and widespread relevance.

Healthy foods story: *"How you can apply this to the public health epidemic globally. Why this is a great example."* —adult at OMSI

Medicinal plants story: *"Where it's happening, what they're finding out, can we Westerners use it too. [The story] encompasses all of them."* —adult at OMSI

## LOCAL ENVIRONMENTAL ISSUES TO SHARE

Youth on both the Tulalip and Umatilla Reservations were asked an additional question at the end of the interview to find out about environmental issues or stories from their community that they would like to share in this type of exhibit.

After hearing about the six potential stories, half of the 18 youth interviewed at Tulalip offered something they would like to share from their community in the exhibit. Five described something about their culture they would like to share such as traditional art and crafts, the Lushootseed language, and their youth programs and powwows.

Two wanted to share specific traditional stories. One talked about wanting to share a traditional story he called the Eagle Boy story. The other wanted to share a traditional story about the Salmon people who offered themselves as food in the form of salmon fish. He described how the salmon people required that the bones be thrown back into the water for their spirits to be reborn again as fish.

Two mentioned specific observations about animals they wanted to share. One wanted to share about the importance of salmon as food for the Tribes. "If they [salmon] go away, we would only have junk food to eat." The other talked about how they are able to see eagle nests in Tulalip because of all the trees. "It's wonderful to have eagle nests near you. They can pick where they want to be and they want to be here." Earlier in another interview, another person pointed out the eagle nest that could be seen out the window.

Half of the 24 respondents on the Umatilla Reservation shared environmental issues from their community to feature in the exhibit. Nine focused on pollution and this included land, water, and air pollution.

> *"[I want to] share how people shouldn't trash the community or it will be a bad environment to grow up in."*
>
> *"[There is] a lot of littering in rivers and roads. People don't throw things away, they just leave them by dumpsters."*
>
> *"Pollution to the river, fish are dying."*
>
> *"Pollution by cars. It depletes the ozone layers and kills a lot of things."*

Three people were concerned with health issues, such as diabetes and drinking.

> "*The increasing diabetes is due to the cigarettes and the bad food everywhere."*
>
> *"Drinking. A lot of the community, a lot of my family members, are drinking too much. They used to play sports, and they used to be really good, but they don't now because of the drinking. My cousin is like a role model, she shows what you can do without drugs and alcohol."*

## ADDITIONAL THOUGHTS OR COMMENTS FROM PARTICIPANTS

For the last question of the interview, all participants were asked if they had any additional thoughts or comments to share. About 42% of the 122 participants offered a comment or suggestion.

Most made suggestions about the exhibit experience or content to be included.

> *"Make it interactive, use demos and show how to do some things, touch."* —adult at OMSI
>
> *"Activities around the stories and have videos with the elders talking."* —adult at OMSI
>
> *"Make it authentic and interactive and have as many primary sources as possible."* —adult at OMSI
>
> *"Get real objects and stuff to show it."* —youth on the Umatilla Reservation
>
> *"Put the history of the tribes in it."* —youth at OMSI

> *"Put in a little bit of everything—include a lot of tribes so people can learn which tribes are in which areas."* —youth at OMSI
>
> *"You should bring in about eagle feathers, they're very important to the Indian Nation."* —youth on the Umatilla Reservation

Others responded and commented on the exhibition idea.

> *"It would be great to give not only non-Natives exposure to these stories, but also Natives."* —adult at OMSI
>
> *"It's a neat thing. I haven't seen anything like it."* —adult at OMSI
>
> *"I think it would be fun for other kids to learn."* —youth on the Umatilla Reservation

A few commented on the collaboration and restoration found in the stories.

> *"I hope the scientists do a good job."* —youth at OMSI
>
> *"More tribes should try and do stuff like this."* —youth on the Tulalip Reservation
>
> *"People and scientists should combine to help make places a better place for their kids."* —youth on the Umatilla Reservation

## DISCUSSION

### FAMILIARITY AND AWARENESS OF TRADITIONAL ECOLOGICAL KNOWLEDGE (TEK)

It was found that half of adults and about one-third of youth were able to demonstrate an awareness of TEK using the definition related to Native American TEK. Following up the definition of TEK with a simplified prompt, which focused less on a specific group of people or traditions, allowed participants to greatly increase their ability to offer examples of long-term and place-based environmental knowledge. It seems as though this second prompt allowed the participant to make it personal and relevant and therefore easier to answer and perceived as less reliant on previous knowledge specifically about Native American culture. While most answered the second prompt still referring to Native American TEK, they seemed to have found it necessary to first have it explained more simply and in less culture-specific terms.

Most examples of traditional or local ecological knowledge provided by participants were about factual or rational knowledge of the environment, such as knowing about such matters as weather, seasons, animal behavior, or locations of things. If TEK can be thought of as both knowledge of how things work and a guide to action related to the environment, this latter portion of the concept of TEK as a guide to action was mentioned far less frequently and may be important to elaborate upon in more detail in the exhibition.

