OFFICE OF EDUCATIONAL ASSESSMENT
Improving Learning Through Assessment

Final Evaluation Report of the Swinomish Study of Bioaccumulative Toxics in Native American Shellfish Project

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BACKGROUND

The Swinomish Tribe received a four-year EPA grant in 2002 to assess the accumulation of toxics in the shellfish and sediment in some of the areas traditionally harvested by Swinomish tribal members. The initial goals of the project were:

1. To determine whether Swinomish people are exposed to low level, chronic bioaccumulative toxics when participating in subsistence gathering and consumption of shellfish;
2. To communicate any identified health risks to the community in a culturally appropriate manner;
3. To develop mitigation options;
4. To identify major health issues on the Reservation that may be related to eating contaminated shellfish, and develop hypotheses between Swinomish health problems and toxics found.

This project was directed and implemented by the Swinomish Indian Tribal Community Planning Department. The project has a technical advisory board, composed of technical experts in a variety of fields, and a tribal advisory board, composed of representatives of several regional tribes.

The initial proposal called for an internal evaluation to be conducted by the project manager. The decision was made to engage an external evaluator from the Office of Educational Assessment (OEA) at the University of Washington in a participatory evaluation approach.

The primary goal of the evaluation was to provide constructive and accurate information to the project staff that may validate what the staff already knows, and perhaps, provide some additional insight that may be useful for program improvement. The OEA strives to offer an outside perspective of the project's effectiveness in accomplishing its goals. The evaluation focuses on the project's processes and procedures – how the goals are accomplished, as well as the project's outcomes and impacts – how the project has affected the community. The evaluation team and the project manager worked together to develop a two-part evaluation.

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Part one, the mid-term evaluation, focused on the development and implementation of the processes and procedures to conduct the work of the grant. Information was gathered from review of project materials and semi-structured key informant interviews. Project materials included project files and reports. One telephone interview was conducted with a project staff member and in-person interviews were conducted with five project staff and one Tribal Senate representative. Two in-person interviews were conducted with representatives of the tribal advisory board, and one telephone interview and three in-person interviews were conducted with representatives of the technical advisory board. This report was completed in January 2005.

Part two, the final evaluation, focused on the dissemination to the community of information about the findings from the study, including any risks of consumption associated with seafood gathered from local waters or specific locations.

METHODS

This report is based on several sources of information:

- A brief community survey was administered in both electronic and paper format;
- Attendance and observation at the Native Lens film premiere and in person interviews with five Swinomish community members conducted after the screening;
- A video recording of the Tribal Senate meeting in which the project final results and recommendations were presented;
- Selected information extracted from the initial report of the 76 individual interviews to complete the Seafood Diet Interviews (the Swinomish version of a fish consumption survey), analyzed and provided by project staff;
- Written material and responses to questions provided by project staff;
- Observation of the final meeting of the project's Technical Advisory Board;
- Project material available on the Tribal website;
- The mid-term evaluation report.

DETAILED FINDINGS

Dissemination Strategies

Many of the mid-term interviewees discussed issues related to community education and broader dissemination of the study findings. One theme that emerged consistently in those interviews was the challenge of balancing the culturally important incorporation of high levels of seafood consumption – consumption levels that several remarked are a treaty right – and managing health risks if the water and the shellfish harvested from it are found to be contaminated. Several mid-term evaluation interviewees explained that this project is at the intersection of public health, policies governing water quality standards, and the enforcement of related treaty rights.

When asked whether the message from the study is expected to evolve, project staff explained that they are continuing to work on an alternative framework for assessing health, risks, and impacts, taking into consideration the Swinomish model of good health, which includes not only physical well-being, but mental, social, and cultural well-being as well. Current risk assessment frameworks only focus on physical health, ignoring the many other interconnected aspects of health that the Swinomish believe must be assessed together.

Project staff emphasized the critical importance of the dissemination component of the project, first within the Swinomish community, then with other tribes who are facing similar situations, and then with the broader scientific, governmental and academic communities.

Challenges and rewards of information sharing

[My hope is that] The results [will] be known wide enough to have impact on those that need to be given that information to reduce their risk…that's the only thing you can do. You can hopefully prevent health issues someplace and that's a big good result…but what we know right now is that in this case, if you're going to have effective risk reduction, you may end up with some cultural take-away.

Staff

The real work is still ahead of us. The science was easy, I think, on this one. How do you deal with the effect on the community is the hard one. I go to a lot of other meetings where the fish advisory is that people just can't eat what they used to eat. That just changes their way of life...you lose some of your culture.

Staff

It's not just dissemination but working with people, teaching, and being taught at the same time and then trying to figure out a solution. It's… working with the community and me teaching the western science and them teaching me their ways of thinking about shellfish contamination and then going from there that is the real meat of this project. I didn't realize that when we first started because I was just thinking about trying to figure out how bad the contamination was. But once I got into it I realized that we would never know the true risks and impacts from the contamination until we figured out a different way to evaluate health—i.e. the alternative framework. Until we complete the alternative framework, the current method is just another example of western science trying to find the fixes for a tribal community that operates on a different set of values.

Staff

Staff reported using a number of strategies to keep the community informed about the study as it progressed, and to share findings about the level of contamination at various collection sites, and recommendations about harvesting and consumption practices. A comprehensive list of dissemination activities are presented in Appendix I. They will be summarized here.

Local Community Dissemination Efforts

Print media: Project staff reported that they have submitted monthly articles on the BTNAS project to the Tribal newspaper, *Kee-yoks*. The purpose of these articles has been to inform the community of the purpose of the project and to keep the community updated as to project accomplishments and findings, such as harvesting recommendations and suggestions on how to prepare foods in ways that minimize consumption of contaminants. In addition, the *Skagit Valley Herald*, the regional newspaper, has written three articles about the project. These articles have focused on basic introductory project information, project progress after it was underway, and the project's outreach and educational activities. A press release regarding the findings and conclusion of the project, is in preparation, and will be submitted to the paper in December.

SWN96 Cable Television Station: Project staff noted that the cable station has aired the harvesting site recommendation maps, and consumption recommendations submitted by project staff.

Swinomish Tribal Website (http://swinomish.org): Project staff reported that the harvesting recommendation maps have been posted to the website, as well as the consumption recommendations. Additionally, the website contains links to several conference abstracts.

Community Presentations: Project staff reported that they have presented information about the project in several community venues, including *Tribal Senate meetings*, *Health Education and Social Services (HESS) Committee meetings, and Cultural Resources Committee meetings*. Staff noted that since Senators and Committee members are all community members, presentations to these bodies began the process of dissemination into the community.

Staff also reported presentations delivered to both children and adults, both on the reservation and off the reservation in the local communities and at gatherings. Presentations focus on the BTNAS project specifically, as well as on more general information about toxics in the environment.

