Salmon Camp Research Team
2004–2005 Annual Evaluation Report

Prepared for

OMSI
OREGON MUSEUM OF SCIENCE AND INDUSTRY

by

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ANNUAL REPORT

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National Science Foundation Information Technology Experiences for Students and Teachers Grant

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~~Phyllis Campbell Ault
Senior Program Advisor, NWREL

PROJECT IMPLEMENTATION

The Oregon Museum of Science and Industry (OMSI) is striving to provide middle and high school students with engaging and personally relevant experiences that build skills and knowledge through the Salmon Camp Research Team (SCRT) project. Participating students have Native American community affiliations and are interested in advancing their learning to pursue technologically rich careers or areas of study. The long-term goal of Salmon Camp is to increase representation of Native Americans in IT-related career fields.

During the 2004–2005 project cycle activities included curriculum development for summer 2005 camps, enrichment sessions during the 2004–2005 school year, three spring break camps, and the implementation of three summer sessions for high school aged students as well as one session for middle school students. In the summer camps, high school sessions explored three different ecological regions in Oregon, California, and Washington. The middle school program operated out of Wolf Creek Education Center, located near Orick, California, within Redwood National Park. Twenty-four students participated in the summer high school research team sessions. The middle school group also totaled 24 students. Taken together, 48 students participated in Salmon Camp Research Teams in the summer 2005. During the 2004–2005 academic year five enrichment sessions took place. Three spring break sessions occurred.

Each of the summer high school research teams participated in an intensive experience over the two-and-a-half-week 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. The weeklong summer middle school team worked out of Wolf Creek Education Center in Redwood National Park as a residential camp but also took an overnight camping trip. The students in both middle and high school groups worked directly with university, tribal, and agency scientists, researchers, and natural resource managers. Students were exposed to advanced technologies currently used in salmon recovery and habitat restoration such as Global Positioning System (GPS) units and Geographic Information Systems (GIS).

Summer camp high school students also 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. Students presented to an audience of fellow campers and invited elders, parents, and researchers.

Eight enrichment sessions were designed during the school year and students were recruited to attend. However, students followed through on attending only five out of the eight sessions offered. Conflicts with high school sports and personal commitments precluded students from attending the other sessions. Across the five sessions that occurred, 30 students participated.

One spring break camp for middle school students and two for high school students were held. The middle school session took place at OMSI's Camp Kiwanilong on the Oregon coast. One high school spring break session was in California, the other was in the San Juan Islands, Washington.

EVALUATION ACTIVITIES

The goal of the Salmon Camp project is to create a continuum of culturally relevant, information technology (IT) focused, science experiences for middle school through high school students with Native American community affiliations to address their educational career needs.

To reach this goal, the objectives of the project are to:

1a. Develop and disseminate a model science IT program that addresses national and state education standards and is relevant to the cultural experience of Native American students.

1b. Immerse students in a culturally relevant, IT intensive, scientific research experience that will allow them to apply information technology to the resolution of real world natural resource problems.

2. Enable students to gain experiences and skills necessary to obtain science and IT-related internships and jobs.

3. Enable students to work together with educational and professional mentors through cooperative hands-on, inquiry-based research activities.

4. Provide students with opportunities to interact in a positive and supportive learning and work environment.

To evaluate the project's progress toward meeting its goal and objectives, a multiple measures approach was used to gather input from participants and assess impact. The evaluation included quantitative and qualitative methods that facilitated triangulation of findings. Pre-involvement surveys, end-of-session feedback forms, in-camp interviews, a sample of parent phone interviews, and post-camp student and counselor debriefing sessions were used to measure progress. Copies of the instruments may be found in Appendix A.

At the beginning of each high school camp session, students completed a survey using laptops in the field. The SCRT Student Survey was developed by NWREL in collaboration with the OMSI evaluator and Salmon Camp coordinator in 2004. The survey is being used each year before 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, experience with science, as well as workplace and basic academic skills derived from the Secretary's Commission on Achieving Necessary Skills (SCANS). The middle school student survey was modified this year to be more age appropriate and was completed by students in paper form at the conclusion of their session.

During the high school camp sessions an in-camp interview was conducted with each student by the coordinator. 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 A).

An evaluator attended the culminating Salmon Bake for the Washington session. This provided an informal opportunity to discuss Salmon Camp with Native American adults who have been involved in the program, were preparing the Salmon Bake, and/or parents who attended the event. The culminating Salmon Bake also provided an opportunity to conduct informal interviews with students.

The conclusion of each of the camps included an end-of-session feedback form that contains closed-response Likert-style ratings on camp implementation and impact as well as qualitative items to provide insight into the most successful or effective aspects of the camp session.

Parent phone interviews were conducted with a randomly selected group of parents of 2005 high school summer Salmon Camp participants. Parents of seven students were interviewed using a semi-structured interview protocol. (See Appendix A-5 for a sample of the interview questions and verbatim responses.)

Ongoing communications between NWREL and project leaders/OMSI staff members provided feedback on implementation for SCRT planners and evaluators. The variety of evaluation activities provided documentation of activities and data to measure project impact.

Taken together these activities provide data to answer broad evaluation questions. Overarching evaluation questions focus on continuous improvement, the degree to which the Salmon Camp project achieves its objectives with regards to students' skills and attitudes, as well as implementation and outcome questions. Evaluation activities are designed to probe five major areas:

1. **Student Knowledge and Skills.** To what extent do students gain experience with digital tools, field research, and workplace skills?
2. **Student Attitudes.** How are students' attitudes and self-efficacy as science students changing with involvement in Salmon Camp? How are career interests changing or deepening? Are there differences in these dispositions based on level of participation in activities?
3. **Implementation.** What is the fidelity of project implementation? Is the project being implemented as envisioned? What factors influence implementation? What is the level of participation? Are cultural as well as technical aspects of the project being addressed?
4. **Outcomes.** What impact is the project having? Are there unanticipated or ancillary impacts to the community of learners involved in Salmon Camp? How are former Salmon Campers, counselors, mentors, researchers, parents, and family members influenced by the project?
5. **Continuous Improvement.** How can the project improve? What is working? How can evaluation findings be most useful to the project as it unfolds?

ACHIEVING OBJECTIVES

In the first two years of the project 140 different students participated in Salmon Camp sessions. Of those, 74 percent attended one session (68% of whom were middle school students). Twenty-six percent attended more than one session. Of those, 42 percent attended three sessions or more. In the 2004–2005 year, 103 different students participated in sessions. The group was 64 percent male. Sixty percent attended middle school (40% high school). Project activities were designed to achieve multiple objectives with strategies complementing each other and building on previous or ongoing activities. Although a linear model does not capture the dynamic well, it does show key connections between objectives and activities. Table 1 shows objectives associated with primary strategies used to achieve the objective. Highlighted areas have not been fully implemented to date.

Table 1
SCRT Objectives and Implementation

Objectives	Strategies/Activities
(1a) Develop and disseminate a model science and IT program that addresses national and state education standards and is relevant to the cultural experience of Native American students.	HS: 3-week summer program MS: 1-week summer program Science Enrichment Activities HS&MS: 1-week spring break program HS&MS: 12–14 weekend residential programs
(1b) Immerse students in a culturally relevant, IT intensive, scientific research experience that will allow them to apply information technology to the resolution of real world natural resource problems.	Side-by-side collaboration with: • Researchers in the field • Native Americans with traditional ecological knowledge
(2) Students will gain experiences and skills necessary to obtain science and IT-related internships and jobs.	Exposure to: • Advanced information technology used by scientists and resource managers • Career opportunities
(3) Students will work together with educational and professional mentors through cooperative hands-on, inquiry-based research activities.	Personal connection to local: • Academic mentors • Professional mentors
(4) Provide students with opportunities to interact in a positive and supportive learning and work environment.	Participation in • Authentic data collection • Engaging field experiences

A new Salmon Camp Coordinator began work at the end of the summer 2004 sessions. This enabled him to transition into the role during the last summer 2004 sessions and continue working with students through the year in enrichment sessions. Planning and organizational work occurred throughout the year in preparation for ongoing enrichment sessions as well as the spring break and summer camp sessions. Through project activities, the heaviest attention was given to exposing students to the nature of fieldwork and habitat restoration/preservation and Native American knowledge. Students also received increased exposure to advanced information technology tools this year. The following sections synthesize findings from the full course of evaluation strategies to draw conclusions on the extent to which the project is making progress toward each objective.

Objective One, Part A

Develop and disseminate a model science and IT program that addresses national and state education standards and is relevant to the cultural experience of Native American students.

The Salmon Camp Research Team project is in the early stages of developing as a model program. The current Salmon Camp coordinator plans to continue in that role for the 2005–2006 implementation year, which enables the project to build on successes and apply consistent expectations for project implementation. Salmon Camp has been evolving over the last six years under separate funding to the stage where OMSI staff members saw the potential for the program to be an exemplar. SCRT leaders continue to use past experience, contacts, and seasoned staff members to hold the program to more rigorous standards and integrate more content into the curriculum. The staff members' and students' adjustment to increased emphasis on technology tools that occurred in the 2004 sessions seems to have been successfully accomplished.