### PERCEPTIONS OF THE RELATIONSHIP BETWEEN TRADITIONAL KNOWLEDGE AND SCIENCE

The majority of participants, about 71%, described the benefits for both Native communities and scientists to work together or focused in particular on how the traditional knowledge would benefit or complement science. Participants related the term “science” most often with a wide range of fields of study, the scientific process, and technology. They also related it to intelligence and as a way to understand the world. To describe traditional knowledge, participants most often used words or phrases about it having a historical perspective, being sensitive to the environment, and based on observation and experience. They also described it as sustainable, important, special, and effective. All of these findings together seem to indicate that most participants thought the two ways of knowing are both complementary and valuable.

A much smaller number of participants seemed to indicate that science was more valuable or that it was necessary to validate the indigenous knowledge with science. It should also be noted that about 26% of youth on the reservations responded with “I don’t know” to this question. The interviewers’ observational notes seem to suggest that this lack of response does not necessarily indicate that they do not value collaboration in this context, but instead seemed to be less engaged by this point in the interview potentially due to a less than optimal interview process in these settings.

### REACTIONS TO THIS TOPIC BEING PRESENTED IN A MUSEUM

Most participants were found to be familiar with museums, in particular science museums or science centers. They also related to museums most often as a fun or interesting place that is interactive or hands-on, and where you would learn about history. OMSI adults in particular also thought of museums as a place where important knowledge is collected or displayed.

An overwhelming majority of participants had a positive reaction to the idea of the stories about Native communities and scientists working together being displayed in a museum setting. Participants liked that Native Americans were being portrayed in this way and that it would be an opportunity to learn more about traditional knowledge and share the knowledge more widely. Youth on the reservations often also expressed surprise in a positive way, typically because they did not think it was the kind of exhibit topic that would normally be in a science museum or because the stories ended up being more interesting or important than they originally thought they would be. Overall, it seems as though people would find it an appropriate and perhaps important exhibit for a museum, but it would also need to be inviting, engaging, and interactive as well to be attractive to people.

### INTERESTS RELATED TO STORIES ABOUT TRADITIONAL KNOWLEDGE AND SCIENCE WORKING TOGETHER

Overall, most participants were interested in stories about returning to healthy traditional foods, researching medicinal plants, and restoring Hawaiian fish ponds. Adults at OMSI were attracted to stories that could offer a more personal or widespread relevance beyond just the Native communities, which is why they strongly focused on the health topics of foods and medicine. They wanted to learn more about how to use the TEK in the story in their own life and also how the knowledge could be shared more widely. There was also a small indication that some were also interested in knowing if the knowledge is proven, in terms of reducing blood sugar or curing ailments.

Youth were attracted by elements of the stories, such as the fish in the Hawaiian fish pond story or the beetle in the ash tree story. It is possible that the animals featured in these two stories were especially appealing for youth. They were also interested in learning more about the restoration or resolution of the environmental issue in the story. Youth at the locations on the reservations were more attracted than adults or youth at OMSI to stories related to restoring native wild rice or sweetgrass, possibly because they were more familiar with these plants than OMSI participants. The restoration described in these stories could be perceived as being a more local issue and they also include more cultural relevance than other stories.

### NATIVE YOUTH SHARING LOCAL ENVIRONMENTAL ISSUES

Youth on the Tulalip Reservation were interested in sharing stories in an exhibit of this kind about their culture and the events and activities of their tribes. They also mentioned wanting to share about both salmon and eagles through traditional storytelling and also about the importance of the presence of these animals in their community today.

Youth on the Umatilla Reservation were asked more specifically about environmental issues in their community that they would like share. The most common issue mentioned was of pollution, often related to the rivers, which is then affecting the local fish. Health issues, such as diabetes and alcoholism, were also of concern.

### SUGGESTIONS RELATED TO THE EXHIBIT EXPERIENCE AND CONTENT

Throughout the interview many participants made suggestions related to the exhibit experience. Because the story examples used in the interviews were shown as text on cards, many seemed concerned that this is how the exhibit would be as well. There was also an issue observed related to youth literacy levels that seems to suggest that reducing the amount of reading required in the exhibit

would be best. Participants suggested that the exhibit should be interactive, hands-on, and tangible. They also suggested using videos and real objects. It should also be considered how these recommendations relate to the proposed two-dimensional banner exhibit as well.

# PROFESSIONAL AUDIENCE FRONT-END REPORT

By Jane Grover, RMC Research Corp.

## INTRODUCTION

The *Generations of Knowledge* project is under development by the Oregon Museum of Science and Industry (OMSI) and supported by a grant from the National Science Foundation. This five-year project is a collaborative effort involving OMSI and their partners: Indigenous Education Institute (IEI), Smithsonian Institution's National Museum of the American Indian (NMAI), Tamástslikt Cultural Institute, and the Hibulb Cultural Center and Natural History Preserve. The project team, which includes members of the partner organizations, will collaboratively develop a traveling museum exhibition highlighting the complementary relationship between Native American traditional ecological knowledge and Western science; a smaller banner version of the exhibit; a virtual exhibition website; and a youth activity kit for use in schools, tribal museums, and science centers. The project will also document the exhibition development and evaluation processes to identify model practices for similar collaborative projects.