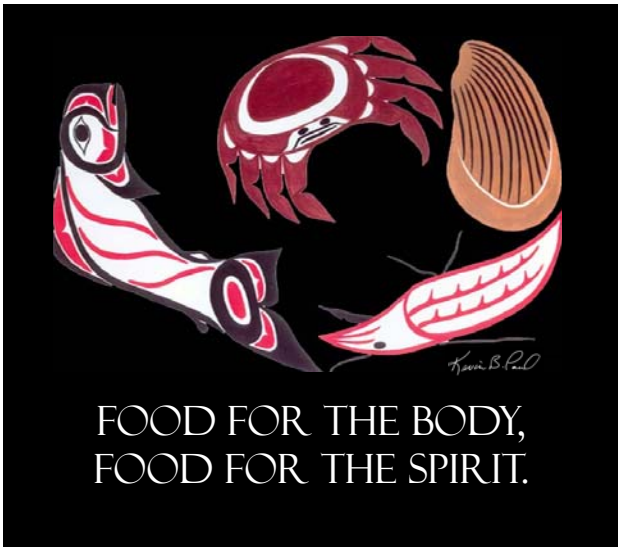
Dissemination plans in the mid-term

One component of this study that's been pretty nice is the health education component - the Tox in the Box and getting that discussion into the community…It's getting into the schools… we've done health fairs, things of that sort…there are a number of mechanisms [for dissemination]. We've got Tox in the Box for the classroom and good receptivity in the schools. We have a community newspaper and Jamie's been a regular contributor to that and also…mid course additions - working with the Native Lens program to record the whole process and then put it on the community TV channel…we have more opportunities for community education than is typical…and I'm sure we'll do some community dinner type things

Staff

Project staff also reported that they have participated in the *Swinomish Community Health Fair*, providing available project information, and will continue to do so. In addition, staff reported that they have conducted a special workshop at the Swinomish Health Clinic to educate the health care providers about toxics in the seafood and to provide harvest and consumption guidelines indicated by the research.

Material Produced to Distribute in the Community: Project staff reported the development of a pamphlet for distribution to community members at the health clinic and other locations. The pamphlet contains harvesting and consumption recommendations, as well as healthier seafood preparation techniques. Additionally, the project has commissioned the creation and distribution of artwork promoting the consumption of seafood and conveying the message that community members should continue to eat seafood that is harvested from the cleaner sites because the benefits outweigh the risks. The artwork includes a magnet bearing the artwork and message at right to be distributed at the health clinic and at the Swinomish Health Fair, and the book *13 Moons*, showing the traditional thirteen moon harvest cycle, what is harvested with each moon, and each moon's name in the native Lushootseed language. The purpose of this book is to support the importance of traditional foods in the practices and diets of the Swinomish people.



Community Gatherings: Project staff described a traditional beach bake for Swinomish community members held in August 2006 at one of the cleaner harvesting locations. This gathering was used as an opportunity to bring Tribal members together to share traditional food (clams, oysters, and mussels baked in the pit style, as well as other seafood, including crab and salmon) and to share study findings. Project staff reported that the 125 participants were happy both to be part of a community gathering, as well as to have the seafood which, staff reported, is difficult for some to access, especially many elders. The purpose of the beach bake was to bring together the community and communicate the results of the study in a culturally appropriate way, and to demonstrate some preparation techniques that help avoid contamination.

In a report to the Senate

In the summer for Planning we do a lot of shellfish collection and testing the beaches.... It would be great if instead of just throwing the shellfish out, being able to give the clams to people who want them. Setting up some sort of program so that was one of our recommendations. If you want some butters and steamers, let me know...

Some of those ways [to tell the community about the study results] would be for instance perhaps having a mussel and clam bake on the beach in the summer, doing a traditional clambake. And bringing in the kids and having them learn from the elders how to do it. Also maybe bake bread... do tea, cut berries, that kind of thing. Just have it so the whole community can come and enjoy the food.

Staff

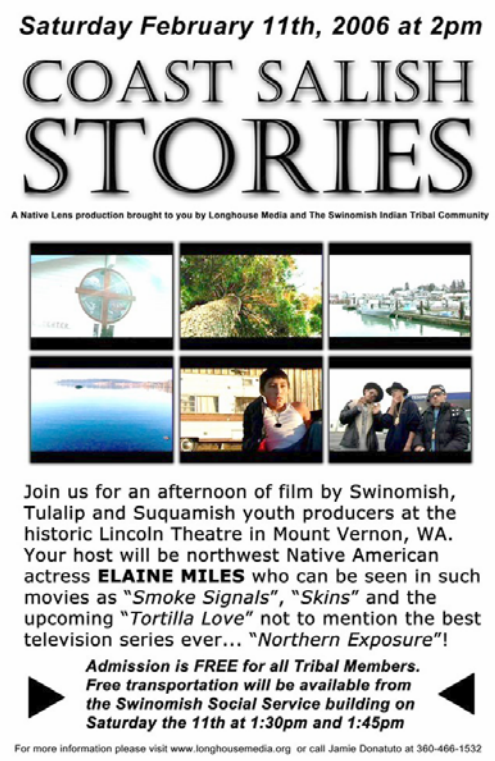
The project manager is also considering other traditional food-related events meant to bring the community together with special roles for both the children and the elders.

Native Lens Film Premiere: Staff explained that the BTNAS project initially supported Native Lens to tell the youths' stories about their connection with the environment and their culture. Nine students, ages 13-16, honed their video production skills through creating a series of short films called "Swinville." They then created a series of environmental education-based public service announcements (PSAs) aimed at the Swinomish Community. The PSAs aired on the Swinomish cable channel, SWN96. Three Native Lens youths then created a 20-minute documentary, *Slow Burn*, on the history of March Point, an area of land located directly north of the Reservation, currently occupied by petrochemical refineries. *Slow Burn* premiered at the Lincoln Theater in February 2006 in Mt. Vernon, Washington (see poster at left). The audience response was overwhelmingly positive and the three youths are currently working to create a full length feature of the film.

On the history and philosophy of Native Lens

We started with the Swinomish Tribe as our partner and home and then we reached out to [other tribal communities in the region].

We want a program that changes young people's lives – and our lives when we see what they create. It should be offered to more tribes. The health of the environment is critical to the health of the tribe.



When one of the speakers remarked, "We don't allow smoking where it can affect non-smokers. Shouldn't that apply to industry too?" the audience responded by standing and offering a long applause.

The premiere was used as a data gathering opportunity. The evaluator estimated between 150 and 200 attendees; ticket sales indicated between 250 and 300. Project staff noted that the majority of the audience was from the Swinomish Community.

Seafood Diet Interviews (Swinomish version of a fish consumption study): Tribal members were hired to visit 76 Tribal community households and interview household members about their seafood gathering and consumption patterns – what they eat, how much, how often, how it's prepared, and any effect of season. Additionally, interviewees were asked their impressions about changes in diet over time and the importance of seafood to Tribal members. Although the primary purpose of these interviews was to gather both quantitative and qualitative data about Tribal seafood consumption, it also served as an outreach activity, raising the awareness of the project and issues related to consumption of local seafood among the

Getting and Giving Information

The interviews were a great way to get people to think about [environmental contamination and health] too…it was an unintentional but positive outreach and educational method, one that uses the community's knowledge transfer pathways of oral, face-to-face communication.

Staff

interviewees and others in the community with whom the interviewees may have discussed the interview.

Dissemination Efforts Beyond The Community

Conferences or Meetings: Project staff has presented this project at 25 public forums for the larger community, both regionally and nationally. Regional conferences/meetings include local gatherings of nontribal community members such as the Skagit Marine Resources Committee and the Skagit Beachwatchers, and regional conferences such as the Puget Sound Georgia Basin Conference. National venues have included the meetings of the American Public Health Association, the Society for Risk Analysis, and the Society for Applied Anthropology.

Tribal Advisory Board Presentations: Project staff report also making ongoing presentations to the project's Tribal Advisory Board in an effort to get the word out to other Puget Sound area tribes. In addition, staff reports that a copy of the risk report and a final video will be distributed to all members of the Tribal Advisory Board.

