Salmon Camp Research Team Renewal
2010 FINAL EVALUATION REPORT

Prepared for

OMSI
OREGON MUSEUM OF SCIENCE AND INDUSTRY

by
Phyllis C. Ault
Education Northwest

with the generous support of

This material is based upon work supported by the National Science Foundation under grant Number DRL-0737528. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

National Science Foundation Information Technology Experiences for Students and Teachers Grant

2010 FINAL EVALUATION REPORT

Salmon Camp Research Team Renewal

Oregon Museum of Science and Industry
National Science Foundation Innovative Technology Experiences for Students and Teachers Grant

May 2010

education northwest
CREATING STRONG SCHOOLS & COMMUNITIES

2010 FINAL EVALUATION REPORT

Salmon Camp Research Team Renewal

Oregon Museum of Science and Industry
National Science Foundation Innovative Technology Experiences for Students and Teachers Grant

Phyllis Campbell Ault, Ed.D.

May 2010

Evaluation Program
Center for Research, Evaluation, and Assessment
Dr. Robert Rayborn, Director

education northwest
CREATING STRONG SCHOOLS & COMMUNITIES

101 SW Main Street, Suite 500
Portland, Oregon 97204
http://educationnorthwest.org

EXECUTIVE SUMMARY

The Salmon Camp Research Team (SCRT) project was created to address the under-representation of Native Americans in information technology (IT) and IT-intensive professions in science, technology, engineering, and mathematics (STEM).

After an initial Innovative Technologies for Students and Teachers grant through the National Science Foundation (NSF), the Oregon Museum of Science and Industry (OMSI) partnered with the Native American Youth and Family Association (NAYA) under renewed NSF funding to strengthen community involvement and work directly with students year round. An SCRT program website was developed with program information and a social networking page (URL: http://www.salmoncamp.org/).

The evaluation of the project found evidence of effective implementation and data on important student attitudes and dispositions to support students in STEM coursework and as they consider secondary and post-secondary options in STEM.

Implementation

The Fall 2007 Family Event was the first activity under the renewal funding and focused on inclusion of families in the project. Registration documents showed 61 youth and adults attended the event. The event was valued by those who attended and provided a collaborative environment for launching the grant renewal.

The SCRT renewal provided multiple opportunities to involve youth in STEM activities and exposure to IT careers. The centerpiece of SCRT was immersion of Native American middle and high school students in engaging and personally

relevant experiences in the field. Expanding field experiences in an after-school setting through NAYA was central to the renewal vision. Participants in both branches of the project had Native American community affiliations and were interested in advancing their learning to pursue technologically rich careers or areas of study.

In 2007–2008, 80 students participated in the various field-based "Salmon Camp" sessions. Seventeen different high school students were involved in the four summer research teams, and twenty-two middle school students participated in the session at Camp Magruder. In 2008–2009, 54 students participated in Salmon Camp sessions. Sixteen different high school students were involved, and 31 students participated in the Camp Magruder session. Remaining students for each year participated in spring break, fall, or weekend trips.

A new component of the renewal funding was an after-school program for 5th through 9th grade students. Partnering with NAYA, the after-school format provided a club-style experience by building from NAYA's existing after-school program. The "Salmon Club" after-school sessions were offered at the NAYA Family Center two evenings per week in a nine-week session cycle. In all sessions combined, 35 students participated in Salmon Club in each renewal year (2007–2008 and 2008–2009). In addition, the NAYA Salmon Club leaders coordinated a Salmon Club session at a nearby middle school where another eight students attended sessions.

Accomplishing Impacts

Findings from the full spectrum of evaluation strategies suggest that the project largely accomplished intended objectives (called impacts by the project). Successes were accrued through collaborative efforts between OMSI and NAYA and implementation of the SCRTs (Salmon Camp and Salmon Club, collectively).

Impact 1: Spark and Sustain the Interest of Native American Youth in STEM and IT Careers

Data from the annual student survey, in-camp interviews, and end-of-session feedback suggest the Salmon Camp field sessions positively influenced most participants' interest and knowledge of STEM careers. For high school students, exposure to various colleges and universities was important to their thinking about post-secondary aspirations.

Impact 2: Develop Participants' Abilities to Use Information Technologies to Collect, Analyze, and Interpret Data and Solve Real-World Problems

Participants in the field SCRT sessions reported fairly high levels of learning with regards to using technological tools to collect, analyze, and interpret data in authentic, "real world" situations. Across students, areas of strength were reported in e-mail and related applications. Students also reported high levels of interest in learning more about how technology is used in science and resource management. .

Most Salmon Camp participants clearly believed that the program increased their awareness of how computers and technology are used in science/resource management, by providing hands-on experience and exposure to authentic research conducted in the field.

Overall feedback from the field sessions suggests that nearly all students increased their science knowledge and skills in using technology in science research. The use of technology tools was not an emphasis in the after-school program and did not emerge as a theme students mentioned in any of the data collection strategies used.

Impact 3: Promote Participants' Understanding of, and Appreciation for, the Complementary Relationship between Cultural Knowledge and Western Science

Students in field sessions of Salmon Camp reported learning about ecological relationships and ecosystems, cultural traditions of various tribes, and ways in which tribes use Western science.

Salmon Club students effectively demonstrated their learning about ethnobotany through the Trading Knowledge event—an evening open house in which students shared projects through a poster session for other students, parents, and interested stakeholders.

Perspectives

Developing the Salmon Club program was a significant undertaking requiring major investments in time and relationship building. While well received and reportedly valued by stakeholders, Salmon Club may be difficult to sustain without external funding.

Planned efforts to more significantly involve parents and increase career readiness among middle schoolers was challenging in the midst of developing Salmon Club and sustaining SCRT programs.

The importance of relationships at all levels cannot be understated. From ensuring success of Salmon Club to transitioning new staff members into Salmon Camp, in many ways, the impact of the project hinged on relationships as much as program design or any other components.

CONTENTS

Page

Executive Summary iii
Table of Contents v
Introduction 1
Evaluation Methods 2
Family Involvement in SCRT 4
Field Experiences 5
NAYA After-School Program 8
Participation across Programs 12
Stakeholder Interviews 13
Achieving Intended Impacts 17
Summary and Concluding Comments 28
References 31

APPENDICES

Appendix A: OMSI/NAYA Salmon Camp ITEST Renewal Grant Logic Model 33
Appendix B: SCRT Instruments
- Appendix B-1: Sample High School SCRT Annual Survey 41
- Appendix B-2: SCRT In-Camp Interview Protocol 51
- Appendix B-3: End-of-Session Feedback Form 55
- Appendix B-4: Sample Field Journal Page 57
- Appendix B-5: Salmon Camp Interview Protocol and Questions 58
- Appendix B-6: SCRT Stakeholder Interview Questions 59

Appendix C: A Collaborative Framework for a High Quality Grant Initiative 61
Appendix D: Fall 2007 Reunion Family Event 71
Appendix E: Salmon Camp Research Sites 2007–2009, by State 81
Appendix F: End-of-Session Feedback Summaries 89
Appendix G: Annual Student Survey Responses 99
Appendix H: Student Journal Excerpts
- Appendix H-1: Salmon Club Journal Samples 115
- Appendix H-2: Sample Excerpts from 2009 Salmon Camp Journal Spring Break Session 118

TABLES

Page

Table 1. High School Participation across Sessions 5
Table 2. Level of Participation across All Sessions 2007–2009 6
Table 3. End-of-Session Feedback Data For All Salmon Club Sessions 11
Table 4. SCRT Student Survey Subscales Relevant to Post-Secondary Aspirations 17
Table 5. SCRT Student Survey Subscales 20
Table 6. Salmon Camp Research Team End-of-Session Feedback Data on Impact 2 24
Table 7. Salmon Camp Research Team End-of-Session Feedback Data on Impact 3 26

FIGURES

Figure 1. Tribal Member, Assisted by SCRT Leader, Preparing Salmon in Traditional Manner 3
Figure 2. Salmon Camp Participants Setting a Net 5
Figure 3. Salmon Camp Research Sites 2007–2009 7
Figure 4. Salmon Club Students Testing pH 8
Figure 5. Intersections of Sets of Participants in Three Programs 12
Figure 6. Fish Hatchery Personnel Preparing to Work with SCRT Students 15
Figure 7. Composite Graph of Student Responses, 2008 21
Figure 8. Composite Graph of Student Responses, 2009 21
Figure 9. Trading Knowledge about Edible Plants 26
Figure 10. Trading Knowledge about Ceremonial Plants 27
Figure 11. Trading Knowledge about Plants Used to Prepare Salmon 27