The intended impact of this collaborative process on the professional audience is an increase in their capacity to facilitate reciprocal collaborations that bring traditional ecological knowledge (TEK) and Western science together in informal learning environments. This evaluation study, led by RMC Research Corp., was conducted to better understand this audience at the beginning of the project. For the purposes of the front-end phase, the professional audience was defined as members of the project team from the partner organizations and these were also the same members as the project's Evaluation Input Committee. As more partners join the project, the definition of who is included in professional audience is expected to change over time.

The professional audience front-end evaluation was designed to address the following questions:

- How confident do stakeholders feel in their knowledge of TEK?
- How confident do stakeholders feel in their knowledge of Western science?
- What experiences have stakeholders had in collaborating with partners from cultures other than their own?
- What training or experience have stakeholders had in group process?
- In what areas do stakeholders feel they need training or education to become effective at reciprocal collaboration in their planning and educational material development processes?

An online survey of the professional audience with eight respondents was conducted in May and June 2011 and was followed in July with seven in-depth interviews. The survey included an adaptation of the Levels of Collaboration Scale (Frey, Lohmeier, Lee, & Tollefson, 2006) to understand the current level of collaboration in the project and for use as a baseline to understand the development of reciprocal collaboration over the course of the project. See Appendix B for the interview instrument and Appendix C for the online survey instrument. Both evaluation activities explored stakeholder perceptions and experience in working in groups and in collaborating in cross-cultural settings, particularly in the areas of developing exhibits and educational materials.

## FINDINGS

### PROFESSIONAL AUDIENCE BACKGROUND AND PREVIOUS EXPERIENCE

During June and July, RMC Research conducted telephone interviews with seven representatives of the partner organizations: Oregon Museum of Science and Industry (OMSI), Indigenous Education Institute (IEI), Tamástslikt Cultural Institute, Hibulb Cultural Center and Natural History Preserve, National Museum of the American Indian (NMAI). None of the respondents had professional education in museum work. All but one were either from the field of education or had engaged in educational programming. One person had a master's in Tribal Governance and Tribal Law and had taught courses on the college level. Four had administrative positions which included management and budget responsibilities, grant writing, and educational programming. Three had extensive TEK knowledge from their tribal cultures. None considered themselves to be scientists in the Western sense; two respondents described themselves as science educators.

#### *Familiarity with traditional ecological knowledge (TEK)*

Most respondents were more familiar with TEK because of having grown up in their cultures and in most cases on their tribe's reservations. Survey results showed that about 25% were mostly oriented toward TEK, the same percentage was equally oriented toward both, and 37.5% were most oriented toward Western science.

One interview respondent said she was familiar with TEK from a historic perspective, including treaty rights and territorial rights. Another said that he was raised in the culture and that his own deeper thinking comes through his own Native language. He is aware of differences in the meaning of words between his language and English. For example, when his people say the word "land" that refers to human connection to the land, walking on Mother Earth. It means an infant's connection to its mother. The English meaning is very different. In translation to English the word loses its original meaning. He said, "The richness of the project will be to apply the indigenous meaning—reflection on interrelationship vs. Cartesian paradigm."

Another respondent said she participated in food gathering as a child and participated in the long house. Her mother spoke all three languages of the tribes on her reservation. She grew up hearing the languages and has worked with linguists, so she feels she has a handle on the language. Her father hunted so she was there for game processing, fish processing, and gathering huckleberries at Mt. Adams. Her family followed the seasonal rounds and they also gathered Indian hemp for weaving. She did bead working and sewing in her younger years and is well schooled in how young people come of age in their culture—getting an Indian name and participating in give-a-ways. The last interviewee had a general knowledge from growing up on her tribe's reservation and being aware of the language and the teachings of elders. In connection with her work, she completed a website on American Indian/Alaskan Native solutions to problems related to wildlife, food, ash bore insect, salmon restoration, and wetlands.

Another interviewee was most familiar with TEK through reading and participation in the Cosmic Serpent meetings. She said she has also learned more about some of the connections of TEK with Western science in other parts of the globe. She would like to learn as many examples of these connections as possible.

Yet another interviewee was knowledgeable about cosmology and astronomy as well as educational and environmental issues. She was also familiar with Native literature, which may include TEK.

### *Areas where more TEK knowledge is needed or desired*

Respondents would like to know what is happening in other areas regarding collaboration of TEK and Western science and would particularly appreciate having examples of such connections. A respondent who is knowledgeable concerning TEK in her culture would like to know more about water conservation. She said that water is the habitat for tule reed, which is used for making mats and anything of value. She also is concerned about the effect of cattle grazing on camas and tule. Ranchers in her area are trying to use Indian pasture lands for grazing.