Community Survey

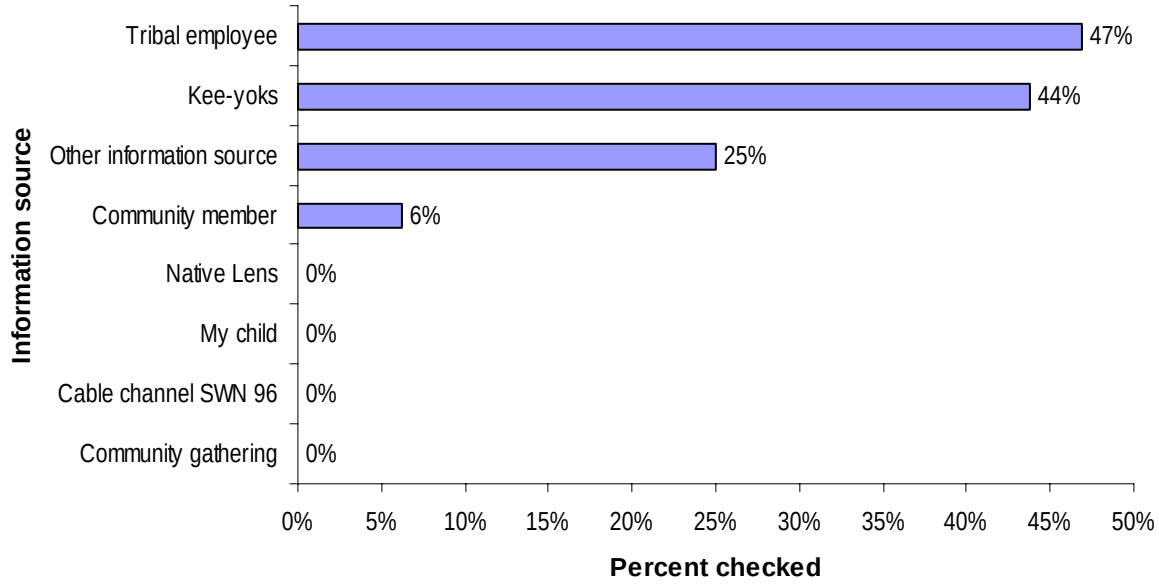
A brief survey was conducted of community members in September and October 2006 to learn more about the effectiveness of community education and its impact. Respondents had the option of using an electronic version of the survey or a paper version. To encourage participation, respondents were entered into a drawing for a gift certificate at a local department store.

Thirty-two individuals responded to the community survey. Twenty of the respondents (63%) were Swinomish community members; ten are not community members and two are not known. Not quite half (44%) of these responses were online, and the others were paper surveys collected at the Tribal administration buildings. Of the 14 surveys that were completed online, 12 were completed by Tribal employees.

Additional demographic questions were asked of the 14 online respondents. These respondents, 64% of whom were women, reported an average household size of between three and four individuals (3.4). One person reported living alone and two reported having six household members. Eight of these 14 (57%) reported having at least one child at home, with seven (50%) reporting at least one child between the ages of five and 18. Three reported having pre-schoolers at home. Most of the household members were adults between the ages of 19 and 50, with an average of 2.1 individuals in this age range living in the households.

Of the 32 respondents, 30 (94%) had heard about the BTNAS project. Respondents were given a list of possible information sources and asked to check all the places where they heard about it. Figure 1 shows that nearly half of the respondents have heard about the project from a Tribal employee. Nearly as many (44%) checked *Kee-yoks*.

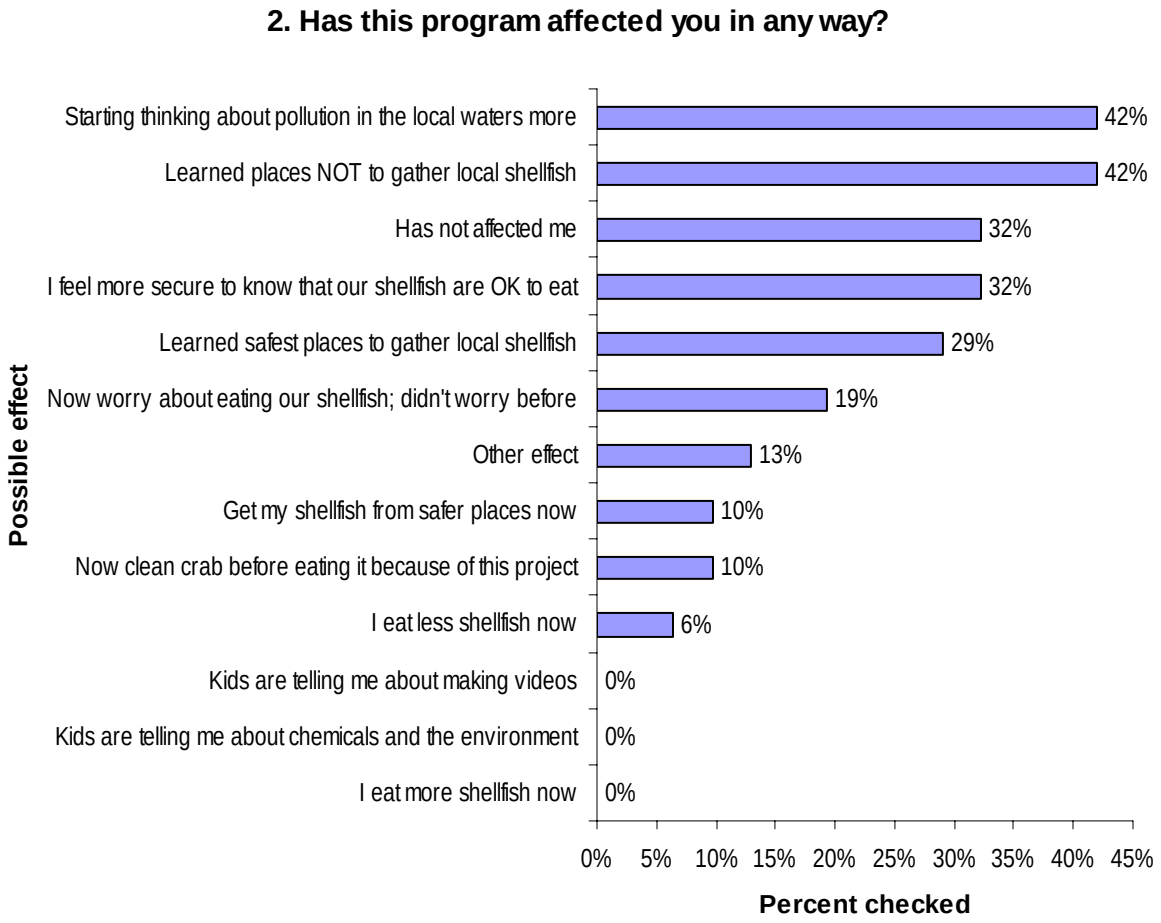
1. Where the respondent heard about the BTNAS project



The eight individuals who checked "other" filled in the following responses:

- HESS Meeting
- *Skagit Valley Herald*
- A little bi-valve told me about it
- Senate meeting (2)
- From processing when [serving as a temporary employee for the Tribe]
- Tribal Internet

Respondents were asked whether the project had affected them and given options to check, including "other," with the instruction to "check all that apply." Figure 2 summarizes the responses. The most frequently selected choices were "I started thinking about pollution in the local waters more" and "I learned the places NOT to gather local shellfish. About one third indicated that the project has not affected them. One of these selected "other" and noted that s/he had not yet seen the results of the project. Another wrote in: "Know toxins in crab gills/organs & not meat."