ACKNOWLEDGEMENTS

Compilation of this report would not have been possible without the collaboration of my many colleagues striving to ensure success for the Salmon Camp Research Team project. Thank you to team members at OMSI and NAYA, as well as families, counselors, students, and stakeholders who offered their feedback. I extend my appreciation to Salmon Camp and Salmon Club counselors and leaders who somehow kept evaluation strategies on the agenda while implementing programs and guiding students. Hearty congratulations to my colleague, Matt Lewis, for applying the much-touted-by-Salmon-Campers GIS technology to creating maps for this report.

~~~Phyllis Campbell Ault

INTRODUCTION

"Salmon Camp" evolved in conjunction with tribal leaders and Oregon Museum of Science and Industry (OMSI) native and non-native staff members over the course of more than 10 years before receiving funding as the Salmon Camp Research Team (SCRT) project. The project was created to address the under-representation of Native Americans in information technology (IT) and IT-intensive professions in science, technology, engineering, and mathematics (STEM). This report focuses on accomplishments under the two-year Salmon Camp renewal under National Science Foundation (NSF) ITEST (Innovative Technologies for Students and Teachers) funding. A logic model for the project may be found in Appendix A.

Project Impacts and SCRT Renewal Strategies

Project objectives under renewal funding were:

- Spark and sustain the interest of Native American youth in STEM and IT careers
- Develop participants' abilities to use information technologies to collect, analyze, and interpret data and solve real-world problems
- Promote participants' understanding of, and appreciation for, the complementary relationship between cultural knowledge and western science

OMSI partnered with the Native American Youth and Family Association (NAYA) under the renewed funding through NSF's ITEST program to strengthen community involvement and work directly with students year round. An SCRT program website was developed with program information and a social networking page. Family take-home activities and links to resources were planned. The renewal also included the broad dissemination of the SCRT program model through a publication designed to serve as a program development guide for educators and community leaders working with Native American youth. The project team aimed to use the renewal to strengthen participants' interest in, and access to, IT and STEM careers through three strategies used in original NSF funding: (1) advancing the level of IT content by offering students more experience with data analysis and interpretation, (2) increasing opportunity for parental involvement, and (3) providing more direct assistance with internship placements and college preparation. In implementation of the renewal, these strategies received comparable attention to that of the original ITEST funding. A fourth strategy: partnering with NAYA to broaden Native American community involvement and to develop an after-school component was a new direction for the project—one that was successfully implemented to expand SCRT approaches to a new audience.

The project intended to continue using strategies that applied situated cognition and culturally responsive learning, including:

- Engaging participating students in authentic, IT-intensive research
- Working closely with STEM professionals to expose students to opportunities available through higher education and IT careers
- Placing IT/STEM in a cultural context by partnering with Native American professionals, emphasizing research of cultural importance, and including traditional knowledge and skills
- Involving students year-round with a progression of IT skills, STEM learning, and enrichment activities to maintain student engagement and deliver a comprehensive experience

Research sites reached from the Columbia River Slough in Portland, Oregon, east to Idaho, north to British Columbia, and south to California—encompassing a vast network of salmon habitat.

EVALUATION METHODS

To evaluate the project's progress in achieving anticipated impacts, a mixed methods approach was used to gather input from participants and stakeholders. The evaluation included quantitative and qualitative measures that facilitated triangulation of findings.

Instruments

Annual student surveys, end-of-session feedback forms, in-camp interviews, and field journals were used to measure the influence of participation in field research teams (referred to as Salmon Camps).

Six different instruments were used to gather data from the Family Event. These "instruments" were designed to be engaging and interactive activities, which evoked data of interest. At the dining tables, participants found paper s*wimming salmon* and paper *roe* for the *Dream Hatchery*, each with prompts to which guests were invited to respond. In addition, mock t-shirts were available on the tables for a design-a-t-shirt activity. One wall of the café was covered with a large format "river" (the *Dream Hatchery*) for posting the *swimming salmon* and *roe*. Another wall held an enormous graph for recording years in which guests were involved with Salmon Camp and a *Graffiti Board* for posting impressions of Salmon Camp.

Development of the project and student outcomes of involvement in the Native American Youth and Family Association (NAYA) after-school program (Salmon Club) were measured through student journals, projects presented at the Trading Knowledge event, three-step interviews conducted at the close of each nine-week session, and end-of-session feedback forms. Copies of the instruments may be found in Appendix B.

Data Collection

At the beginning of each high school camp session, students completed a survey using laptops in the field. The Salmon Camp Research Team (SCRT) Student Survey was developed by Education Northwest (formerly called Northwest Regional Educational Laboratory) in collaboration with the OMSI evaluator and Salmon Camp coordinator in 2004 and slightly modified each year. (See Appendix B-1 for a paper copy of the 2008 SCRT Student Survey form.) The survey was used each year during the summer camp sessions as a repeated-measures design to show changes over time. Content of the survey includes items on attitudes toward science, technology skills, technology skills aligned with the National Education Technology Standards (NETS), experience with science, as well as workplace and basic academic skills derived from Secretary's Commission on Achieving Necessary Skills (SCANS). The middle school student survey was modified in 2005 to be more age appropriate. It was completed by students on laptops at the conclusion of their summer sessions.

During the high school camp sessions, an in-camp interview was conducted with each student by the coordinator, a senior counselor, or evaluator. The in-camp interview guides were created to learn more about the participants' interests in science careers, computers and technology, job skills, and the relationship of SCRT to success in school. The interviews contained a series of questions that were common across interviews (see sample in Appendix B-2).

An evaluator attended the culminating Salmon Bake for two of the 2008 and one of the 2009 high school summer sessions. An evaluator also attended the final evening meal for the middle school summer sessions each year. This provided an informal opportunity to discuss Salmon Camp with counselors, Native American adults who were involved in the program, or tribal members preparing the Salmon Bake. The culminating Salmon Bake also provided an opportunity to conduct informal interviews with students and hear final project presentations using PowerPoint (one session only).

Field journals were used in the high school, middle school, and NAYA sessions to gain insight into students' understanding and interpretation of material. The conclusion of each of the SCRT sessions included an end-of-session feedback form, which contains closed-response Likert-style ratings on implementation and impact as well as open-response items to provide data on the most successful or effective aspects of the sessions. (See Appendix B-3.)

Interviews were conducted with a set of field research partners and former Salmon Camp Research Team students using semi-structured interview protocols.

Regular monthly meetings and communications between Education Northwest and project leaders at NAYA and OMSI kept SCRT planners and evaluators informed of ongoing activities. The variety of evaluation strategies provided documentation of activities and data to measure project impact.

Collaborative Framework

The complex nature of collaborating across NAYA, OMSI, and Education Northwest prompted the development of a "Collaborative Framework." The framework

Figure 1

Tribal Member, Assisted by SCRT Leader, Preparing Salmon in Traditional Manner

was designed collaboratively (of course) to serve as a strategy to develop agreed upon common approaches and perspectives and as guidance as the project strove to accomplish envisioned aims and impacts.

The Collaborative Framework was based on intensive work by Education Northwest (Northwest Regional Educational Laboratory 2002) on assessing High-Performing Learning Communities.

The document was used as an evolving framework to organize strategies used under the National Science Foundation renewal funding of Salmon Camp, provide a system-level approach to thinking about the work, and as a strategic document fusing multiple components of the renewal proposal. The expectation was that the tool could be revised and used with other projects. The primary value of the framework was in the process of discussing key features and principles that ran across programs. The framework contains six domains of: (1) engaged student learning, (2) collaborative learning community, (3) proactive community relations, (4) shared vision, (5) facilitative leadership, and (6) supportive organizational structure. Each domain is articulated through dimensions and key elements. See Appendix C for a copy of the framework.

FAMILY INVOLVEMENT IN SCRT

Family Involvement Activities

Expansion of parent involvement was an aim of the renewal funding. The project proposed to expand ways in which parents supported their children in Salmon Camp Research Teams (SCRTs) through a variety of activities and formats. The SCRT renewal proposed to include (per year):

- Family day capstone event, held at the end of the summer at Oregon Museum of Science and Industry (OMSI) or Native American Youth and Family Association (NAYA) (1)
- Family weekend held at the end of the fall at a location convenient to parents not from the Portland area, with transportation from Portland and lodging provided by OMSI (1)
- Take-home activities, including background information for parents, which could be completed at a time and location that was convenient to families (6)
- Opportunities for parents to participate in SCRT programs as chaperones and helpers
- Opportunities for parents with science backgrounds or relevant careers to share their expertise and knowledge with SCRT groups
- Annual OMSI memberships provided to families of SCRT participants and an organizational membership provided to NAYA

The Fall 2007 Family Event was the first activity under the renewal funding and focused on inclusion of families in the project. Participants were recruited through e-mail and personal invitations to the broad Salmon Camp community. (See Appendix D for a detailed report on the reunion.) The reunion was successfully implemented and drew a good turnout. Across the various instruments used to gather feedback, hallmarks of Salmon Camp emerged as: increased knowledge of Native American culture, exposure to careers, and understanding of science. Participants envisioned a future for Salmon Camp that continues to provide positive experiences for youth and grows over time. Hopes for stronger community connections were noted by some participants, including increased partnerships with tribes. The need for habitat restoration and Native American youth who are knowledgeable about water systems and aquatic life also surfaced as attendees thought about the future of the program. Related to these visions was interest in developing Native American leaders among Salmon Camp participants, who are well versed and experienced in working with natural resources.

The event was valued by those who attended and provided a collaborative environment for launching the grant renewal.

Family weekends were not ultimately used as a strategy to promote family involvement, as envisioned. Some Salmon Club activities included interviews and take-home activities as planned. The most successful strategy to increase family involvement was inclusion of family members in the final Salmon Club "capstone" event, called "Trading Knowledge." Parents were also invited to salmon bakes and tapped for their expertise to some extent. OMSI memberships were provided to full participants, an incentive particularly appreciated by the Salmon Club students.

FIELD EXPERIENCES

The centerpiece of Salmon Camp Research Teams (SCRTs) was immersion of middle and high school students in engaging and personally relevant experiences in the field. Expanding field experiences in an after-school setting through Native American Youth and Family Association (NAYA) was central to the renewal vision. Participants in both branches of the project had Native American community affiliations and were interested in advancing their learning to pursue STEM careers or areas of study.

Under renewal funding, intensive SCRTs were conducted in the field through high school camping sessions and residential camp experiences for middle school students. Sessions were held over spring break, summer, and fall week-long enrichment sessions.

Students were exposed to advanced technologies used in salmon recovery and habitat restoration such as Global Positioning System (GPS) units and Geographic Information Systems (GIS), as well as task-specific technologies for habitat monitoring.

Figure 2

Salmon Camp Participants Setting a Net

Each year, four summer sessions for high school aged students were offered in different ecological regions: one each year in Idaho, Oregon, California, and Washington. The summer high school research teams participated in an intensive experience over a 12-day camp period. The groups spent their days exploring local ecosystems, learning traditional Native American knowledge, or working with researchers. The students and counselors either tent camped or stayed at research stations as they traveled to various study sites.

A residential camp experience for middle school students was offered at Camp Magruder, located at the Oregon coast. A second session designed for middle school students was also offered, with travel to the San Juan Islands and Olympic Peninsula, Washington.

In 2007–2008, 80 students participated in the various field-based "Salmon Camp" sessions. Seventeen different high school students were involved in the four summer research teams, and 22 middle school students participated in the session at Camp Magruder. In 2008–2009, 53 students participated in Salmon Camp sessions. Fifteen different high school students were involved, and 31 students participated in the Camp Magruder session. Remaining students for each year participated in spring break, fall, or weekend trips. Table 1 shows the proportion of students who attended one or more sessions.

Table 1
High School Participation across Sessions

Number of Sessions Attended	Students Percentage (#)	
	2008 (n=17)	2009 (n=15)
1	65%(11)	53% (8)
2	24% (4)	27% (4)
3	6% (1)	7% (1)
4	6% (1)	13% (2)

Teasing out the cause of the relatively low enrollments for some sessions is difficult, and to some extent challenging to avoid, as some students who were initially enrolled in the sessions failed to show up, and others returned home after a couple of days. However, it should also be noted that the loss of the long-time Salmon Camp director due to budget constraints at OMSI in late fall 2008 may have played a role in low enrollments in 2009 for high school sessions.

On the other hand, middle school sessions met with robust enrollments and included students drawn primarily from NAYA connections. In 2008, 22 middle school students participated in the session at Camp Magruder; 31 attended in 2009.

As a strategy to minimize frustrations of designing and arranging for weekend enrichment sessions and then have students fail to show up due to conflicts with transportation, high school sports, and personal commitments, enrichment sessions shifted to a full week in the fall/spring. Fall sessions in 2007, 2008, and 2009 were fully enrolled (11, 10, and 11 respectively). Spring break sessions were smaller, with six students in 2008 and seven in 2009.

In previous years, summer camp high school students selected a related topic of interest to study and report on through an oral presentation with a supporting PowerPoint slideshow. Students presented their research topics during the culminating Salmon Bake at the end of the high school summer sessions, with an audience of fellow campers and invited elders, parents, and researchers. Unfortunately the condensed time frame of the renewal funding made completion of these projects quite difficult. With a week less time in the field, the individual projects as previously developed were just not possible to complete in a meaningful way. Students in one of the smaller-enrollment sessions in 2008 did manage to complete projects and present them. However, the presentations did not demonstrate the level of expertise or knowledge conveyed by participants on their topics in previous years.

Participation

Including all Salmon Camp and Salmon Club sessions conducted under ITEST renewal funding, 119 students were served by the project. Intensity of participation ranged from irregular attendance at Salmon Club to two years of participation in nearly every summer session of Salmon Camp. Table 2 displays the number of students who attended one or more sessions. While most students attended only one session, a sizable number attended four or more sessions.

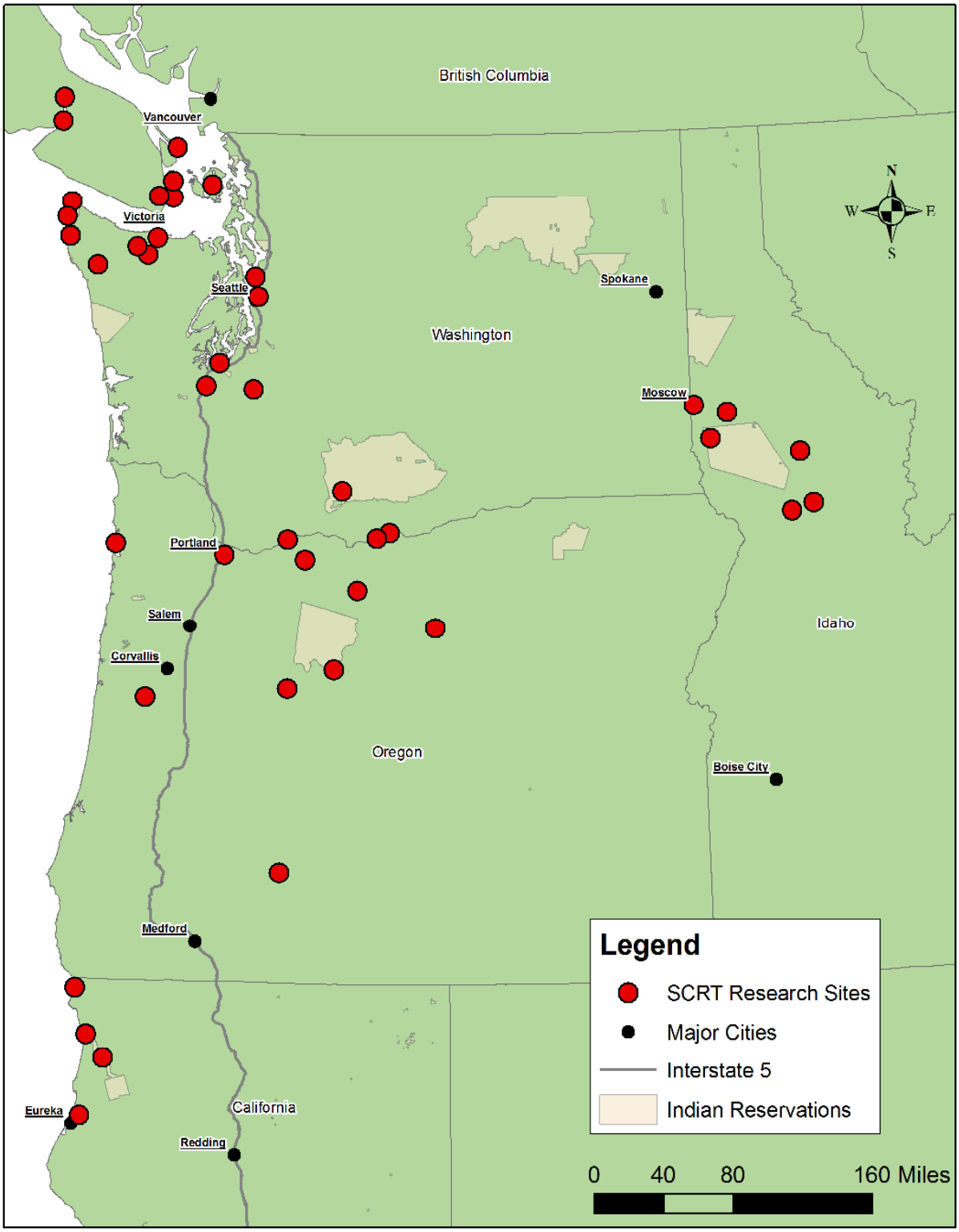
Research Sites

Typically each Salmon Camp Research Team engaged in research activities at a given site for one to three days, then traveled to the next site in the region to work with other scientists, research groups, or tribal members. Figure 3 depicts a composite of key research areas where students worked during renewal funding. Each location where students conducted studies or spent significant time learning about ongoing research is marked by a red dot. Maps by trip/state may be found in Appendix E.

Table 2
Level of Participation across All Sessions 2007–2009 (N=119)

Number of Sessions Attended	Students Percentage (#)
1	55% (65)
2	23% (27)
3	9% (11)
4	8% (10)
5	3% (3)
6	1% (1)
7	2% (2)

Figure 3: Salmon Camp Research Sites 2007–2009



NAYA AFTER-SCHOOL PROGRAM

A new component of the renewal funding was an after-school program for 5th through 9th grade students designed to "provide students with strong, year-round experiences with IT and IT careers, prepare students for summer and spring break intensives, and create a closer connection between the Salmon Camp Research Team (SCRT) program and participants' formal education experience."

Partnering with Native American Youth and Family Association (NAYA), the after-school format provided a club-style experience by building from NAYA's existing after-school program. The "Salmon Club" after-school sessions were offered at the NAYA Family Center two evenings per week in a nine-week session cycle. Two dedicated tutors (instructors) worked with students on Salmon Club content and projects.

Most students took a bus from one of many Portland area schools to NAYA and were involved in other activities through the after-school program. Each year, in all sessions combined, 35 different students participated in Salmon Club. A spring pilot session and fall implementation session were offered in 2008. In 2009, winter and spring sessions were offered.

Figure 4

Salmon Club Students Testing pH.

The curriculum for Salmon Club engaged students in a series of studies and experiential activities focused on water quality issues and culturally relevant science topics. Most of the activities for Salmon Club were adapted from pre-existing material. Some were created specifically for Salmon Club and integrated activities and ideas from other sources. All the units are available through the non-public portion of the project website (http://www.salmoncamp.org/activities.htm). Each document includes teacher/tutor guidelines on time and supplies required for the activity, necessary preparation or setup, science background information, and a description of the investigation/activity. Student pages to record observations, data, questions, or responses are also included. Journal pages are provided for each topic. Units include:

- Making a Journal
- Community Heroes
- Watersheds
- Salmon Map
- Dissolved Oxygen
- pH
- Macroinvertebrates
- Water Filtration
- Dichotomous Key with Native Plants
- Water Quality Digital Lab
- Ethnobotany
- Building a Community from the Ground Up
    - Part 1: The Natural Environment and First People
    - Part 2: Pioneers and Early Settlers
    - Part 3: Early Town
    - Part 4: Modern Town
    - Part 5: Modern City

The units provided opportunities for students to conduct explorations of topics (many with outdoor field components), interact with other Native American adults through interviews, and develop skills using various laboratory and field techniques.

Stakeholder Feedback

In November 2008 focused discussions were held with NAYA staff members who were directly involved in the spring pilot session and fall implementation of Salmon Club. In addition, evaluators met with NAYA's Youth Services team including the director, academic specialists, cultural arts staff members, middle school advocates, and prevention specialists. At the time of the discussions, the fall Salmon Club session was in full operation and students had been able to participate in an assortment of experiences including the spring Salmon Club pilot, as well as Salmon Camps at spring break, during the summer, and the weeklong fall session to Vancouver Island.

Instructional Team Perspectives

The "closeness of friendships" fostered through Salmon Club was an unexpected student outcome described by the team of instructors who worked with students through the spring and fall clubs. Although participants formed an eclectic community of students from a wide range of schools and academic backgrounds, the group established strong personal connections after nine weeks (or more) of seeing each other, learning together, and working together in a variety of Salmon Club settings. Students reportedly looked forward to seeing each other and noticed when a club member was absent. The instructional team agreed that student leaders emerged from those who also participated in SCRT experiences. One instructor described this process commenting: "Those who go on weeklong trips step-up their game." Instructors noted that students who attended the weeklong trip returned "talking and talking" about what they did and learned. Their experiences seemed to position them to share their knowledge and experience with other students, as knowledgeable leaders.

Instructors noted that the summer Salmon Camp session at Camp Magruder was "an amazing experience" for students in which many "had the time of their lives." They found that the social connections initiated in the summer continued through the school year and strengthened in some cases. In addition, instructors saw that students' understanding of science, anchored in experiences from the summer session, "stuck with them" providing scaffolding for additional learning in Salmon Club and more broadly in science.

Activities or units with cultural relevance were viewed by instructors as more successful than others, and the team felt that as they found more ways of making units culturally significant, the program improved. The team was very appreciative of the collegial relationships developed between NAYA and OMSI staff members working on curriculum development. Through their collaboration, instructors grew more comfortable teaching the units and modifying lessons to "work out the bugs."

Salmon Club was viewed by the instructors as boosting participants' confidence in themselves as students and as science learners. Student confidence was further bolstered by learning more about their tribe or other tribes and how cultural knowledge "connects to science." The hands-on nature of the activities was seen as "more exciting" than much of the science work students do in their classrooms because "kids get to *do* science themselves." Instructors saw involvement in Salmon Club as fostering interest in learning more science. The safe and welcoming atmosphere of Salmon Club enabled all students to actively participate regardless of personality, academic or technical skills, or social standing. As a result, Salmon Club became one of the "most attractive and interesting afterschool opportunities" at NAYA.

The team of instructors and managers who were involved in Salmon Club were anxious

to expand the program to other students at NAYA and other schools. They also hoped to communicate more closely with OMSI staff members to enable more Salmon Club participants to attend SCRTs in the future.

Youth Services Team Perspectives

The Youth Services staff members provided perspective from those who were not directly involved with the development and implementation of Salmon Club. Yet, members of the Youth Services team agreed with the Salmon Club instructors that the program was "one of the best clubs" among the after-school offerings. The Youth Services team saw and heard students outside of the club in a variety of different settings. The team recognized the importance of the relationships established between Salmon Club instructors and students and attributed much of the smooth implementation to the skilled and committed instructors. The Youth Services team unanimously agreed that students were excited about Salmon Club, as evidenced by "tons of enthusiasm" over activities and experiences. They saw students excited about their projects, communicating with peers and staff members, and increased interest in the Columbia River Slough (located adjacent to NAYA) where students engaged in water quality activities. Students regularly talked about Salmon Club outside of their club time, which spurred interest among other students. There was growing interest among family members as well. Parents asked staff members, "What is Salmon Club? My [child] talks about it so much!"

Youth Services staff members heard students talking about their final ethnobotany projects and noticed students' anticipation for teaching others about their research. Staff members themselves looked forward to attending the open house event, "Trading Knowledge." The stipends and OMSI family memberships were viewed as effective incentives in combination with the opportunity for students to display their work and discuss it.

With a waiting list growing for the winter Salmon Club session, the Youth Services team agreed it was appropriate to open participation to those who have not been in Salmon Club. However, the group was concerned about how to sustain interest and enthusiasm among the core group of past participants. Staff members suggested exploring ways to differentiate units with extension activities to allow students to learn concepts at a deeper level, a Salmon Club II option, or mentoring possibilities. The Youth Services staff members also suggested increased use of elders and members of the Native community in Salmon Club activities. However, none of these were accomplished under the limited remaining time of renewal funding.

Student Feedback

3-Step Interviews. At the end of each Salmon Club session, evaluators conducted 3-step interviews with Salmon Club participants. Using this strategy, triads of students rotated through roles of interviewee, respondent, and note taker. A discussion of themes across groups was then held, allowing students to voice their own views as well as hear common thoughts across the group.

For all sessions students agreed that positive aspects of Salmon Club included the projects, activities, and research. There was consensus that field trips and outside activities were valued, including work in the Columbia Slough and native gardening activities. Interaction with peers was also important to participants who valued working with friends, meeting new people, and introducing other people to Salmon Club. As one participant explained, "It really did help me in science because we don't do this stuff in my science class." To improve upon the program, students suggested more outdoor

activities and field trips—even after revising the curriculum to specifically include more outdoor experiences.

Student End-of-Session Feedback. A total of 33 Salmon Club students completed the end-of-session feedback forms. A large majority of students (74% or more) agreed that Salmon Club increased their science knowledge, and that they learned about ecological relationships. Based on their experience, 80 percent of student respondents would recommend Salmon Club to others. Table 3 shows responses to key questions. A full set of responses may be found in Appendix F.

Salmon Club Summary

Within a rapid start-up under renewal funding, the project created an after-school component that was well-received by stakeholders from instructors to students. A curriculum cycle was developed and units refined in response to feedback from instructors and students. Participation in the after-school program supported field immersion experiences through Salmon Camp, as many students from Salmon Club also attended a Salmon Camp session.

Although it was successful from the variety of data sources, sustainability remains in question. During 2009–2010, without external funding, the program was not continued at NAYA. A critical issue is how to support student learning launched by the project.

Table 3
End-of-Session Feedback Data
For All Salmon Club Sessions (N=33)

Question	No Way!		Not really		I think so		YES!		Mean (S.D.)	
	Percent-age	n	Percent-age	n	Percent-age	n	Percent-age	n	Mean	S.D.
Did Salmon Club meet your expectations?	9%	(3)	18%	(6)	42%	(14)	30%	(10)	3.0	(.9)
Has this program made you more curious about science?	3%	(1)	36%	(12)	39%	(13)	21%	(7)	2.8	(.8)
Did you learn about ecological relationships and ecosystems?	10%	(3)	10%	(3)	29%	(9)	52%	(16)	3.2	(1.0)
Did you increase your science knowledge?	0%	(0)	16%	(5)	31%	(10)	53%	(17)	3.4	(.8)
Did you gain skills in using technology in science research?	3%	(1)	28%	(9)	22%	(7)	47%	(15)	3.1	(.9)

PARTICIPATION ACROSS PROGRAMS

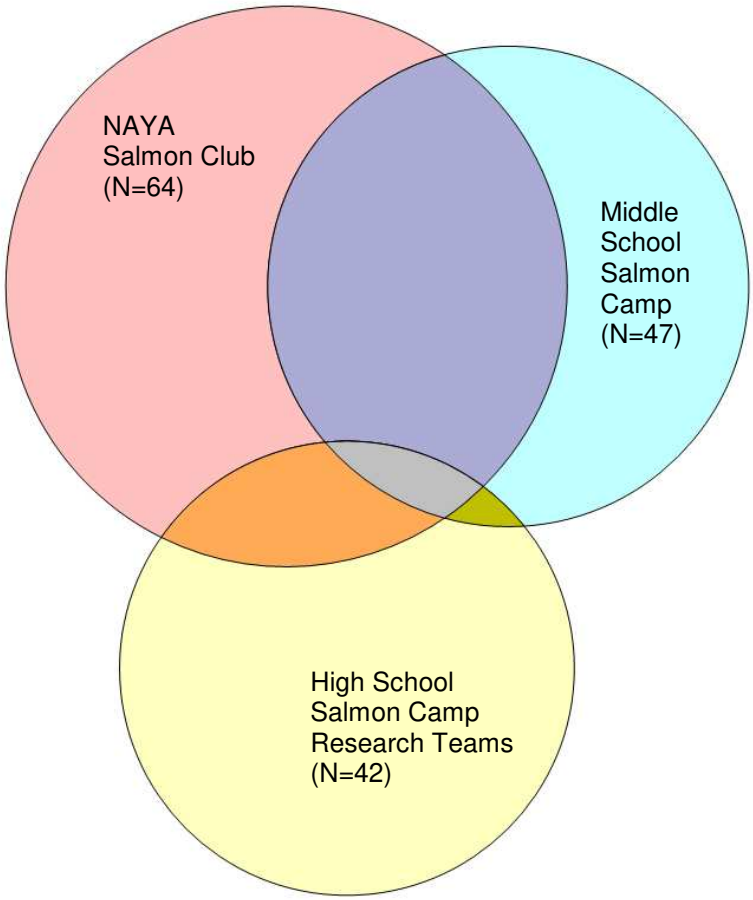
Of the 119 students served by the Salmon Camp Research Team project under renewal funding (Fall 2007–Summer 2009), a majority were middle school students. Salmon Club at NAYA was designed to expand the program reach to middle school students in an after-school setting, which it successfully did.

Participation in Salmon Club, and encouragement from NAYA staff members, enabled many Salmon Club students to participate in the middle school Salmon Camp sessions at Camp Magruder on the Oregon coast. Over half (55% or 26/47) of the students who attended Salmon Camp at Magruder also attended at least one session of Salmon Club at NAYA.

A few students transitioned from Salmon Club to participating in one or more of the intensive SCRT sessions (the high school Salmon Camp Research Teams) (7/42 SCRT participants attended both). A very small number (3) attended Salmon Camp at Magruder and a high school SCRT session.

The Venn Diagram in Figure 5 shows overlaps between the various programs.

Figure 5
Intersections of Sets of Participants in Three Programs



STAKEHOLDER INTERVIEWS

Former Salmon Campers

Three sets of interviews were conducted to investigate long-term influences of Salmon Camp from the perspective of former participants and professionals who partnered with Salmon Camp Research Teams in the field. The intentional samples of respondents for each group were designed to capture perceptions of those who were most heavily involved over the years—as students and researchers. Semi-structured interview protocols were used with all interviews. (See samples in Appendix B-4.)

Responses from former Salmon Camper interviews were gathered through two strategies. In both cases respondents were at least 18 years old at the time of the interviews. The first data set was drawn from face-to-face interviews conducted in spring 2007 as part of a case study of eight young women who were active participants in Salmon Camp for two to seven years (Ault 2007). The second source was a series of phone interviews conducted in 2009 as part of the SCRT evaluation, with seven young men who were also active participants in Salmon Camp for at least two years. Although interviews with the young women were more in-depth, a shortened interview protocol for phone interviews with the young men was designed to parallel relevant questions asked of the young women. Findings reported here draw out themes emergent across both sets of interviews.

Themes from Former Salmon Campers

Findings are not necessarily representative of all participants. However, the emergent ideas reflect findings from other evaluation methods and research suggesting the responses likely reflect the sentiments of many.

Field Research

Students get to work hands-on with professionals and volunteers in the area. They get to be a part of projects that have a point and that will contribute to society. One project I remember was helping out a college student with her senior project. We used GPS units to map the plants throughout a local nature park. It was very hard work as we had to force our way through stands of very dense hawthorn. By the time we were finished, everybody was wet, muddy, scratched, and exhausted. It was, however, extremely rewarding for us, since our small group had made a major contribution to a real project in the area. Our data would be used and appreciated, and we had a taste of how difficult it really is to obtain the data we take for granted in news reports and Internet pages.

—Former Salmon Camper

A key strategy of Salmon Camp Research Teams was experiential learning in field environments (out-of-doors, usually at research sites). These field experiences aimed to ground students in authentic research that they could draw upon to scaffold and boost their understanding and in-school learning.

The importance of field experience was cited by nearly all interviewees as a significant component of their participation in Salmon Camp. Interviewees valued the "hands-on" or experiential aspect of their field research as well as the authentic nature of the projects in which they were involved. This authenticity was viewed as essential to the field experiences as it enabled student contributions to solving real-world problems or collecting valuable information on plant or animal populations. While working in the field, students also valued learning how to work as team members and being treated as genuine members of research teams. As one interviewee noted, "Salmon Camp was amazing because it took high school kids seriously and let them be part of projects