From campers' and parents' perspective Salmon Camp is a highly effective model for learning science content and technology skills. All returning high school campers reported that they would recommend SCRT to others and that the experience made them more curious about science. Parents unanimously reported that the experience was "great" for their children and saw concrete ways in which the experience supported their children's learning in school. Staff members have worked to align the curriculum with academic standards, which enabled some students to accrue science credit for participation in Salmon Camp. See Appendix B for a copy of the standards alignment document used to show how Salmon Camp content addresses national science standards.

Striking a balance between science, field research, IT experiences, and cultural knowledge is a delicate task. The balancing act is highly dependent on staff members with a range of skills and the ability to weave activities into a coherent experience. The stability of having the project director successfully complete a full year's worth of activities, and commit to continuing, enables the project to build on procedural knowledge gained during the first full year of implementation. The importance of dynamic staff members with a range of expertise is a critical variable as the project develops with potential for wider dissemination.

Feedback from all of the 2004–2005 Salmon Camp Research Team sessions was very positive and documented that students learned to use GPS units and were exposed to other technological tools as well as learning science and resource management content. Overall the summer camps appeared to be slightly more successful for students in high school sessions. Middle school students appreciated the various components of the project including science and resource management as well as Native American cultural knowledge.

For the second sequential year, the current Salmon Camp coordinator was part of a five-person panel presentation for the annual conference of the Association of Science-Technology Centers meeting in Richmond, Virginia. He gave an overview of the project with a PowerPoint presentation on the summer's programs. The presentation provided an orientation to the kinds of work taking place under ITEST projects with "intensive, student-centered, hands-on information technology experiences that are embedded in scientific content."

Objective One Part B

Immerse students in a culturally relevant, IT intensive, scientific research experience that will allow them to apply information technology to the resolution of real world natural resource problems.

Feedback from students documented ways in which summer camps provided participants with exposure to science researchers in the field as well as a culturally relevant experience for Native American students. Although less emphasis was placed on this component of the project this year than the previous year, a few students commented on the end-of-session forms that learning about traditional Native American practices, particularly salmon fishing and traditional salmon baking were interesting aspects of camp. The culminating Salmon Bake put on by tribal members at the end of each summer session and Native American staff members involved in programming provided significant cultural context for students. The Salmon Bake used traditional Native American recipes and traditions to prepare and share the meal.

On the end-of-session feedback forms most students agreed that they learned about resource management and gained skills in using technology in science research. The survey used a four-point scale ranging from "No way" to "Yes!" (A sample form may be found in Appendix A-3, with results in Appendix C.) For analyses, a numeric rating was assigned to responses with "1" as the lowest rating and "4" as the highest. Although means were slightly lower for the 2005 data than the 2004 data, differences were not statistically significant. Table 2 shows means for middle and high school summer and spring break sessions on relevant questions.

Table 2
SCRT Survey Responses on Resource Management, Technology in Science Research, and Science Knowledge
Summer Sessions 2004, 2005
Spring Break Session 2005

Survey Item	Year and Session	High School Mean (s.d.) Summer 2004 N=19 Summer 2005 N=24 Spring 2005 N=10	Middle School Mean (s.d.) Summer 2004 N=23 Summer 2005 N=24 Spring 2005 N=22
Did you learn about resource management?	2004 Summer Camp	3.7 (.6)	3.2 (.8)
	2005 Summer Camp	3.2 (.6)	3.0 (.7)
	2005 Spring Break	3.4 (.5)	3.1 (.7)
Did you gain skills in using technology in science research?	2004 Summer Camp	3.7 (.7)	3.4 (.7)
	2005 Summer Camp	3.2 (.8)	3.1 (.7)
	2005 Spring Break	3.4 (.7)	2.9 (.6)
Did you increase your science knowledge?	2004 Summer Camp	NA	NA
	2005 Summer Camp	3.4 (.8)	3.5 (.7)
	2005 Spring Break	NA	NA

End-of-session data were also collected for four of the five enrichment sessions (2 middle school and 2 high school sessions). Even though the enrichment sessions are only over a weekend, students reported comparable levels of gains as for the longer sessions. Table 3 shows these data.

Table 3
SCRT Survey Responses on Resource Management, Technology in Science Research, and Science Knowledge
Combined High School and Middle School Enrichments 2004–2005
N=15

Survey Item	Year and Session 2004–2005	Mean (s.d.)
Did you learn about resource management?	2004–2005 Enrichments	3.3 (.6)
Did you gain skills in using technology in science research?	2004–2005 Enrichments	3.4 (.6)
Did you increase your science knowledge?	2004–2005 Enrichments	NA

Interesting Aspects of Salmon Camp

Forty-nine middle school students across all sessions completed the end-of-session form. A content analysis of the open-ended question regarding the three most interesting things which students learned at camp showed most middle school students noted that they learned:

- Specific scientific information (65%)
- Resource management concepts (29%)
- Native American culture/knowledge (24%)
- IT-related information. (8%)

Numerous middle school students (41%) also commented on generally positive aspects of camp (food, counselors), interpersonal skills, wilderness survival strategies, and one student learned more about college.

Thirty-four high school students completed the end-of-session form. They followed a similar pattern of learning, with higher levels of learning mentioned on information technology tools and resource management. Less frequent mention was made of Native American cultural content as interesting things learned. Interesting topics identified by high school students were:

- Specific scientific information (67%)
- Resource management concepts (35%)
- Native American culture/knowledge (15%)
- IT-related information. (26%)

Table 4 shows a breakdown of responses to "interesting things" learned for middle and high school students.

Table 4
SCRT End-of-Session Feedback Form Responses on Interesting Things Students Learned

Interesting Things Learned at Camp	Year 2004 (Summer Camp only) 2005 (Enrichment, Spring Break, and Summer Camp)	High School Percentage (n) 2004 N=19 2005 N=34	Middle School Percentage (n) 2004 N=23 2005 N=52
Scientific information (ranging from forest ecology, to field study tests/protocols, and specific facts)	2004	47% (9)	100% (23)
	2005	67% (23)	65% (32)
Native American culture/knowledge	2004	79% (15)	17% (4)
	2005	15% (5)	24% (12)
How to use technological tools (GPS, GIS, spreadsheets, graphs)	2004	36% (7)	57% (13)
	2005	26% (9)	8% (4)
Resource management strategies	2004	16% (3)	13% (3)
	2005	35% (12)	29% (14)

High school students also commented on positive aspects of camp such as "fun," outdoor sports skills learned (kayaking, snorkeling), and interpersonal skills developed.

Objective Two

Students will gain experiences and skills necessary to obtain science and IT-related internships and jobs.

A primary metric to gauge student gains in experience and skills is the SCRT Student Survey. The survey was developed in collaboration with OMSI staff members as a repeated measures tool. Content of the survey includes items on attitudes toward science, technology skills, experience with science, as well as workplace and basic academic skills. The instrument draws from the Fennema-Sherman Attitude Scales (Fennema and Sherman, 1976), Efficacy Indices developed by NWREL for measuring self-efficacy with regards to technology, ProfilerPro (Profiler, 2004), and the Secretary's Commission on Achieving Necessary Skills (SCANS, 1991).

In 2004 the survey was administered for baseline data collection on the first day of each SCRT session and was completed by students in the field using a bank of ten portable laptops. In 2005 the survey was also administered as one of the first camp activities. As an introductory activity for each session, the survey set the tone for an information technology-rich camp experience and acted as a performance assessment as staff members observed student completion of the instrument. Most high school students readily used the dropdown boxes and easily saved their surveys to both the desktop and removable disk. A few students were slowed by a lack of typing

proficiency, most showed adequate keyboarding skills. Middle school students struggled with the survey completion during the spring break camp this year. Students were primarily challenged by the terminology used in items which resulted in a lack of understanding on some items. The misunderstandings resulted in high levels of inaccurate self-report. These reactions prompted the evaluation team to revise the middle school survey and use a simplified paper copy during the middle school camp in 2005.

During their camp experience the high school students researched and developed multimedia presentations on topics relevant to Salmon Camp. Students presented as individuals or teams to share information on topics including:

- Cougars
- Coyotes
- Effects on the Forest around the Elwha and Glines Canyon Dams
- Fish in the Nisqually River
- Northwest Clear Cuts
- Owls
- Pebble/Cobble Count along the Elwha River
- Plants—Botany
- Salmon Camp Overview
- Sea Otters
- The Makah Tribe
- Traditional Uses for Plants in the Northwest
- Wolves

A review of the PowerPoint presentations shows that the products are nearly all of very high quality. They are informative, make excellent use of graphics, and use appropriate size and quantity of text. Many reflect student's personal voice and are of appropriate length for presentation. Parents, who attended the Salmon Bakes where presentations were made, were very impressed with the student products and their professional-quality presentations.