When comparing the results of the written Community Survey with those of the in person Seafood Diet Interviews, it is important to remember the differences. First, the Seafood Diet Interviews were conducted in the context of a fairly lengthy conversation during a visit to the respondents' homes. Second, the Seafood Diet Interviews asked participants to consider broadly the local environment and the use of local seafood in their responses while the Community Survey specifically targeted the impact of the BTNAS project. With those considerations, the responses on the Community Survey corresponded well with comments gathered during the household interviews for the Seafood Diet Interviews. For example, many of the household interviewees (83%) confirmed that they think about or hear about pollution in the local waters, listing red tide, toxic chemicals, sewage and septic, boats, mills, oil and gas, refineries, logging, agriculture, fish farms, and garbage. Although this figure is higher than the percentage of survey respondents saying they "Started thinking about pollution in the local waters more," the 42% who check this item were agreeing that the BTNAS project led them to think about it *more* than they had before. About half of the household interviewees (54%) said that they worry about whether or not it is safe to eat fish, while 19% of the written survey respondents indicated that one of the effects of the BTNAS project is that they started to worry about eating local

shellfish where they didn't worry before. (Thus, the 54% figure may have been lower before the BTNAS project.)

The diversity of responses in the Community Survey to the BTNAS study findings deserves some attention.

- **Change in practice:** Seven individuals (23% of the respondents) indicated a change in their seafood consumption practices as a result of the study: two said they eat less shellfish now; three said they now clean their crab before eating it; and three said they get their shellfish from safer places now.
- **More positive:** Ten individuals (32%) indicated that the information they heard had a positive effect: it made them feel more secure to know that their shellfish are OK to eat. None of the respondents indicated that this translated into eating more shellfish. An additional individual indicated in a comment field that he or she feels ok about eating crab and would not if high levels of toxins had been discovered in the crab. This individual brings the "more positive" responses to 11 (35%). The household interviews for the Seafood Diet Interviews may have uncovered other reasons for reduced consumption, including reduced access to seafood (71%) or lower availability of it (55%), or convenience of (58%) and preference for other options – especially among younger respondents (57%).
- **More information:** Fourteen individuals (45%) reported that as a result of the BTNAS project, they have more knowledge about where to gather local shellfish and where NOT to. Eight individuals noted both effects.
- **More concern:** Fifteen individuals (48%) checked one or two of the items indicating a greater concern. These include starting to think more about pollution in the local waters, starting to worry about eating local shellfish and not worrying before, or just eating less shellfish.

It is difficult to differentiate how much of this diversity is due to differences between people in how they receive the same information, and how much is due to different information being transmitted. With about half of the respondents hearing about the project from a Tribal employee, it is possible that some of these respondents received different information or different interpretations, leading to their diverse responses.

An analysis comparing the reported impact with the source of the information revealed very few relationships. Those who indicated that they were now eating less shellfish indicated that they heard about the project in *Kee-yoks*; however, the other 12 individuals who said they heard about it in the *Kee-yoks* did *not* report that they are eating less shellfish. Nevertheless, it may be advisable to consider very carefully how the study results are delivered to community members, especially in non-interactive media.

Respondents were given an opportunity to provide any additional feedback. Eleven (32%) did so. In addition to one individual expressing an unmet desire for study results, another three indicated interest in the project in general with these comments:

- I appreciate the information, it was/is very informative. Will you be studying how these toxins affect us and any diseases (a woman who heard about the project from a Tribal employee).
- The information given has been very beneficial to so many people. I don't live on the reservation, and told others of the information (a woman who heard about the project from a Tribal employee).
- I think it's great that research is being done & information is being passed on to the community (a woman who read about the project in *Kee-yoks*).

Seven individuals were coded as expressing thanks or encouragement. The first two in the list above received this code, as did two simple "Thanks." Others are included below:

- I am very grateful for the information available from the Tribal Test Project (a man who read about the project in *Kee-yoks*).
- Glad to know the tribe has a program to keep us safe. Thanks for all your hard work (a person who read about the project in *Kee-yoks*).
- It's a good thing to know. Keep up the good work! (Another person who read about the project in *Kee-yoks*).

The final coding category was "positive comments." All but one of these comments also received one of the above codes. The unique comment was:

- Feel ok about eating crab. Wouldn't if high toxins crab meat.

Qualitative Sources Inform Evaluation Questions

Opinions About Health Of The Environment And The Seafood In It

Five attendees at the premiere of the Native Lens film *Slow Burn* responded to these questions. All five interviewees are Swinomish Tribal members and four of them live on the reservation. Four said that they believe the air and water to be polluted and one said that he believed the quality overall is pretty good with some exceptions. When asked about the health of the seafood, two interviewees commented that the *quantity* had diminished over the years. One of these added that the *quality* had remained good, with the exception of crab collected in a few specific locations. The other commented that the habitat for the seafood had been damaged, in turn harming the health and quality of the seafood. This individual added, "You fix the habitat, you fix the fish. And it's as simple as that." The interviewee who lived off the reservation didn't know about the quality of the seafood and the other two felt that it was "very poor," or hurt by the pollution.

Health of the environment and seafood

There is a lot of pollution in the air and water and it's affecting crabbing and clamming.
Tribal Member – Native Lens

The amount of food is diminishing. The biggest impact is in shellfish and finfish. The habitat is being ruined with pesticides, PCB, E. Coli.
Tribal Member – Native Lens

Although the quantity of the fish is not what it was 5-10 years ago, I would say the quality of the fish still remains in pretty good shape
Tribal Member – Native Lens

In the household interviews for the Seafood Diet Interviews, 46 interviewees (61%) said that more seafood was available and harvested in the past and several species were listed that had disappeared from the common diet, including sea urchins, slippers, sea cucumbers, flounders, cod, geoduck, octopus, mussels, oysters, seaweed, smelt, sturgeon, and rock fish. Although some (17%) said that they currently eat the same amount as when they were children, six of every ten (62%) said that they ate more seafood as a child than they do now and 60 (79%) remarked that seafood consumption was higher yet in previous generations. Fifty-four people (71%) said they would like to eat more seafood than they do now – another eight said that they already eat a lot, adding up to 82% of the sample remarking that they either currently consume seafood at a high rate, or they would like to do so. Interviewees also remarked that current seafood consumption by Native people is higher than that of other subgroups, raising the question of the impact of that level of ingestion on health risks.

During the mid-term evaluation, several interviewees explained that policies governing water quality standards were set without the traditionally high consumption levels of the Native people or other subgroups in mind. If a lower level of consumption is assumed, higher levels of contaminants will be considered acceptable. When contaminant levels are relatively high, a person, or an entire culture consuming at a significantly higher rate may be receiving a dose that is high enough to pose an unacceptable risk. Further, mid-term interviewees explained that the accepted standards of water quality as well as other factors have led to the currently diminished quantity and quality of seafood, which supports only a suppressed level of consumption among the Native people, and contributes to a change in cultural practices.

Health of the environment and seafood

When you consider the amount of seafood we eat as tribal people, it's much more greater than non-Native people here in the Northwest. We probably consume - just on a rough guess -- probably 4 times the amount of fish compared with the other cultures. We probably eat more than anybody else. I guess that's my biggest concern - what are we actually ingesting? What's going to be the outcome of that?