that some people would have thought were out of their range, but they really weren't at all." For many interviewees, the cultural significance of restoration or monitoring projects was also important. Projects such as working with plants holding cultural significance (e.g., camas) or conducted fish counts of salmon fostered a sense of "giving back" among students. Making a genuine contribution was a significant component of the experience for many former Salmon Campers.

Relationships

My most directly memorable experiences are interpersonal—group bonding experiences—spending a lot of time to bond with a small group of people.

—Former Salmon Camper

[Native researchers] understand the science and have studied it, but they also have their Native backgrounds. It sort of comes together into what I think Salmon Camp is trying to realize. They're not separate or distinct; they work out fine. In fact there are a lot of ideas that can be taken from Native collective knowledge that could benefit science. Also, ya know, working with Native researchers gives you a lot of opportunities. They suggest things to do, they have the know-how in the community.

—Former Salmon Camper

Developing social relationships was inherent in Salmon Camp Research Teams. Counselors strove to establish behavioral norms and expectations of respect and appreciation for others as 10–12 students and a couple of counselors spent weeks in the field together. Embedded in the experience of working side-by-side with researchers, tribal members, and fisheries technicians was the idea that students would develop relationships with those adults as well.

Developing new personal relationships with others emerged as a significant aspect of Salmon Camp for nearly all interviewees. "Bonds" that developed between students and members of various tribes, scientists, counselors, and peers were all reported as an important part of the experience. "The interaction between the other campers, instructors, and connections with researchers" was viewed by several interviewees as a significant enough part of Salmon Camp that they hoped younger siblings or cousins will also be able to enjoy similar interactions. In particular, exposure to other Native researchers and tribal members was influential for many former Salmon Campers interviewed.

For women interviewees, establishing relationships with other women interested in science or working as scientists was important. For all the women interviewed, supportive relationships with other women were viewed as important to their post-secondary successes. All of them were still in touch with many of their friends from Salmon Camp.

Place

It's really nice—you really get to feel like you are learning about the environment and how you are away from society. When in Fossil, Oregon, there wasn't much out there and you really connected to nature.

—Former Salmon Camper

Teaching and learning about "place" are particularly beneficial for Native American students who have tribal heritages inextricably tied to the natural world (Cajete 1994).

About half of the young men and all of the women interviewed discussed the importance of the places they visited in Salmon Camp. Places were memorable in a variety of senses. Some students felt an attachment to specific places because they were beautiful, or their experience in that location was meaningful. Others connected to certain places because of their location as traditional homelands for their tribes. Some expressed a general appreciation for places visited in Salmon Camp as places they

"wouldn't otherwise have been able to visit" because of their distant or restricted location.

Salmon Camp as Bridge Experience

SCRT definitely helped me through school—steered me towards science instead of away from science. Obviously I was already interested in science and SCRT just made me that much more interested.
—Former Salmon Camper

Salmon Camp was perceived as a bridging experience in one form or another by all interviewees. Participation served as a bridge for nearly all students by bolstering their interest and understanding of science which then ensured greater success in school science. They widely viewed Salmon Camp as helping them "do better" in science in school.

For many students Salmon Camp "got them going," meaning their experiences and exposure to various professionals motivated students to want to go to college. One former student commented, "It gave me a jump start on going to college. It gave me a goal to shoot towards."

The experience was also influential for nearly all students in increasing their awareness of careers in sciences and with tribes. As one interviewee described, "It was great to meet all of these people that are doing science with the tribes to see what they do…. It helped definitely with career things—opened my horizons a little bit with what's out there. I was clueless to everything that was available as far as career paths."

Many interviewees commented on the value of Salmon Camp in reinforcing their identity as Native Americans. In fact, for some students Salmon Camp shifted their perception of being Native American from thinking of their identity as a deficit, to seeing their heritage as an asset. In addition, students gained an increased appreciation for the importance of making meaningful contributions as Native Americans. As one interviewee reflected, "I came away with a greater understanding of the importance of being Native American, and the responsibilities to help [tribes] out no matter where I go or what I do in the future."

Aspirations

Former Salmon Camp interviewees expressed high expectations in terms of their post-secondary education and career goals. All aspire to finish college. Thirteen of the fifteen interviewees have specific career goals. Of those, all plan to pursue science, science-related, or engineering careers. Furthermore, all interviewees held their Salmon Camp experience in high regard and expressed strong hopes that the program would continue. For many, they look forward to another generation of students sharing the Salmon Camp experience they felt was so influential on their growth and aspirations.

Figure 6

Fish Hatchery Personnel Preparing to Work with SCRT Students

Field Partner Interviews

To explore Salmon Camp from the perspective of partners working with students in the field, interviews were conducted with six professionals who were collaborators with Salmon Camp Research Teams. Participants were selected based on having long-term involvement and experience working directly

with students in the field for at least two summers. Some were active contributors to Salmon Camp field experiences for as long as 15 years. Interviewees worked in the following capacities:

1. Tribal biologist and former SCRT instructor
2. Government field ecologist
3. Fish hatchery biotechnologist
4. Stream restoration biologist
5. Tribal fisheries and policy leader
6. Tribal natural resources manager

The interviews used a semi-structured interview protocol (see Appendix B-5 for a copy) and provided insight into critical components that were perceived to foster program success. All participants were strong supporters of SCRT, expressed interest in continuing to work with the program, and hoped to see it continue in the future. The following section highlights key elements which emerged across interviews as essential to success.

What Students Can Do

- Students should want to be there. That element of choice was viewed as important to effective research teams.
- Students engage in learning to work as part of a team, developing collegial working relationships as researchers.
- Students should have adequate experience using the technology before working with researchers in the field so they are ready to actively participate at the study site.

Counselors

- Counselors should keep students on task, defusing distracting behavior, and modeling engagement in tasks.
- Counselors must be respectful role models.
- There should be continuity in counselors over time. This enables partner researchers to rely on counselors to know field protocols and how things work at different sites.

Partners

- Partners in the field need to allow time for planning and prepping to make good use of students in field research.
- Partners should bring the best science to students, set high expectations for field work, and support students in meeting them.
- Partners should keep informed of the annual cycle of SCRT to coordinate field work with session schedules.
- Partners need to secure support from their organization's leadership (boss) to ensure that the collaboration is a regular part of their work.

SCRT Program Directors

- Send staff members to professional meetings to network/make contacts.
- Coordinate everything to minimize workload on the field partner.
- Establish one contact person.
- Integrate completion of a product/project into the student experience.
- Attract and retain high quality counselors, Native when possible.
- Build on successes over the years so the program continues to improve.
- Keep the number of students to a manageable size—too many students make field work difficult.
- Provide enough equipment for all students to fully participate.
- Provide a diversity of experiences since different students respond to different activities.
- Recognize that relationships developed through the program build strong bonds with other professionals, counselors, peers that can extend far beyond the program.
- Focus on doing authentic research in the field such as monitoring/data collection.

ACHIEVING INTENDED IMPACTS

Achievement of targeted impacts under the Salmon Camp Research Team (SCRT) renewal funding required progress on the multiple fronts upon which the project was working. This chapter summarizes data from the suite of evaluation instruments used to draw a composite picture of achieving intended impacts.

Impact 1: Spark and Sustain the Interest of Native American Youth in STEM and IT Careers

The SCRT renewal provided multiple opportunities to involve youth in STEM activities and exposure to IT careers through the intensive field experiences and Salmon Club activities. Evidence drawn from annual laptop surveys, in-camp interviews, and end-of-session feedback forms reveal ways in which the project made an impact in this area.

Annual Student Survey

The annual survey completed by students in field-based SCRT sessions included numerous items related to career interests. Self-efficacy as a science learner is an important component of students' post-secondary educational and career aspirations. A full set of self-efficacy questions were used with the high school students, a shorter version was used with the middle school students. Questions on confidence as a student in science and resource management as well as preparation for careers in those fields were also included. Students' perceptions of their basic skills in reading, writing, mathematics, speaking, and listening were also probed as foundational to academic work. Subscales were developed from items within each of these areas. The baseline surveys (2007–2008) showed participating students saw themselves as quite capable and skilled across subscales as shown in Table 4. Matched survey data from students who participated in a 2007–2008 session and a 2008–2009 session were used to examine changes over time. Data tables with survey results may be found in Appendix G.

Table 4
SCRT Student Survey Subscales Relevant to Post-Secondary Aspirations

Subscale Items (*Number of Items in Subscale*)	2007–2008			2008–2009		
	Mean* (1–5 Scale)	Standard Deviation	Valid N	Mean* (1–5 Scale)	Standard Deviation	Valid N
Middle School Science Self-efficacy *Items 1–7 (7 Items)*	3.3	(.3)	19	3.5	(.7)	18
High School Science Self-efficacy *Items 1–12 (12 Items)*	3.8	(.3)	19	3.5	(.6)	18
STEM Career Preparation *(Items 39–44 (6 Items)*	3.8	(.2)	4	4.0	(.6)	9
Basic Skills *Items 51–56 (6 Items)*	3.8	(.6)	19	3.7	(.4)	18

*NOTE: For calculating subscale data, negatively worded items were reversed to generate means that consistently

The related subscales show fairly high levels of self-efficacy in high school science, technology, engineering, and mathematics (STEM) career preparation and basic skills. Middle school students reported somewhat lower levels of self-efficacy in science.

Student In-Camp Interview Findings

The in-camp interviews were conducted by counselors with all high school students at the end of summer sessions each year. A summary of 2008 interviews was previously reported (Ault 2009). In 2009, 15 different students were interviewed. Seven students attended more than one SCRT session, including two students who attended four sessions. Interviews provided dedicated time for counselors to talk with individual students and learn more about their interests and perspectives. Responses, recorded by counselors, were analyzed by evaluators to provide insight into ways in which the project was influencing participants. For students who completed more than one interview, a composite was used in the analysis of responses.

Several interview questions probed how Salmon Camp participation sparked interest in STEM and IT careers. All of the numbers and the percentages below are based on the 15 interviews conducted with students in 2009.

Science career interests

- Over three-quarters of participants (87%) could see themselves working in a science career some day, and marine biology, fisheries, or forestry continue to be the science career interests mentioned most by participants.
- All participants (100%) thought Salmon Camp helped them explore their career interests. When asked how, participants responded that Salmon Camp has expanded their thinking about career options through hands-on experience, meeting other professionals, and "seeing different people doing different jobs."

Future plans

- All of the participants (100%) planned on attending future SCRT camps if possible. They found the camps to be both educational and fun.
- When asked about their plans after high school graduation, all but one participant said they wanted to go on to college (93%). The one participant who did not mention college plans to work after high school.

The interviews highlighted the extent to which students saw Salmon Camp as providing valuable experiences which supported and encouraged their interest in STEM careers. Notably absent in the discussions were internships or placements with mentors in the sciences and resource management. Although students viewed Salmon Camp counselors as mentors, they really did not seem to have other adult mentors in STEM or IT fields. Key supporters of their educational interests were parents and grandparents.

Student End-of-Session Feedback

Several items on the end-of-session feedback forms from summer field sessions provide evidence of how involvement in Salmon Camp influenced students' post-secondary educational or career interests. Two items focus directly on this impact area.

An open-response item explicitly asked, "How has Salmon Camp affected your interest in a science/technology career?" Seventy-nine percent of the 38 high school SCRT responses (30 responses) described effects on interests in this area. The Salmon Club program was not intentionally focused on increasing career interests, prompting students to respond more generally to the question. Students who

responded noted that their experience generally increased their interest in science, or that it was fun. High school students described a number of ways in which Salmon Camp influenced their career interests. Responses were analyzed and clustered into common emergent themes of:

- Increased/sustained interest in a science/technology career (17 responses)
- Increased interest in science (5 responses)
- Exposed to reality of science/technology jobs, developing a better understanding of what science is and/or what scientists do (4 responses)
- Generally learned new things (2 responses)
- Has other plans that do not currently involve a science/technology career (1 response)

While a strong majority of students attributed new interests, knowledge, or exposure to Salmon Camp participation, a few (3 high school students) reported no/little effect on their interest in a science/technology career. Verbatim responses may be found in the End-of-Session Feedback Summary from Field Sessions in Appendix F.

A second open-response item asked students to note what they learned about going to college or a university. High school students reported learning more in this area than the middle school students. As with the previous question, this was not a focus of Salmon Club, therefore students did not report gaining understanding in this area.

Most high school responses fell into clusters of learning about:

- Different science programs offered at universities (6 responses)
- Expenses of attending college/university (3 responses)

Most students were enthusiastic about visits to universities during each SCRT high school session. Wherever they were, the visits inspired students to "want to go there." However, as compared with the previous year, students reported in their journals less detail in what they learned about going to college. Areas that students referenced in 2008 that were *not* mentioned in 2009 included:

- Available scholarships and financial aid
- University support systems for Native American students
- Necessary coursework and preparation in high school for competitive admissions
- "How college classes work"

Accomplishments on Impact I

Data from the annual student survey, in-camp interviews, and end-of-session feedback suggest the Salmon Camp field sessions positively influenced most participants' interest and knowledge of STEM careers. For high school students, exposure to various colleges and universities was important to their thinking about post-secondary aspirations in 2008 and mostly reinforced interests in 2009.

Impact 2: Develop Participants' Abilities to Use Information Technologies to Collect, Analyze, and Interpret Data and Solve Real-World Problems

Annual Student Survey

A substantial portion of the student survey probes students' skills and proficiency with digital tools. Students reported fairly high estimations of their ability in these areas, including graphics and computer use in science. Table 5, below, shows subscales for related items. Data tables with item level findings may be found in Appendix G.

SCRT students completed the annual survey on laptops in the field. Immediately upon completing the survey, students could check their own personal rose graph of technology skills, generated from their responses—a technique designed to provide real-time member checking from students and reflection on areas of strength and opportunities for growth. Across both grant years, areas of strength were reported in e-mail and related applications. Students also reported high levels of interest in learning more about how technology is used in science and resource management. Figures 2 and 3 show composite graphs based on average student responses for each year.

Annual Student Survey Average Responses on Technology Items

Note in the graphs on the following page, the increase in the darkly shaded area of the center in 2009 compared with 2008. While this may be due to maturation to some extent, the increased skill level suggests students perceive themselves as gaining skills in many technology areas addressed in SCRT. While using GIS and Arcview remained relatively low as compared with some areas, students did post strong gains in these areas.

Table 5
SCRT Student Survey Subscales

Subscale Items (*Number of Items in Subscale*)	2007–2008			2008–2009		
	Mean* (1–5 Scale)	Standard Deviation	Valid N	Mean* (1–5 Scale)	Standard Deviation	Valid N
Proficiency with Basic Technology Tools *Items 13–19 (7 Items)*	3.6	(.4)	4	4.1	(.6)	9
Proficiency with Advanced Technology Tools *Items 20–27 (8 Items)*	3.7	(.4)	4	3.9	(.6)	9
Internet Proficiency *Items 28–34 (7 Items)*	4.0	(.3)	4	4.2	(.6)	9
Graphics Technology Skills *Items 35–38 (4 Items)*	3.3	(1.0)	4	4.2	(.9)	9
SCANS Skills *Items 45–50 (6 Items)*	3.7	(.5)	19	3.6	(.6)	18

NOTE: For calculating subscale data, negatively worded items were reversed to generate means that consistently report higher ratings as more positive.

Figure 7: Composite Graph of Student Responses, 2008

N=13

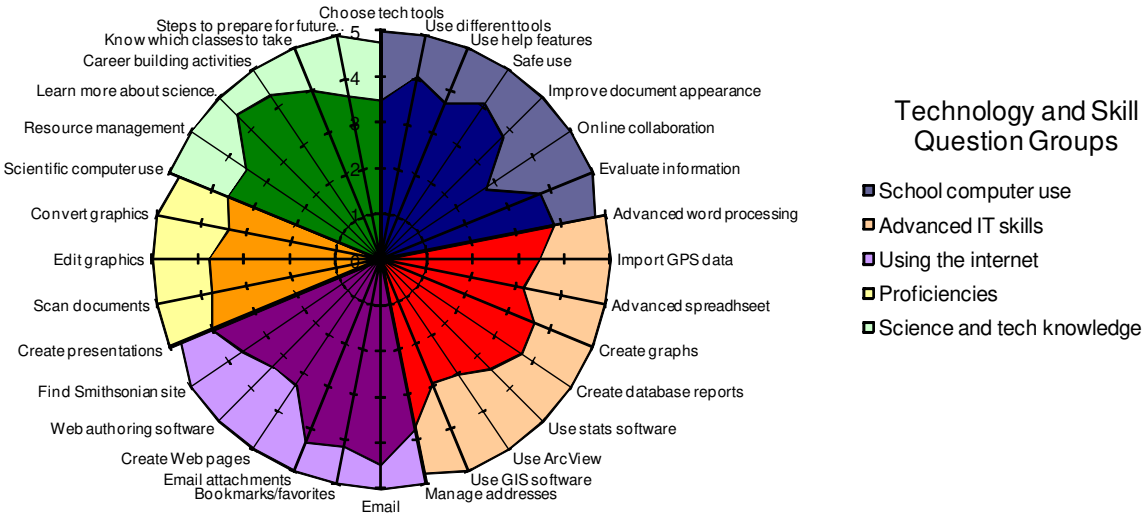
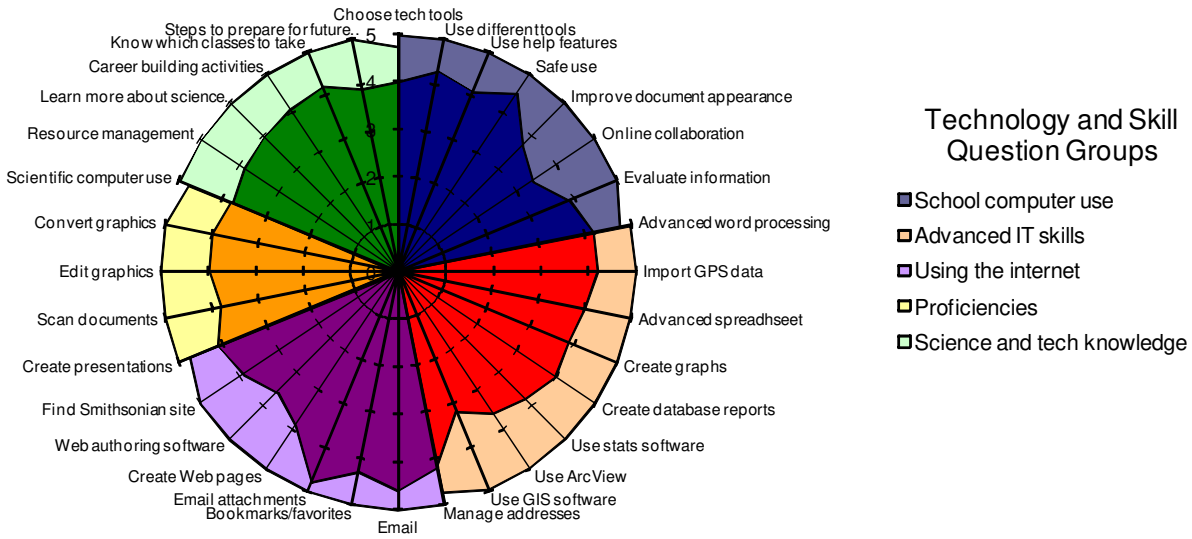


Figure 8: Composite Graph of Student Responses, 2009

N=13



High School Student Field Journal Responses

Throughout each field session high school and middle school students kept field journals to record work they were doing in the field, researchers with whom they worked, instruments/technology used, interesting information learned, and how the activities fit into the "big picture" of salmon restoration/ecology. Abstracts of journals from the summer sessions may be found in Appendix H. Field journal entries show ways in which students were gaining experience using information technology tools to gather data on authentic resource management issues. High school journal entries during 2009 sessions were fewer in number and less substantial than in previous years. However, numerous students did document their work and connect it to broader restoration and ecological issues. Key emergent ideas from journal entries are highlighted in the following section.

Spring Break, Oregon: Students visited Oregon State University and helped tag and sample fish at the OSU hatchery. They also toured Hatfield Marine Science Center with focus on stingrays. Students reported learning about job opportunities in science and fisheries, fish physiology, and the great diversity of fish species. Dissection tools, scales, aquascopes, and electric fish shockers were used. One student wrote, "There are many new and unknown species and facts about underwater creatures. [Today's activities] helped me understand the awesomeness of science."

Idaho: Students worked with researchers at the Nez Perce Biological Control Center, "sweeping for bugs" using sweep nets. They conducted tree measurements at the Nez Perce Forestry Center using specific technology developed for forestry monitoring. After a visit to the University of Idaho, students commented: "Pretty amazing," and "The college is awesome and I really want to go there." From the university the team moved on to work with hatchery personnel at the Nez Perce Tribal Hatchery. Students gained an appreciation for salmon predators and the role of hatcheries in salmon habitat and population restoration. One student noted, "Fact: Salmon go out to the ocean for one year. They are conveniently referred to as 'precocious salmon' because they almost immediately turn around once they hit the ocean."

Oregon: This team visited Bonneville Dam and several fish hatcheries and restoration areas focusing on measuring water quality healthy ecosystems for salmon using specific tools. They used Passive Integrated Transponder (PIT) tags and PIT tag readers to enable tracking of hatchery fish. Students increased their understanding of dams—how they work and how they pose problems for salmon. They learned about the importance of habitat restoration to healthy rivers and salmon runs. The team used GPS units to measure streams and water quality measurement tools to measure pH and dissolved oxygen. Participants also gained appreciation for the commitment of those working on habitat preservation and restoration. Most students included specific facts about salmon and their needs to survive. A few selected comments are representative:

- "Sand can ruin redds."
- "I learned that the water needs to be in certain conditions."
- "I learned that shade in creeks is crucial."
- "…it's fun to investigate!"

California: Participants took part in the Smith River fish count and worked with a number of

researchers and tribal members in the area of Redwoods National Park. As described by one student, "This place is amazing to be here, to be away from the city, away from things that worry me—no worrying. This place is peaceful, so nice. I wish I could come here again."

Students learned about threats to salmon survival including warm water, blue algae, and suspended sediment. They also learned how riparian zones keep water cool and about the salmon food chain. Participants used "super probes" that can port information back to a computer to measure water quality and conductivity. They gained appreciation for the number of people that care about fish habitat and the complexity of riverine restoration—summarized by one student as, "Rivers are hard to fix."

Washington: The Washington trip involved students in hiking and restoration beginning along the Nisqually River. They worked with University of Washington researchers at Pack Forest and moved to study sites in Olympic National Park. Students used GIS, computers, thermometers, microscopes, and seine nets in their studies. They learned about "the Nation within a nation" from Makah tribal members, and visited Elwha tribal grounds. Students reported increasing their understanding of salmon ecology and restoration as well as issues for tribes such as the Makah.

Student In-Camp Interview Findings

A section of the in-camp interview protocol provided an opportunity for discussion of whether (or not) Salmon Camp increased students' awareness of how computers and technology are used in science and resource management. The following section summarizes responses.

Computers and Technology

- Salmon Camp increased participants' awareness of how computers and technology are used in science/resource management. Almost all participants (93%) were able to name a specific example of a technology they had used during the camp. GPS/GIS technology was frequently mentioned as an example, as it has been during previous programs. Participants also mentioned specific types of wildlife or water monitoring technologies and tools specific to fisheries/hatcheries such as water probes.
- When asked how Salmon Camp could help them gain more experience with computers and technology, participants were interested in generally having more time using different technology tools during camp or additional time and opportunities for hands-on use of computers and GIS/Arcview.

Important aspects of being able to authentically use information technology for problem solving are work-related experiences and connections to school academics. Experience in these areas set students up for internships and placements with mentors in the field. A summary of interview responses in these areas showed some connections, with potential for much more.

Work Experience and Skills

- All students reported gaining skills they might use in a job in the future.
- The work experience and skills participants said they gained during the camp were:
    - Working under/with professionals
    - Learning field techniques
    - Discipline to complete tasks
    - Team work/cooperation
    - Interpersonal skills/communication
    - On-the-job training
    - Hands-on learning

- Patience
- Technology skills
- Leadership

- When participants were asked how Salmon Camp could further help them with work experience and skills, participants suggested that the camp could provide more of the types of experiences already provided (e.g., more opportunities to see job skills in action, hands-on experience with technology tools). Individual participants suggested new things the camp could do, including a document describing what students do in SCRT and scholarship opportunities.

Connections to School

- All participants reported that Salmon Camp helped/will help them in school. Some thought it would help them develop the knowledge and skills to take advanced science classes. Several students observed that ideas they learned in SCRT were taught in the following school year in their science classes. Only a couple of students thought their experience would help with advanced math courses. However, one student noted, "Doing math in the field, it suddenly makes sense!"

- Over one-third of participants (38%) received, or planned to receive, school credit for attending Salmon Camp.

- About half (53%) of participants reported attending some sort of extracurricular activity. Activities mentioned by participants included science or math related clubs such as the zoo, ivy pulls, presentations for teachers on Salmon Camp, Ecology Club, Wilderness Society, and MESA (Math Engineering Science Achievement). Other activities were sports and volunteering at a local hospital.

Student End-of-Session Feedback

Overall feedback from the field sessions suggests that nearly all students increased their science knowledge and skills in using technology in science research. The end-of-session exit data show that 91 percent of participants thought participation in Salmon Camp increased their science knowledge ("I think so" and "Yes!" categories combined). Eighty-three percent reported gaining skills with technology tools used in science research. Table 6 shows responses to these items. A full set of responses may be found in Appendix F.

Table 6
Salmon Camp Research Team
End of Session Feedback Data on Impact 2 (N=106)

Question	No Way!		Not really		I think so		YES!		Mean (S.D.)	
	Percentage	n	Percentage	n	Percentage	n	Percentage	n	Mean	S.D.
Did you increase your science knowledge?	—	(0)	9%	(10)	20%	(21)	71%	(75)	3.6	(.7)
Did you gain skills in using technology in science research?	3%	(3)	14%	(15)	36%	(38)	47%	(50)	3.3	(.8)

NOTE: Total percentages may not add up to 100% due to rounding.

Accomplishments on Impact 2

Participants in the field Salmon Camp Research Team sessions reported fairly high levels of learning with regards to using technological tools to collect, analyze, and interpret data in authentic, "real world" situations. Across students, areas of strength were reported in e-mail and related applications. Students also reported high levels of interest in learning more about how technology is used in science and resource management. Interestingly students reported gaining skills with GIS in journals and interviews while rating their proficiency with advanced GIS skills as lower than other areas.

Most Salmon Camp participants clearly believed that the program made them more aware of how computers and technology are used in science/resource management, by providing hands-on experience and exposure to authentic research being conducted in the field.

Overall feedback from the field sessions suggests that nearly all students increased their science knowledge and skills in using technology in science research.

The use of technology tools has not been an emphasis in the after-school program and did not emerge as a theme students mentioned in any of the data collection strategies used.

Impact 3: Promote Participants' Understanding of, and Appreciation for, the Complementary Relationship between Cultural Knowledge and Western Science

"Traditional Native knowledge" or "cultural knowledge" are used to identify indigenous knowledge "acquired through direct experience in the natural world" (Barnhardt & Kawagley, 2005, p. 11). Traditional Native knowledge is understood as an integral component of traditional Native peoples' lived experiences. The anticipated impact of the project in this area encompasses both a deeper understanding of Traditional Native knowledge and how those ways of knowing interact with Western science ways of knowing.

Student End-of-Session Feedback

At the heart of the Salmon Camp approach is exposing students to Native American (and non-Native) scientists, researchers, and natural resource personnel working on issues that are of importance to Native peoples and tribal sovereignty. Fostering students' understanding of, or appreciation for, the complementary relationship between different knowledge systems, goes hand-in-hand with stoking students' curiosity about science and their understanding of ecosystems from different perspectives.

The end-of-session feedback forms asked students about the extent to which Salmon Camp made them more curious about science, and whether they thought they learned about ecological relationships or ecosystems. A large majority of students reported gains in both areas. Nearly 80 percent thought their Salmon Camp experience made them more curious about science. This is a difficult question to analyze since students self select to participate in large part because they already have a degree of interest in science. However, considering their predisposition toward science, the reported gains appear quite high. Nearly all students (92%) reported learning about ecological relationships and ecosystems, a remarkably high level. Table 7 shows these data. As mentioned earlier, the full set of data tables may be found in Appendix G.

An open-response item specifically asked students, "How has Salmon Camp impacted your awareness of Native American culture?" Students described impacts ranging from a deeper appreciation for different tribes to learning about traditional practices. Themes

from comments follow, with the full set of responses available in Appendix G.

Table 7
Salmon Camp Research Team
End of Session Feedback Data on Impact 3 (N=106)

Question	No Way!		Not really		I think so		YES!		Mean (S.D.)	
	Percentage	n	Percentage	n	Percentage	n	Percentage	n	Mean	S.D.
Has this program made you more curious about science?	2%	(2)	19%	(20)	22%	(23)	58%	(61)	3.3	(.9)
Did you learn about ecological relationships and ecosystems?	1%	(1)	7%	(7)	34%	(36)	58%	(62)	3.5	(.7)

NOTE: Total percentages may not add up to 100% due to rounding.

Clustered themes of written comments were:

- Increased understanding/appreciation of Native culture (8 responses)
- Increased pride in Native culture (4)
- Greater understanding of connections between Native American culture and Western science (3)
- Learned about traditional practices used by tribes (2)

NAYA Salmon Club Projects and Trading Knowledge Events

Salmon Club participants presented a capstone project at an evening open house for family and community members, called "Trading Knowledge," after each session. The focus of the projects was primarily on ethnobotany. Students shared their knowledge about edible plants, sacred/ceremonial plants, poisonous plants, and watersheds. Students developed posters and manned tables with their posters and related plant samples. Knowledgeable Salmon Club participants responded to questions on their topics or engaged interested attendees through discovery activities during the evening event. Poster topics included:

- Edible Plants
- Medicinal Plants
- Plants Used with Salmon
- Sacred/Ceremonial Plants

The Trading Knowledge sessions were very well attended, with 50–60 people joining in

Figure 9

Trading Knowledge about Edible Plants

to "trade knowledge." The event exemplified a blending of traditional cultural knowledge and Western science through topics of significance to Northwest tribes. The projects and evening provided an opportunity for students to demonstrate their understanding and appreciation for the complementary relationship between cultural knowledge and Western science. It also provided an opportunity to involve family members and tribal members in sharing Traditional Ecological Knowledge and Western science.

Accomplishments on Impact 3

Promoting understanding of, and appreciation for, the complementary relationship between cultural knowledge and Western science is a lifelong endeavor. Related changes in student thinking attributable to Salmon Camp and Salmon Club will in all likelihood be steps along a pathway toward a more complex understanding of how the two world views might blend, intersect, or complement each other. However, students did report ways in which the project influenced their thinking.