SCRT High School Student Survey Findings

The repeated-measures survey administered to students on laptops indicated general trends in student ratings when the 2004 cohort was compared with the 2005 cohort. Although not matched students, means on the sections of the survey were reinforced by a matched-student analysis discussed later in this section. The overall means for the Baseline (2004) to Time 2 (2005) data showed slight declines in students':

- School computer use
- Information technology confidence
- Advanced technology proficiency
- STEM career preparation
- Basic skills

The declines in technology skills and career preparation are not substantiated by interview data, which raises the possibility that students overestimated their skills at Baseline and, now that they are more familiar with what is actually involved in some technology uses and preparation for careers, students realize they may not be as proficient or confident as initially reported. This phenomenon has often been reported in technology-infused grant projects (Ault, 2003). It is also possible that the influence of a change in the population of students served in 2005 accounts for the difference. While not a large proportion, about fifteen percent of the students were new in 2005.

The students posted slight gains in their ratings in:

- Science self-efficacy
- Internet proficiency
- SCANS skills

The following graph shows high school (HS) participants' Baseline-Time 2 means for indices. A complete data table with ratings on each item may be found in Appendix D.

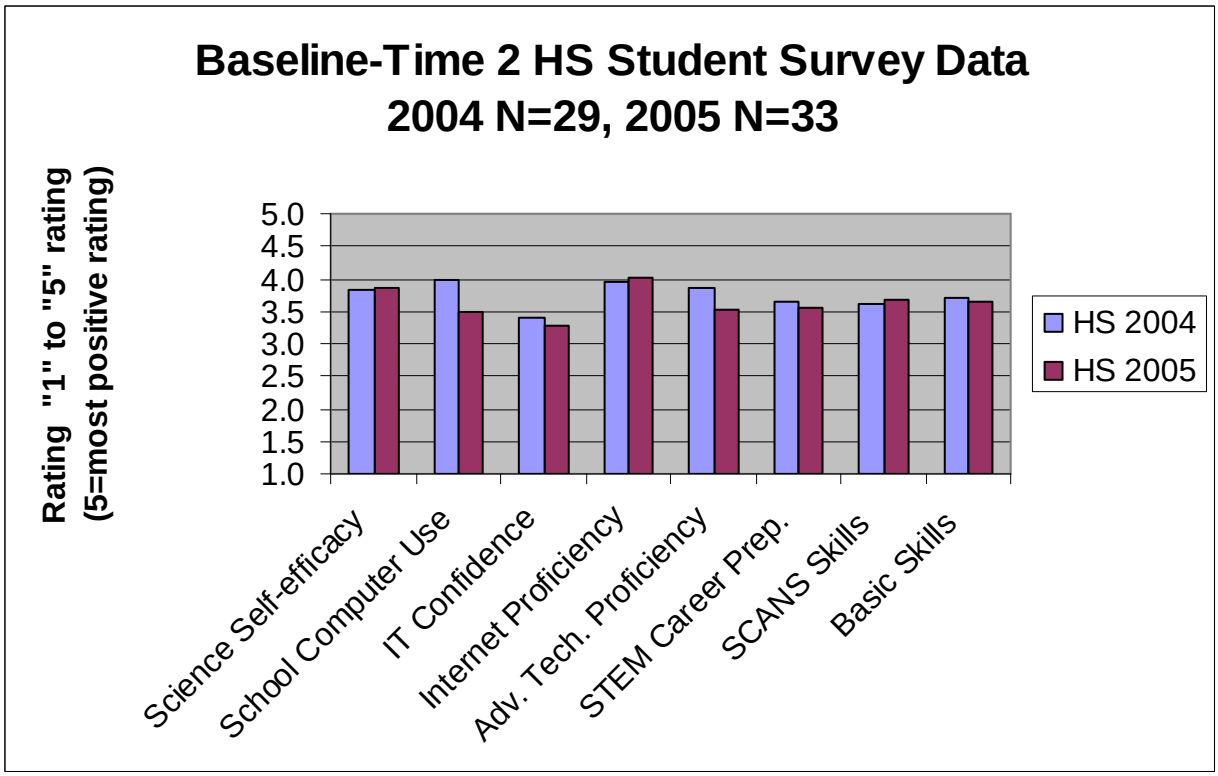


Figure 1: Baseline to Time 2 High School Student Mean Ratings on Student Survey

A matched set of surveys was used for a more rigorous 2005 analysis of the student survey data. Ten high school students completed a 2004 survey and either a spring break or summer camp survey in 2005. They served as the Baseline to Time 2 group. The matched group was composed of three males and seven females. All were in tenth or eleventh grade, all Native American. They all expressed interest in focusing on science while at Salmon Camp and saw science as a subject

they enjoy and hope to pursue in their education and as a career possibility. Half of the ten matched Baseline to Time 2 students participated in only the two summer sessions. The other half also participated in spring break and/or enrichment sessions, with three of them participating in all types of sessions available to them. Survey results documented students' self-reported attitudes and skills before their participation in the first NSF-ITEST Salmon Camp and at Time 2 (a year later in most cases).

The Baseline-Time 2 data showed students appear to be gaining confidence and self-efficacy in their science interest and learning. The following table shows agreement in their attitudes toward science. Further analysis revealed that changes were distributed across students rather than an intact group of two–three students accounting for improvements in ratings.

Table 5
SCRT Student Survey Responses on
Confidence and Self-Efficacy with Science

Survey Item	Percentage Agreement	
	2004	2005
Science teachers have made me feel I have the ability to go on in science.	60	80
I am sure of myself when I do science.	50	70
I would choose to take an elective science class.	50	70
My teachers have been interested in my progress in science	40	70
I'll need a good understanding of science for my future work.	50	70

Four of these items emerged in the 2004 analysis as attitudinal questions that pointed toward areas where students had high rates of undecidedness or disagreement. These areas have become areas of growth:

- I am sure of myself when I do science.
- I would choose to take an elective science class.
- My teachers have been interested in my progress in science.
- I'll need a good understanding of science for my future work.

The next section of the survey asked students to report on the kinds of things they do "a lot" using a computer at school. As in the previous year, students continued to report high rates of:

- Looking up information on the World Wide Web
- Word processing activities
- Creating presentations (PowerPoint, KidPix, etc.)

In addition, 60 percent of the students in 2005 reported using computers in school for:

- Spreadsheet activities
- Looking up information on CD-ROMs

In the Baseline and Time 2 data, students reported confidence in their abilities to create graphs from spreadsheet data, use advanced features of a word processor, and digitally manipulate graphics. Internet-related skills in which students reported high proficiency in 2004 received comparable or higher ratings in 2005—notably the Web-related items. Furthermore, students posted gains in some areas where they did not report proficiency in 2004. The following table shows student agreement levels with their Internet proficiency.

Table 6
SCRT Student Survey Responses on Internet Proficiency
N=10

Survey Item	Percentage Agreement	
	2004	2005
Manage names and groups in an address book	80	80
E-mail messages and attachments	90	100
Create and use bookmarks/favorites	80	70
Send, receive, and open e-mail attachments	90	100
Create a Web page	40	70
Maintain/edit a Web site	20	60
Web searches	70	90

At both data points, students reported a lack of confidence or proficiency in several areas of higher level technology use that may be addressed by the project in the future such as:

- Using statistical software for data analysis
- Importing data from a GPS to a database
- Using formulas and/or functions in a spreadsheet
- Creating database reports
- Using ArcView to make maps
- Using GIS software to analyze data

The high school Salmon Campers expressed high interest in science and technology, although in both years only about half knew which classes to take to help them succeed in a science career. In 2005, students reported higher rates of agreement on several items related to science and resource management. This trend points toward significant change in a key area of interest and impact for the Salmon Camp project. These items are highlighted in the following table:

Table 7
SCRT Student Survey Responses on
Science Career Preparation
N=10

Survey Item	Percentage Agreement	
	2004	2005
I can explain how computer applications are used in science.	0	40
I can explain how resource managers use technology to analyze data.	10	40
I have been involved in activities that help me think about science/resource management career options.	50	90
I know of steps I can take to prepare for a career in science/resource management.	30	60

There also appears to be some growth in students' workplace and basic skills over the year. Mathematics was the area where most students rated themselves as good or great (70%) in 2004. Students' assessment of their skills in mathematics continued to be positive in 2005, although slightly fewer (60%) rated themselves as good or great. Interestingly, students' estimations of their "listening" skills improved from 50 percent rating themselves as good or great in 2004 to 80 percent ratings of good or great in 2005.

Ratings on workplace skills remained fairly stable with the exception of students planning "time, money, materials, and space to get things done," in which 30 percent of the students rated themselves as good or great in 2004. In 2005, this improved to 60 percent of the students agreeing on the item.