Tribal Member – Native Lens

For better or worse we need to find out exactly what is currently being ingested by these fish and shellfish in the water and the possible negative impacts it could have on our people that ingest probably five times more of it than other races or cultures or populations.

Tribal Member

Personally, I'm kind of motivated or pushed by an overarching kind of notion that as we enter an era of more environmental degradation that Native peoples are most at risk of human populations. Somehow we need to address that. We need to define it better, what those risks are, develop strategies to deal with them. This is just one little piece of that puzzle.

Staff

This project must consider the traditional level of consumption – the level the tribe would undertake if they could fully exercise their treaty rights, and their responsibility to do so… you have a resource that the tribe has a responsibility to consume, so just to go lightly into the tribal membership and say, "You have to stop doing this" is an extraordinary statement.

Technical advisory board

They do this whole risk analysis as if the average adult is eating this much fish - I think it's 7 and a half grams a month - how much of each of these known contaminants in our environment can the body realistically assimilate and metabolize in a way that's not going to cause them undue health risks…what the rate of exposure is to a human based on the hazard that these various carcinogens have or other contaminants…That's fine to do it that way. But what happens if you are in a population that has a higher level of exposure than that? … If you're a tribal person that's eating a half-pound, are you being protected by the state water quality standards? And is that not an environmental justice issue if not?

Tribal advisory board

The reasons given for the decline in consumption are multiple. Some (55%) mentioned the lower availability that two of the interviewees at the *Slow Burn* premiere noted, or less access, possibly due to loss of harvesting locations or equipment, more regulations, or loss of food sharing networks (71%). When the study finding that March Point was too contaminated for safe harvesting of seafood was presented to the Tribal Senate, one of the older Senators remarked that that was one of the prime harvesting locations 30 years ago. Only eight people (11%) attributed this decline to pollution, although both of the more commonly mentioned barriers, lower availability and less access) could be the result of pollution.

Importantly, another type of reason was prevalent. Forty-four people (58% of the sample) mentioned the convenience of buying food at the store rather than harvesting it (perhaps a particularly persuasive reason in the face of reduced availability and access), and about the same percentage (57%) commented on changes in food preference, especially the younger respondents.

Recommended Strategies for Community Dissemination

Project staff developed several ideas for getting the information out to the community, as described above. Two of the individuals who were interviewed at the Native Lens premiere remarked on the value of word of mouth for disseminating information throughout the community, with one person suggesting that someone visit door to door with an informational pamphlet. Two interviewees thought that a print medium would be very effective, mentioning *Kee-yoks* and the *Skagit Valley Herald*. One mentioned the community cable channel and another mentioned the Tribe's website. Two people noted both the draw and the impact of the event's premiere by Native Lens, with one commenting that the event's strong turnout was because people were supporting the kids who produced the film, and would do so again. This person also suggested engaging elders in getting the information out to the community. The other remarked on the effectiveness of the premiere venue for reaching many people at once. This person also alluded to an interesting distinction between passive and active education strategies. This individual identified different ways of getting information from the Tribal offices, but acknowledged that those strategies would serve only those people who came looking for the information. In contrast, the film premiere educated the audience without their having to develop an initial curiosity.

How to get the word out

We're oral people so word of mouth is probably another great way for us to be able to communicate our concerns

Tribal Member – Native Lens

I think I would like to see… I think it would be cool for some kids to do a piece like that on seafood. It would be cool

Tribal Member – Native Lens

Each community is different and unless you know that community well, you will not know what the best methods are [for education and dissemination]. For the Swinomish community, person-to-person oral communication was key as well as using visual media via the cable channel and film.

Staff

I think using the kids is one of the best ways to get the information out because you will draw audiences that you wouldn't necessarily just draw for environmental information. The community is going to support the kids no matter what the information is so I think that using other mechanisms such as what happened today than just dry information from professionals is really the route to go because you wouldn't have gotten probably half the people here today if it wasn't presented and developed by the kids

Tribal Member – Native Lens

I think that anything that talks about our rights and how things have changed and is developed by our kids should have an impact on anybody

Tribal Member – Native Lens

This is related to another point made by one of the interviewees. This person remarked that it is difficult to respond well to the question "Is there any other information you'd like or do you have any questions about our environment and seafood?" without an initial basic education about the issues. This person advocated continuing efforts to educate the public about general issues so that they will be better prepared to ask good, educated questions.

How to get the word out

I think that right now the important part is just to get out the general knowledge so that people can get educated and get up on the information enough to know what kind of questions that they would like to ask. I think it's interesting to ask people "what is your question" when they have no knowledge base to bring that question from, so I think these types of projects and things such as today's informational session and other ways to get out information will help people get to a point where they can ask educated good questions about the issues.

Tribal Member – Native Lens

Comments About Broader Dissemination and Consequential Project Implications

Although project staff reports several dissemination activities in the broader community, both with regional Tribes and in the broader scientific community, few comments were recorded about these dissemination activities from sources within the community. The Tribal Advisory Board and Technical Advisory Board members discussed this perspective.

Technical Advisory Board members explained the health and policy implications of the high consumption levels among Tribal members and the tension of maintaining cultural practices associated with seafood while avoiding undue health risks that may be associated with high levels of consumption depending on the level of contamination found. They also discussed the political issues related to treaty rights and tribal sovereignty. Treaty rights were usually discussed in terms of the right of traditional levels of access to the resource. Tribal sovereignty was often discussed in terms of data ownership and information flow. Some informants described situations in the past where researchers used the tribal community for data collection, but did not share the results as expected. Interviewees explained that partly as a result of this kind of interaction, Tribal government established a policy of carefully guarding its sovereignty and its interests, as well as building its reputation in matters of environmental research and protection.

Project Implications

The most important thing about this project is not necessarily the findings per se… I think what's most important about this particular project is that it showcases the capacity and the quality of the tribe's work and the ability of what they're able to do. And their concern and their proactive action on issues like this. This is something that the Tribe is actively going after and researching themselves. It's all part of sovereignty and self-determination, and basically, part of their treaty rights. And whatever their findings are I think will help them assert those treaty rights.

Staff

One of the buzzwords in Indian Country is 'capacity-building'… there are now young tribal scientists who know how to conduct a research project…Typically the EPA will fund a project for three to four years and the capacity is in the person. When the project ends, the person goes and the Tribe has lost its capacity. Not with this project. The reports stay in the community for a lasting benefit.

Technical advisory board

What we need to start figuring out is how can we use this as an opportunity to work between different programs because I think there's a continuing role for more of the research and water resources programs with more of the regulatory and management side…

Staff

Broader Dissemination

Our Tribal Habitat conference that we have in February is a great opportunity for them to speak to a very large group of people about a technical project, and I think that there's a great opportunity there for them to participate there in a big way - you know, to really lay out what their question was, how they carried it out.

Tribal Advisory Board

The EPA went way out there and funded them at a real level…I think they should take that and build off it by going to some of the larger research conferences that aren't limited to the tribal community - there's a big Puget Sound Georgia Strait Science Conference - where I think they can really put themselves up at the level of science and what the tribal community has taken the initiative to find out. That helps the Tribes both in a public perception kind of way and recognition of their scientific stature…and I think it's of value beyond just the toxics kind of stuff.