Salmon Camp and Salmon Club students primarily live in urban settings. Some have had little exposure to their own tribal backgrounds or the cultural traditions of others. Many have heritages with multiple tribal affiliations. Therefore opportunities to learn more about various tribes were welcome and appreciated by students. Learning from and with tribal members was consistently influential on students' understanding.

Students in field sessions of Salmon Camp reported learning about ecological relationships and ecosystems, cultural traditions of different tribes, and ways in which tribes use Western science in habitat/species monitoring, restoration, and preservation.

Salmon Club students effectively demonstrated their learning about ethnobotany through the Trading Knowledge event. This opportunity to interact with peers, family members, Western scientists, and tribal members provided an authentic setting to share knowledge of plants and learn from others.

Figure 10

Trading Knowledge about Ceremonial Plants

Figure 11

Trading Knowledge about Plants Used to Prepare Salmon

SUMMARY AND CONCLUDING COMMENTS

Summary

The Native American Youth and Family Center and Oregon Museum of Science and Industry developed a collaborative relationship to effectively accomplish National Science Foundation grant impacts. The team successfully created an after-school component to the project that continuously improved to become increasingly more effective and meaningful for students. The immersion experiences in Salmon Camp were successful even with a shorter time in the field for high school students. There are some indications that students who participated in both Salmon Club and Salmon Camp activities found their experiences reinforced each other and strengthened their understanding as well as technology/field protocol skills.

Implementation

Overall, Salmon Camp Research Team was implemented as envisioned under ITEST renewal funding. From 2007–2009 SCRT served 119 different students, nearly all with Native American affiliations. Many lived in urban areas and had little or no experience in the out-of-doors or with Native Americans from other tribes. The project provided opportunities through four sessions of Salmon Club and two Salmon Camp sessions for middle school students. Eight summer sessions were offered to high school students. Middle and high school students participated in two fall and two spring break sessions. In total, 18 different options were offered over the course of two years.

Developing the Salmon Club program was a significant undertaking requiring major investments in time and relationship building. While well-received and reportedly valued by stakeholders, Salmon club proved difficult to sustain in the initial year after external funding (2009–2010). During the no-cost extension year, the program was not continued at NAYA.

Planned efforts to increase attention to family connections were mainly implemented through the Trading Knowledge events at Salmon Club. Envisioned family weekend and take-home activities did not materialize. These extension activities may have been unreasonable given the challenge of developing the new Salmon Club program and sustaining SCRT offerings. While parents have always been welcome at SCRT sessions and events, increased involvement of parents in field sessions was also envisioned but not realized. Perhaps the transition in Co-PIs made it difficult to involve parents as chaperones, assistants, or "experts" in related field activities.

Accomplishments

Drawing from the various methods used to evaluate the renewal grant, it appears that the project succeeded in accomplishing intended impacts.

Impact 1: Evidence from laptop surveys, in-camp interviews, and end-of-session feedback forms suggests that project activities sparked and sustained the interest of high school participants in STEM and IT careers. For high school students, visits to universities and working with a variety of professionals were important to increasing interest in STEM and IT careers. Impacts on middle school students did not emerge in this area, nor was this a focus of middle school programs.

Impact 2: Evidence from the technology sections of the laptop surveys, field journals,

in-camp interviews, and end-of-session forms indicates that participants developed abilities to use information technologies to collect, analyze, and interpret data and solve real-world problems. Particularly high school students, who used more IT tools in the field, were impacted in this area.

Impact 3: End-of-session feedback forms and the Salmon Club Trading Knowledge event demonstrated ways in which the project promoted participants' understanding of, and appreciation for, the complementary relationship between cultural knowledge and Western science. High school students were impacted in different ways depending on the session, partners with whom they worked, and their background. Middle school students were impacted through their studies of ethnobotany and presentations.

Relationships

Embedded in the story of SCRT successes are lessons regarding the significance of relationships, particularly in programs serving Native American youth. Relationships between students and teachers are woven through culturally responsive practice and promote retention of Native American students in school as well as out-of-school programs (Alaska Native Knowledge Network 1998; Tharp 2006). For Salmon Camp students, relationships with counselors and the project Co-PI, who coordinated all field experiences, were particularly significant. A level of trust between the Co-PI, students, and parents was built over four and a half years of crafting and implementing Salmon Camp field experiences. Additionally, the Co-PI nurtured relationships with contacts in the field such as university scientists, field researchers, tribal fisheries personnel, tribal members, and elders.

In November 2008, OMSI dismissed the Co-PI as part of a staff cutback precipitated by economic pressures. The unexpected decision was made without adequate communication with Salmon Camp colleagues, collaborators, or partners.

In practice, the decision closed the door to ongoing institutional commitment to a program successfully sponsored by OMSI for 16 years. The position was assigned to another OMSI employee, with assistance from another camp program staff member and counselors in the field. While the new personnel were dedicated to ensuring program continuity, they did not have relationships with SCRT students. Furthermore, the new Co-PI was not working day-by-day in the field with students—under a revised plan of using counselors as the primary coordinators in the field.

Low enrollments in the 2009 sessions and an increase in behavioral incidents may have been related to leadership changes or the nature of students in particular sessions. On the other hand, a number of students attended multiple sessions, suggesting the field sessions worked particularly well for a few students. Furthermore, 2008 sessions (led by the former Co-PI) were also under-enrolled.

Relationships were also at the crux of success for the NAYA Salmon Club and middle school Salmon Camp programs. Middle school student involvement was a shining star in the cluster of SCRT programs.

The importance of relationships at all levels cannot be understated. It is perhaps the secret ingredient that has fostered program success through the years of Salmon Camp under various leaders and funding agencies. Under the ITEST renewal, relationships ensured the success of Salmon Club, enabled transitions in staff members, and even emerged as an enduring influence cited by former participants. In many ways, the impact of the project hinged on relationships as much as program design or any other components.

Concluding Comments

A preponderance of evidence suggests that project successes outweigh any deficits in implementation or deviations from envisioned plans. The project leaders are to be congratulated on the many successes under the renewal funding. Programs had a positive influence on students—in fact, a profound influence on some. Many students were deeply appreciative and recognized how important their involvement was to their growth and development. Comments such as the following are sprinkled throughout the data:

- "I liked meeting all the different and interesting people. They opened my eyes to different career fields and helped me to understand the restoration project. Plus, I experienced many things I would never have been able to without Salmon Camp."
- "Salmon Camp was a great experience and the people who go and help out the camp are really awesome ..."
- "[The work we did today was important because it was] to have fun and learn about our sea life because someday I could help the environment."
- "Salmon Camp is a great experience. The counselors were awesome! This program has given me a chance to visit California and my roots. And the science has inspired me to work in the environmental field."

Recognition is due to all who invested their time and energy into Salmon Camp Research Teams. If historic patterns of influence continue, the project will have lasting effects on the many Native American students who engaged themselves in SCRT under ITEST funding.

Salmon Camp is now at a crossroads. The NSF renewal demonstrated the efficacy of integrating SCRT approaches into an after-school program. ITEST funding has also demonstrated the effectiveness of integrating technology experiences into a culturally responsive project with intensive exposure to field experience and post-secondary options in STEM and resource management. OMSI has shepherded the program to this point. It is now in need of a champion for the future. The possibilities are exciting. Leadership through the Columbia River Intertribal Fish Commission (CRITFC), American Indian Science and Engineering Society (AISES), a consortium of tribes, individual tribes, or a collaboration of partners, all have potential.

The "toolkit" publication under development should provide inspiration and guidance for others. By sharing the Salmon Camp story more broadly, the grant work may spawn new programs and serve as groundwork for continued project evolution.

Feedback from participants and staff members provides insight into the perceived influence of Salmon Camp. Our aim is for these data and voices to be useful to project leaders and to help inform future projects. Data are not generalizable to other programs or audiences. However, they suggest the potential for locally adapted, contextually relevant initiatives to support Native American students in STEM.

REFERENCES

Alaska Native Knowledge Network. (1998). *Alaska standards for culturally responsive schools.* Anchorage, AK: Author.

Barnhardt, R., & Kawagley, A.O. (2005). Indigenous knowledge systems and Alaska Native ways of knowing. *Anthropology and Education Quarterly, 36*(1), 8–23.

Berman, P., & Fields-Tyler, C. (1999). *Revised research design for developing and implementing high performance learning communities.* Emeryville, CA: RPP International.

Dufour, R. (2004). What is a "Professional Learning Community"? *Educational Leadership. 61*(8), 6–11.

Northwest Regional Educational Laboratory. (2002). *Annual evaluation report (2001–2002): Regional Educational Laboratory—Northwest Region Contract Number ED-01-CO-0013*. Portland, OR: NWREL.

Tharp, R.G. (2006). Four hundred years of evidence: Culture, pedagogy, and Native America. *Journal of American Indian Education, 45*(2), 6–25.

APPENDIX A

OMSI/NAYA Salmon Camp ITEST
Renewal Grant Logic Model

Appendix A
OMSI/NAYA Salmon Camp ITEST Renewal Grant Logic Model

Inputs (SCRT model, pedagogical approach, ITEST requests)	Short-Term Objectives	Long-Term Objectives	Measures	Impacts
Program strategies: • Engaging participating students in authentic, IT-intensive research projects • Working closely with academic community and STEM professionals as mentors • Exposing students to opportunities available through higher education and in the world of IT careers • Placing IT and STEM learning in a cultural context • Involving students in a year-round program of IT skills, STEM learning, and enrichment activities Educational strategies: ▪ Successful learning strategies based on the theory of situated cognition ▪ Best practices from research on culturally responsive learning models Barriers for NA youth transitioning into IT careers (1): ▪ Lack of computer resources in Native American communities ▪ Tension between traditional culture and academic culture of STEM programs ▪ STEM programs are not presented as a viable career path to Native Americans ▪ Lack of family experience with STEM careers Strategies for transitioning NA youth to adulthood (2): ▪ Increasing youth involvement in spirituality and traditional activities ▪ Increasing contact between youth and parents, elders, and other community members ▪ Increasing employment opportunities (particularly on the reservation,	High School—Summer: • (4) two-week, field-based experiences (OMSI) High School—Spring break: • (1) one-week residential program (OMSI) Middle School—Summer: • (1) five-week day (NAYA) • (2) one-week field-based experiences (OMSI)	• Improved academic achievement associated with SCRT involvement • Increased student understanding of: • Courses and preparation required for college • Required steps for college admissions • Pathways to STEM careers • Post-secondary opportunities • Improved preparation for college • Improved preparation for STEM careers. • Alumni attribute current positive interest and access to STEM and IT careers in part to Salmon Camp involvement • Alumni attribute current positive interest and access to IT in part to Salmon Camp involvement	• Student laptop surveys • In-camp interviews • Field journals • 3-step interviews with NAYA participants • Alumni interviews	**Impact 1:** *Spark and sustain the interest of AI/AN youth in STEM and IT careers*

Inputs (SCRT model, pedagogical approach, ITEST requests)	Short-Term Objectives	Long-Term Objectives	Measures	Impacts
so that young people can stay to work with their community) ▪ Giving youth a real and important role in the community ▪ Making sure research done in NA communities is participatory Needs and interests of Native American youth and Native American community Needs and interests of SCRT participants and participants' parents IT educational strategies (e.g., from *Being Fluent with Information Technology*)	MS & HS—School Year: • (2) six-week after school sessions fall/spring (NAYA) • (2) weekend enrichment experiences (fall/spring) (OMSI) • (2) dedicated staffers to offer year-round tutoring support for NAYA participants	• Stronger connections developed between Salmon Camp and formal academics • Extended reach of program to other students • Expanded relationships with Salmon Camp and Native American community	• Participation rate documents for NAYA after-school program • Feedback forms • Constituent interviews	

Inputs (SCRT model, pedagogical approach, ITEST requests)	Short-Term Objectives	Long-Term Objectives	Measures	Impacts
Program strategies: • Engaging participating students in authentic, IT-intensive research projects • Working closely with academic community and STEM professionals as mentors • Exposing students to opportunities available through higher education and in the world of IT careers • Placing IT and STEM learning in a cultural context • Involving students in a year-round program of IT skills, STEM learning, and enrichment activities Educational strategies: ▪ Successful learning strategies based on the theory of situated cognition ▪ Best practices from research on culturally responsive learning models Barriers for NA youth transitioning into IT careers (1): ▪ Lack of computer resources in Native American communities ▪ Tension between traditional culture and academic culture of STEM programs ▪ STEM programs are not presented as a viable career path to Native Americans ▪ Lack of family experience with STEM careers	Infuse hands-on experience with data analysis and interpretation into field and after-school sessions	• Increased confidence and skills with general IT literacy • Increased confidence and skills with selected technologies including advanced technologies • Extent and ways in which participants meet the "performance indicators" relevant to selected National Educational Technology Standards • Greater confidence with selected SCANS skills • Deepen understanding of one "big idea" of the program: Information technology is a tool that can be used to solve real-world problems	• Student laptop surveys • In-camp interviews • Review of student products (e.g., PowerPoint presentations) • Embedded assessments using technology tools • Parent and student feedback forms	**Impact 2:** *Develop participants' abilities to use information technologies to collect, analyze, and interpret data and solve real-world problems*
	Opportunities for parental involvement	Expand circles of involvement for parents		

Inputs (SCRT model, pedagogical approach, ITEST requests)	Short-Term Objectives	Long-Term Objectives	Measures	Impacts
Strategies for transitioning NA youth to adulthood (2): ▪ Increasing youth involvement in spirituality and traditional activities ▪ Increasing contact between youth and parents, elders, and other community members ▪ Increasing employment opportunities (particularly on the reservation, so that young people can stay to work with their community) ▪ Giving youth a real and important role in the community ▪ Making sure research done in NA communities is participatory Needs and interests of Native American youth and Native American community Needs and interests of SCRT participants and participants' parents IT educational strategies (e.g., from *Being Fluent with Information Technology*)	Provide more direct assistance with internship placement	Increased number of internships	• Alumni interviews	

<table>
<tr><th>Inputs
(SCRT model, pedagogical approach, ITEST requests)</th><th>Short-Term Objectives</th><th>Long-Term Objectives</th><th>Measures</th><th>Impacts</th></tr>
<tr><td rowspan="4">Program strategies:
• Engaging participating students in authentic, IT-intensive research projects
• Working closely with academic community and STEM professionals as mentors
• Exposing students to opportunities available through higher education and in the world of IT careers
• Placing IT and STEM learning in a cultural context.
• Involving students in a year-round program of IT skills, STEM learning, and enrichment activities.

Educational strategies:
▪ Successful learning strategies based on the theory of situated cognition
▪ Best practices from research on culturally responsive learning models

Barriers for NA youth transitioning into IT careers (1):
▪ Lack of computer resources in Native American communities
▪ Tension between traditional culture and academic culture of STEM programs
▪ STEM programs are not presented as a viable career path to Native Americans
▪ Lack of family experience with STEM careers

Strategies for transitioning NA youth to adulthood (2):
▪ Increasing youth involvement in spirituality and traditional activities
▪ Increasing contact between youth and parents, elders, and other community members
▪ Increasing employment opportunities (particularly on the reservation, so that young people can stay to work with their community)
▪ Giving youth a real and important role in the community</td><td>Develop and publish a SCRT “case study” to facilitate the dissemination of the SCRT program model</td><td>Document the SCRT approach to building IT skills and knowledge in a culturally responsive context.</td><td>Document development and dissemination of the SCRT publications on program model</td><td rowspan="4">Impact 3:
Promote participants’ understanding of and appreciation for the complementary relationship between cultural knowledge and Western science</td></tr>
<tr><td>Website to stimulate interest/expand reach</td><td>Sustainability of SCRT approach</td><td rowspan="3">• Website review
• In-camp interviews
• Field journals
• Review of student products (e.g., PowerPoint Presentations)
• 3-step interviews
• Parent and student feedback forms
• Feedback on internships</td></tr>
<tr><td>Explore relationships between traditional ecological knowledge and western science</td><td>Deepen understanding of the one “big idea” of the program: Cultural knowledge and western science can have a complementary relationship such as in enhancing the understanding of watersheds</td></tr>
</table>

Inputs (SCRT model, pedagogical approach, ITEST requests)	Short-Term Objectives	Long-Term Objectives	Measures	Impacts
▪ Making sure research done in NA communities is participatory Needs and interests of Native American youth and Native American community Needs and interests of SCRT participants and participants' parents IT educational strategies (e.g., from *Being Fluent with Information Technology*)				

APPENDIX B

SCRT Instruments

B-1: Sample High School SCRT Annual Survey

B-2: SCRT In-Camp Interview Protocol

B-3: End-of-Session Feedback Form

B-4: Sample Field Journal

B-5: Former Salmon Camp Participant Interview Protocol

B-6: Salmon Camp Partner Interview Protocol

Appendix B-1
Sample High School SCRT Annual Survey

Welcome to Salmon Camp!

Part I. We are excited you are here and hope you learn a lot and laugh a lot in the next few weeks. As a way of getting to know you, please fill out this survey about YOU! There are no wrong answers. We want to know what you really think about each question. Thank you in advance, for giving these questions your careful consideration.

Your Name:
Date:

What is your gender?

Male Female

What grade are you currently in (Fall 2007)?

Science classes you took (or are taking) this year (2007-2008):

What is your ethnicity? (place an 'x' next to each that applies)

- Alaskan Native/Native American
- Black/African American
- White/Caucasian
- Asian/Pacific Islander
- Latino/Hispanic
- Other (please specify below)

Part II. Below are statements concerning science. Please indicate "how you really feel" by selecting the response which shows your level of agreement with each question.

1. **Understanding science will help me be a better community member.**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

2. **Science is hard for me.**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

3. **Science teachers have made me feel I have the ability to go on in science.**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

4. **I am sure of myself when I do science.**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

5. **Doing well in science is not important for my future.**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

6. **My teachers think advanced science will be a waste of time for me.**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

7. **I would choose to take an elective science class.**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

8. **I think I could handle more difficult science.**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

9. **It's hard to get science teachers to respect me.**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

10. **Most subjects I can handle OK, but I just can't do a good job in science.**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

11. **My teachers have been interested in my progress in science.**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

12. **I'll need a good understanding of science for my future work.**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

Part III. Please complete the section below by selecting one of the choices (indicating your best estimate of your skill or knowledge level).

I could describe how to:

13. **Choose an appropriate technology tool to use for a specific purpose**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

14. **Use PowerPoint, Excel, Word processing, and graphics for a project**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

15. **Online help features**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

16. **Safely use technology tools**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

17. **Improve the appearance of documents with formatting, graphics, etc.**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

18. **Use a listserv or discussion group to collaborate**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

19. **Evaluate Internet information for accuracy, bias, appropriateness**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

I feel confident that I could:

20. **Use advanced features of a word processor (tables, headers and footers, macros, table of contents, columns, etc.)**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

21. **Import data from a Global Positioning System (GPS) to a database**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

22. **Use formulas and/or functions in a spreadsheet (Excel, SPSS, etc.)**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

23. **Create and populate a database**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

24. **Create a graph from spreadsheet data**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

25. **Use statistical software for data analysis**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

26. **Use ArcView to make maps**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

27. **Use GIS software to analyze data**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

Using the Internet, I can proficiently:

28. **Manage names and groups in an address book**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

29. **Reply to and forward email messages**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

30. **Create and use bookmarks/favorites**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

31. **Send, receive and open email attachments**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

32. **Create a Web page**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

33. **Maintain/edit a Web site**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

34. **Search for and find the Smithsonian Institution Web site.**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

I can proficiently:

35. **Create an electronic presentation (PowerPoint)**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

36. **Scan a document**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

37. **Reduce, enlarge, or crop a graphic**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

38. **Convert graphics from one file format to another**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

Science and Resource Management

39. **I can explain how computer applications are used in science**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

40. **I can explain how resource managers use technology to analyze data**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

41. **I want to learn more about using technology in science or resource management**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

42. **I have been involved in activities that help me think about science/resource management career options**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

43. **I know which classes I should take to help me succeed in a science career**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

44. **I know of steps I can take to prepare for a career in science/resource management**

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

Part IV: Rate yourself on these skills

45. **I plan my time, money, materials, and space to get things done.**

I'm Great	Quite Good	OK	Not bad, could be better	Bad News
5	4	3	2	1

46. **I work well on teams, teach others, and work well with people from culturally diverse backgrounds.**

I'm Great	Quite Good	OK	Not bad, could be better	Bad News
5	4	3	2	1

47. **I think creatively to imagine new ideas.**

I'm Great	Quite Good	OK	Not bad, could be better	Bad News
5	4	3	2	1

48. **I use logical reasoning to make decisions.**

I'm Great	Quite Good	OK	Not bad, could be better	Bad News
5	4	3	2	1

49. **I take careful steps when I am trying to solve problems.**

I'm Great	Quite Good	OK	Not bad, could be better	Bad News
5	4	3	2	1

50. **I can draw conclusions from reliable evidence.**

I'm Great	Quite Good	OK	Not bad, could be better	Bad News
5	4	3	2	1

51. **Basic Skills: Overall**

I'm Great	Quite Good	OK	Not bad, could be better	Bad News
5	4	3	2	1

52. Reading

I'm Great	Quite Good	OK	Not bad, could be better	Bad News
5	4	3	2	1

53. Writing

I'm Great	Quite Good	OK	Not bad, could be better	Bad News
5	4	3	2	1

54. Mathematics

I'm Great	Quite Good	OK	Not bad, could be better	Bad News
5	4	3	2	1

55. Speaking

I'm Great	Quite Good	OK	Not bad, could be better	Bad News
5	4	3	2	1

56. Listening

I'm Great	Quite Good	OK	Not bad, could be better	Bad News
5	4	3	2	1

Part IV: During Salmon Camp activities we work on all of the following areas. Please mark TWO that you really want to focus on with an 'x' …Why?

Choose TWO

	Information Technology
WHY?	
	Science
WHY?	
	Ecological Relationships and Ecosystems
WHY?	
	Interpersonal Skills
WHY?	
	Critical Thinking
WHY?	

Part V: In the next section, rate the importance of what motivated you to come to Salmon Camp.

	Very Important	Important	Somewhat Important	Not Important
57. Working with scientists	4	3	2	1
58. Camping--being outdoors	4	3	2	1
59. Location	4	3	2	1
60. The Native American connections	4	3	2	1
61. Being with friends/making new friends	4	3	2	1
62. Reimbursement (getting paid)	4	3	2	1
63. Learning more science	4	3	2	1
64. Using science in the real world	4	3	2	1
65. OTHER (write in)				

You're Finished! Woohoo! Thank you for your time and patience with completing the survey.

Appendix B-2

SCRT In-camp Interview Protocol

Meeting guide to update participant's interests and impressions

Participant: _____ Camp: _____

Meeting date: _____

Staff member leading meeting and recording information: _____

Introduction

During this meeting I would like to discuss your interests with respect to careers, technology, job skills, and school. I want to learn more about how Salmon Camp supports your interests, so I hope you will tell me your ideas as best you can.

You may have answered some of these questions before at other Salmon Camp programs, but I am interested in your interests and ideas now that you have been here this summer.

I'd like to write down your ideas so that I have a record I can refer back to as I make plans for future events -- none of the other campers will see what you tell me. Would you be willing to talk these things over with me now?

Career interests

Ok, first I'd like to talk about your interests in science careers.

Can you see yourself working in a science career some day? YES MAYBE NO NOT SURE

Such as?

Has this camp helped you explore your career interests? YES SORT OF NO NOT SURE

How has it helped?

How could it help more?

What have you learned about the integration of traditional Native American knowledge and modern science?

Computer and technology interests

Ok, next I'd like to talk about your interests in computers and technology.

Has this camp made you more aware of how computers and technology are used in science/resource management?

YES SORT OF NO NOT SURE

Can you give an example from this camp of how computers and technology are used in science/resource management?

How can Salmon Camp help you learn more about computers and technology?

Job skill interests

Ok, now I would like to discuss job skills.

Has this camp helped you build skills you might use in a job later on? YES SORT OF NO NOT SURE

Such as?

How has it helped you develop these (go through each mentioned)?

What could Salmon Camp provide to help you build job skills further?

Connections to school

New participants only:

Do you think your participation in Salmon Camp will help you succeed in school? YES SORT OF NO NOT SURE

Why or why not?

Do you think Salmon Camp is helping you develop the knowledge and skills to take advanced math or science classes?

YES NO NOT SURE

Why or why not?

Do you know how to find out if you can get school credit for participating in this camp?

Are you interested in having an active mentor this year? YES NO NOT SURE

Why or why not?

Who would you want as a mentor and what would you like to see happen?

Are you interested in an internship this year? YES NO NOT SURE

Why or why not?

What internship might you want?

Are you involved in out of school/extracurricular activities related to science, math, or the environment? (e. g.; ecology/science club, Matheletes, science fair, ivy pulls/other volunteer restoration activities)

Returning participants only:

Has your participation in Salmon Camp helped you succeed in school this year? YES SORT OF NO NOT SURE

Why or why not?

Do you think Salmon Camp is helping you develop the knowledge and skills to take advanced math or science classes?

YES NO NOT SURE

Why or why not?

Have you gotten school credit for your participation? YES NO MAYBE

If not: Do you know how to find out if you can get school credit for participating in this camp?

Are you interested in having an active mentor this year? YES NO NOT SURE

Why or why not?

Who would you want as a mentor and what would you like to see happen?

Are you interested in an internship this year? YES NO NOT SURE

Why or why not?

What internship might you want?

Are you involved in out of school/extracurricular activities related to science, math, or the environment? (e. g.; ecology/science club, Matheletes, science fair, ivy pulls/other volunteer restoration activities)

Future plans

Would you be interested in attending future Salmon Camp programs? YES NO NOT SURE

Why or why not?

What are your plans after high school?

Would you be interested in helping Salmon Camp as a [counselor, instructor]? YES NO NOT SURE

Why or why not?

Well –those are my questions for now about your interests in careers, technology, job skills, and school. I would like to keep the Salmon Camp experience in line with what campers want to gain from it and your responses will help me with that.

Would you like to share any other suggestions or comments? Do you have any questions?

Appendix B-3
End-of-Session Feedback Form

End of Camp Feedback

Please rate and/or respond to each item to help us make Salmon Camp a great experience for more campers!

Your gender? **Male** ☐ **Female** ☐

Tribal Affiliation_____

(Name of tribe/tribes to which you are affiliated)

The grade you are in: 5 6 7 8 9 10 11 12 **Other:** _____

1. Did Salmon Camp meet your expectations?	No way!	Not really	I think so	YES!
2. Has this program made you more curious about science?	No way!	Not really	I think so	YES!
3. Did you learn about ecological relationships and ecosystems?	No way!	Not really	I think so	YES!
4. Did you increase your science knowledge?	No way!	Not really	I think so	YES!
5. Did you gain skills in using technology in science research?	No way!	Not really	I think so	YES!
6. Did you have fun?	No way!	Not really	I think so	YES!

7. How has Salmon Camp affected your interest in a science/technology career?

Instrument co-developed by OMSI & NWREL Evaluation Program (101 S.W. Main St., Ste 500, Portland, OR. 97204) under NSF funding 2003-2007.

8. What part of Salmon Camp surprised you the most?

9. Would you recommend this program to others?

No way! Not really I think so YES!

Why, or why not?

10. What did you learn about going to college or a university?

11. How has Salmon Camp impacted your awareness of Native American culture?