Overall, the comparison study of students from Baseline to Time 2 on the high school survey revealed that students felt they had strong skills in basic computer literacy with room for growth in using more advanced information technology tools. They are gaining proficiency with Internet-related skills such as work on Web sites. Students reported strong gains in their understanding of technology applications in science and resource management. They report a high level of involvement in science/technology career preparation activities. The lack of confidence and support for pursuing science in school in 2004 seemed to be greatly diminished in 2005. Students are also gaining valuable study and work skills in listening and planning.

SCRT Middle School Student Survey Findings

Twenty-three middle school students completed the student survey. Since only three of the students had completed a survey the previous year, a matched comparison with baseline data was not reasonable. The first part of the survey measured students' attitudes toward science and technology and self-efficacy as science learners. Most students agreed that science would be important to them as community members and in their careers. However, one-third or more of the students were undecided on five of the seven questions in this section. The following table shows results for these items.

Table 8
SCRT Middle School Survey Responses on Attitudinal and Self-efficacy Items
N=23

Survey Item	Strongly Disagree		Disagree		Undecided		Agree		Strongly Agree	
	Count	%	Count	%	Count	%	Count	%	Count	%
Understanding science will help me be a better community member.	—	—	—	—	7	30%	15	65%	1	4%
Science is hard for me.	4	17%	8	35%	5	22%	5	22%	1	4%
I think I could handle more difficult science.	4	17%	4	17%	4	17%	9	39%	2	9%
My teachers believe I am good at understanding science.	1	4%	3	13%	7	30%	9	39%	3	13%
I'll need a good understanding of science for my future work.	1	4%	—	—	7	30%	7	30%	8	35%
I can explain how computers are used in science.	4	17%	4	17%	7	30%	7	30%	1	4%
I want to learn more about using technology in science.	—	—	3	13%	9	39%	4	17%	7	30%

Students showed confidence in their workplace and collaborative skills in their responses to the items drawn from the SCANS skills. Most students rated themselves at least "OK" on the items. A majority of students reported strengths in their collaborative skills and thinking creatively. The weakest area was in taking careful steps to solve problems. The following table reports results for these items.

Table 9
SCRT Middle School Survey Responses on
SCANS Skills Items
N=23

Survey Item	Bad News		Not bad, could be better		OK		Quite good		I'm Great	
	Count	%	Count	%	Count	%	Count	%	Count	%
I plan my time, money, materials, and work space to get things done.	—	—	6	26%	11	48%	3	13%	3	13%
I work well on teams, teach others, lead, negotiate, and work well with people from culturally diverse backgrounds.	—	—	2	9%	8	35%	8	35%	5	22%
I think creatively to imagine new ideas.	—	—	1	4%	9	39%	7	30%	6	26%
I take careful steps when I am trying to solve problems.	1	4%	3	13%	10	44%	7	30%	2	9%

The middle school students also reported confidence in their basic academic skills. Most students saw themselves as at least "OK" in core academic areas as well as speaking and listening. Mathematics, which was reported as a strength among high school students, was an area where students reported less skill. The following table shows students' ratings.

Table 10
SCRT Middle School Survey Responses on
Basic Academic Skills Items
N=23

Survey Item	Bad News		Not bad, could be better		OK		Quite good		I'm Great	
	Count	%	Count	%	Count	%	Count	%	Count	%
Reading skills	—	—	3	13%	8	35%	6	26%	6	26%
Writing skills	—	—	6	26%	8	35%	5	22%	4	17%
Mathematics skills	4	17%	4	17%	5	22%	4	17%	6	26%
Speaking skills	1	4%	5	22%	8	35%	5	22%	4	17%
Listening skills	2	9%	3	13%	6	26%	8	35%	4	17%

In-camp Interview Findings

The in-camp interviews were conducted with all 24 high school SCRT participants toward the end of each camp session. The interviews drew from expressed interests and goals gathered during previous assessments (either the pre-camp phone interview or the SCRT Student Survey). A full report on the in-camp interviews may be found in Appendix E. Overall, the interviews substantiated survey and parent interview results. Findings indicated that Salmon Camp gave students more specific knowledge of careers, technology tools, and job skills as well as supporting interest in science in school. The numbers and the percentages in the following section are out of the total population of 24 students.

Science career interests

- The majority of participants (79%) can see themselves working in a science career some day, and marine biology/fisheries continues to be the science career interest mentioned most by participants (9 participants).
- Most participants (88%) think Salmon Camp is helping them explore their career interests. When asked how, participants responded that Salmon Camp has expanded their thinking about career options (50%) and provided them with hands-on experience with real scientists (33%).
- When asked how Salmon Camp could help participants explore their interests further, most responses were about more exposure to researchers (21%) or activities (21%). One participant suggested that SCRT staff prepare some written information to distribute ahead of time. This has happened in past camps and SCRT staff may want to consider this request.
- When participants were asked what they had learned about the integration of traditional Native American knowledge and modern science, there appeared to be a difference between the experiences provided at the camps. While six participants gave responses about specific traditional methods, and four talked about the traditional integrated with modern, another four gave responses that could be categorized as traditional Native

American knowledge versus modern science rather than integrated with modern science. Three of these four were participants from the California camp (only three participants from the California camp answered this question and all of them fell into this category). This difference can be attributed to a particular presenter at the California camp. SCRT staff might consider how to help all participants take away the message that the two methods can be integrated.

Computers and technology

- Salmon Camp is making participants more aware of how computers and technology are used in science/resource management. Almost all participants (92%) were able to name a specific example of a technology they had used during the camp. GPS technology was the most frequently mentioned example (12 participants), as it has been during previous programs. Participants also mentioned specific types of wildlife or water monitoring technology and software such as Excel, PowerPoint, and GIS.
- When asked how Salmon Camp could help them gain more experience with computers and technology, participants were interested in having more time and opportunities for hands-on use of computers and different technology (63%).

Work experience and skills

- The work experience and skills participants said they gained during the camp were related to having hands-on/real-world experience (63%) and communication/teamwork (21%).
- When participants were asked how Salmon Camp could further help them with work experience and skills, 11 participants suggested that the camp could provide more of the types of experiences already provided (e.g., more science and math activities, more hands-on experience, and more interactions with professionals). One participant requested SCRT staff help with resume development.

Connections to school

- Most participants (75%) say that Salmon Camp is helping/will help them in school and also that it will help them develop the knowledge and skills to take advanced math or science classes (63%).
- Few participants are receiving or think they can receive school credit for attending Salmon Camp (33%). Most simply did not know if they could and were not sure how to go about finding out. SCRT staff may want to consider further supporting participants in getting school credit for their attendance.
- When asked if they would be interested in having internships and mentors, almost all participants would like an internship (96%), while just over half are interested in mentors (58%). Some participants already have mentors or people who fulfill that role. However, there was more enthusiasm for internships—particularly in marine biology/fisheries (seven participants). Internships may appeal to participants more than having mentors because internships can provide hands-on experiences that let participants explore different options, while having a mentor may force them to be more focused on a particular area.
- Salmon Camp staff could consider ways to help participants find relevant internships. Perhaps weekend enrichment programs could be used to teach participants how to pursue an internship, practice interview skills, and help them develop resumes.

Future plans

- Almost all of the participants (96%) plan on attending future SCRT camps because they found the camps to be both fun and educational.
- When asked about their plans after high school graduation, most participants said they wanted to go on to college (88%) and some mentioned pursuing specific programs or careers (wildlife biology, other biology, nursing, English literature, business, cooking).

Objective Three

Students will work together with educational and professional mentors through cooperative hands-on, inquiry-based research activities.

To gather data on the impact of Salmon Camp on students in their school work and career preparation, phone interviews were conducted with a sample of parents. Ten parents of students who attended a high school Summer Camp session were randomly selected. Seven were reached for interviews. The semi-structured phone interview posed questions on each of the project objectives. (See Appendix A for a copy of the protocol and verbatim responses.) Parent responses were unanimously positive and appreciative of Salmon Camp at every level. The parents felt that their children were being exposed to technology, science, and resource management careers and professionals which was having a positive effect on their children's school work and interests. They saw connections between Salmon Camp and what their children were doing in science classes. Parents expressed high interest in supporting their children in science and IT-related internships. Several parents mentioned that their child had a mentor at school and viewed that as a positive additional support structure. Most parents simply could not praise the approach, mentors, and staff members associated with Salmon Camp enough.

Objective Four

Provide students with opportunities to interact in a positive and supportive learning and work environment.

The summer camps provided daily opportunities for students to interact in learning environments. Daily camp schedules and debriefing sessions with counselors provided insight into opportunities to learn and work with others. Although students in the summer sessions often saw scientists and resource managers at work in their field sites rather than their offices, they were exposed to field sites as authentic outdoor work environments. High school students in each session met with numerous specialists during their camp experience. The specialists spoke with students or engaged them in activities during their presentations or fieldwork. Students interacted with presenters or researchers on topics ranging from indigenous knowledge to highly sophisticated information technology tools and field protocols. (See Appendix F for a sample camp schedule.)