Technical Advisory board

Praise to the funding agency for funding this kind of research conducted on the reservation by tribal members. It's a study that only tribal members could conduct…the Swinomish is the only group that could do this well and accurately. They are uniquely qualified, more than the most skilled of environmental scientists.

Technical Advisory board

The other thing I really hope they do is set up a future kind of…to build off this thing. I would really hate to see it, 'Ok, here's your one and a half million.' Some of these things, you really need to follow through.

Technical Advisory Board

These were issues discussed in principle during the mid-term evaluation. During the information gathering for the final evaluation, these issues emerged again, as the technical advisory board worked with the study findings to identify the correct consumption parameters to use in the risk analysis, aware that the impact of the report will extend beyond the Swinomish community itself. The concerns raised about the Seafood Diet Interviews related to self-reported portion size and the skewed "shape" of the distribution of the consumption curve. The Advisory Board expressed concern that because the model presented to the interviewees as "a serving" was fairly small, interviewees may have underreported their consumption due to a social desirability response. Several ideas were suggested for testing or correcting this portion of the estimate, including finding and substituting published portion size information established in similar populations, returning to a subsample of the households to explore the question of portion size more carefully, or observing portion size as a community gathering offering target foods. However, all ideas were beyond the scope and timing of the project. The second issue that the Advisory Board considered at length was the best way to fairly and appropriately represent in both the risk assessment and the description of the population those individuals and families that continue to consume at close to traditional levels within a community whose overall levels of consumption have declined from traditional levels. Two solutions were explored for this concern: 1) using deciles instead of an overall measure of population central tendency (mean or median consumption) or 2) transform the data to a log normal distribution, conduct the risk analysis, and then convert the data back to interpret the analysis.

At the mid-term evaluation, many of the Technical Advisory Board members urged the project staff to present the study to the larger scientific community, commenting both that the study was of a quality that it could sustain the scrutiny, and to highlight the capacity and initiative of the Native American communities in general, and the Swinomish Tribe in particular. The project manager has made a number of presentations before different audiences of the larger community to describe the implementation of the scientific component of the project. Two factors may impact the schedule of dissemination of the final study results. One factor is the need to resolve the concerns described in the previous paragraph. The other involves the

decision to develop an alternative framework for assessing Swinomish health risks due to environmental contaminants, as mentioned earlier in this report.

> **Evaluator's note:** The evaluator's understanding of the issues that the alternative framework is being developed to address is described here. One critical difference between the alternative framework versus the typical approach is **the breadth of the definition of health**. The typical approach considers physical health as it can be measured on physiological scales. The alternative framework incorporates a much broader definition of health – the Swinomish definition of health, which includes physical health, but also includes mental, social, spiritual, and cultural health and well-being. Thus a typical risk assessment may result in the predicted impact of a given contaminant, at a given exposure level on a person's or a community's physical health. The alternative framework, being multidimensional, would assess the impact of an environmental contaminant on multiple aspects of the individual's health, as well as on the health of the individual's community and the culture that holds that community together. Additionally, this model would incorporate the interconnectedness of the individual, the environment, the community, and the culture and would take into account the impact of the change in the community and the change in cultural practices, creating a far more complex model of health and wellness. Project staff pointed out that the World Health Organization supports this broader and more complex definition of health in their 1946 constitutional definition.

Project staff reported that work to develop this alternative framework is currently underway and will be incorporated in Community dissemination when it is available.

Another issue that interviewees commented on in the mid-term evaluation interviews is the challenges involved in sharing with other tribes. This was expressed in three ways: 1) some concerns were expressed about acceptance of the findings by other tribes who have not been as involved in the project as the Swinomish; 2) some remarked that other tribes may find it difficult to use the results as well as the Swinomish will be able to use them because of the knowledge and experience that accrued to the Swinomish tribe in general and the Planning Department in particular, during the implementation of the project. The third concern was not expressed directly. A member of the Tribal Advisory Board commented that their tribe had considered setting up a monitoring system for their shellfish, but reported discouragement and abandonment of the ambition when they learned from the Swinomish project about the seemingly insurmountable requirements of obtaining a credible sample, commenting that "The scope of the idea ended the impetus to do it."

Project Impact

Although project staff has not yet received feedback from the scientific or governmental community about the study findings, they sense interest in the study findings from these quarters. Since the study findings have not called for changes in the consumption practices of tribal members, except possibly to *increase* consumption, the local impact of the study findings themselves have been hard to detect. However, project staff report important learning about the community on their part. It is the developed perception of project staff that because of the cultural and spiritual importance of seafood, some tribal members would continue to consume it, even if the project recommendations had been that consumption poses a significant health risk. However, as the Community Survey, the Seafood Diet Interviews, and the interviews following the Native Lens premiere all show, community members are concerned about the safety of their local seafood. But as the Seafood Diet Interviews also shows, even though pollution is of concern to many of the interviewees, it was identified by only 11% as a reason for reduced consumption. Lower availability and less access, as well as more conveniently available alternatives were mentioned more often as a reason for reduced consumption.

Policy impacts of the study findings have not yet emerged. Early reports indicate that the Tribe has decided to use treaty-protected consumption rates in the water quality standards in lieu of current suppressed consumption rates. The goal is to eventually restore the habitat so that it becomes safe to consume seafood at the treaty-protected rates. Other impacts will wait for the alternative

Staff learning

People will continue to eat these species because they are important to them more so than just sustenance, the "food for the body, food for the spirit" message. There are deeper connections there. This is one of the things that I have learned from the community.

Staff

I'm hoping that with the program that we have in place and that we're looking into we could get additional funding to improve [environmental health] over time. And I also think that people need to realize that it took a long time to get as bad as it is now and it's going to take a long time to recover it and I know funding - people in positions to bring funding sometimes have a hard time understanding that and …short term grants and things like that are not going to sustain real improvement over the long run.

Tribal Member – Native Lens

There certainly have been adjustments made in practices…some people don't harvest in certain places anymore, for example, or eat certain species. But for the most part I think that the community already knew that there was contamination and it was the scientific and governmental entities outside the community that needed the "hard facts" to act. The evidence is necessary in order to have dialogue with these external entities about cleanup measures.

Staff

Continuing Education

It's important that people who do know this information work hard to get it out there and education can change the world so anything that people can do to educate the public and get their voice heard is worthwhile.

Tribal Member – Native Lens

For the first year or so I was afraid that we wouldn't be effective in getting any message out but that was because at that time I was only thinking of the western science message of the exact amount of contaminants in the shellfish and physiological implications. I was measuring success on whether a tribal member could tell me which species was the most contaminated…which also assumes that those are species that will no longer be eaten. Now I understand that it simply doesn't work this way in the community.

Staff

I think that we have more work to do in terms of addressing some particular concerns, as exemplified in the evaluations but I plan to try to, grant or no grant. And I hope that the information from the interviews and the alternative framework will help in this.

Staff

framework for assessing risk and health, and for the Tribe's decision-making process.

Project staff believes that community education has been successful – the Community Surveys indicate that people know there is contamination, although project staff believes that community members were already aware of this and had already moved away from the most contaminated locations. Project staff acknowledges that more education – both of the community and by the community – is needed.

Legacy of the project

Advisory Board members have lauded the EPA for their foresight in funding this project "at a real level." The project staff was determined to conduct responsible science and develop credible answers for the community. The Technical Advisory Board's statements, the evaluation's review of files, and the project manager's success in presenting the scientific work in peer-reviewed settings corroborate a successfully implemented and disseminated scientific investigation.