~~~~~~Thanks so much for your input. ~~~~~~~~~~~~~~~~~~~~~~~~~~

Instrument developed for OMSI by NWREL Evaluation Program (101 S.W. Main St., Ste 500, Portland, OR. 97204) under NSF funding 2003-2009.

Appendix B-4
Sample Field Journal Page

Day1
Date:_____

Location: *(Where were you today? —forest, river, camp, reservation, watershed, nearest city and state)*

Activity:

Researchers you worked with today:
(and their role—biologist, botanist, student, etc.)

Researcher	*Role*

Instruments/technology used:

Specific facts or interesting information you learned:

How did this activity help you understand the "big picture" of salmon restoration/ecology?

Participant ID #: _____
Date of Interview: _____
Location: _____

Appendix B-5

Salmon Camp
Interview Protocol and Questions

Questions

1) When you think back on your Salmon Camp experiences, what are your most memorable experiences?

2) What are you doing now? (school? Working? Helping out at home?)

3) What are your plans for the future?
   a. *(Probe if not mentioned)*… What about personal goals?
   b. *(Probe if not mentioned)*… What about educational goals?
   c. When did you start thinking about that career/direction?

4) Could you talk about how Salmon Camp might have influenced your goals?

5) We are interested in ways in which traditional Native knowledge and Western science interact or blend together. Are there ways in which you see the knowledge and perspective you've gained as a Native American young adult blending with your career/educational plans for the future?
   a. *(Probe if not mentioned)*… Where CAN it happen? What might it look like?

6) Questions, final thoughts?

Appendix B-6
SCRT Stakeholder Interview Questions

Question 1: In what ways have you been involved in Salmon Camp?

Question 2: In your experience, what changes, if any, have you seen in students who participate in Salmon Camp?

Question 3: From your observations, what influence does Salmon Camp have on students' interest in science, technology, engineering, and mathematics or information technology careers?

Question 4: What evidence have you seen of changes in:

- Student abilities to use information technologies to collect, analyze, and interpret data?

- Student ability to solve real-world problems?

- Student experience with field research?

Question 5: What suggestions do you have to make Salmon Camp better?

APPENDIX C

A Collaborative Framework for a High Quality Grant Initiative

Appendix C

A Collaborative Framework for a High Quality Grant Initiative

The Collaborative Framework is designed to provide a foundation for a collaborative, multi-dimensional initiative such as the *Salmon Camp Research Team* (SCRT) project. The framework can serve as guidance as the project strives to accomplish envisioned aims and impacts.

The Collaborative Framework is based on intensive work by Education Northwest (formerly known as Northwest Regional Educational Laboratory 2002) on assessing High-Performing Learning Communities. The High Performing Learning Community notion is anchored by research conducted by Research, Policy, Practice (RPP) International (Berman & Fields-Taylor 1999). Elements of the framework are also drawn from research on Professional Learning Communities (Dufour 2004) which focus on developing cultures of collaboration in school settings, aimed at improving student achievement. The framework was developed through initial conversations and reviews with one of the *Salmon Camp* Principal Investigators and the external evaluator at Education Northwest. During a work session, the revised framework was then discussed among SCRT staff team members (with representatives from the Oregon Museum of Science and Industry, the Native American Youth and Family Center, and Education Northwest).

At this point, the document is set forth as an evolving framework to organize strategies used under the National Science Foundation renewal funding of *Salmon Camp*, provide a system-level approach to thinking about the work, and as a strategic document fusing multiple components of the renewal proposal. The expectation is that as a project community uses and reflects on the tool, it will evolve. As the framework evolves it has the potential to clarify and operationalize project collaborations, define and share effective aspects of a quality project, and scaffold effective strategies. The framework is *not* intended to be a recipe book, do-it-yourself manual, or checklist, rather it is envisioned as working guidance.

Project impacts and SCRT grant renewal strategies anchor the framework. Figure 1 depicts, at the center, the vision of fostering or developing among participating American Indian/Alaska Native (AI/AN) students interests and capacities to address the under-representation of Native Americans in Information Technology (IT) and IT-intensive STEM (science, technology, engineering, and mathematics) professions. Primary project impacts are shown in the expanding circles as:

- **Impact 1:** *Spark and sustain the interest of AI/AN youth in STEM and IT careers*
- **Impact 2:** *Develop participants' abilities to use information technologies to collect, analyze, and interpret data and solve real-world problems*
- **Impact 3:** *Promote participants' understanding of and appreciation for the complementary relationship between cultural knowledge and western science*

In the Figure 1 graphic representation of the model, aims and impacts are nested inside the domains of a high-performing collaborative project shown in the outer orbit of the model. Key elements of domains and dimensions of the framework are highlighted in subsequent tables. As the framework is further developed collaboratively, evidence of accomplishments may be recorded and shared in the right-hand column.

NOTE: "All students" includes all children regardless of gender, racial/ethnic, socio-cultural and socio-economic differences.

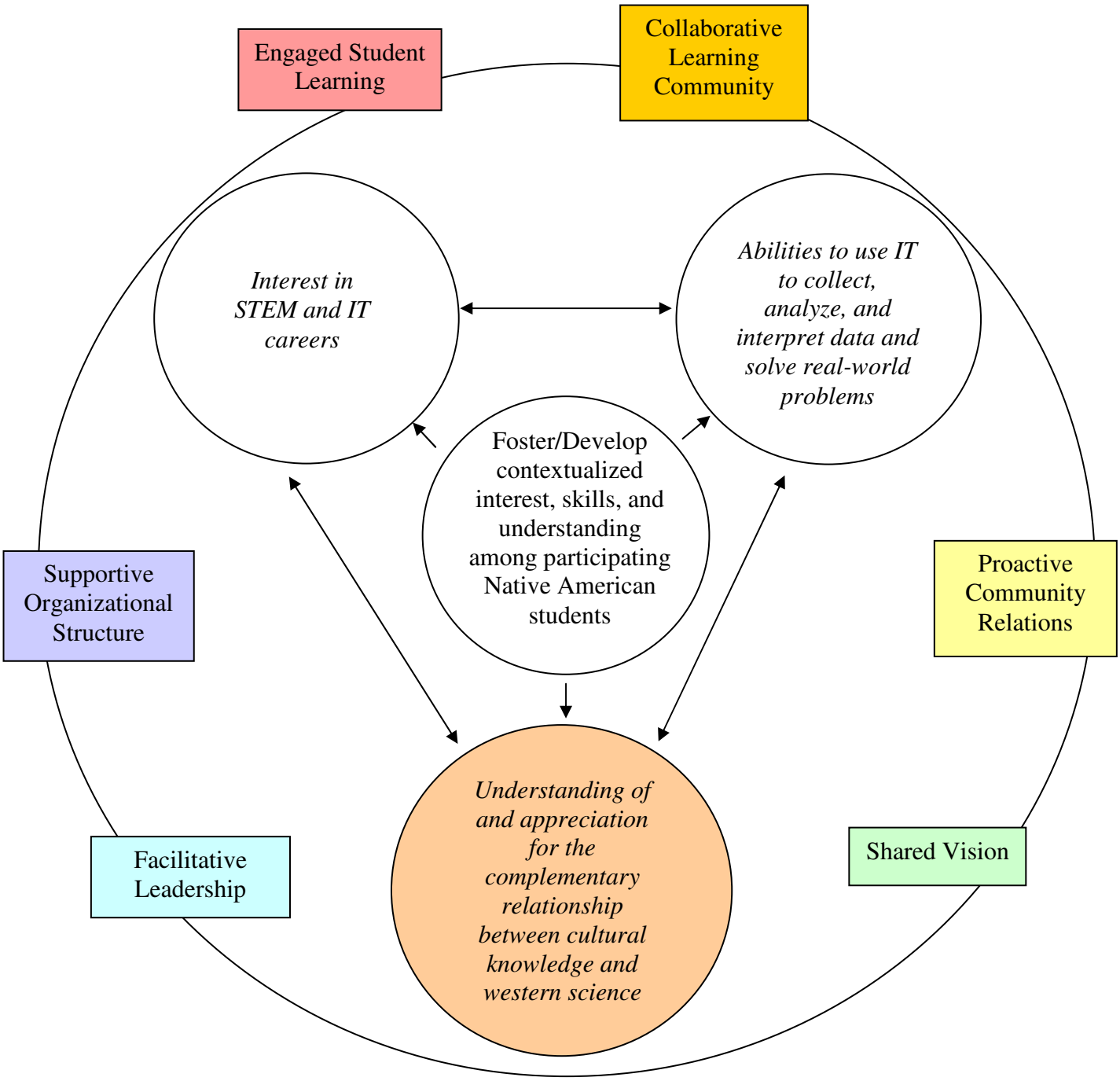


Figure 1: Salmon Camp Collaborative Framework Model

Collaborative Framework Table

Domains and Dimensions	*Key Elements of Each Dimension*	*Evidence*
Domain I—Shared Vision/Goal **1. Inclusiveness.** The vision or project goal is shared by project team members and is created and maintained through an inclusive process.	• Community members together create and articulate a shared vision for project goal(s). • The vision is communicated to the broader community and the staff's behaviors demonstrate the shared vision. • The project team regularly revisits and reviews the vision through an inclusive process. • There is a process to help new staff to understand the shared vision.	
2. Expectations. The project team creates and sustains a coherent vision of high expectations for all students.	• The project team believes that all students are able to achieve academic success. High expectations for all students are the community norm. The staff believes that it is their responsibility to ensure student success. • The vision explicitly addresses learning issues of all low performing students. There may be barriers for students to overcome, but the barriers are addressed and/or removed to ensure student success. • All project components are interlinked and working towards the vision.	
3. Diversity. The project vision includes core beliefs about how students learn in light of socio-cultural, racial/ethnic, linguistic, and socio-economic differences and a commitment to removing barriers to student success.	• The vision includes a commitment to recognize and value all aspects of student diversity. • Understanding, respecting, and valuing of students' experiences, backgrounds, and learning differences are evidenced throughout the project components. • Project staff demonstrates a high knowledge of the cultural experiences of project students. • Differences among community members are respected.	

Domains and Dimensions	*Key Elements of Each Dimension*	*Evidence*
Domain II—Shared Facilitative Leadership **4. Participatory decision making.** The project leadership team actively engages partners, instructors, and other staff in decision making regarding programming, project activities, and deliverables.	• Project leadership (Project Investigator/ Co-Project Investigators) or small leadership team) takes the responsibility to provide direction, guidance, and support. • Project leadership models an inclusive decision-making process that is shared among multiple groups and in which children are placed at the center. • Project staff demonstrates a sense of efficiency or willingness to participate in decision making. There's an atmosphere of collective responsibility for ensuring student and project success. • A consensus building process is regularly used for making key decisions. • Mechanisms and structures are in place to ensure the voices of all stakeholders are considered in decision making. • The project leadership ensures the efficient and effective communication avenues are in place that connect decision-making groups and to inform all community members.	
5. Culture of inquiry and improvement. Project leaders facilitate a culture of continuous inquiry, evaluation, reflection, and program improvement.	• The leadership models a continuous process of inquiry to improve project success. • Project staff demonstrates a willingness to improve student success, instructional practices, and programs through inquiry. • Structures that support continuous inquiry are in place, such as allocated time, opportunities to explore and experiment, and adequate resources. • Successes are celebrated and accomplishments recognized/rewarded. • The project leadership monitors effective use of resources, meeting time, and student activities in order to sustain inquiry and improvement.	

Domains and Dimensions	*Key Elements of Each Dimension*	*Evidence*
Domain III—Supportive Organizational Structure **6. Organization for Learning.** The project organizes staff, resources, and programs in ways that support the needs of various project components. The project adapts to changing needs in order to support all students to succeed.	• The project has systematic mechanisms for identifying emergent needs of project components and monitors the development of components. • The project varies support services to take in account social distinctions and to make it possible for all students to succeed. • Adequate and updated print and electronic resources are provided. • The project is organized into smaller learning communities to better meet student needs. Students feel respected and connected with the staff. Instruction is personalized and small learning environments increase student contact with instructors.	
7. Learning Environment. The project organizes components into cohesive units that are safe and nurturing learning environments in which students are known. The units are organized in ways that support the social and learning needs of students.	• The physical environment is welcoming and kid friendly. • The project maintains a safe environment that is respectful (free of bullying, intimidation, and harassment). Staff values the contributions that each student brings to the project. • The project environment honors students and their diverse cultures.	
8. Use of Time. The project organizes, protects, and extends instructional time and schedules to maximize student and adult learning, instructor planning, and collaboration.	• Time is prioritized for activities that maximize student progress. More time is made available for instruction or participation if needed. • Scheduling decisions and decisions to maximize time are guided by the research on how students learn and effective practices. • Use of time is maximized by having few interruptions and employing effective strategies to use time better, such as smooth transitions, increasing engaged student learning time, etc. • Sufficient and protected time for instructional planning is provided.	

Domains and Dimensions	*Key Elements of Each Dimension*	*Evidence*
Domain IV—Engaged Student Learning **9. Culturally Responsive Environment.** The project infuses a culturally responsive approach into all components.	• The project considers students' cultural background as an asset. • The importance of cultural identity is recognized and fostered. • The project regularly analyzes activities through a culturally responsive lens such as that of the Alaska Native Knowledge Network [ensure that the curricula (1) begins with culturally significant topics and involves local experts; (2) links science instruction to locally identified topics and science standards; (3) devotes large blocks of time and provides ample opportunity for students to develop a deeper understanding of culturally significant science-linked knowledge; (4) incorporates teaching practices that are compatible with the cultural context and focus on student understanding and use of knowledge and skills; and (5) engages in ongoing authentic assessment which subtly guides instruction and taps deeper cultural and scientific understanding, reasoning, and skill development tied to standards (Stephens 2000)] • All staff and instructors are trained and supported with materials to implement a culturally responsive curriculum.	
10. Contextualized/Authentic Experiences. It offers activities that engage students in authentic, challenging, and experiential learning.	• Instructors communicate a love of learning to their students and use a variety of instructional strategies that are research based, tied to students' needs, and designed to engage students. • Technology is integrated to support meaningful learning and build skills. • Learning activities are authentic (focused on real-world investigations) and challenging. • Activities take into account the language and literacy needs of all students.	

Domains and Dimensions	*Key Elements of Each Dimension*	*Evidence*
Domain V—Collaborative Learning Community **11. Collaboration.** Members of the project team work collaboratively to improve the project.	• Sufficient time and resources exist for project instructors/curriculum designers to regularly plan and work together. • Experimentation and risk taking are encouraged. There is a safe environment conducive to genuine reflection on practices. • Collaboration is grounded in research on effective instructional practices. • Regular opportunities exist for the community to learn, network, and collaborate.	
12. Professional Growth. Project staff members are continuously engaged in a broad variety of professional learning opportunities consistent with the project's vision/goals and targeted to project improvement.	• There is a coherent plan for professional development. • Staff members are connected to other staff members within and across the project components. • The project team is involved in ongoing staff development that includes inquiry, reflection, and collaboration. • The project staff has formal and informal opportunities to discuss current research on effective educational strategies for targeted students. • There are processes to bring new staff on board.	
13.Multiple Measures. Multiple forms of evaluative feedback are used to measure all aspects of the project.	• Evaluation strategies are culturally responsive. • Stakeholders are involved in development/selection of instruments and strategies that are qualitative and quantitative. • Evaluation strategies are linked to project goals/objectives. • Formative (process/progress) and summative feedback are provided. • Project team members and evaluation staff members use multiple forms of formal and informal assessments to gauge progress and inform the project. • Evaluation findings are communicated to the project team in a timely fashion. • The project has a culture of data-based inquiry. It regularly evaluates the performance of the project, including the implementation and effectiveness of components and the capacity of staff to carry out objectives. • Time and support are available for staff members to examine and interpret feedback for decision making.	

Domains and Dimensions	*Key Elements of Each Dimension*	*Evidence*
Domain VI—Proactive Community Relations **14. Family Engagement.** The project creates strategies for parents and family members to be active participants in student learning.	• Concrete opportunities are in place to facilitate parent and family engagement. • There exists a range of volunteer options with different time commitments for parents and family members. . • Communications between the project and family are two-way and continuous. There are multiple and frequent opportunities for exchanging information. • Special efforts are made to communicate with and involve parents and family members in a variety of different formats. • The project offers events to help parents/family members to support learning at home and to share information about what students are learning in the project.	
15. Partnerships. The HPLC school is engaged in partnerships with external entities that garner resources and support and that strengthen important aspects of schooling and students' lives.	• There is a coordinated and intentional approach to building community partnerships. Multiple strategies are used to build these partnerships and to target different populations. • The project has multiple partners who are engaged in long-term efforts to support the project.	
16. Community relations. The project has effective strategies for creating and maintaining relationships with funders/sponsors and potential funders.	• There is an atmosphere of mutual positive support, collaboration, and shared vision between the project, the umbrella organizations, and the funding agencies. • The project employs a variety of ongoing strategies to build and maintain positive relationships with the supporting organizations.	
17. Dissemination of Resources. The project documents, collects, and shares the approach/model in a variety of formats.	• The project community works together to make project ideas available to a wider audience. • The project uses a variety of strategies to disseminate evaluation and descriptive findings.	

NOTES

"All students" includes all children regardless of gender, racial/ethnic, socio-cultural, and socio-economic differences.

The Collaborative Framework is based on intensive work by the Northwest Regional Educational Laboratory (2002) on assessing High-Performing Learning Communities, which was anchored by research conducted by Research, Policy, Practice (RPP) International (Berman & Fields-Taylor 1999)

APPENDIX D

Fall 2007 Reunion
Family Event

Appendix D

Fall 2007 Reunion Family Event

Family Involvement in SCRT

Expansion of parent involvement is an aim of the renewal funding. The project proposed to expand ways in which parents support their children in Salmon Camp Research Teams (SCRTs) through a variety of activities and formats. The SCRT renewal proposed to include (per year):

- Family day capstone event, held at the end of the summer at Oregon Museum of Science and Industry (OMSI) or Native American Youth and Family Association (NAYA) (1)
- Family weekend held at the end of the fall at a location convenient to parents not from the Portland area, with transportation from Portland and lodging provided by OMSI (1)
- Take-home activities, including background information for parents, which can be completed at a time and location that is convenient to families (6)
- Opportunities for parents to participate in SCRT programs as chaperones and helpers
- Opportunities for parents with science backgrounds or relevant careers to share their expertise and knowledge with SCRT groups
- Annual OMSI memberships provided to families of SCRT participants and an organizational membership provided to NAYA

The Fall 2007 Family Event was the first activity under the renewal funding and focused on inclusion of families in the project. Participants were recruited through e-mail and personal invitations to the broad Salmon Camp community.

Reunion Implementation

The Fall 2007 Family Event or *Reunion* was held Friday evening November 9, 2007, at OMSI. Key purposes for the session were (1) community building, (2) communicating the status of Salmon Camp funding, and (3) envisioning a future for Salmon Camp. Guests were welcomed near the lobby and ushered to a registration desk which contained sign-in sheets and consent forms. The main event was held in the café which was transformed into an inviting space complete with tablecloths and candlelight. Information, activity tables, and appetizers were set up in the café hallway and entrance. Partners and collaborators with Salmon Camp set up tables with displays and information about their organizations.

The event began with informal time to explore the adjacent special exhibit, *Ends of the Earth: From Polar Bears to Penguins,* and check out the display tables. Attendees gradually filtered into the café, engaged in activities on the tables, and found a seat.

The "formal" program began with a welcoming from the Co-Project Investigators and a representative from NAYA. Images of students and activities from previous Salmon Camp Research Teams were projected on a large screen at the front of the room. Dinner, a presentation by NAYA students of traditional dances, and presentations by past SCRT participants rounded out the evening. Embedded throughout the event were engaging data collection strategies.

Data Collection

Descriptive data were collected through the sign-in and consent forms at the registration desk. Additional feedback and data collection activities were infused into activities for the evening, using a number of participatory approaches.

Instruments

Sample data collection tools were aimed to be creative, engaging, and appealing to the wide range of family members in attendance and are outlined in Table 1

Findings

Responses from the various data collection strategies employed indicate that participants enjoyed the Reunion Family Event, valued their participation in Salmon Camp, and were committed to sustaining Salmon Camp in the future.

Figure 1

Buffet Line at SCRT Reunion Family Event

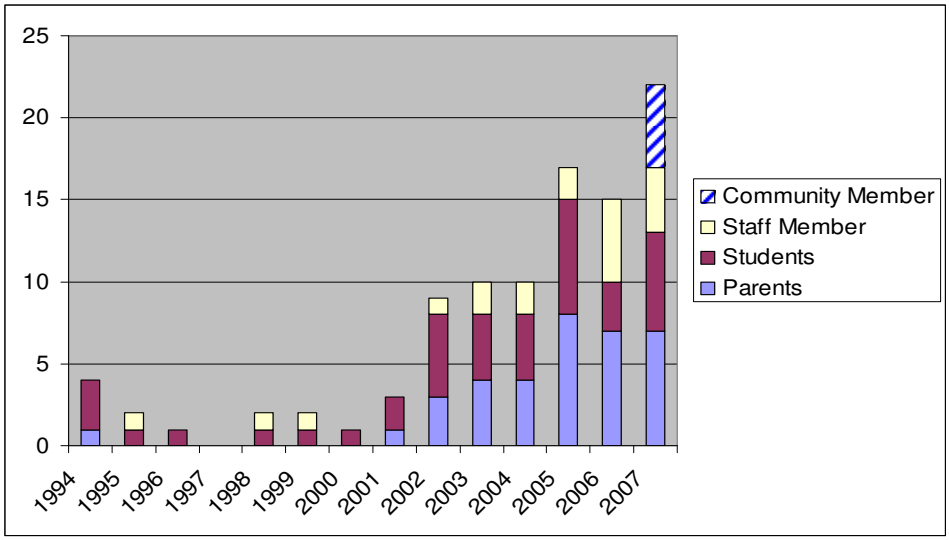
Figure 2

Past Participation Graph Display

Table 1
Reunion Event Instruments

Activity	Data of Interest
Past Participation Graph	Participation rates and roles by year as represented at reunion event
Design a T-Shirt	• Take-away messages from Salmon Camp involvement • Perceptions of key components as integral to Salmon Camp
Swimming Salmon	Connections between previous involvement and current positions
Dream Hatchery	• Sustainability strategies • Envisioned futures for Salmon Camp
Graffiti Board	Perceived impact of Salmon Camp
Event Feedback Form	Extent to which the event accomplished purposes

Figure 3



Reunion Participants by Year of Participation

NOTE: Respondents may have participated in multiple years and/or in multiple roles.

Participants

Attendees at the event were predominately former or current students, with a strong representation of parents of former or current students. Several community members were present as well. Registration documents showed 61 youth and adults attended the event.

The graphing activity prompted attendees to mark years in which they participated and the capacity in which they participated. Data from the graph shows strong representation from recent years of Salmon Camp as well as some former participants from the very first years of Salmon Camp (see Figure 3).

Perceptions

The *swimming salmon* placed at dining tables asked participants to note their current occupation, Salmon Camp role(s) and years involved, and perceptions of how Salmon Camp influenced them.

Figure 4

Dream Hatchery Display

Posted responses by parents, foster parents, caregivers, and/or other family members were:

- Brings me enjoyment what they are doing for the kids. And enjoying it this evening.
- Great experience for granddaughter.
- Hearing about youths' experience.
- I am learning about Salmon Camp for the 1st time!
- Promoted intelligent conversation.
- When I first came to PDX and enrolled my children in Title VII, they were just coming home from a Salmon Camp adventure and I was impressed that this program was available to encourage and expose my child to this type of opportunity and education around conservation and sustainability culture. That was in 2004.
- Salmon Camp has served students well.
- Helped my … boys identify with native kids and culture as well as science.
- It has connected my son to his culture and encouraged him to do well in school.
- Enhanced my children's curiosity then in science.
- Inspired and encouraged me.
- Helped shape my career as an educator.
- Broaden family and friends.