As another indicator of the extent to which these interactions were positive and supportive, the end-of-session feedback forms asked several related questions. On the feedback forms nearly all

the high school students and most middle school students agreed that Salmon Camp met their expectations, made them more curious about science, and was fun. One question asked if students would recommend the program to others. The 2005 high school spring break camp received significantly more positive ratings on all the affective questions than the middle school spring break session. As mentioned earlier, the survey used a four-point scale ranging from "No way" to "Yes!" For analyses a numeric rating was assigned to responses with "1" as the lowest rating and "4" as the highest. (See Appendix C for data tables by session.) Table 11 shows means for middle and high school spring break and summer sessions on related questions. Ratings on all items for both groups were quite high. As with the other end-of-session survey responses, the high school students were slightly more positive than the middle school students.

Table 11
SCRT End-of-Session Survey Responses on Affective Questions

Summer Sessions 2004, 2005
Spring Break Session 2005

Survey Item	Year and Session	High School Mean (s.d.) Summer 2004 N=19 Summer 2005 N=24 Spring 2005 N=10	Middle School Mean (s.d.) Summer 2004 N=23 Summer 2005 N=24 Spring 2005 N=22
Did Salmon Camp meet your expectations?	2004 Summer Camp	3.7 (.5)	3.2 (.9)
	2005 Summer Camp	3.8 (.5)	3.4 (.6)
	2005 Spring Break	3.8 (.4)	2.9 (.6)
Has this program made you more curious about science?	2004 Summer Camp	3.6 (.5)	3.1 (.7)
	2005 Summer Camp	3.4 (.7)	3.3 (.6)
	2005 Spring Break	3.9 (.3)	2.9 (.8)
Did you have fun?	2004 Summer Camp	3.9 (.2)	3.3 (1.1)
	2005 Summer Camp	4.0 (.2)	3.8 (.4)
	2005 Spring Break	4.0 (.0)	3.6 (.8)
Would you recommend this program to others?	2004 Summer Camp	4.0 (.2)	3.6 (.9)
	2005 Summer Camp	3.4 (.8)	3.8 (.4)
	2005 Spring Break	4.0 (.2)	3.6 (.7)

Enrichment sessions were also very well received. Means are reported in Table 12. Note the extremely high rates of "fun" and recommendations to others.

Table 12
SCRT End-of-Session Survey Responses on Affective Questions
Combined High School and Middle School Enrichments 2004–2005
N=15

Survey Item	Year and Session 2004–2005	Mean (s.d.)
Did Salmon Camp meet your expectations?	2004–2005 Enrichments	3.4 (.5)
Has this program made you more curious about science?	2004–2005 Enrichments	2.9 (.8)
Did you have fun?	2004–2005 Enrichments	3.9 (.3)
Would you recommend this program to others?	2004–2005 Enrichments	4.0 (.0)

SUMMARY

The National Science Foundation—Information Technology Experiences for Students and Teachers Grant to the Oregon Museum of Science and Industry for the Salmon Camp Research Team is making strong progress toward achieving objectives. The full spectrum of measures used to date show many accomplishments and suggest impact on students who received the "full treatment" of enrichments, spring break sessions, and summer camp during the 2004–2005 academic year. A summary of findings to date was shared during the Third Annual NSF ITEST Summit poster session (see Appendix G for selected slides from the poster).

Successes

Student feedback from the summer camps was very positive. Two and a half weeks is a long period of time for high school students to be involved in a project of this nature. The retention of nearly all students through the duration of the camp is an accomplishment in itself and speaks to the success of the project. The high school students in the summer sessions rated their experiences somewhat more positively than the middle school students who participated in a one-week session. Evaluation findings indicate that across sessions, Salmon Camp successfully:

- Provided culturally relevant experiences to Native American students in the high school sessions, less so for middle school students
- Exposed students to some technology use in the field, particularly Global Positioning Systems
- Improved understanding of science content and resource management ideas
- Heightened interest and curiosity in science

High school students appeared to enjoy the presentation of their final projects. They were well versed in their topics and professional in their presentations. This is an area where students could build on their skills as they become more involved in specific research projects and present findings.

In parent interviews parents of high school campers unanimously shared their highly positive view of Salmon Camp. In some cases, parents attribute involvement in the camp with sustaining their children's interest and achievement in science. Some parents saw ways in which Salmon Camp experiences have led to internships and summer jobs for their children as well. For others, the cultural connection is equally important.

Considerations

In planning for the coming academic year, evaluation findings point to several worthwhile considerations. Two major objectives were touched on during the summer sessions but will be more relevant in the next stage of implementation: addressing educational standards and working with educational and professional mentors. These are both important areas that should help sustain student involvement with the project. They also may help increase student confidence in science and provide support for advanced study, two areas in which most students gave themselves low ratings on the SCRT Student Survey. Other areas that were addressed during summer camps and have potential for growth are:

- Increased involvement of students with ongoing field research through mentors or school year activities.
- Building on student presentation skills with an eye toward presentation of research studies.
- Greater attention to field notebooks, student journals, or products to demonstrate growth and achievement. These could be valuable to students in their regular science classes or portfolios for job/school.
- More skill building with technology tools. Students have been exposed and are highly interested in learning more.
- Opportunities to use problem solving strategies and collaboration in the field. These are areas where few students feel they have strong skills and are critical career/personal skills.
- SCRT staff might consider how to help all participants take away the message that the traditional Native American knowledge and modern science ideas can be integrated.
- SCRT staff may want to consider further supporting participants in getting school credit for their attendance at summer camp.
- Salmon Camp staff could consider ways to help participants find relevant internships. Perhaps weekend enrichment programs could be used to teach participants how to pursue an internship, practice interview skills, and help them develop resumes.

From the perspective of camp staff there needs to be more time between camp sessions in the summer. After a two-and-a-half-week session counselors and leaders needed more than a couple of days to be reenergized and organized for the next session. Continuous intensive involvement increases the likelihood of staff burnout and interpersonal strife.

Overall, the project appears to be on track to continue making strong progress toward achieving objectives. Project leaders are commended on achievements to date. They have shown commitment to assuring project success and responsive to evaluative feedback. The aim of this report is to further support project growth with information so that the project planners can make data-based as well as experience-based decisions.

CITATIONS

Fennema, E., & Sherman, J. (1976). Fennema-Sherman Mathematics Attitudes Scales: Instruments designed to measure attitudes toward the learning of mathematics by female and males. JSAS: Catalog of Selected Documents in Psychology, 6, 31.

ProfilerPro. URL: http://profilerpro.com/

Secretary's Commission on Achieving Necessary Skills. WHAT WORK REQUIRES OF SCHOOLS. Washington, DC: SCANS, U.S. Department of Labor, 1991. (ED 332 054)

Appendices

Appendix A-1
Paper Copy of SCRT Student Survey form

Welcome to Salmon Camp!

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: _____Today's Date: _____
(Please Print)

What is your gender?
☐ Male
☐ Female

What grade will you be in for Fall 2004?
☐ 7th
☐ 8th
☐ 9th
☐ 10th
☐ 11th
☐ 12th

Please list science classes you took last year:

What is your ethnicity? (Please check all that apply.)
☐ Alaskan Native/Native American
☐ Black/African American
☐ White/Caucasian
☐ Asian/Pacific Islander
☐ Latino/Hispanic
☐ Other (please specify):_____

Please continue on other side

Part II: Below are statements concerning science. Please indicate how you really feel by circling the response which shows you "strongly agree," "agree," are "undecided," "disagree," or "strongly disagree" with the statement.

Understanding science will help me be a better community member.
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

Science is hard for me.
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

Science teachers have made me feel I have the ability to go on in science.
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

I am sure of myself when I do science.
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

Doing well in science is not important for my future.
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

My teachers think advanced science will be a waste of time for me.
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

I would choose to take an elective science class.
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

I think I could handle more difficult science.
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

It's hard to get science teachers to respect me.
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

Most subjects I can handle OK, but I just can't do a good job in science.
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

My teachers have been interested in my progress in science.
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

I'll need a good understanding of science for my future work.
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

Please continue on other side

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

The kinds of things I do a lot on a computer at SCHOOL are:

1. Subject-specific software (for math, reading, etc.)
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

2. Word processing activities
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

3. Spreadsheet activities
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

4. Database activities
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

5. Creating presentations (PowerPoint, KidPix, etc.)
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

6. Looking up information on CD-ROMs
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

7. Looking up information on the World Wide Web (Internet)
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

I feel confident that I could:

8. Use advanced features of a word processor (tables, headers and footers, macros, table of contents, columns, etc.)
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

9. Import data from a Global Positioning System (GPS) to a database
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

10. Use formulas and/or functions in a spreadsheet (Excel, SPSS, SAS, etc.)
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

Please continue on other side

11. Create database reports
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

12. Create a graph from spreadsheet data
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

13. Use statistical software for data analysis
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

14. Use ArcView to make maps
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

15. Use Geographical Information Systems (GIS) software to analyze data
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

Using the Internet, I can proficiently:

16. Manage names and groups in an address book
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree
17. Reply to and forward email messages
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

18. Create and use bookmarks/favorites
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

19. Send, receive, and open email attachments
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

20. Create a Web page
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

21. Maintain/edit a Web site
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

22. Search for and find the Smithsonian Institution Web site.
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

Please continue on other side

I can proficiently:

23. Create an electronic presentation
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

24. Scan a document
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

25. Reduce, enlarge, or crop a graphic
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

26. Convert graphics from one file format to another
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

Science and Technology

27. I can explain computer applications used in science
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

28. I can explain how resource managers use technology to analyze and interpret data
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

29. I want to learn more about using technology in science or resource management
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

30. I have been involved in activities that help me think about career options
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

31. I know which classes to take to help me succeed in a science career
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

32. I know of steps I can take to prepare for a career in science/resource management
☐ Strongly Agree
☐ Agree
☐ Undecided
☐ Disagree
☐ Strongly Disagree

Please continue on other side

Part IV: Rate yourself on the following skills

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

Bad News Not bad, could be better OK Quite good I'm great

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

Bad News Not bad, could be better OK Quite good I'm great

I think creatively to imagine new ideas.