Innovations

We are going to figure out how contaminated shellfish impacts the Swinomish definition of health and then once we know that, we can really set about figuring out how we can provide outreach and education, and ultimately help in risk reduction, not risk avoidance like current advisory measures.

Staff

At the mid-term evaluation, interviewees suggested that the science component of the project would be the easy part in comparison to crafting a constructive message to the tribe representing the harvesting and consumption recommendations supported by the science while giving cultural practices their full importance. As it turned out, the risk analyst determined that the majority of the people were ingesting seafood below the limit of safe consumption, given the level of contamination detected in the commonly used locations. The message the project staff has developed for the community about consumption is that it's safe to eat more seafood harvested in the majority of the areas tested and that the benefits of eating more seafood outweigh risks associated with increased consumption. Project staff report ongoing work to develop a novel alternative health assessment framework based on the Swinomish model of health, which includes the health of the environment, and not only the physiological impacts of environmental health, but also the mental, social, and cultural impacts.

The message about harvesting is only slightly more complex. Although contamination was found at all collections sites, few sites – those around March Point and Fidalgo Bay--were so contaminated that the study supported a recommendation to avoid consuming any seafood harvested from those sites. Project staff did not anticipate that this message would create any new problems within the Tribe as these were not identified as current harvest locations for Tribe members. However, one Senate member recalled that area now most heavily contaminated had been one of the prime harvesting locations 30 years ago, reinforcing the point of reduced access mentioned by people who were interviews for the Seafood Diet Interviews. This location came up again in this project as the youth participating in the Native Lens project

articulated through their film *Slow Burn* the possibility that that region of the coastline may actually belong to the Tribe.

An interesting finding to come out of the data gathering for the final evaluation is the extent of incorporation of some of the components of the BTNAS project into ongoing Tribal services. When project staff were asked about community dissemination strategies, some that figured prominently in the mid-term evaluation and have since become more established in the community were initially omitted from discussion, which was interpreted by the evaluator to indicate that these components are no longer thought of as being project-specific. Upon prompting, project staff reported that:

- **The environment education program**, a program that other informants remarked had been "kick-started" by the BTNAS grant, will continue by shifting funding to more permanent programs. Staff report that this educational program brings a person-to-person, "hands-on" approach to education and outreach that previously had been limited to articles in the Tribal newspaper and signs posted on the beach.

Hands-On Environmental Education

The program was created and proved that it makes a difference in the community and now the Tribe is willing to take it on and support it. One of my favorite stories from [our Environmental Educator] is how when she is in the local grocery store and kids will come up to her and then introduce her to their parents/ guardians as something along the lines of "the lady who teaches me that recycling is good" and the parents will say, "oh, I've heard a lot about what I should be doing from my kids." An excellent example of how [she] is making a positive impact with the kids and also getting at the parents.

Staff

About Native Lens

I see a lot of changes in all of them
Youth Group Facilitator

From the youth

- *Annie wouldn't let me quit*
- *Viviana is getting us to talk about our culture and getting our culture back*
- *Native Lens is really fun and I want to do it more.*

- **Longhouse Media**, a Native based non-profit organization "which supports the growth and expression of Indigenous youth through digital media making[1]" was created as a way to sustain and expand Native Lens. In addition to entering a Native Lens film at the Seattle International Film Festival (SIFF) Longhouse Media staff partnered with the SIFF to conduct a workshop on "fly filmmaking," an innovative filmmaking method pioneered by the Native Lens youth. Native Lens has expanded and is now working with other tribes in the Pacific Northwest to produce short films about their local environment. Native Lens films have been honored at film festivals across the country from San Francisco to New York.

[1] http://www.swinomish.org/native_lens/native_lens_home.html

- **SWN96 Cable channel:** In the mid-term evaluation interviews, staff remarked that the community's cable channel had not yet been put to work for the community. In another example of resource sharing, the BTNAS project engaged the Native Lens videographer, who had also been working with *Kee-yoks*, the Tribal newspaper, to begin get the SWN96 channel up and running. Study results and recommendations, and Native Lens films have become part of the channel's programming.

In addition to these changes within the community, project staff reports that the BTNAS project has permitted the Tribe to form or strengthen existing relationships with a number of agencies and organizations outside the Swinomish Community. These include:

- The Tribal Advisory Board and Longhouse Media provided an opportunity for Swinomish staff to form relationships with staff from other tribes, creating a network that provides a forum to get help with questions a Tribe is working through, disseminate information and share information about funding opportunities.

- The Technical Advisory Board provided Swinomish staff with the opportunity to form relationships with the UW Department of Environmental and Occupational Health Services, the Institute for Risk Analysis and Risk Communication, and the Center for Ecogenetics and Environmental health, as well as with government agency researchers at County, State, and Federal levels.

- The project's environmental education component has established links with a number of local organizations outside the Swinomish Community, including:
    - The Skagit County Children's Museum
    - The La Conner Boys' and Girls' Club
    - People for Puget Sound
    - Project WET
    - Environmental education for local towns such as Anacortes and Penn Cove such that the Environmental Educator is included in the environmental education activities in these communities such as the Anacortes Marine Day and the Penn Cove Water Festival
    - The environmental education program has also provided a stronger link between the Environmental Science program of the Planning Department (The Water Resources Program) and the Social Services Department which houses birth-to-six daycare and youth activity programs in which the Environmental Educator is now involved.

CONCLUSIONS AND RECOMMENDATIONS

- The evaluation of the BTNAS project focused on two different components: 1) the sampling and labwork to determine the level of contamination at traditional sites for harvesting shellfish; and 2) the dissemination of the information back to the Swinomish Community, and to other Tribal communities in a culturally appropriate way, as well as other scientific and governmental entities.
- The Swinomish Tribe has successfully implemented a credible process for testing contaminants in local shellfish. Project staff reported that they relied heavily on several sources of support: a well-chosen, responsive, and supportive Technical Advisory Board; a well established and supportive Planning Department with a strong Water Resources Program; a supportive project officer; and available literature on conducting the science, as well as the capacity to incorporate the input from these sources.
- Project management was flexible in responding to unanticipated project needs, such as the need to establish a realistic estimate of current seafood consumption rates by Community members. Midway through the project, project management learned that this information would improve the risk assessment significantly and accordingly developed the culturally appropriate Seafood Diet Interviews to be conducted via in-home interviews.
- Project staff exhibited a significant ability to identify and share useful resources, leveraging the value of the resource. Two immediate examples of this are the use of expertise and, to some extent, the equipment of the Water Resources Program; and the decision to develop the community cable channel from its initially unformed state to a useable community resource.
- Project staff identified a number of local dissemination strategies, going beyond the previously limited dissemination of print media and posting signs on the beach. Innovative strategies included initial dissemination via reports to the community members who sit on the Tribal Senate and Senate subcommittees, the Native Lens films, the development of the SWN96 channel, the Tribal website, a wide range of hands-on community education efforts, targeting both children and adults, the development of original artwork and informational pamphlets to be distributed at the health clinic and at the annual Swinomish Health Fair, and community gatherings. An unintended but effective dissemination strategy was the in-home interviews for the Seafood Diet Interviews, providing the project staff with a chance to learn about the value of face-to-face oral communication for the community.
- Many of these strategies dovetail with recommendations made by community members about preferred ways of getting more information from the study. These community members emphasized the importance of word of mouth, with one individual suggesting taking a pamphlet door to door to present to and discuss with community members. They also commented on the wisdom of using the community's kids to develop and carry the information. One of these also suggested engaging elders in the delivery of the messages as well.
- Project staff talked about the pattern of reciprocal learning with community members and the impact of that learning on the project. A critically important new awareness for the

project staff was the realization of the depth of the importance of the seafood. Project staff reported that the Seafood Diet Interviews increased their understanding that according to the values of the Tribal members, and like the magnet says, seafood is "food for the body; food for the spirit." This awareness, and with it the awareness of the Swinomish definition of health, led project staff to work toward developing an innovative risk assessment framework that incorporates the multi-dimensional Swinomish definition of health and well-being rather than the current relatively narrow definition of health. It is the goal to create the alternative assessment so that Native communities may gain more benefit from studies such as these.