### *Areas where more Western science knowledge is needed or desired*

Respondents would like more information on ecological issues, both through Western science and TEK perspectives. Concerns include the worldwide imbalance in the ecology and also local issues affecting their tribal communities. One interviewee said she would like to know more about what is happening in Western ecological science and how this is complementing TEK and how not. She said, "I am a generalist and not comfortable with my knowledge of Western ecological knowledge." Another said she would like more information about how to put Western ecological knowledge into practice. She said, "It feels abstract with only a narrow application—compartmentalized. How can it be integrated more?" She went on to say that she does not see herself as highly trained in interpreting scientific knowledge and how to communicate it to others. She would like more information about how to do this.

Another said she would like scientists to determine whether we are going through long-term climate change or a climate shift. She said that in her area river flooding has wiped out a lot of trees. She lives in an area that is quite dry and said that water is at a premium there. Respondents raised the issue of fish contamination. One person said her tribe is promoting eating fish, but because they are downwind from a nuclear facility and a chemical depot, there is concern about nuclear contamination. She said that being such a small population the epidemiology is meaningless and they cannot prove through their own data that a high incidence of thyroid disease in the tribe is related to the facility.

Another respondent also expressed concern regarding environmental pollution of fish and disparities in reporting on this between the EPA and the tribes. She said the tribes in her area have done their own study on this and the findings do not agree with those being circulated by the EPA, which she considers false information. She expressed an interest in the use of mushroom compost to take the impurities (oils from freeway run off for example) out of the water and wonders why this is not used more.

A participant remarked, "We're in dire straits on this planet. If there's an illness, there's a way to fix it, a return to balance. Not all people believe this—but many scientists believe it. How do we work together to return the planet to health?"

### *Other thoughts or ideas on the Generations of Knowledge project*

Some respondents volunteered ideas about *Generations of Knowledge* exhibit themes and issues. One interviewee felt that the major issue facing the *Generations of Knowledge* project was that of protecting cultural knowledge, saying that "the struggle is to protect cultural knowledge, yet save our environment." She said the question is how to frame this cultural knowledge so that it is being considered as science. She said that scientists have stolen from indigenous people and that we need to have the exhibit address this issue. For example, she mentioned tribal knowledge about the uses of the plant, devil's club. How can science learn and grow if indigenous people do not share their knowledge? How much does the tribe feel safe in sharing?

Another idea was that good quotes from tribal elders could be a rich primary source material. The exhibit could address issues such as agricultural runoff, herbicides, and pesticides getting into the water. She also mentioned that animals are becoming endangered or rare, for example the spotted owl. She said these issues do matter.

A third person mentioned the use of stories. He said, "When we went to Tamástslikt there were a lot of stories connected to the coyote. We are all saying the issue is restoration of balance and order. The trickster creates chaos. (Different tribes have different tricksters, e.g., rabbit, raven, coyote.) We humans do things without thinking and create chaos. We can talk about regional differences: geography and land makes each tribe unique, but the need to restore balance is a common meeting place." The question, he said, is "what can we provide that connects tribal history, cultural identity, and use that will enable tribes to reach back into culture and reapply it to contemporary life concerns." He said that there are a lot of commonalities among tribes that we can use, but we must be cautious about the fact that the meaning of words is different between English and tribal languages; for example, land includes people's relationship to Mother Earth in the indigenous concept but has an entirely different meaning in English.

## COLLABORATION AMONG THE PROFESSIONAL AUDIENCE MEMBERS

As noted previously, for the purposes of the front-end study the professional audience was defined as project team members from all partner organizations and who were also on the Evaluation Input Committee (EIC). This section includes both interview and on-line survey results.

### *Hopes for Generations of Knowledge collaboration*

Tribal museum staff members understandably placed more emphasis on their hopes for the resulting exhibits for their museums, while other partners focused more on the importance of the collaboration process. One of the partners said, "I hope to gain a damn good exhibit—an awesome million-dollar exhibit for our gallery. If we go into it with clean hearts and minds hopefully we can solve these issues regarding what kind of questions we are asking and answering. We need to find people with the answers to issues around cultural and intellectual property. We need to bring experts together and figure out how we can work together to restore the health of our planet."

Another said that she was looking forward to a traveling exhibit, which will hopefully reflect regional issues and concerns. She appreciates the resources that the National Museum of the American Indian can offer, such as materials to support the exhibits. OMSI has a shop to build exhibits, which it will do for the project.

Deepening of the relationship between Indigenous Education Institute, the tribal museums, and OMSI is vital to the collaboration, according to another interviewee. She hopes that the direct content will include ecological advances made by tribes, their needs, and accomplishments. She hopes that the process can be a creative example of what it takes for collaboration between tribal museums and science museums. She said, "OMSI is really going to the tribal museums to learn what the obstacles are and how to handle them as a part of a teaching model. As far as the exhibit itself is concerned, we want to build something young Native people can take pride in and non-Native people can gain an appreciation of Native ways."