Bad News Not bad, could be better OK Quite good I'm great

I use logical reasoning to make decisions.

Bad News Not bad, could be better OK Quite good I'm great

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

Bad News Not bad, could be better OK Quite good I'm great

I can draw conclusions from reliable evidence.

Bad News Not bad, could be better OK Quite good I'm great

Basic Skills

Overall:

Bad News Not bad, could be better OK Quite good I'm great

Reading:

Bad News Not bad, could be better OK Quite good I'm great

Writing:

Bad News Not bad, could be better OK Quite good I'm great

Mathematics:

Bad News Not bad, could be better OK Quite good I'm great

Speaking:

Bad News Not bad, could be better OK Quite good I'm great

Listening:

Bad News Not bad, could be better OK Quite good I'm great

Please continue on other side

Part V: During Salmon Camp we will be working on all of the following areas. Please mark TWO that you really want to focus on or learn more about, and elaborate on why you chose those two.

Subject Area	Why?
_____Information Technology	
_____Science	
_____Resource Management	
_____Interpersonal Skills	
_____Critical Thinking	

Last Question: What do you hope to gain from Salmon Camp?

Appendix A-2
In-Camp Interview Form

OMSI is interested in the number of Salmon Camp programs each student has attended over the years. Please help us out by filling in the information below.

Student's name:		
Street address:		
City, state, zip code:		
Home phone:		
Year of birth:	Name of high school:	
☐ male ☐ female		
Please check if you have attended Salmon Camp or SCRT programs during the times listed:		
2004-2005	☐ summer camp '04	☐ weekend(s) (Sept. '04 – May '05) ☐ spring break '05
2003-2004	☐ summer camp '03	☐ weekend(s) (Sept. '03 – May '04) ☐ spring break '04
2002-2003	☐ summer camp '02	☐ weekend(s) (Sept. '02 – May '03) ☐ spring break '03
2001-2002	☐ summer camp '01	☐ weekend(s) (Sept. '01 – May '02) ☐ spring break '02
2000-2001	☐ summer camp '00	☐ weekend(s) (Sept. '00 – May '01) ☐ spring break '01
1999-2000	☐ summer camp '99	☐ weekend(s) (Sept. '99 – May '00) ☐ spring break '00
1998-1999	☐ summer camp '98	☐ weekend(s) (Sept. '98 – May '99) ☐ spring break '99
1997-1998	☐ summer camp '97	☐ weekend(s) (Sept. '97 – May '98) ☐ spring break '98
1996-1997	☐ summer camp '96	☐ weekend(s) (Sept. '96 – May '97) ☐ spring break '97
☐ Not sure (please explain):		

Salmon Camp Research Team
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

Do you plan on attending future Salmon Camp programs? YES NO NOT SURE

Why or why not?

What are your plans after high school?

Are you 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 A-3: Sample End-of-Session Feedback Form
OMSI Salmon Camp Research Team—Summer 2005—Middle School
End of Camp Feedback

c

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

Your gender? **Male** ☐ **Female** ☐

The grade will you be in (fall 2005): 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. What were the three most interesting things you learned at camp?

1.

2.

3.

7. What surprised you the most?

8. Would you recommend this program to others?

☹ No way! 😐 Not really ☺ I think so ☺ YES!

Why, or why not?

In the table below, please tell us which 3 scientists/researchers you learned the most from during Salmon Camp, and what you learned:

Scientist/researcher	What You Learned
1.	
2.	
3.	

What was your favorite camp activity?	Why?
What technology tools interested you most?	