Staff members noted:

- [Provided opportunity to share] traditional uses of nature plants for food, medicine, ceremony.
- It has brought me joy to have these opportunities for our youth.
- Made me a better person.
- Great opportunity for students to experience culture in different ways.
- Get to see a great program and how it works.

Students commented on changes in their knowledge of native culture or heritage, understanding of science, and influence on postsecondary choices. They wrote:

- Became more a part of native community.
- Taught me about my native culture and about salmon. Good experience overall!
- It has given me more knowledge on my heritage.
- It's helped me learn native heritage.
- I learned to understand to keep our water systems clean for marine life.
- Being able to participate in the trip to Vancouver Island.
- Science.
- Showed me a lot about science.
- It has enabled me to graduate early.
- College.
- Broaden my future.
- I'm taking fisheries technology in college! It helped a lot.
- Salmon Camp has given me lots of stories.

Salmon Camp Wishes and Dreams

Masses of salmon eggs are known as *roe* and served as imagery for the growth of Salmon Camp in the future. Paper cutout roe were placed at tables with a prompt asking: "What are your wishes and dreams for Salmon Camp?" Respondents' wishes and dreams were posted in the gravel riverbed depicted in the large-format *Dream Hatchery*. A content analysis of the responses shows wishes and dreams clustered around ideas of sustainability, community connections, ecological restoration, building leadership skills for Native American youth, and specific suggestions for program enhancement. The following sections show responses within common themes.

Sustainability

Nearly half of the comments (48%) pertained to sustaining Salmon Camp, including wishes that the program continue to provide positive experience for Native American youth and expand or grow. Comments included:

- Keep it going.
- I wish Salmon Camp could be expanded to include more students.
- That it would be a wonderful experience for [my] granddaughter.
- I wish everyone has a good time.
- I wish for Salmon Camp to continue to provide youth with enriching experiences.
- To continue ongoing forever.
- Get more people involved, have camp more often.
- That it continues.
- Salmon Camp continues for many years to come…I want my 2 year old to have this dream.
- To grow and stay alive for years to come.
- I want Salmon Camp to continue.
- I wish Salmon Camp continues to grow.
- I want it to continue forever and EVER.

Community

Several comments also clustered around ideas of connecting with communities of people, in particular partnerships with tribes, as well as connections between communities and salmon. Statements under this common theme include:

- Openness to many people and places in salmon nation…calling us all to come home.
- Connect people with salmon.
- I wish Salmon Camp could be funded by Oregon and Washington's casino TRIBES.
- My wish for Salmon Camp is an increased partnership with the tribes of Oregon.
- I hope that Salmon Camp can reach many different communities and educate youth, as well as give them an understanding of the importance about salmon.
- For it to build a strong community in and around the Pacific NW.

Ecological Restoration/ Salmon Knowledge

A third theme apparent in responses addressed visions of healthier environments and youth who are knowledgeable about watersheds and aquatic life. They responded:

- Restore watersheds.
- Regenerate biospheric and ethnospheric connection.
- To restore Riparian Habitat.
- My dreams are for the kids to learn more about marine life and the water systems and keeping rivers clean.
- Learn more about the life of salmon.

Additional themes were mentioned by at least a few participants, in their wishes and dreams. These include youth leadership development and specific ideas to enhance programming, highlighted below.

Increased Leadership Skills/Career Opportunities for Salmon Campers

- Have returning youth take on more roles in the camp.
- To address the role Salmon Camp can have in fostering leaders in Natural Resources who can work closely with tribes and help [illeg.].
- I would love to see career opportunities evolve from the youth who attend. Leadership skills and teaching abilities nurtured.

Specific Program Suggestions

- To have small numbers of students on HS trips.
- Snorkeling [opportunities].
- Some camps "day camps" for younger youth.

Graffiti Board

The Graffiti Board was used to draw out key messages or encapsulated perceptions of Salmon Camp impact. While relatively few attendees (about 18 of the 61 attendees) posted graffiti, those who did provide a portrait of impressions. In true graffiti style, there were several "tags" (signatures) as well as several comments which were cryptic or sarcastic. The text of other postings included:

- Knowledge and understanding
- Opportunity
- Lifelong friends
- A great way to learn
- An amazing program
- Salmon Camp was fun in '94
- A great experience
- Super
- Fun

Overall Feedback on Event

A short exit survey was available for participants to provide feedback on the Reunion event. The form prompted participants with three questions:

1. What was your favorite part of the Salmon Camp Reunion?
2. What would you have done differently?
3. Is there anything else you want us to know?

Sixteen attendees (26%) completed the short survey. Responses were analyzed for common themes which are summarized, by question, in the following section.

1. Favorite Parts of the Reunion

Dance. The traditional Native American dance portion of the evening, presented by a NAYA dance group, was identified by nearly half (7) of the 16 respondents as their favorite part of the event. One emblematic comment was, "The performance (NAYA dancers) was awesome…."

Activities. Several participants noted that they enjoyed various activities available during the evening. The participant graph enabled one family to appreciate their long involvement in Salmon Camp, writing: "My kids were the oldest participants ('94)—an unexpected surprise. My brother was a mentor in '95." Others commented:

- Seeing the pictures and the activities helped everyone to feel a part.
- Slide show [was my favorite part].
- Walking around the OMSI exhibit. I wish I could see more of the exhibit. It would be nice to see real marine life here.
- The energy and enthusiasm the OMSI staff brought to the event was admirable. The event was a great experience and it was very nice to see what OMSI does for so many youth.
- Getting to see the exhibit with the penguins and bears.
- Seeing the stuff in a social setting instead of a parking lot.
- Listening to the Salmon Campers' stories.

Socializing. Five comments pointed to appreciation for an opportunity to see old friends and meet new people associated with Salmon Camp. These responses read:

- Seeing friends
- Seeing old frenz
- Seeing some friends hadn't seen in a long time
- Seeing familiar faces
- …meeting new people

Food. The dinner was also appreciated specifically by three attendees who noted their favorite part of the evening as:

- The food.
- Dessert!
- Cake. Yum yum.

2. What Could Be Done Differently

Relatively few people could think of significant ways they would have changed the evening. About one-third either could think of nothing they would have done differently or expressed appreciation for the event. Nearly as many respondents offered various suggestions. Responses are summarized in the following paragraphs.

Kudos. Under the question asking participants, "What would you have done differently?," five (31%) responded with kudos or approval, noting:

- Nothing (3)
- It was great, It was awesome (2)

Suggestions. Several responses (6) offered suggestions or comments such as:

- Looked around some more
- Create an alumni club—bring back
- Former participants to help plan reunions
- I'm not sure—maybe more mixers
- Have smoked salmon appetizers
- More fun stuff
- Live drummers—not a CD
- The dance floor was kinda cramped

Music/Sound System. The music which accompanied the dancers and use of audio equipment prompted three responses:

- Sound system—practice first...and play from an iPOD :)
- Instruct students how to use microphone
- Music "situation"

More Information. Two respondents would have liked to have additional information available. They wrote:

- More information on future Salmon Camps.
- Be a little more specific about "activities" on the e-mail. We'd 'a been here earlier [if we had known what would be available].

3. Additional Comments

The final question asked if there was anything else which participants wanted to convey. The majority of comments (9 out of 11) simply offered words of thanks or appreciation, including:

- Thank you (4).
- Thank you for having Salmon Camp.
- I liked the event and I'm excited that my [relative] is leaving on the trip to Vancouver Island tomorrow.
- Excellent catering. Thank the grant writer.
- We love you.
- You're awesome.

Two respondents offered suggestions of:

- Make more activities
- Maybe info for [prospective] Salmon Campers to take with them

Family Reunion Event Summary

By all accounts, the Family Reunion Event appears to have succeeded in bringing together, for the first time, the often isolated players in the Salmon Camp Research Team (SCRT) project. It was the first gathering of parents; family members; past, present, and prospective participants; community members; staff members; and volunteers who comprise the broader Salmon Camp "family," as well as a first step toward expanding the circle to include Native American Youth and Family Association (NAYA). The Reunion was successfully implemented and drew a good turn out. The event seems to have laid the groundwork for strengthening community and parent involvement.

Reunion participants appreciated the Native American dance performance by the NAYA students, the activities available during the evening, socializing, and the food. Some people would have arrived earlier and spent more time at the event had they known the extent of opportunities that would be available. Others would have liked even more activities. The sound system for the dancers was the only significant problem raised. The recorded music was indeed not ideal, but ultimately functioned adequately, and the dancers were very well received in spite of any shortfalls in the audio equipment.

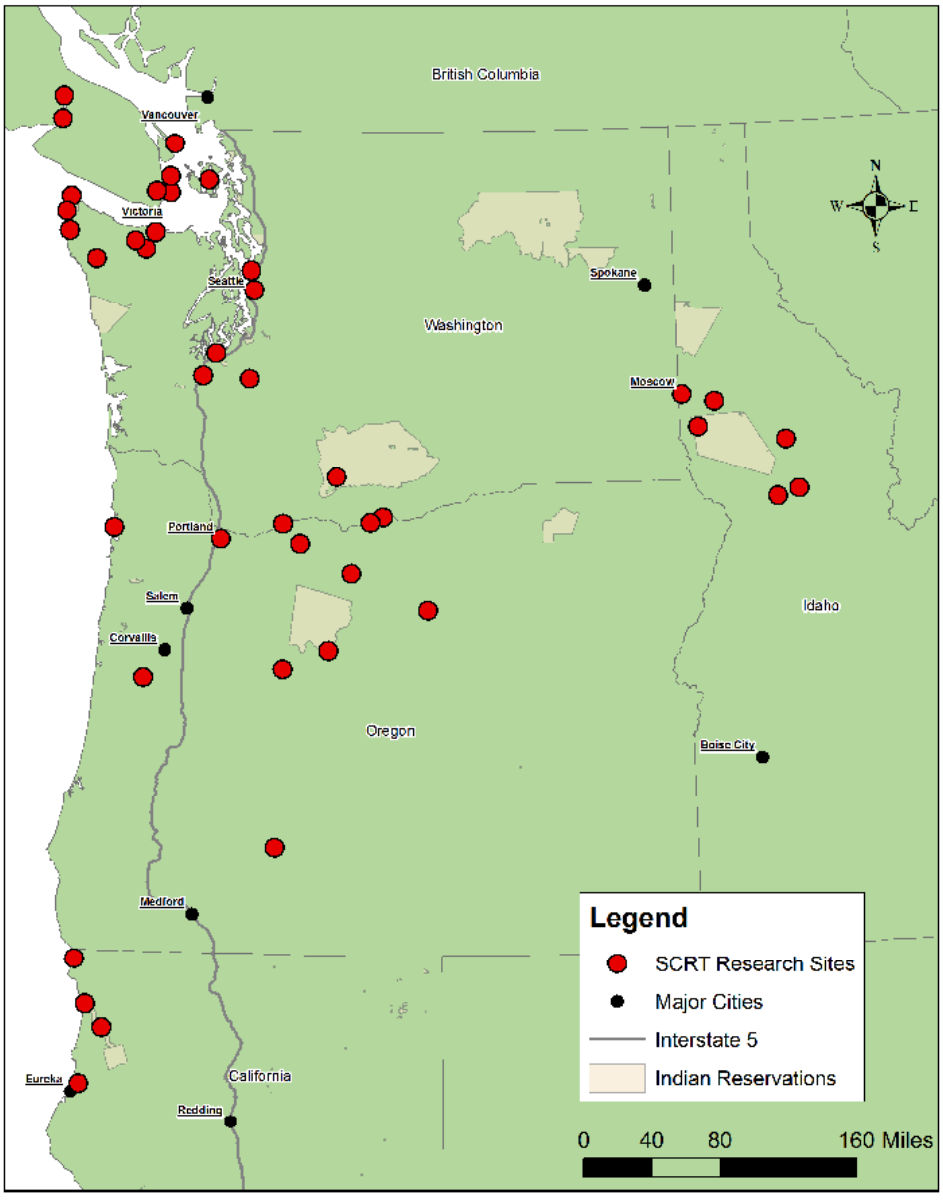
Across the various instruments used to gather feedback, hallmarks of Salmon Camp emerged as: increased knowledge of Native American culture, exposure to careers, and understanding of science. Participants envisioned a future for Salmon Camp that continues to provide positive experiences for youth and grows over time. Hopes for stronger community connections were noted by some participants, including increased partnerships with tribes. The need for habitat restoration and Native American youth who are knowledgeable about water systems and aquatic life also surfaced as attendees thought about the future of the program. Related to these visions was interest in developing Native American leaders among Salmon Camp participants, who are well versed and experienced in working with natural resources.

The event was valued by those who attended and provided a collaborative environment for launching the grant renewal.

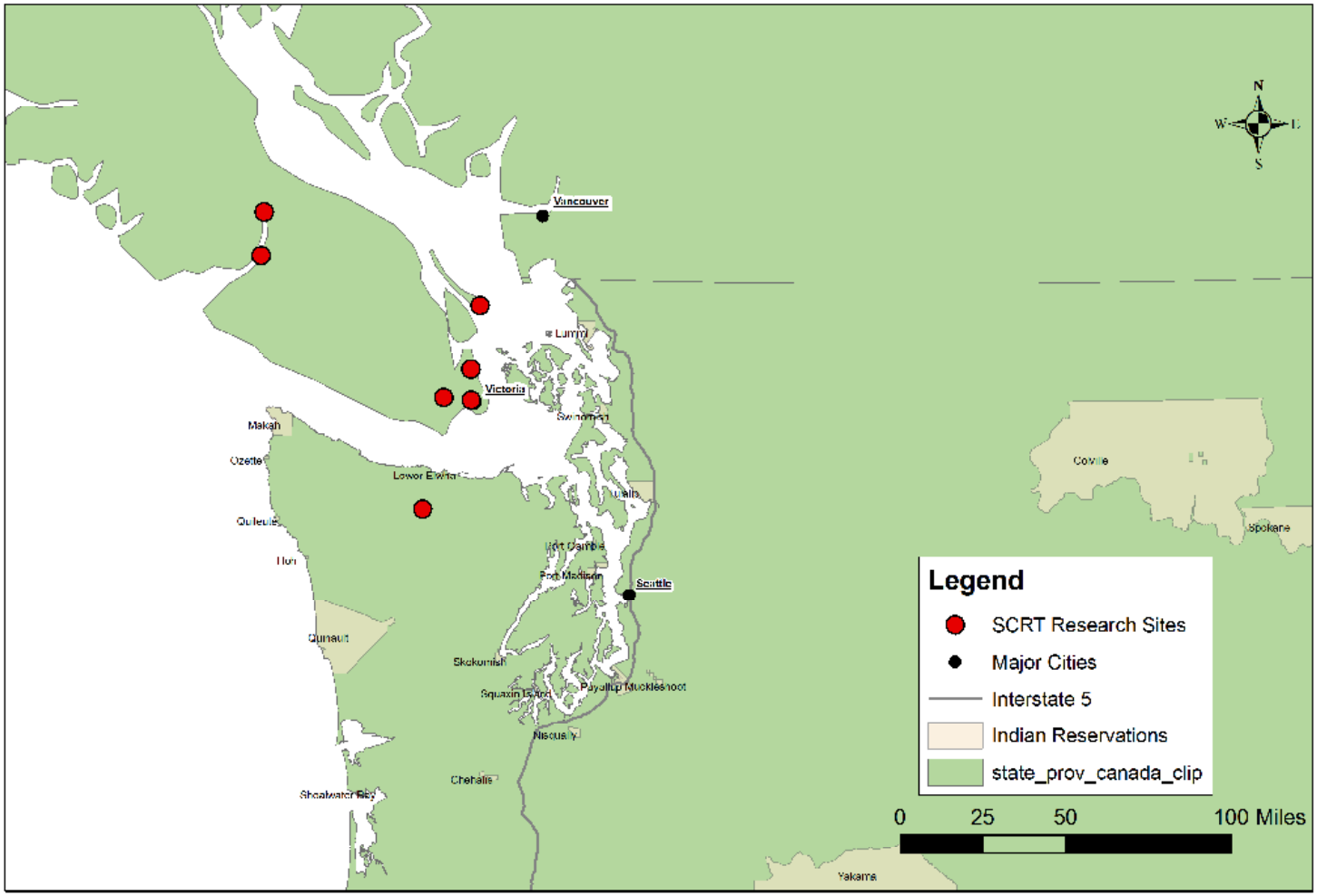
APPENDIX E

SCRT Research Sites 2007–2009, by State

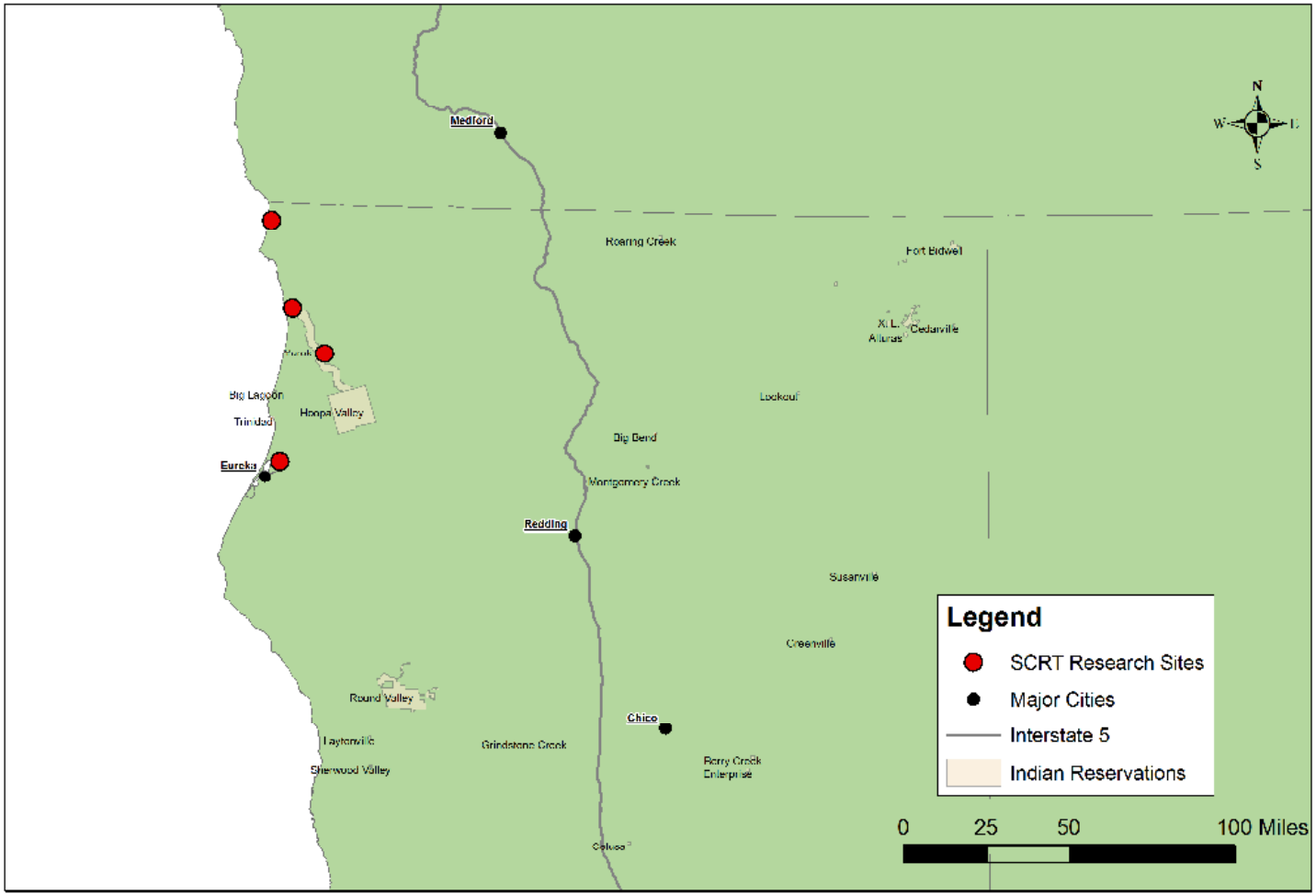
Salmon Camp Research Sites



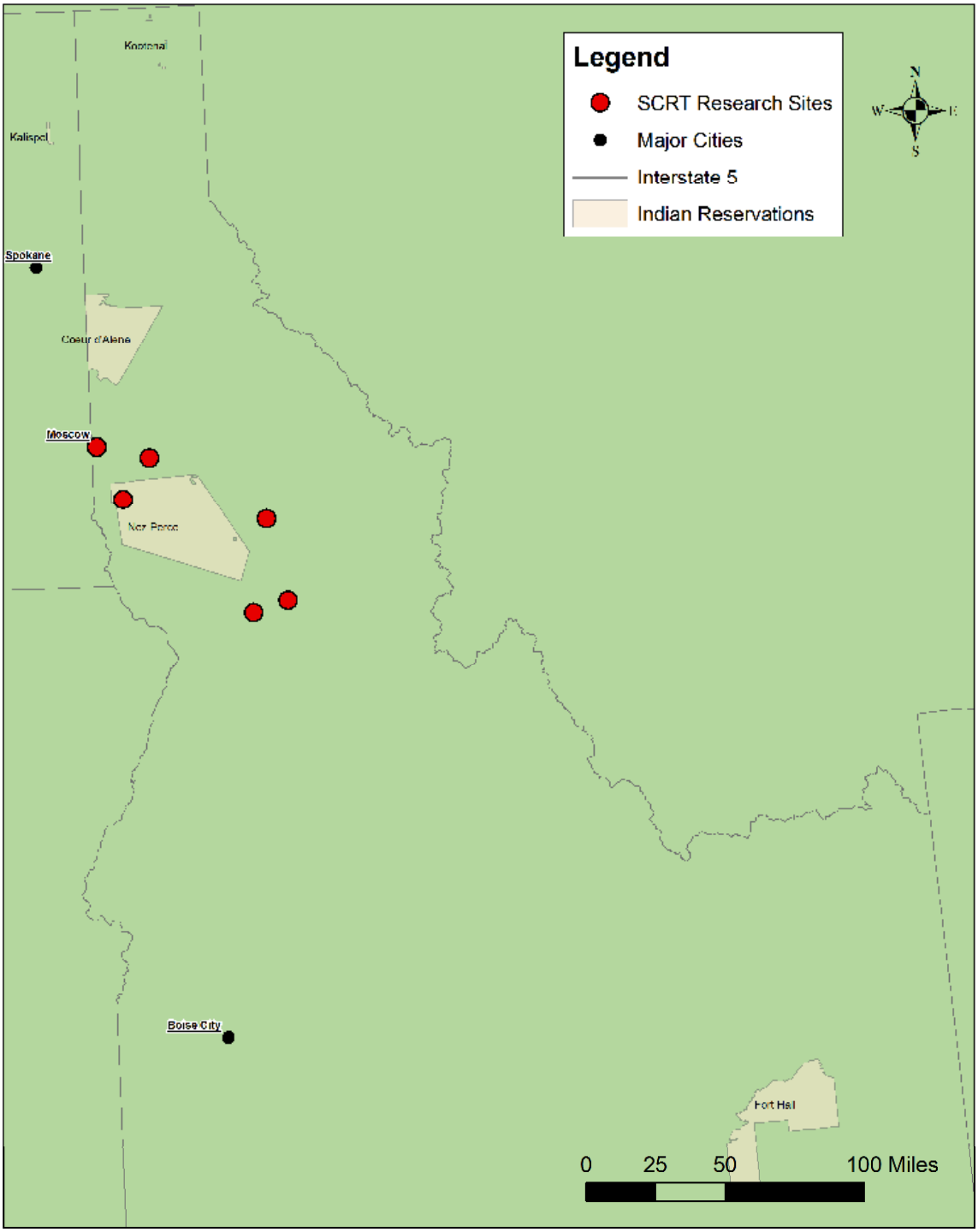
Salmon Camp Vancouver Island Research Sites