Another person felt that a lot depends on everyone's participation. He said that because the work is based on networking, all players need to be a part of the execution of the goals the project set for itself. He believes that much depends on collaboration, and that how we all benefit is going to depend on how we understand our differences, honor those differences, and allow those differences to develop a much richer collaboration and gathering of information. He added, "We've gone through an introductory phase, smiling and shaking hands. As we work we will start to know more about people and their thinking and concerns so we can be clear about our challenges and [our] awareness of what's important." He said it is important to talk more specifically about what each partner might address and how we can build a good communication system. He said we need to make clear the roles of each partner and what it might entail. We need to provide a process so we can narrow the focus on the needs of the project in conjunction with what we said we would do. He was confident that this would evolve as we work together. He said, "We can't put our hands on it now but it will develop as we go along. It needs to be dynamic."

Another respondent said, "It is really valuable to learn how to collaborate with different cultures for its own sake. The whole is more than the sum of the parts when you collaborate. When you try to learn a lot about other cultures you learn more about your own culture. You don't realize the [your own cultural] lens is there until you learn to see things through other's eyes." She said she looks at her own knowledge in a different way now. She has learned through cross cultural work that there are different ways of understanding the world. "If you stay within your own, it becomes your reality and you don't really see that it is something you've constructed." She said that in OMSI's collaboration with the Anchorage Museum, which is an artifacts based collection, and in OMSI's collaboration with the Yupik people, "we felt we had a completely different process and language. When culture and language are different you never know what will trip you up. The result is productive friction, but it is a bumpy process."

### *What would successful reciprocal collaboration look like?*

One respondent envisioned that in a successful reciprocal collaboration everyone would feel they were really heard and that all collaborators had an influence on the end product and could perceive their voices reflected in it. One respondent said, "There have to be compromises… It would be successful if people felt they could speak up and could trust the group, that it is safe to speak up and that people will really listen and not gloss over anyone's thoughts."

"Reciprocal collaboration would address these issues [tribal concerns] or ask the right questions about them," according to a second interviewee. She said she liked the process at the project's last advisor

meeting, in which small groups prioritized themes and concepts and brought some interesting ideas forward. She felt that since the advisors have so much expertise and knowledge, the exhibit should be designed for a wider audience than a middle school.

An OMSI member said this project calls upon them to do something really different from what they are accustomed to doing and that having Indigenous Education Institute as a bridge is very helpful. She said that the way they were trying to work directly with the tribal museums in the past did not work well, but the Cosmic Serpent professional development project she participated in has made a lot of difference. She said that OMSI could do the project from a Western perspective, but if they did they would be missing so much. She said, "This is very different. Normally we just tell the Western science story rather than the indigenous voice. We have a really good team with a shared vision. That's very encouraging."

### *Current level of collaboration in the project*

Two survey questions provided some baseline data for assessing levels of collaboration within the *Generations of Knowledge* project. The first looked at some of the characteristics of good collaboration and the extent to which respondents felt these were implemented at the advisor meeting in April 2011 (Table 1).

Table 1. Collaboration at the April 2011 advisor meeting (n=8)

| Item | Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|---|
| There was adequate social time built into the meeting days. | | | | 7 (87.5%) | 1 (12.5%) |
| All members were treated equally and with respect. | | | | 4 (50%) | 4 (50%) |
| Members were asked about their interests and needs were considered. | | | 2 (25%) | 3 (37.5%) | 3 (37.5%) |
| Member contributions were recognized. | | | | 3 (37.5%) | 5 (62.5%) |
| Members felt free to speak their views, confident they would not be criticized. | | | 1 (12.5%) | 4 (50%) | 3 (37.5%) |
| Total | | | 7.5% | 52.5% | 40% |

The second called upon them to rate their level of collaboration with their fellow partners. The question provided a scale upon which those surveyed rated each of the partners in terms of their current level of collaboration with them. Table 2 includes the definition of terms given to participants with the scale. Table 3 demonstrates the findings and provides a baseline to track changes in level of collaboration during the course of the project.

Table 2. Five levels of collaboration and their characteristics (Frey, Lohmeier, Lee, & Tollefson, 2006)

| | Networking | Cooperation | Coordination | Coalition | Collaboration |
|---|---|---|---|---|---|

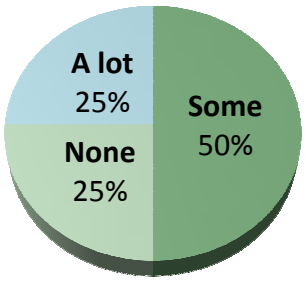
| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Relationship Characteristics | -Aware of organization<br>-Loosely defined roles<br>-Little communication<br>-All decisions are made independently | -Provide information to each other<br>-Somewhat defined roles<br>-Formal communication<br>-All decisions are made independently | -Share information and resources<br>-Defined roles<br>-Frequent communication<br>-Some shared decision making | -Share ideas<br>-Share resources<br>-Frequent and prioritized communication<br>-All members have a vote in decision making | -Members belong to one system<br>-Frequent communication is characterized by mutual trust<br>-Consensus is reached on all decisions |

Table 3. Interaction among partners after Q3 of Year 1 of the project (n=7)

| Partner | Mean Score | Mean Level |
|---|---|---|
| Indigenous Education Institute (IEI) | 3 | Coordination |
| OMSI | 3 | Coordination |
| Tamástslikt Cultural Institute | 2.3 | Cooperation |
| Hibulb Cultural Center and Natural History Preserve | 1.6 | Networking |
| National Museum of the American Indian (NMAI) | 3.1 | Coordination |
| RMC Research Corp | 1.9 | Networking |
| Institute for Learning Innovation (ILI) | 3.2 | Coordination |
| ***Project Team Overall*** | ***2.6*** | ***Cooperation*** |

The survey also looked at the extent to which the professional audience had participated in other museum projects that involved both Western and indigenous ways of knowing. The pie chart in figure 1 indicates that half of the respondents had some experience with such projects. The rest were equally divided between those with a lot of experience and those with no experience. This balance of experience is encouraging, given the pioneering work being done on this national project.