Other thoughts/comments/suggestions?

~~~~~~~~~~~~~~~~~Thanks so much for your input. Have a great summer!~~~~~~~~~~~~~~~~~

Appendix A-4
Post-camp SCRT Student Interview Questions

Question 1: A major goal of Salmon Camp is to increase your exposure to and interest in technology, science, and resource management. So, here you are at the end of camp…Did it work? How have your experiences over the last few weeks impacted your skills/knowledge/interest in technology, science, and resource management?

Question 2: Part of your involvement with Salmon Camp includes follow-up sessions during the year. What kinds of things do you think would be interesting to do/learn more about during those sessions?

Question 3: What suggestions do you have to make Salmon Camp better?

Appendix A-5
SCRT Parent Interview Questions and Verbatim Responses

Question 1: A major goal of Salmon Camp is to increase students' exposure to and interest in technology, science, and resource management. Do you think it's working? Are there ways that your child's experience in Salmon Camp impacted their skills/knowledge/interest in technology, science, and resource management? (e.g.)

Responses:

- Awesome.
- [Student] had a great time—clicks happen—but it was really great.
- They get to experience so much.
- Great—loved these people.
- It's a class act.
- Fabulous.
- We love it, I don't know what else to say.
- [Student] is already planning for next year.

Question 2: Have you seen any evidence of:

…Increased interest in science/technology in school work/courses connected to Salmon Camp?

Responses:

- [Student] wants to pursue science in college now.
- It's opened up eyes as to what's out there.
- It's a wonderful part of a whole portfolio.
- There are a lot of connections with science s/he's taken—biology, marine biology, chemistry.
- [Student] will now take every science class s/he can.
- [Student] has already done some stuff from biology that's related to what they did this summer.
- Oh yes, all the science and technology, it just adds up.

…Science and IT-related internships and jobs?

Responses:

- The presentations are totally cool.
- Anything with a computer will help with internships and jobs.
- [Student] is taking calculus-based physics.
- [Student] talked about different technology they used, kept a journal and went through the whole thing when s/he got back [home].
- The family watches the discovery channel and PBS specials, [student] will say, "We used something like that in Salmon Camp!"
- [Student] got an internship last year because of being in Salmon Camp.

Question 3: One objective of Salmon Camp was to work with students to connect them with educational and professional mentors. Suggestions on how to get this going?

Responses:

- [Student] tried to talk to teacher about credit but didn't get anywhere. We tried to explain to the teacher that it's not just playing around, but they have their own curriculum, etc.
- [Student] has lots of support at school and home, doesn't really need a mentor.
- The self-confidence from being out there "on own" so to speak is wonderful.
- Yes, the mentorship is already taken care of, got it set the first week of school. The math/science teacher set it up and guidance counselor.

Question 4: Part of Salmon Camp includes follow-up sessions during the year. What kinds of things do you think your child would be interested in doing/learning more about during those sessions?

Responses:

- This is so important. School science can be defeating. I wish science in school could be more like Salmon Camp—experiential, learning while doing. [Student] learns so much in Salmon Camp and it fits with his/her learning style, but back at school it's just rote memorization and textbook learning. So, keeping involved through the year is really important.
- [Student] wants to go every year, or 2 times/year.
- Spring break was gauged for Oregon, but it's OK
- Weekend enrichments, s/he's interested in, but it's just hard to get there.
- [Student] was going to go this weekend, but had family commitments
- Driving—getting there from here is the only challenge.
- More of anything from the summer would be good.

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

Responses:

- What's really nice is the small group [for high school students].
- [Salmon Camp leaders] are flexible about going with the flow of what they're interested in.
- [Student] has been keeping in contact with some of the campers s/he met.
- [Student] would like more chemistry and testing and sampling.
- It's a great program. [Student] really want to do it again. I can't really think of ways to improve. [Student] is interested in being a counselor for the middle school kids.
- [Student] definitely wants to go back next year. The entire thing is great.
- [Student] likes meeting more people.
- It's great, informative.
- [Student] likes the friends they've made. The presentations are really neat to show what they've been doing at the end.

Suggestions:

- [From a student:] Working with the fish hatchery people and park rangers was good, but we didn't hear back about what we studied. It would be nice to learn what they found out.
- Could a CD of pictures and their PowerPoints be made available?
- Could there be Salmon Camp for parents? That would be really cool.
- Make sure the flyers about the programs get out. We never got anything in the mail last year.

Appendix B
Alignment of OMSI's Salmon Camp Research Team Curriculum with the National Science Education Standards

As noted in the Overview of the National Science Education Standards (http://www.nap.edu/readingroom/books/nses/html/overview.html#content), "The *Standards* rest on the premise that science is an active process. Learning science is something that students do, not something that is done to them." This premise captures the essence of the Salmon Camp Research Team as well. The active involvement of students in field research and exposure to the work and ideas of scientists and resource managers build student understanding and skills across the standards. The following sections specify curriculum alignment with the *Standards*.

Life Science Standards

TABLE 6.3. LIFE SCIENCE STANDARDS

LEVELS K-4	LEVELS 5-8	LEVELS 9-12
Characteristics of organisms	Structure and function in living systems	The cell
Life cycles of organisms	Reproduction and heredity	Molecular basis of heredity
Organisms and environments	Regulation and behavior	Biological evolution
	Populations and ecosystems	Interdependence of organisms
	Diversity and adaptations of organisms	Matter, energy, and organization in living systems
		Behavior of organisms

Salmon Camp Research Team (SCRT) programming incorporates several of the Life Science Standards benchmarks. The following high school benchmarks are addressed regularly in many aspects of SCRT programming.

- Molecular basis of heredity
- Biological evolution
- Interdependence of organisms
- Matter energy and organization in living systems
- Behavior of organisms

Concepts and Activities

SCRT's primary focal point is fisheries biology, with a particularly heavy accent on salmon ecology, and salmon population restoration efforts. Students work with researchers in the field and receive presentations from professionals focusing on ecological issues related to salmon. In order for students to understand the nature of salmon ecology, they must understand the complex ecological interactions that drive and influence salmon populations.

The students perform a myriad of activities that allow them to understand energy and nutrient cycling in natural ecosystems, and they get first hand experience understanding the interdependence of organisms in the wild. These lessons come in many different forms. Students spend time collecting and analyzing data, they perform a variety of habitat monitoring activities such as GPS mapping of stream morphology and terrain features, performing water quality chemical analysis, performing fish counts and snorkel surveys, and directly participating in a variety of riparian restoration projects.

The genetics of different salmonid stocks play a crucial role in fisheries biology. During SCRT programming the students visit federal, state, and tribal fish hatcheries and interact with a variety of professionals learning the importance of maintaining genetic diversity and how different populations of salmon species have evolved very

specifically to exist in the streams where they complete their life cycles. The SCRT students have participated in a wide variety of habitat restoration projects; several of these projects have involved planting native plants in riparian areas. In order for these plants to have the best chances of surviving they need to be grown from genetically localized plant populations. SCRT programming also involves interactions with a variety of wildlife biologists. Some of these biologists deal with endangered populations, through interactions with these scientists the students are able to gain an understanding of how important genetic diversity is and how interconnected all the organisms in an environment really are.

Earth and Space Science Standards

TABLE 6.4. EARTH AND SPACE SCIENCE STANDARDS

LEVELS K-4	LEVELS 5-8	LEVELS 9-12
Properties of earth materials	Structure of the earth system	Energy in the earth system
Objects in the sky	Earth's history	Geochemical cycles
Changes in earth and sky	Earth in the solar system	Origin and evolution of the earth system
		Origin and evolution of the universe

Science in Personal and Social Perspectives

TABLE 6.6. SCIENCE IN PERSONAL AND SOCIAL PERSPECTIVES

LEVELS K-4	LEVELS 5-8	LEVELS 9-12
Personal health	Personal health	Personal and community health
Characteristics and changes in populations	Populations, resources, and environments	Population growth
Types of resources	Natural hazards	Natural resources
Changes in environments	Risks and benefits	Environmental quality
Science and technology in local challenges	Science and technology in society	Natural and human-induced hazards
		Science and technology in local, national, and global challenges

Nearly all of the activities that SCRT students participate in focus on natural resource management, indeed the program is billed as a natural resources career exposure program. Natural resource management can encompass nearly every field of science in one way or another. The students work with researchers in the field collecting data that can be used to help validate various management approaches. Different resource management schemes directly influence energy and nutrient flow in urban and rural ecosystems, it can affect geochemical cycles by altering erosion and other weathering patterns, it can also directly influence habitat abundance and therefore population dynamics.