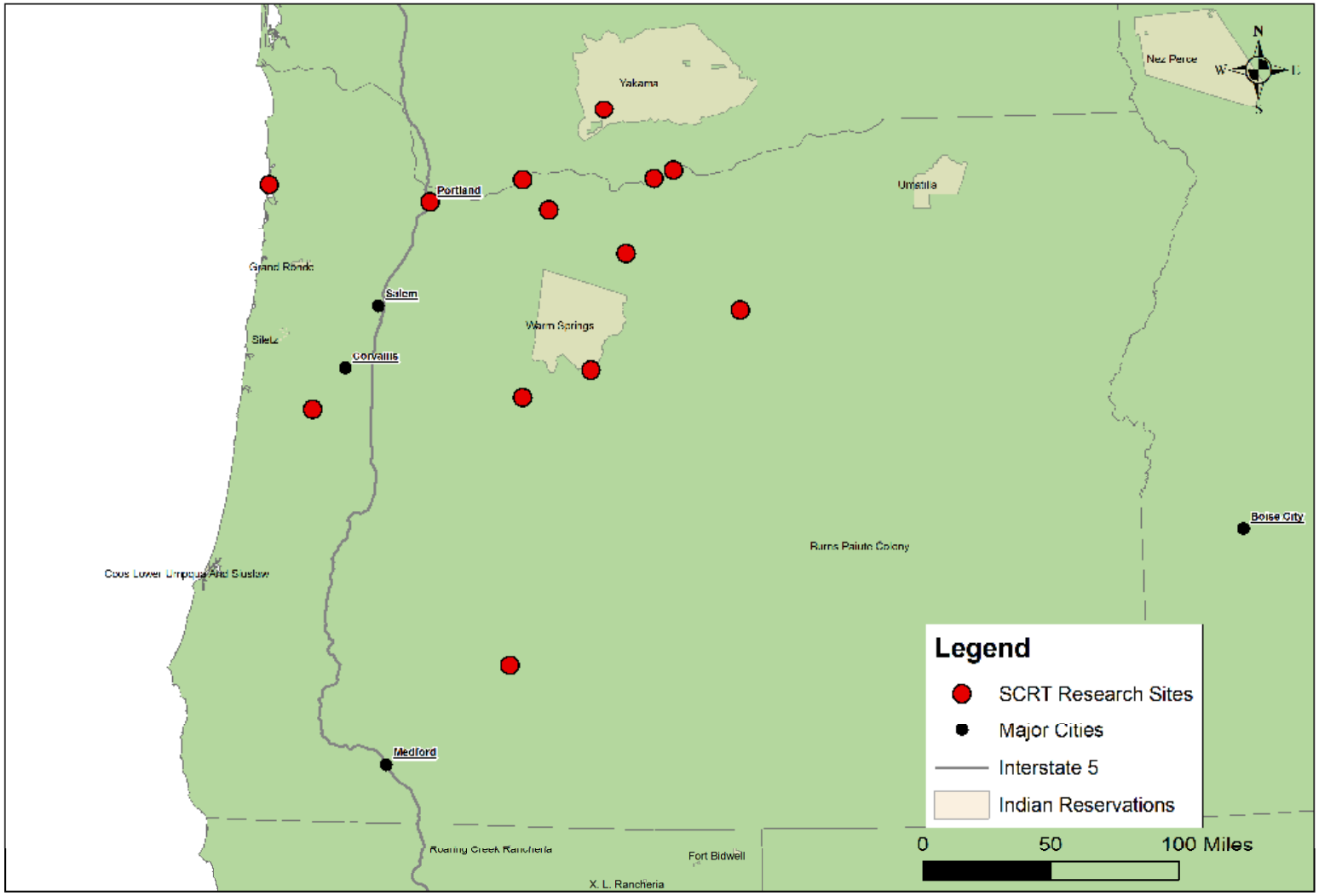
Salmon Camp California Research Sites



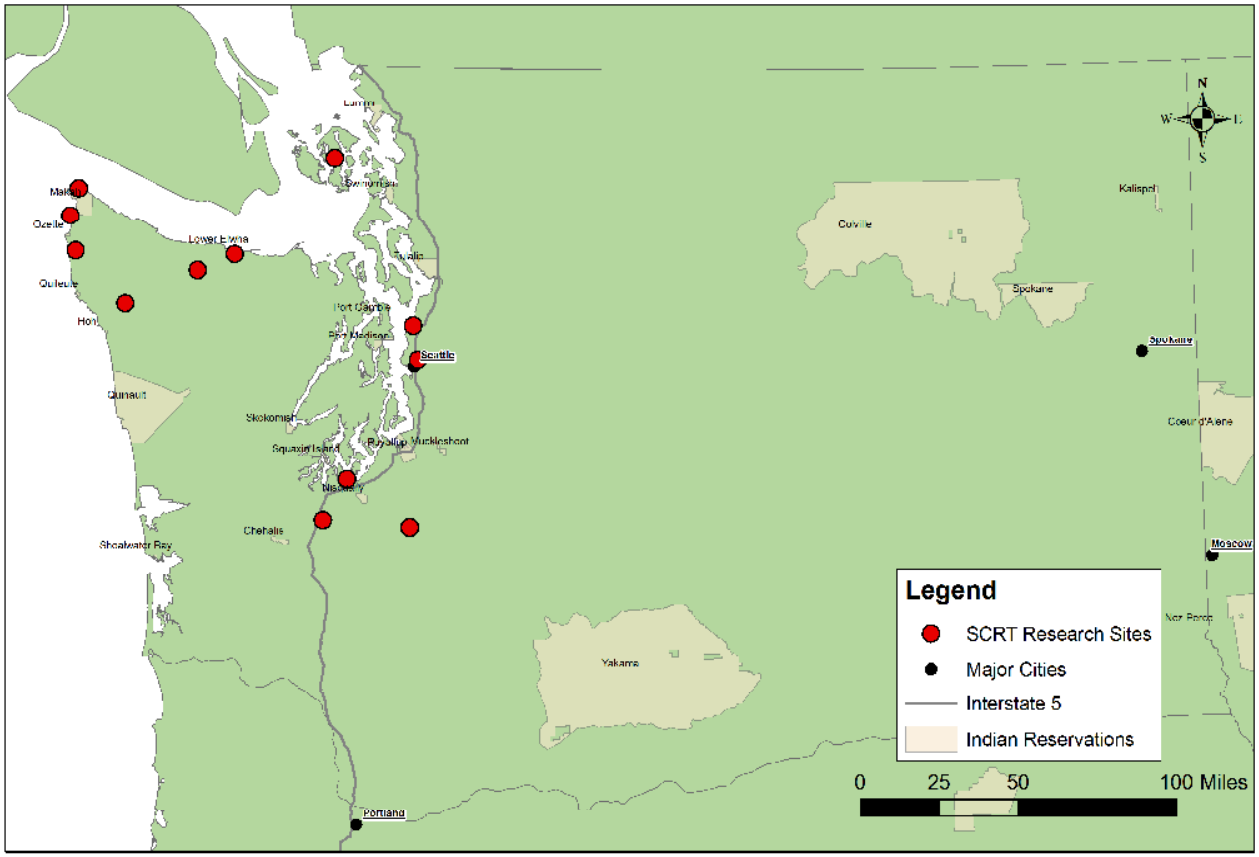
Salmon Camp Idaho Research Sites



Salmon Camp Oregon Research Sites



Salmon Camp Washington Research Sites



APPENDIX F

End-of-Session Feedback Summaries

Salmon Club

End of Session Feedback Summary—All NAYA Programs, 2008–2009

(N=33)

Tribal Affiliation

Tribe	Frequency
Apache	4
Black Feet	2
Burns Piuute and Canada Cowachin and Mexican	1
Cherokee, Chippewa	2
Grand Rhonde Klamath	1
Klamath Paiute	1
Modoc, Cherokee, and Klamath	1
Ojibwa	1
ShimShin	2
Sioux	1
Sioux, Cheyenne, Arapaho	1
Turtle Mountain Chippewa	1
Yakama, Mian	1

Grades Represented

Grade	Frequency	Valid Percent
3	1	3
5	5	16
6	7	22
7	13	41
8	6	19
Total	32	101.0

Gender Breakdown

Gender	Frequency
Male	16
Female	16

Question	No Way!		Not really		I think so		YES!		Mean (S.D.)	
	Percentage	n	Percentage	n	Percentage	n	Percentage	n	Mean	Standard Deviation
1. Did Salmon Club meet your expectations?	9%	(3)	18%	(6)	42%	(14)	30%	(10)	2.9	(.9)
2. Has this program made you more curious about science?	3%	(1)	36%	(12)	39%	(13)	21%	(7)	2.8	(.8)
3. Did you learn about ecological relationships and ecosystems?	10%	(3)	10%	(3)	29%	(9)	52%	(16)	3.2	(1.0)
4. Did you increase your science knowledge?	.0%	(0)	16%	(5)	31%	(10)	53%	(17)	3.4	(.8)
5. Did you gain skills in using technology in science research?	3%	(1)	28%	(9)	22%	(7)	47%	(15)	3.1	(.9)
6. Did you have fun?	3%	(1)	23%	(7)	16%	(5)	58%	(18)	3.3	(.4)

7. How has Salmon Club affected your interest in a science/technology career?

- I don't know. (3)
- I wanna be a marine biologist!
- A little bit.
- I already knew most of the things, but I have always liked science.
- Yes because I want to be a doctor and a doctor needs to know science.
- It made me realized science is fun.
- Because Salmon Club helped me learn more about science.
- It makes me want to do something with science and technology and make me want to learn more about my tribe.

- Salmon Club helped me in learning and I can't really say career in science/technology. (I don't like it) but it did show me many different things.
- It has done enough because it would be fan but I still want to be a fighter pilot.
- It was okay but I wouldn't have a career in science/technology.
- It made me more curious about science I might want to do it again.
- Salmon Club hasn't really changed my perspective toward science because I already love the subject. But it did make me even more excited when we used technology for science. So it might have affected me a little more because it helped me to continue loving science. So that when I become an adult, I may successfully be a marine biologist.
- It makes me ask more questions about things I don't know.
- It makes me want to do something about the environment.
- I learned more about science.
- By bringing in fun guests and having the trip to the slough.
- It was fun and it made me get better grades in science and I learned A LOT.
- Yes, very much so. I like being able to be hands on. I know how to do things now. So I'm very happy I did this.
- It could.
- It hasn't affected me that much/not really/not much. (10)
- I hate science period no matter what!

8. What part of Salmon Club surprised you the most?

- Everything. (2)
- The last day.
- How much we did on the computer. I thought it was going to be more hands on.
- The presentation.
- I think the posters.
- The part when we had to do the posters and research.
- We had to learn science.
- I was surprised about how many rude people were in my class.
- That we are all connected.
- Not studying salmon.
- The way everything was fun.
- The reading test.
- All the plants I never heard of before.
- How many times we went to the slough.
- Going to the slough.
- Well...I found that going down to the slough and sticking half your arm into the gross water just to find clams was surprising and unexpected. What also surprised me is that at the end I get $100.
- When we did the pH experiment. (3)
- When we did the touch screen thing.
- The wolf movie. (2)
- Water filtration.
- The free days we got.
- None of it/Nothing. (4) Nothing really because I have done this before. (1)

Question	No Way!		Not really		I think so		YES!		Mean (S.D.)	
	Percentage	n	Percentage	n	Percentage	n	Percentage	n	Mean	Standard Deviation
9a. Would you recommend this program to others?	7%	(2)	13%	(4)	26%	(8)	55%	(17)	3.3	(.9)

9b. Why, or why not recommend Salmon Club to others?

- I do, it was fun. (5)
- Because it's a great experience.
- Because some of the things we did were fun but some weren't as fun as others.
- For me it wasn't really that fun but for other people it might be.
- It is cool and fun.
- The only fun thing about is making acids.
- It's fun but boring!
- You get to be with friends and learn more!
- So they can make new friends.
- Because it's pretty interesting if you like science you will like this.
- Because it helps your science skills.
- Learn more about science.
- Because it was interesting.
- Because it teaches you more about Native Americans.
- Because you get money and food and go to the slough.
- You received the chance to make/meet new friends/people and have fun at the same time (while learning).
- OMSI is ok.
- Yes because you get to have fun, learn more about plants and other stuff and get $100 dollars. (2)

- Because you learn and get money.
- Why because you get money.
- I don't know. (2)
- No Because it's Boring.

10. What did you learn about going to college or a university?

- [No relevant responses by most students. Clearly was not viewed as an aspect of Salmon Club.]
- That it is a great experience and that it is a great way to get a good education and Ya!!!
- I really want to go.
- Nothing. (7)

11. How has Salmon Club impacted your awareness of Native American culture?

- The things the government does effect Native American traditions. (2)
- Learning the plants.
- Not much.
- A lot! (3)
- It has taught me a lot and made me more informed about my heritage!! (2)
- Yes, Yes it Did.
- It's shown me not to take so much away from the native people.
- I thought more about what they did when sick, what is edible, etc.
- It helped me be aware because I know more about what natives use plants for!
- It has impacted me because I learned how to do many of their things.
- How tribes used different plants. By telling us about the plants and animals. (2)
- Very much because some things tribes do with trees and plants I didn't know they weren't used in that way.
- It made me understand how they live.

- It has made me more aware of what I do to the plants that are in my community, and has made me more mature toward my Native American culture.
- It makes me want to learn more.
- Not that much we didn’t talk about Native American people only what they used.
- I am Native.
- A little.
- I don’t really know. (2)
- Not much/Nothing. (4)

APPENDIX G

Annual Student Survey Responses

Annual Student Survey Responses 2009
For Matched Students 2008–2009

Table 1
Middle and High School Self-Efficacy in Science (N=18)

Attitudes toward Science	Strongly Disagree (1)		Disagree		Undecided (3)		Agree (4)		Strongly Agree (5)		Total (1–5 Scale)	
	Percentage	#	Percentage	#	Percentage	#	Percentage	#	Percentage	#	Mean	Standard Deviation
1. Understanding science will help me be a better community member.	0%	(0)	6%	(1)	17%	(3)	61%	(11)	17%	(3)	3.9	(.8)
2. Science is hard for me.	22%	(4)	33%	(6)	17%	(3)	11%	(2)	17%	(3)	2.7	(1.4)
3. Science teachers have made me feel I have the ability to go on in science.	11%	(2)	17%	(3)	11%	(2)	44%	(8)	17%	(3)	3.4	(1.3)
4. I am sure of myself when I do science.	0%	(0)	11%	(2)	22%	(4)	44%	(8)	22%	(4)	3.8	(.9)
5. Doing well in science is not important for my future.	11%	(2)	22%	(4)	33%	(6)	22%	(4)	11%	(2)	3.0	(1.2)
6. My teachers think advanced science will be a waste of time for me.	11%	(2)	44%	(8)	17%	(3)	22%	(4)	6%	(1)	2.7	(1.1)
7. I would choose to take an elective science class.	6%	(1)	6%	(1)	22%	(4)	44%	(8)	22%	(4)	3.7	(1.1)

Table 2
Additional High School Self-Efficacy in Science Items (N=9)

Attitudes toward Science	Strongly Disagree (1)		Disagree		Undecided (3)		Agree (4)		Strongly Agree (5)		Total (1–5 Scale)	
	Percentage	#	Percentage	#	Percentage	#	Percentage	#	Percentage	#	Mean	Standard Deviation
8. I think I could handle more difficult science.	0%	(0)	0%	(0)	22%	(2)	33%	(3)	44%	(4)	4.2	(.8)
9. It's hard to get science teachers to respect me.	33%	(3)	22%	(2)	11%	(1)	11%	(1)	22%	(2)	2.7	(1.7)
10. Most subjects I can handle OK, but I just can't do a good job in science.	33%	(3)	33%	(3)	11%	(1)	22%	(2)	0%	(0)	2.2	(1.2)
11. My teachers have been interested in my progress in science.	11%	(1)	0%	(0)	11%	(1)	44%	(4)	33%	(3)	3.9	(1.3)
12. I'll need a good under-standing of science for my future work.	11%	(1)	0%	(0)	11%	(1)	33%	(3)	44%	(4)	4.0	(1.3)

Table 3
High School Proficiency with Basic Technology Tools (N=9)

I could describe how to…	Strongly Disagree (1)		Disagree		Undecided (3)		Agree (4)		Strongly Agree (5)		Total (1–5 Scale)	
	Percentage	#	Percentage	#	Percentage	#	Percentage	#	Percentage	#	Mean	S.D.
13. Choose an appropriate technology tool to use for a specific purpose.	0%	(0)	0%	(0)	0%	(0)	67%	6	33%	(3)	4.3	(.5)
14. Use PowerPoint, Excel, word processing, and graphics for a project.	0%	(0)	0%	(0)	0%	(0)	33%	(3)	67%	(6)	4.7	(.5)
15. Online help features.	0%	(0)	11%	(1)	0%	(0)	44%	(4)	44%	(4)	4.2	(1.0)
16. Safely use technology tools.	0%	(0)	0%	(0)	0%	(0)	44%	(4)	56%	(5)	4.6	(.5)
17. Improve the appearance of documents with formatting, graphics, etc.	11%	(1)	0%	(0)	33%	(3)	33%	(3)	22%	(2)	3.6	(1.2)
18. Use a listserv or discussion group to collaborate.	11%	(1)	0%	(0)	22%	(2)	44%	(4)	22%	(2)	3.7	(1.2)
19. Evaluate Internet information for accuracy, bias, appropriateness.	0%	0	22%	2	11%	1	33%	3	33%	3	3.8	(1.2)

Table 4
High School Proficiency with Advanced Technology Tools (N=9)

I feel confident that I could….	Strongly Disagree (1)		Disagree		Undecided (3)		Agree (4)		Strongly Agree (5)		Total (1–5 Scale)	
	Percentage	#	Percentage	#	Percentage	#	Percentage	#	Percentage	#	Mean	Standard Deviation
20. Use advanced features of a word processor (tables, headers and footers, macros, table of contents, columns, etc.).	0%	0	0%	0	22%	2	33%	3	44%	4	4.2	(.8)
21. Import data from a Global Positioning System (GPS) to a database.	0%	0	11%	1	11%	1	33%	3	44%	4	4.1	(1.1)
22. Use formulas and/or functions in a spreadsheet (Excel, SPSS, etc.).	0%	0	0%	0	33%	3	11%	1	56%	5	4.2	(1.0)
23. Create and populate a database.	0%	0	22%	2	22%	2	22%	2	33%	3	3.7	(1.2)
24. Create a graph from spreadsheet data.	0%	0	0%	0	11%	1	56%	5	33%	3	4.2	(.7)
25. Use statistical software for data analysis.	0%	0	22%	2	0%	0	33%	3	44%	4	4.0	(1.2)
26. Use ArcView to make maps.	0%	0	22%	2	22%	2	33%	3	22%	2	3.6	(1.1)
27. Use GIS software to analyze data.	11%	1	22%	2	11%	1	44%	4	11%	1	3.2	(1.3)

Table 5
High School Internet Proficiency (N=9)

Using the Internet, I can proficiently….	Strongly Disagree (1)		Disagree		Undecided (3)		Agree (4)		Strongly Agree (5)		Total (1–5 Scale)	
	Percentage	#	Percentage	#	Percentage	#	Percentage	#	Percentage	#	Mean	Standard Deviation
28. Manage names and groups in an address book.	0%	0	0%	0	11%	1	44%	4	44%	4	4.3	(.7)
29. Reply to and forward e-mail messages.	0%	0	0%	0	0%	0	33%	3	67%	6	4.7	(.5)
30. Create and use bookmarks/favorites.	0%	0	11%	1	0%	0	11%	1	78%	7	4.6	(1.0)
31. Send, receive, and open e-mail attachments.	0%	0	0%	0	0%	0	11%	1	89%	8	4.9	(.3)
32. Create a Web page.	0%	0	11%	1	11%	1	67%	6	11%	1	3.8	(.8)
33. Maintain/edit a Website.	0%	0	22%	2	22%	2	44%	4	11%	1	3.4	(1.0)
34. Search for and find the Smithsonian Institution Website.	11%	1	0%	0	11%	1	22%	2	56%	5	4.1	(1.4)

Table 6
High School Graphics Skills (N=9)

I can proficiently….	Strongly Disagree (1)		Disagree		Undecided (3)		Agree (4)		Strongly Agree (5)		Total (1–5 Scale)	
	Percentage	#	Percentage	#	Percentage	#	Percentage	#	Percentage	#	Mean	Standard Deviation
35. Create an electronic presentation (PowerPoint).	0%	0	0%	0	11%	1	33%	3	56%	5	4.4	(.7)
36. Scan a document.	0%	0	11%	1	22%	2	22%	2	44%	4	4.0	(1.1)
37. Reduce, enlarge, or crop a graphic.	0%	0	11%	1	11%	1	22%	2	56%	5	4.2	(1.1)
38. Convert graphics from one file format to another.	0%	0	11%	1	11%	1	11%	1	67%	6	4.3	(1.1)

Table 7
High School Science and Resource Management Career Preparation (N=9)

Skill/Knowledge	Strongly Disagree (1)		Disagree (2)		Undecided (3)		Agree (4)		Strongly Agree (5)		Total (1–5 Scale)	
	Percentage	#	Percentage	#	Percentage	#	Percentage	#	Percentage	#	Mean	Standard Deviation
39. I can explain how computer applications are used in science.	0%	0	11%	1	11%	1	67%	6	11%	1	3.8	(.8)
40. I can explain how resource managers use technology to analyze data.	0%	0	11%	1	11%	1	44%	4	33%	3	4.0	(1.0)
41. I want to learn more about using technology in science or resource management.	11%	1	0%	0	11%	1	33%	3	44%	4	4.0	(1.3)
42. I have been involved in activities that help me think about science/resource management career options.	0%	0	0%	0	11%	1	56%	5	33%	3	4.2	(.7)
43. I know which classes I should take to help me succeed in a science career.	0%	0	11%	1	22%	2	11%	1	56%	5	4.1	(1.2)
44. I know of steps I can take to prepare for a career in science/resource management.	0%	0	0%	0	33%	3	33%	3	33%	3	4.0	(.9)

Table 8
Middle and High School Proficiency with SCANS Skills (N=18)

Skill	Bad News (1)		Not Bad, Could Be Better (2)		OK (3)		Quite Good (4)		I'm Great (5)		Total (1–5 Scale)	
	Percentage	#	Percentage	#	Percentage	#	Percentage	#	Percentage	#	Mean	Standard Deviation
45. I plan my time, money, materials, and space to get things done.	6%	(1)	28%	(5)	50%	(9)	11%	(2)	6%	(1)	2.8	(.9)
46. I work well on teams, teach others, and work well with people from culturally diverse backgrounds.	0%	(0)	6%	(1)	17%	(3)	33%	(6)	44%	(8)	4.2	(.9)
47. I think creatively to imagine new ideas.	0%	(0)	6%	(1)	33%	(6)	33%	(6)	28%	(5)	3.8	(.9)
48. I use logical reasoning to make decisions.	0%	(0)	11%	(2)	33%	(6)	33%	(6)	22%	(4)	3.7	(1.0)
49. I take careful steps when I am trying to solve problems.	6%	(1)	17%	(3)	28%	(5)	44%	(8)	6%	(1)	3.3	(1.0)
50. I can draw conclusions from reliable evidence. (H.S. only, N=8)	11%	(1)	11%	(1)	22%	(2)	22%	(2)	33%	(3)	3.6	(1.4)

Table 9
Middle and High School Proficiency with Basic Academic Skills (N=18)

Skill	Bad News (1)		Not Bad, Could Be Better (2)		OK (3)		Quite Good (4)		I'm Great (5)		Total (1–5 Scale)	
	Percentage	#	Percentage	#	Percentage	#	Percentage	#	Percentage	#	Mean	S.D.
51. Overall Basic Skills (H.S. only, N=8)	0%	(0)	0%	(0)	13%	(1)	75%	(6)	13%	(1)	4.0	(.5)
52. Reading	0%	(0)	0%	(0)	29%	(5)	29%	(5)	41%	(7)	4.1	(.9)
53. Writing	6%	(1)	22%	(4)	22%	(4)	22%	(4)	28%	(5)	3.4	(1.3)
54. Mathematics	0%	(0)	11%	(2)	6%	(1)	50%	(9)	33%	(6)	4.1	(.9)
55. Speaking	28%	(5)	6%	(1)	56%	(10)	6%	(1)	6%	(1)	2.6	(1.1)
56. Listening	0%	(0)	11%	(2)	0%	(0)	67%	(12)	22%	(4)	4.0	(.8)

Table 10
High School Motivators for Attending Salmon Camp (N=9)

Motivator	Not Important (1)		Somewhat Important (2)		Important (3)		Very Important (4)		Total (1–4 Scale)	
	Percentage	#	Percentage	#	Percentage	#	Percentage	#	Mean	Standard Deviation
57. Working with Scientists	67%	(6)	0%	(0)	33%	(3)	0%	(0)	1.7	(1.0)
58. Camping/Being Outdoors	22%	(2)	56%	(5)	22%	(2)	0%	(0)	2.0	(.7)
59. Location	67%	(6)	0%	(0)	33%	(3)	0%	(0)	1.7	(1.0)
60. The Native American Connections	78%	(7)	0%	(0)	22%	(2)	0%	(0)	1.4	(.9)
61. Being with Friends/ 62. Making New Friends	0%	(0)	0%	(0)	0%	(0)	0%	(0)	.	.
63. Reimbursement (Getting Paid)	0%	(0)	0%	(0)	0%	(0)	0%	(0)	.	.
64. Learning More Science	0%	(0)	0%	(0)	0%	(0)	0%	(0)	.	.
65. Using Science in the Real World	0%	(0)	0%	(0)	0%	(0)	0%	(0)	.	.