Figure 1. Experience with related museum projects



In order to facilitate communication among the partners, respondents were asked to indicate their preferred means of staying in touch with the project. Seven out of eight respondents expressed a preference for e-mail; one respondent preferred to use the networking software platform, which OMSI has provided for project use. This finding should be a key consideration because of the importance of communication for successful collaborations, especially in this project in which stakeholders are located at a distance from one another.

## CONCLUSIONS

The front-end evaluation study of the professional audience impact indicates that the group:

- Shares a common vision for an exhibit that will demonstrate complements between indigenous knowledge and Western science.
- Would like more knowledge of Western ecological science and in some cases is mistrustful of Western scientific studies.
- Aspires to have tribal perspectives on ecological issues and tribal traditional ecological knowledge strongly reflected in the resulting exhibits and educational materials.
- Breaks new ground in collaboration across cultures with few members having prior experience in such collaborations.
- Seeks to document a model for collaborations between science museums and tribal museums.

## WORKS CITED

Frey, B., Lohmeier, J., Lee, S., & Tollefson, N. (2006). Levels of Collaboration Scale: Measuring collaboration among grant partners. *American Journal of Evaluation*, *27*(3), 383–92.

Usher, P. (2000). Traditional ecological knowledge in environmental assessment. *Arctic*, *53*(2), 183–193.

# APPENDIX A.

***Public Audience Front-end Interview Instrument***

**Date:** _____
[ ] Weekday [ ] Weekend

| Consent | Assent | No. in group | Interviewer | Scribe |
|---|---|---|---|---|
| | | | | |

**Time:** [ ] Before 12:00 [ ] 12:00-2:00
[ ] After 2:00

1. When you hear the word "museum," what do you think of? What words and ideas come to mind for you?

2. When you hear the word "science," what do you think of? What words and ideas come to mind for you?

3. *Questions about previous museum visitation vary by location:*

(if at OMSI)

3. Is this your first visit to OMSI *(circle one):* Yes No I don't know

(if on Tulalip Reservation)

3. Have you ever visited a science museum before, such as Pacific Science Center in Seattle or OMSI in Portland? *(circle one)* Yes (PSC / OMSI ) No I don't know

3a. Have you heard about the new museum opening soon in Tulalip, the Hibulb Cultural Center?

*(circle one)* Yes No I don't know

3b. *(if they have heard of it)* How did you hear about it?

(if on Umatilla Reservation)

3. Have you ever visited a science museum before, such as OMSI in Portland?
*(circle one)* Yes (OMSI ) No I don't know

3a. Have you ever visited the Tamástslikt Cultural Institute located here on the reservation?

Yes No I don't know

3b. *(if yes)* Who did you go with? *(circle one)*

Family School Group Friends Other *(specify)*

*4.* This is an idea we are thinking about presenting in a new exhibit: [*Give the card about TEK and read it aloud]*

*Native American communities have been living in the same place for a very long time.*
*They pass information down through generations by storytelling and traditions.*
*Because of this, they have learned a lot about the environment where they live.*

Can you think of any examples? (If they're hesitant see prompt)

Prompt: If you lived in the same place for a long time, what would you know about the environment where you live? ☐ (Mark if prompted)

5. This new exhibit would tell stories about how Native people with this knowledge about the environment work together with scientists to understand and care for the environment. Here are some examples of potential stories from around the country that could be featured in the exhibit.
***[SHUFFLE****….Read description and lay down card for each story]* **READ SLOWLY!**
Can you tell me which one sounds the most interesting to you? *(circle the top pick):*

| | | |
|---|---|---|
| SouthEast/Plant Medicine | NorthEast/Ash Tree | Hawaii/Fish Ponds |
| SouthWest/Healthy Foods | NorthEast/Sweet Grass | Midwest/Wild Rice |

*[Put the other cards away and leave out the top pick]*
5a. Can you tell me more about why this one is the most interesting to you?

5b. In this story, what in particular would you want to learn more about?

6. Why do you **<u>think</u>** it might be valuable for Native communities and scientists to work together?

7. If you were to see stories like these featured in a museum, what would your reaction be?
*[Possible probe needed to understand why]*

8. *Question varies by location:*

(if at OMSI) *Skip*

(if on Tulalip Reservation)

If you were to share a story from your community in an exhibit like this, what would it be?