- Staff reports that several of these innovations have already resulted in sustained impact. Specifically:
    - Native Lens is now one of Longhouse Media's programs. Longhouse Media is a newly formed Native-held, non-profit organization developing a new generation of storytellers among Native American youth, using today's technology;
    - The SWN96 cable channel is now a functional Community resource, with continual programming;
    - The Community Education Program has expanded and transformed the Planning Department's outreach strategies, and has strengthened the Department's link with other Tribal departments.
    - The Environmental Educator and the project manager have both forged relationships that they expect to be ongoing with organizations, tribes and other entities outside the Swinomish Community, both in the nearby communities, and statewide.

This section will gather recommendations made by others and reported above. It will also include some evaluator observations and suggestions.

- Having observed the impact of household visits for the Seafood Diet Interviews on community education, consider implementing some version of the dissemination strategy of visiting Community households door to door with an informational pamphlet, as suggested by a community member.
- Consider engaging community elders in developing and carrying the project's message to the community.
- Consider addressing the follow up questions asked by Community Survey respondents, as well as any others during the course of the project.
- Consider collecting additional information, either through re-interviewing Seafood Diet Interviews participants or by observing consumption behavior at a community gathering to develop a more accurate estimate of portion size and current seafood consumption.
- Address the diversity in response to the message as it has gone out so far. This will be difficult because it will be difficult to differentiate differences in how information is received from differences in how information is conveyed. The development and incorporation of the alternative framework for risk assessment may address this concern. It may also be worthwhile to develop or review the message with all potential messengers to be sure that all potential messengers understand *and agree with* the message. This may require a process similar to that engaged at the beginning of the project to establish QAPP and other protocol.

- Several indications of the importance of word of mouth or person-to-person dissemination emerged throughout this evaluation. Combined with the diversity of reactions to the information, it stimulated the hypothesis that an important component of successful and complete dissemination may be the opportunity for interaction about the material. Perhaps the chance for Community members to ask clarifying questions or provide additional information, or the chance to talk about the meaning of the information to the recipient's life or just a chance to have a reaction in the company of another person. If this hypothesis has merit, the idea of going door to door with a pamphlet is an excellent suggestion.
- This project has a very strong community education component. I'd like to offer two minor suggestions to strengthen dissemination outside the community;
    - Canvass other tribes to find out who has or had any interest in monitoring the health of their shellfish. Develop a response that communicates both that although it *is* a demanding process, it is feasible for a tribe to implement it successfully. Realize that if the tribe is seeking support, but hear how tedious, difficult, and demanding it was to meet the EPA's requirements, it may be overwhelming and discouraging.
    - Consider working with your many new contacts to put a link on their websites to the BTNAS study on the Swinomish website. Also, consider adding your partners' links to your website.

APPENDIX

Dissemination outside the Swinomish Community

EPA reports

Basabe, F. A. and J. Donatuto, 2001, Bioaccumulative Toxics in Native American Shellfish Quality Assurance Project Plan, La Conner, WA, Swinomish Indian Tribal Community.

Donatuto, J., 2002, Quality Assurance Project Plan for Speciated Arsenic Analyses in *Saxidomis giganteus* as part of the Bioaccumulative Toxics in Native American Shellfish Project., La Conner, WA, Swinomish Indian Tribal Community.

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Public posters and presentations

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Donatuto, J. and L. Campbell, 2003, Project Design and Implementation: Bioaccumulative Toxics in Native American Shellfish., U.S. EPA Science Forum, Washington, DC.

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Donatuto, J., 2004, Developing a Human Health & Cultural Risk Assessment: Toxics in Shellfish on the Swinomish Reservation, Society for Applied Anthropology, Dallas, Texas.

Donatuto, J., 2004, Subsistence lifeways: Native American fish consumption rates and risk, Society of Toxicology and Environmental Chemistry, Portland, OR.

Donatuto, J., 2005, Rounding the Home Stretch: Learning Experiences from the Bioaccumulative Toxics in Native American Shellfish Project, Puget Sound Georgia Basin Research Conference, Seattle, WA.

Donatuto, J. and K. Smith, 2005, *Poster*: Bioaccumulative Toxics in Native American Shellfish, National Institute for Environmental Health Sciences Annual Grantees Conference , Talkeetna, AK.

Donatuto, J., 2005, Bioaccumulative Toxics in Native American Shellfish, Region 10 EPA Tribal Leaders Summit, Sitka, Alaska.

Donatuto, J., 2006, The Importance of Fish Consumption Surveys for Native Americans, RMES 502 Seminar, University of British Columbia, Vancouver, Canada.

Donatuto, J., 2006, Swinomish Tribe's Bioaccumulative Toxics and Native American Shellfish Project, Skagit Marine Resources Committee, Mt Vernon, WA.

Donatuto, J., 2006, Swinomish Tribe's Bioaccumulative Toxics and Native American Shellfish Project, People for Puget Sound's Toxics Forum, Seattle, WA.

Donatuto, J., 2006, Articulating socio-cultural health effects from contaminated subsistence foods, American Public Health Association, Boston, MA.

Donatuto J., B. H., 2006, Fish Consumption and Policy in the Tribal Context, Society for Applied Anthropology, Vancouver, Canada.

Donatuto J., B. H., 2006, Results and Discussion of the Swinomish Tribe's Toxics in Shellfish Project, EPA Tribal Leaders Summit, Confederated Tribes of the Umatilla Indian Reservation.

Donatuto J., B. H., 2006, Results and Discussion from the Swinomish Tribe's Toxics in Shellfish Project, EPA Tribal Science Forum, Quinault Indian Nation.

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Harris, S., B. Harper, J. Donatuto, and A. Harding., 2006, Impacts to Tribal Health and Culture of Mercury and Other Contaminants in Columbia Basin Fish. Mercury, Conference on Mercury as a Global Pollutant; Toward Integration of Science, Policy, and Socioeconomics., Madison, WI.

Community and Regional Educational Outreach Activities

Classroom Tox in a Box® and EnviroScapes© presentations
Substantial hands-on outreach and instruction with middle and high school students, including labs and/or field trips
Presentation for pre-schoolers (weekly – includes lead education, recycling)
Participation in annual Earth Day celebrations
Swinomish Health Fair "Alternatives to Pain Medications" presentation
Marine Ecology Day in Anacortes
La Conner Boys' and Girls' Club (weekly)
Swinomish Earth Day Enhancement annual celebrations
Thousand Trails enhancement celebration, interpretive walks, meetings
Penn Cove Water Festival
Women's Soroptimist of Skagit County
Meetings with teachers
Project WET meetings
Skagit County Children's Museum monthly visits
Traditional Food Celebration/Clam Bake
Pacific Marine Research Afloat Field Trip