Table 11
SCRT Student Survey Subscales

Subscale Items (*Number of Items in Subscale*)	**Mean* (1–5 Scale)**	**Standard Deviation**	**Valid N**
Middle School Science Self-efficacy *Items 1–7 (7 Items)*	3.5	(.6)	18
High School Science Self-efficacy *Items 1–12 (12 Items)*	3.5	(.7)	18
Proficiency with Basic Technology Tools *Items 13–19 (7 Items)*	4.1	(.6)	9
Proficiency with Advanced Technology Tools *Items 20–27 (8 Items)*	3.9	(.6)	9
Internet Proficiency *Items 28–34 (7 Items)*	4.3	(.6)	9
Graphics Technology Skills *Items 35–38 (4 Items)*	4.3	(.9)	9
STEM Career Preparation *(Items 39–44 (6 Items)*	4.0	(.6)	9
SCANS Skills *Items 45–50 (6 Items)*	3.6	(.6)	18
Basic Skills *Items 51–56 (6 Items)*	3.7	(.4)	18

*NOTE: For calculating subscale data, negatively worded items were reversed to generate means that consistently report higher ratings as more positive.

Table 12
Science Classes taken by High School Students

during the School Year Previous to Summer Session (N=13)

Class	2007–2008	2008–2009
General/Integrated		
Advanced Science		1
Integrated Science	1	1
8th Grade Science		3
9th Grade Science	1	2
Life Sciences		
Biology	5	5
Advanced Placement Biology	2	1
Field Biology	1	
Biochemistry		1
Botany		1
Life Science	1	
Oceanography/Marine Biology		1
Astronomy		1
Chemistry	1	
Chemistry-Food Science	1	
Ecology	2	
Environmental Science	1	
Environmental Conservation	1	
Global Warming		1
Physical Science	2	1
Physics	2	
Science and Sustainability	1	2
Salmon Club	1	1
Weather		1
None	1	

Areas Students Wanted to Focus on in Salmon Camp
(Students chose two areas)

Focus Area (Number of Middle or High School Students)	Percentage of Students Who Chose Area (Number of Students)
Information Technology (N=18: MS & HS)	<1% (1)
Science (N=18: MS & HS)	67% (12)
Ecological Relationships and Ecosystems (N=9: HS)	56% (5)
Interpersonal Skills/Getting along with Other People (N=18: MS & HS)	78% (14)
Critical Thinking/Problem Solving (N=18: MS & HS)	44% (8)

Rationale for Choosing Information Technology as Focus Area (N=6)

- Because I'm good with technology and I like learning about it and how it works.

Rationale for Choosing Science as Focus Area (N=12)

- Because I aspire to be a Marine Biologist.
- Because I enjoy learning things about the environment I am in and I like to learn about animals and new things.
- Because science is fun:)
- Because that is why I come cus' I wanna learn about camp.
- 'cause I'm good at it and then I don't get bad grades at it and then it's fun.
- I like it very much.
- I like to learn about new things.
- I really enjoy learning new, exciting things and I think that Salmon Camp really allows me to find out my strengths and weaknesses. I like the thought that I get to learn new things.
- I think I could be good at science if I really tried and learned a little.
- I could always use some help in the field of science.
- Well, I want to get the most out of my camping learning experience and learn new things that might help my science career.
- I have always liked science and it has always been one of my best subjects in all my years of school.

Rationale for Choosing Ecological Relationships and Ecosystems as Focus Area (High School Only) (N=5)

- I have experienced quite a bit but I feel that I can go and learn about what the rest of the world has in store like bio habitats and marine life.
- Because I aspire to be marine biologist.
- Because this is the field I wanna go in to.
- I someday want to go to school to study ecology.

Rationale for Choosing Interpersonal Skills as Focus Area (N=14)

- Because I don't know what that is.
- Because I'm a friendly person and I'm open to getting to know somebody.
- I am good at making friends. I can make friends really easily.
- I am not always good about thinking ahead. I just do what I want to do then. I don't think about how that will cause more problems in the future.
- I can get along with people, most of the time, but other times I don't really get along with others and that's something that I would really like to work on. It would be a wonderful experience to know that I have really good people skills.
- I get along cause I don't start problems I solve them.
- I get along with people but when they don't get along with me and say they don't like me then I just won't get along with them.
- I like playing games with my friends. Sometimes we run into some bumps but get through them.
- I think I work good with people I haven't worked with before. Also when we worked in groups.
- I try to solve problems the best I can and try not to make things go bad and try not to bring so much drama.
- I want to work on some self management skills and ways to learn better in science.
- I'm good getting along with other people cuz I won't judge people when I just c them so I try to get to know people I want to be friends with.
- Meeting new people is fun. I'm just not good at it.
- Okay I guess, but some of them not so much

Rationale for Choosing Critical Thinking as Focus Area (High School Only) (N=4)

- Because I aspire to be a Marine Biologist.
- I feel that if I can find another way to do something then I can maybe find an easier route to completing the task at hand.
- I'm good at it.
- I like to do it. I like to think about problems and the solution and other solutions to the same problems.

Rationale for Choosing Problem Solving as Focus Area (Middle School Only) (N=4)

- I want to work on some self management skills and ways to learn better in science.
- I like playing games with my friends. Sometimes we run into some bumps but get through them.
- I think problem solving could help me in my life in the future.

APPENDIX H

H-1: Salmon Club Journal Samples

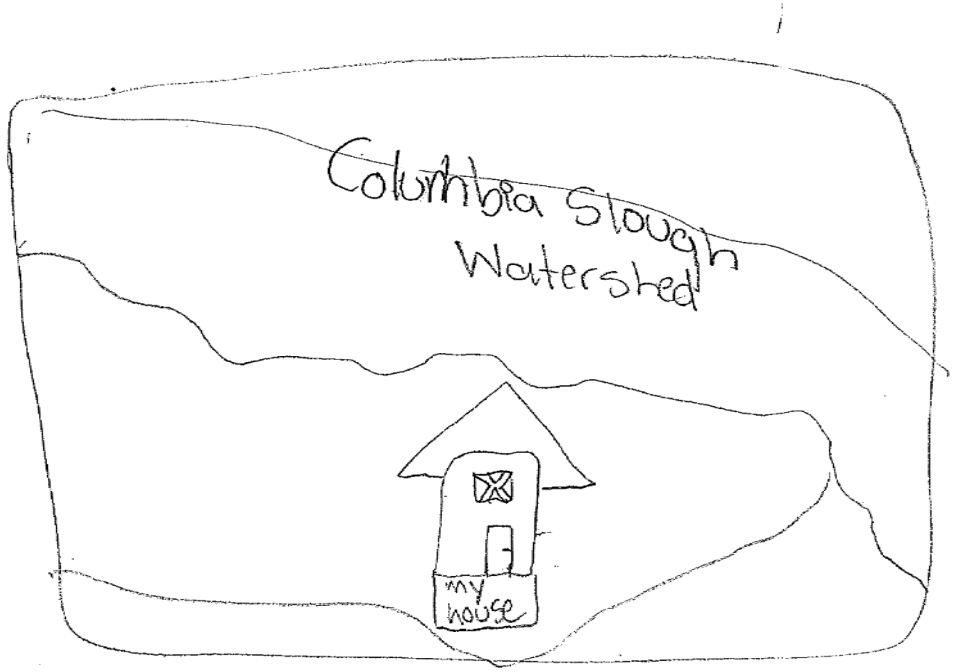
H-2: Sample Excerpts from 2009 Salmon Camp Journals

Appendix H-1

Salmon Club Journal Samples

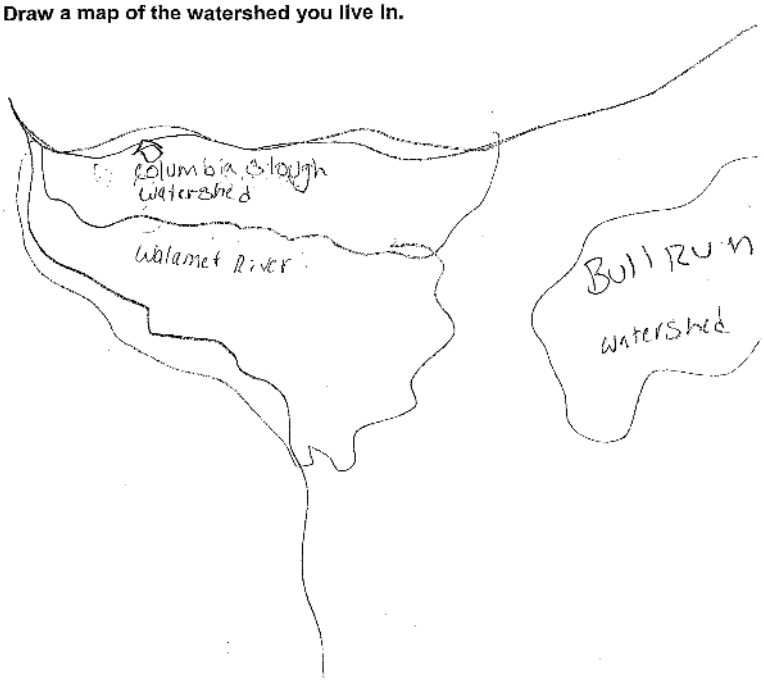
Name of Scientist:_____ Date:_____

Draw a map of the watershed you live in.



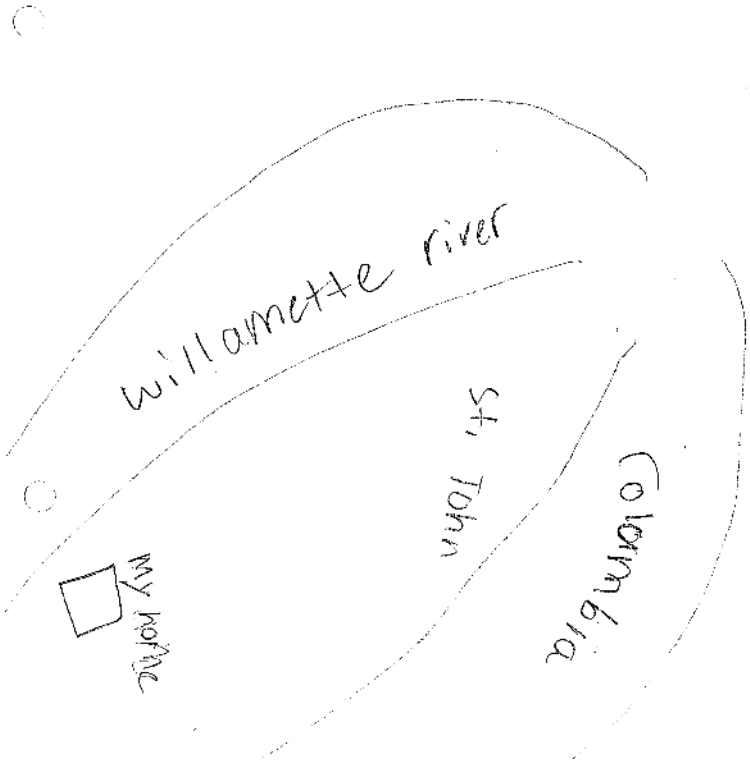
Name of Scientist:_____ Date:_____

Draw a map of the watershed you live in.



Name of Scientist:_____ Date:_____

Draw a map of the watershed you live in.



Scientist: _____ Date: _____

Journal (continued)

Make a list of things that indigenous people could have used native plants for before contact with Europeans:

- food
- Shelter
- medican
- Spiritual

How do Native people continue to use native (and sometimes introduced) plants today?

- medican
- food
- shelter
- spiritual

Have you every harvested plants for medicine, food, materials, or other purposes? What did you harvest? When? Why? Tell us your story.

yes I planted native plants at school. I used sward fern at ~~fry~~ an farm for stinging neddel, in may. I wanted to see how stinging neddel felt and I used the spores on the back and rubbed it on my arm to make it feel better.

Appendix H-2

Sample Excerpts From 2009 Salmon Camp Journals
Spring Break Session

Day 1

ID	Specific facts…	Understand the "big picture" of salmon…
2	Being able to hang out with some native at the dorms	Opportunity to help with ecology and culturally way to help in the treaties
4	OSU is really pretty and there is a lot of great opportunities. We toured the native Lang house, it was so cool.	Well, salmon is a important and big part of my "n8tive" (sic) heritage.
5	Lots of old buildings	Didn't
6	OSU has it's own pharmacy & clinic...	It made me see how, I guess old stuff can be used for a lot of very handy things!
6	OSUs oldest building is like from the 1800s.	
7	I learned that college is very big and OSU is a very wonderful place to become almost anything you want.	It helps me to realize that old things can be used for many great things and they could even help us in things today.
8	Where everything is, how to apply, how everything is going	Fishers catch them, and helps restore them

Day 2

ID	Specific facts…	Understand the "big picture" of salmon…
2	I was interested in looking at how they might be deformed.	It helps me to know salmon might disappear.
4	I learned a lot of the things are the fisherie center.	I did not know anything about the fisherie center.
5	They have the perfect set-up for this stuff here.	Salmon have many unknown things about them.
6	I learned what in fact a hatchery was and it is a place to research and learn about fish, etc. We also cleaned the fish tanks.	There are plenty of jobs in Oregon that you can have if you are interested in science.
7	I learned that OSU is very big and a really good place to do.	It helped me to know that any where you go fish are important. They help our environment.
8	They have the perfect set up.	It helped us learn more.

Day 3

ID	Specific facts…	Understand the "big picture" of salmon…
1	Cleaned out fish tanks and hiked	Cleaning after fish is a tough job.
2	The fish from the hatchery can't spawn with the wild fish.	It help me understand that hatchery fish live for nothing if they can't spawn.
4	How to disect a rainbow trout.	I never knew what go-nads were.
5	The tanks get really!!! dirty.	It showed me how bad it would be to be one of these fish here. Shhhh. Don't tell anyone.
6	Fish have a round eye lense while humans are flat. Fish have hole on the sides of their faces. All hatchery fish are missing a certain fin.	It let me know a lot of stuff about fish, that I had no idea even existed.
7	I learned that sharks have no bones at all.	It helped me to realize all under sea animals can not harm you.
8	The tanks get really dirty.	It showed me how bad it would be to ???? on of these ????.

Day 4

ID	Specific facts…	Understand the "big picture" of salmon…
1	That m--chead sharks are classified with Rays.	
4	The capitated sting rays don't have their stingers.	I never knew anything about sting rays.
5	There's a lot of stuff to do.	
6	The capitated sting rays don't have their stingers. The biologists remove their stringers.	Science is cool and fun! A lot of scientists capitate different kinds of animals so they can do different kinds of experiments.
7	I learned that the bigger a sting ray is the more dangerous they are.	Because now I know that they are a fish cause I thought they were in the shark family.
8	There was a lot of stuff to look at.	I've seen a lot of stuff and it shows how people help salmon.

Day 5

ID	Specific facts…	Understand the "big picture" of salmon…
4	There are some weird fish. This museum has the weirdest fish I ever seen in my life.	That all fish are weird and different.
5	There are many new and unknown species and facts about under water creatures.	It helped me understand the awesomeness of science.
6	Where the tide comes in (high tide) there are a lot of sea anenemes and urchins and star fish etc. Once it's done (in low tide)	In a tide pool "aftermath" there are a lot of different animals and such things just lying there on rocks and sand
7	I learned that there are many many different types of fish	It helped me to know there's not just cat fish and salmon but there's many other like the sting ray.

8	We all seen the Devil's Punch Bowl.	

Day 6

ID	Specific facts…	Understand the "big picture" of salmon…
1	Fish are cool!!	Fry grow up to be smolt.
4	The fishes fins are like your dad's chest hair.	I learned what certain fish look like.
5	There are a lot of stuff out there to see.	
6	There are four common flies and scientists remember them by (SMAC) which each letter stands for a kind of common fly. I learned how to be an anchor whicl capturing fish to do an experiment.	It showed me what giologist and upcoming biologists do in their every day life while working.
7	I learned that when you shock the fish it doesn't kill them it just puts them in shock.	It helped me to know they don't kill all the fish.
8	I was the only one to find an oyster.	They help salmon.

Day 7

ID	Specific facts…	Understand the "big picture" of salmon…
4	The place was a mess! (LOL)	To keep our environment clean.
6	A tent can fit in its bag once it's wet!	It didn't--we are leaving...boo hoo
7	I learned that even being far from home you could still have fun.	It helped me to know more about fish.

High School Idaho Summer Session Excerpts

ID	Specific facts…	Understand the "big picture" of salmon…
1	Burbot are a type of cod fish	Burbot eat salmon sometimes as they come up stream. This is another one of the salmon's natural enemies.
3	University of Idaho	Pretty amazing
4	The college is awesome and I really want to go there.	Nope.

ID	Specific facts…	Understand the "big picture" of salmon…
1	Fact: Salmon go out to the ocean for one year. They are conveniently referred to as precocious salmon because they almost immediately turn around once they hit the ocean.	Hatcheries are a very important part in the restoration/ecology of salmon.
2	Fish have slime on them.	
3	Fish are sweet!!	Salmon stuff
4	Fish are cool.	Salmon stuff

ID	Specific facts…	Understand the "big picture" of salmon…
1	The Selway River has a lot of rattlesnakes along it. They usually tend to be dark green to brown.	Because when they raise and transplant these fish to the river they are actively restoring the population of fall and spring Chinook salmon.
3	Help fish	Salmon life
4	You have to wake up early to ship fish out	Salmon life

High School California Summer Session Excerpts

ID	Specific facts…	Understand the "big picture" of salmon…
1.	Salmon like to hide in cold water.	They are doing fish counts on the Smith River trying to see if they can eventually get the fish count back to where it has historically been, which is an effort to restore the steelhead/ Chinook population.
2.	They run on solar power.	
3.	None	There are very few salmon in the Smith.
4.	I learned about plants that can grow on very rocky banks.	The riparian zone is essential for salmon because it keeps water cool.
5.	Smith River isn't dammed anywhere on its basin.	
6.	The basics of river anatomy.	The Smith River is highly habited.
7.	Berry, Barrin, and Shean are all working together to find out why the Smith River is so clean and abundant with life. Also, they're working to make	It shows me that there are lots of people out there that actually care for the fish's habitat.

ID	Specific facts…	Understand the "big picture" of salmon…
	other rivers as clean as the Smith.	

ID	Specific facts…	Understand the "big picture" of salmon…
1	Cutthroat trout only grow up to 15 inches as juveniles.	It helped us to know how many fish were in one river.
2.	Very hard to dive.	
3.	The water is so clean.	
4.	Wolf eels are not true eels because they have lateral fins.	With out small fish in the ocean salmon would starve.
5.	Anadromous: goes to the ocean and back; resident: stays in the river	
5.	Vocab: Pool; riffle; eddy; Thalweg (sp?); bar; substrate	
6.	HSU is a clean kept place that's pretty nice.	
7.	Salmon and trout like to get into the small hiding spots.	It showed me that there are people out and about looking for and counting the salmon so they can see their numbers.
9.	How to make a stuffed bird.	So we can know about the things that are going all around us.

ID	Specific facts…	Understand the "big picture" of salmon…
2.	Animals can hide really well	
4.	Leopard sharks live in the lagoon.	Salmon travel through estuaries like the big lagoon to get to and from the ocean.
6.	I saw a seal, pelican and a few other kinds of birds.	
7.	The more predator micro invertebrates that you get the more possible other invertebrates there could be in the river.	If there is a huge number of invertebrates in the water then the river is really healthy.
8.	How to have a sp? time in the water.	Salmon are very important.
9.	The sun star is faster than the sea star.	To know what lives in the water.

ID	Specific facts…	Understand the "big picture" of salmon…
2.	It's kind of hard.	
4.	While restoring one of the main things is to not let dirt into the creek.	Salmon's gills can get clogged from too much suspended sediment.
8.	How to use a canoe.	

High School Oregon Summer Session Excerpts

ID	Specific facts…	Understand the "big picture" of salmon…
1	None	I didn't
2	Four things dam is used for: electricity, wildlife, transporting, research	It made me understand how the tribal deal and the dam and how they are preserving their habitat.
4	About fish and fish	Salmon Sweet
5	How the dam worked	No
6	I learned about the AC/DC current.	It showed exactly how the dam works and all the work that goes into it.
7	AC current, DC current, 70 SPM, 1005 hp	
8	One thingy is used for electricity, wildlife, transporting, research; 2 things occurring: AC and DC.	It helps me understand that the people are doing something to help the salmon.
9	A PIT tag is a tag to track and know their info.	I can see how they really care about the population of salmon camp.

ID	Specific facts…	Understand the "big picture" of salmon…
2.	How to differentiate between gender and wild or not; how they track them and find their survivability rate	That now I know that when we dam things, many salmon get stuck so we have to be careful of blocking them.
4.	How to tag fish and have fun	Salmon need help.
5.	Where fish hide and where to put a pit tag	Nope
6.	Clove oil knocks fish out.	There's a lot of fish that need help.
9.	They are trying to see if their spawning project is working up in Little Fall Creek.	Same as the 6th

ID	Specific facts…	Understand the "big picture" of salmon…
2.	Fish have no pancreas and a different thing instead and how temperature and conditions affect fish life.	That much research is still needed to understand how to help salmon.
4.	How to cut fish open.	
6.	I learned about Rockfly things.	How much work it is to learn about taking care of fish.
7.	Salmon usually don't eat when they go back up the stream.	
8.	Salmon don't usually care much about themselves when they head back upstream to spawn.	They can monitor where the salmon go and what was a good fat content for the salmon.
9.	The water has to be a certain temp for the fish.	"Same"

ID	Specific facts…	Understand the "big picture" of salmon…
2.	How restoring creeks works and about their importance.	That helping the fields gives the salmon a good habitat so it has to be done too.
4	Fish stuff	
6	Sand can ruin Redds.	
7	Klickitat River is mountain snow run off. (2)	
9	They can really make improvements.	

ID	Specific facts…	Understand the "big picture" of salmon…
2.	The oxygen is surprisingly good but the water is kinda basic which isn't too good.	I understand that the water needs to be in certain conditions.
4.	Teachers	Stuff
5	How much air was in the water.	Nope.
7	Pine Creek has beavers that are reintroduced into this ecosystem.	

High School Washington Summer Session Excerpts

ID	Specific facts…	Understand the "big picture" of salmon…
1.	He works on the river building log jams so the banks don't erode more.	It helped me understand that if more people don't contribute to the restoration of wildlife, the more those problems all build up especially in the Nisqually River.
2.	Pink salmon, which are extremely rare in the more southern states such as Oregon and South. Have a run in the Nisqually and other Basins in these parts of Washington.	The Restoration Projects that the Nisqually folks are working on include such things as building log jams like the Project we saw today and counteracts the constant logging that has happened in the past.
3.	A lot. LOL it was all interesting.	3. You need pools in the rivers for salmon.

ID	Specific facts…	Understand the "big picture" of salmon…
1.	A lot of the pharmaceutical medicines we take are harming the aquatic life. There's a big problem in the Puget Sound.	
2.	Estuary zones, which are my specific area of interest, are very important to all wildlife in the food chain. The Puget Sound is an almost perfect estuarian zone except for the fact that Interstate 5 is on the plane, which makes it hard on fish.	These activities all helped me understand salmon ecology and restoration. The Badger Marsh Project is an amazing example of this. They have saved about 1,000 acres of land in order to help chum salmon still have a place to spawn in the winter time.
3.	There are nine orders of bugs and insects.	Salmon kick it in estuaries (to get used to sale or fresh water)

ID	Specific facts…	Understand the "big picture" of salmon…
1.	I learned about the dam removal project and that salmon are recyclers.	
2.	Columbian Blacktail Deer are a specific subspecies of Blacktail deer native to the Northwest.	These folks are trying to rear steelhead and Coho salmon populations in wait for the two major dams on the Elwah River that are slated to come out by 2011.
3.	None really LOL oh but they are taking a dam out.	Fish will be able to pass again.

ID	Specific facts…	Understand the "big picture" of salmon…
1.	I learned a lot about the Makah Nation.	
2.	Makah Indians are separated into 3 different bands.	

Final Thoughts:

- The fact that I keep coming to Salmon Camps and I still keep learning new and exciting things every time.
- All of them LOL I liked it all.

Favorite day:

- My favorite Salmon Camp day this year is hard to choose because I had so much fun during Salmon Camp this year.