(if on Umatilla Reservation)

Is there an environmental issue in your community that you think would be important to feature in an exhibit like this?

9. Do you have any additional thoughts or comments about this upcoming exhibit or topic that you would like share?

**Thank the visitor and distribute demographics sheet**

*Great! Thank you so much for your time. Now I'd just like to get some information about you so that we know who we've talked to today…*

**Demographic Information**

What is your gender? (*circle one*) Male / Female / Prefer not to answer

What is your age? (*circle one*)

5—10 11—14 15—18 19—29 30—39 40—49 50—59 60+

What is your race? (*circle as many as apply*)

| | | | | | | |
|---|---|---|---|---|---|---|
| American Indian or Alaskan Native | Asian | Pacific Islander or Native Hawaiian | Black or African American | White | Not sure | Prefer not to answer |

What is your ethnicity? (*circle one*)

| | | | |
|---|---|---|---|
| Hispanic or Latino | Not Hispanic or Latino | Not sure | Prefer not to answer |

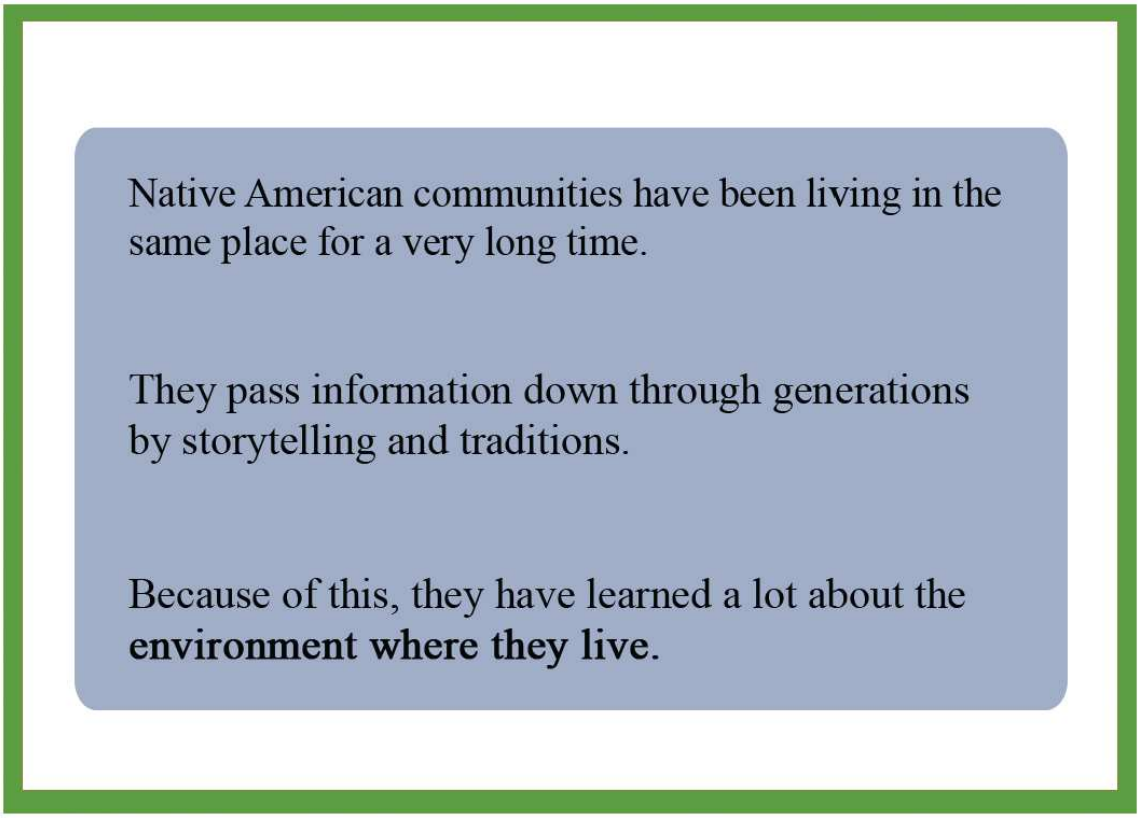
Are you a member of a tribe/nation or have tribal heritage? (*circle one*) Yes / No / Prefer not answer

If so, would you be willing to share the name(s) of the tribe/nation?

_____

Each of the following cards were printed, cut, and laminated to be used during the interview

**Native American TEK definition**



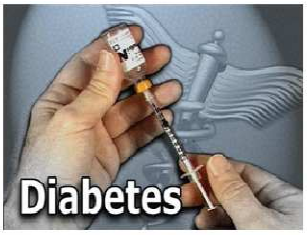
**Six Stories:**

Northeastern U.S.:

A Native American tribe is sharing traditional knowledge with scientists to control an invasive beetle that attacks and kills a type of ash tree.

The tree is important to the local tribes because they have traditionally used it to make baskets, which they then sell to sustain their people.

Southwestern U.S.:




A local tribe is working with nutritional experts to bring traditional healthy foods back to their culture and move away from modern junk food.

The tribe has the highest levels of diabetes in the country, so the return to healthier foods is critical for their future, particularly because some of the traditional foods actually lower blood sugar naturally.

Northeastern U.S.:

A Native American scientist is working with local tribes to restore sweetgrass. Development and pollution have destroyed many of the places where sweetgrass grew traditionally.

This important type of grass is used in basket making and traditional medicines.

Southeastern U.S.:

Tribal elders are collaborating with scientists to research the plants that have been used as medicine by their tribe for thousands of years.

In better understanding the plants, the tribe hopes to strengthen and retain a very important part of their tribal identity.

Hawaii:

Hawaiian people are working to restore and care for their traditional fish ponds.

The ponds are important to their culture because they provide a steady source of food and also allow them to use sustainable practices in fish farming.

Midwest U.S.:

A native tribe is joining with other local communities to bring back native wild rice that traditionally grew in the wetlands of the area. It is rare today because river dams resulted in a loss of wetlands.

The rice is not only an important food source for the tribes but also an important part of a healthy local ecosystem.

# APPENDIX B:

### *Professional Audience Telephone Interview Instrument*

This telephone interview will take approximately 30 minutes. It is part of the front end evaluation of the professional audience for the *Generations of Knowledge* Project. We hope to interview at least one person from each of the partner organizations. In writing the report we will not mention your name or institution. We realize that with a small group of respondents some people might be able to identify respondents, but we hope that we can count on one another to be respectful and open in responding to these questions so that the project can provide for the needs of its collaborators as we progress in our work together. For example, when the evaluation team first began its work, OMSI evaluators asked the evaluators with experience in indigenous evaluation to provide them with training in that area.

1. What is your role at your job? What previous positions have you held there? What kinds of work activities engage most of your time? Do you tend to work alone or in a group?

2. What areas of TEK (that is indigenous knowledge) are you most familiar with?
(Probes: What areas do you think you could provide information or training to others about? What areas would you like to know more about? How do you go about finding information about TEK?)

3. Are there aspects of Western Ecological Knowledge you would like more information about? Are there aspects of Western Ecological Knowledge you could provide information or training to others about?

4. What do you hope to gain from the collaboration with your partner organizations (OMSI, tribal museums, NMAI?) To you, what would successful reciprocal collaboration look like?

5. Anything else you would like to share?

# APPENDIX C.

### *Professional Audience Online Survey Instrument*

Please share some information about yourself:
1. Your Name:

2. Your Institution:

3. How would you describe your background and/or training? (please check all that apply)
( ) Mostly oriented toward Western science
( ) Mostly oriented toward Indigenous knowledge
( ) Equally oriented toward Western science and Indigenous knowledge
( ) Other perspective

4. The Advisor Meeting, April 4 & 5 2011

| | Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|---|
| There was adequate social time built into the meeting days. | | | | | |
| All members were treated equally and with respect. | | | | | |
| Members were asked about their interests and needs. | | | | | |
| Member contributions were recognized. | | | | | |
| Members felt free to speak their views, confident they wouldn't be criticized. | | | | | |

5. Comments on your ratings:

Please review these descriptions of different levels of collaboration:

| | Five Levels of Collaboration and their Characteristics | | | | |
|---|---|---|---|---|---|
| | Networking 1 | Cooperation 2 | Coordination 3 | Coalition 4 | Collaboration 5 |
| Relationship Characteristics | -Aware of organization<br>-Loosely defined roles<br>-Little communication<br>-All decisions are made independently | -Provide information to each other<br>-Somewhat defined roles<br>-Formal communication<br>-All decisions are made independently | -Share information and resources<br>-Defined roles<br>-Frequent communication<br>-Some shared decision making | -Share ideas<br>-Share resources<br>-Frequent and prioritized communication<br>-All members have a vote in decision making | -Members belong to one system<br>-Frequent communication is characterized by mutual trust<br>-Consensus is reached on all decisions |

6. Using the scale provided, please indicate the extent to which you currently interact with each of the other partners in the Generations of Knowledge project.

| | This is my organization | No interaction at all | Networking | Cooperation | Coordination | Coalition | Collaboration |
|---|---|---|---|---|---|---|---|
| Indigenous Education Institute | | | | | | | |
| OMSI | | | | | | | |
| Tamastslikt Cultural Institute | | | | | | | |
| Hibulb Cultural Center and Natural History Preserve | | | | | | | |
| National Museum of the American Indian | | | | | | | |
| Institute for Learning Innovation | | | | | | | |
| Native Pathways | | | | | | | |

To help us in drafting a collaboration plan for the project, please tell us:

7. What would be the best way for you to stay in touch with and provide input to the Generations of Knowledge project?

( ) E-mail
( ) Telephone
( ) Other

8. How much past experience have you had in collaborating with other museum projects that involve both Western and Indigenous ways of knowing?

( ) None
( ) A little
( ) Some
( ) A lot

9. What would be your preference in relation to interviews/surveys with the public audience for the purposes of evaluation?

( ) Conducted by OMSI research assistants
( ) Conducted by tribal museum staff
( ) Other

Thank you for taking this survey! We appreciate your input.