The SCRT participants spend time monitoring the effects of different management practices. The data they collect and the scientists they interact with give them an understanding how different management schemes can have negative or positive effects on environmental quality and overall ecosystem health. Different management schemes can also influence the effects of storms, earthquakes, and other natural disasters. The SCRT participants work with a variety of cutting-edge technological tools being used by researchers. SCRT participants can be used to help spread and propagate.

C-1 End-of-Session Survey Responses
SCRT-All Enrichments 2004–2005

N=15

Item	Ratings (4=Most positive rating) Percentage (n)				
	No Way	Not Really	I Think So	Yes!	Average Rating
Did Salmon Camp meet your expectations?	—	—	60% (9)	40% (6)	3.4
Has this program made you more curious about science?	—	33% (5)	40% (6)	27% (4)	2.9
Did you learn about resource management?	—	7% (2)	53% (8)	40% (6)	3.3
Did you gain skills in using technology in science research?	—	7% (2)	47% (7)	47% (7)	3.4
Did you have fun?	—	—	13% (2)	87% (13)	3.9

What were the three most interesting things you learned at camp?

# Responses	Knowledge/Skill/Activity
4	Traditional culture/knowledge/land management/tribes that inhabited the area
3	The Redwood's canopy level
2	GPS
2	Flint knapping.
2	Native/indigenous rights
1	GIS
1	Tullie ducks
1	Tsunami deposits
1	David West at SOU
1	How the Redwoods were managed
1	How a tremble unit worked

C-2 End-of-Session Survey Responses
SCRT-All High School Spring Break Sessions 2005

N=10

Item	Ratings (4=Most positive rating) Percentage (n)				
	No Way	**Not Really**	**I Think So**	**Yes!**	**Average Rating**
Did Salmon Camp meet your expectations?	—	—	20% (2)	80% (8)	3.8
Has this program made you more curious about science?	—	—	10% (1)	90% (9)	3.9
Did you learn about ecological relationships and ecosystems?	—	—	60% (6)	40% (4)	3.4
Did you gain skills in using technology in science research?	—	10% (1)	40% (4)	50% (5)	3.4
Did you have fun?	—	—	—	100% (10)	4.0

C-3 End-of-Session Survey Responses
SCRT-All Middle School Spring Break Sessions 2005

N=21

Item	Ratings (4=Most positive rating) Percentage (n)				
	No Way	**Not Really**	**I Think So**	**Yes!**	**Average Rating**
Did Salmon Camp meet your expectations?	—	24% (5)	62% (13)	14% (3)	2.9
Has this program made you more curious about science?	—	36% (8)	36% (8)	27% (6)	2.9
Did you learn about ecological relationships and ecosystems?	—	19% (4)	57% (12)	24% (5)	3.1
Did you gain skills in using technology in science research?	—	23% (5)	64% (14)	14% (3)	2.9
Did you have fun?	5% (1)	9% (2)	5% (1)	82% (18)	3.6

C-4 End-of-Session Survey Responses
SCRT-All High School Summer Sessions 2005

N=24

Item	Ratings (4=Most positive rating) Percentage (n)				
	No Way	**Not Really**	**I Think So**	**Yes!**	**Average Rating**
Did Salmon Camp meet your expectations?	—	4% (1)	13% (3)	83% (20)	3.8
Has this program made you more curious about science?	—	13% (3)	33% (8)	54% (13)	3.4
Did you learn about ecological relationships and ecosystems?	—	13% (3)	58% (14)	29% (7)	3.2
Did you increase your science knowledge?	4% (1)	8% (2)	29% (7)	58% (14)	3.4
Did you gain skills in using technology in science research?	—	20% (5)	38% (9)	42% (10)	3.2
Did you have fun?	—	—	1% (4)	96% (23)	4.0

What were the three most interesting things you learned at camp?

Responses % (#)	Knowledge/Skill/Activity
15% (23)	Science
35% (12)	Resource management/ecosystems
26% (9)	Technology tools
44% (15)	Other skills such as • Outdoor sports/skills (kayaking, snorkeling) (4) • Interpersonal skills (2) • Positive experience (8)

C-5 End-of-Session Survey Responses
SCRT-All Middle School Summer Session 2005

N=24

Item	Ratings (4=Most positive rating) Percentage (n)				
	No Way	**Not Really**	**I Think So**	**Yes!**	**Average Rating**
Did Salmon Camp meet your expectations?	—	4% (1)	50% (12)	46% (11)	3.4
Has this program made you more curious about science?	—	8% (2)	54% (13)	38% (9)	3.3
Did you learn about ecological relationships and ecosystems?	—	33% (8)	42% (10)	25% (6)	2.9
Did you increase your science knowledge?		8% (2)	33% (8)	58% (14)	3.5
Did you gain skills in using technology in science research?	—	21% (5)	54% (13)	25% (6)	3.0
Did you have fun?	5% (1)	9% (2)	5% (1)	78% (18)	3.8

Appendix D
SCRT High School Student Survey Data Table

Attitudes toward science	Strongly Disagree		Disagree		Undecided		Agree		Strongly Agree	
	Count	%	Count	%	Count	%	Count	%	Count	%
Understanding science will help me be a better community member.	1	3.0%	2	6.1%	5	15.2%	20	60.6%	5	15.2%
Science is hard for me.	7	21.2%	19	57.6%	3	9.1%	3	9.1%	1	3.0%
Science teachers have made me feel I have the ability to go on in science.	1	3.0%	3	9.1%	4	12.1%	18	54.5%	7	21.2%
I am sure of myself when I do science.	1	3.0%	2	6.1%	6	18.2%	16	48.5%	8	24.2%
Doing well in science is not important for my future.	11	33.3%	11	33.3%	8	24.2%	1	3.0%	2	6.1%
My teachers think advanced science will be a waste of time for me.	13	40.6%	9	28.1%	9	28.1%			1	3.1%
I would choose to take an elective science class.	1	3.0%	2	6.1%	8	24.2%	12	36.4%	10	30.3%
I think I could handle more difficult science.	2	6.1%	4	12.1%	8	24.2%	15	45.5%	4	12.1%
It's hard to get science teachers to respect me.	9	27.3%	15	45.5%	5	15.2%	4	12.1%		
Most subjects I can handle OK, but I just can't do a good job in science.	13	40.6%	16	50.0%	1	3.1%	1	3.1%	1	3.1%
My teachers have been interested in my progress in science.	1	3.0%			7	21.2%	17	51.5%	8	24.2%
I'll need a good understanding of science for my future work.	2	6.1%			10	30.3%	10	30.3%	11	33.3%

The kinds of things I do on a computer at school are:	Strongly Disagree		Disagree		Undecided		Agree		Strongly Agree	
	Count	%	Count	%	Count	%	Count	%	Count	%
Subject-specific software (for math, reading, etc.)	5	15.6%	6	18.8%	7	21.9%	12	37.5%	2	6.3%
WORD PROCESSING ACTIVITIES	1	4.0%	2	8.0%	4	16.0%	11	44.0%	7	28.0%
Spreadsheet activities	3	9.1%	9	27.3%	3	9.1%	13	39.4%	5	15.2%
DATABASE ACTIVITIES	4	12.1%	7	21.2%	11	33.3%	9	27.3%	2	6.1%
Creating presentations (PowerPoint, KidPix, etc.)	1	3.0%	4	12.1%	3	9.1%	19	57.6%	6	18.2%
LOOKING UP INFORMATION ON CD-ROMS	6	18.2%	4	12.1%	4	12.1%	16	48.5%	3	9.1%
Looking up information on the World Wide Web (Internet)	1	3.0%			1	3.0%	11	33.3%	20	60.6%

I feel confident that I could:	Strongly Disagree		Disagree		Undecided		Agree		Strongly Agree	
	Count	%	Count	%	Count	%	Count	%	Count	%
Use advanced features of a word processor (tables, headers and footers, macros, table of contents, columns, etc.)	2	6.1%	2	6.1%	6	18.2%	15	45.5%	8	24.2%
IMPORT DATA FROM A GLOBAL POSITIONING SYSTEM (GPS) TO A DATABASE	3	9.1%	5	15.2%	9	27.3%	11	33.3%	5	15.2%
Use formulas and/or functions in a spreadsheet (Excel, SPSS)	2	6.1%	9	27.3%	3	9.1%	13	39.4%	6	18.2%
Create database reports	3	9.1%	5	15.2%	13	39.4%	7	21.2%	5	15.2%
Create a graph from spreadsheet data	3	9.1%	1	3.0%	4	12.1%	17	51.5%	8	24.2%
Use statistical software for data analysis	2	6.1%	4	12.1%	13	39.4%	10	30.3%	4	12.1%
Use ArcView to make maps	6	18.2%	10	30.3%	9	27.3%	7	21.2%	1	3.0%
Use Geographical Information Systems (GIS) software to analyze data	7	21.2%	6	18.2%	9	27.3%	8	24.2%	3	9.1%

Using the Internet, I can proficiently:	Strongly Disagree		Disagree		Undecided		Agree		Strongly Agree	
	Count	%	Count	%	Count	%	Count	%	Count	%
Manage names and groups in an address book	2	6.1%	1	3.0%	3	9.1%	13	39.4%	14	42.4%
Reply to and forward e-mail messages	1	3.0%			1	3.0%	14	42.4%	17	51.5%
Create and use bookmarks/favorites	2	6.1%			3	9.1%	13	39.4%	15	45.5%
Send, receive, and open e-mail attachments	1	3.0%			2	6.1%	13	39.4%	17	51.5%
Create a Web page	1	3.0%	6	18.2%	5	15.2%	13	39.4%	8	24.2%
Maintain/edit a Web site	1	3.0%	6	18.2%	6	18.2%	14	42.4%	6	18.2%
Search for and find the Smithsonian Institution Web site.	2	6.1%	1	3.0%	4	12.1%	17	51.5%	9	27.3%

I can proficiently:	Strongly Disagree		Disagree		Undecided		Agree		Strongly Agree	
	Count	%	Count	%	Count	%	Count	%	Count	%
Create an electronic presentation	2	6.1%	9	27.3%	3	9.1%	10	30.3%	9	27.3%
Scan a document	1	3.0%	3	9.1%	6	18.2%	14	42.4%	9	27.3%
Reduce, enlarge, or crop a graphic	1	3.0%	6	18.2%	5	15.2%	12	36.4%	9	27.3%
Convert graphics from one file format to another	3	9.1%	6	18.2%	11	33.3%	7	21.2%	6	18.2%

Science and Resource Management	Strongly Disagree		Disagree		Undecided		Agree		Strongly Agree	
	Count	%	Count	%	Count	%	Count	%	Count	%
I can explain computer applications used in science	2	6.1%	10	30.3%	5	15.2%	10	30.3%	6	18.2%
I can explain how resource managers use technology to analyze and interpret data	2	6.1%	7	21.2%	9	27.3%	14	42.4%	1	3.0%
I want to learn more about using technology in science or resource management	3	9.1%	2	6.1%	6	18.2%	16	48.5%	6	18.2%
I have been involved in activities that help me think about career options	1	3.0%	2	6.1%	3	9.1%	18	54.5%	9	27.3%
I know which classes to take to help me succeed in a science career	2	6.1%	3	9.1%	7	21.2%	14	42.4%	7	21.2%
I know of steps I can take to prepare for a career in science/resource management	1	3.0%	4	12.1%	8	24.2%	13	39.4%	7	21.2%

SCANS Skills	Not Bad		OK		Good		Great		5	
	Count	%	Count	%	Count	%	Count	%	Count	%
I plan my time, money, materials, and work space to get things done	1	3.0%	8	24.2%	9	27.3%	10	30.3%	5	15.2%
I work well on teams, teach others, lead, negotiate, and work well with people from culturally diverse backgrounds	2	6.1%	2	6.1%	6	18.2%	15	45.5%	8	24.2%
I think creatively to imagine new ideas	2	6.1%	3	9.1%	5	15.2%	11	33.3%	12	36.4%
I use logical reasoning to make decisions			3	9.1%	11	33.3%	12	36.4%	7	21.2%
I take careful steps when I am trying to solve problems			4	12.1%	8	24.2%	16	48.5%	5	15.2%
I can draw conclusions from reliable evidence			2	6.1%	11	33.3%	13	39.4%	7	21.2%

Academic skills	Not Bad		OK		Good		Great		5	
	Count	%	Count	%	Count	%	Count	%	Count	%
Overall Basic Skills			1	3.1%	11	34.4%	16	50.0%	4	12.5%
Reading	2	6.1%	3	9.1%	5	15.2%	10	30.3%	13	39.4%
Writing	3	9.1%	3	9.1%	9	27.3%	13	39.4%	5	15.2%
Mathematics	2	6.1%	2	6.1%	10	30.3%	9	27.3%	10	30.3%
Speaking			9	27.3%	12	36.4%	8	24.2%	4	12.1%
Listening	1	3.1%	1	3.1%	8	25.0%	11	34.4%	11	34.4%

Appendix E

Report of SCRT participants' interests in careers and job skills
Results from summer 2005 in-camp interviews

Introduction

This document contains results from in-camp interviews conducted with OMSI's Salmon Camp Research Team (SCRT) summer 2005 high school age participants. These results are to be considered along with results from other methods (e.g., pre-post annual assessments, end-of-session feedback, and other logistical documents). The results are intended to help guide camp improvements with respect to the Salmon Camp objectives.

SALMON CAMP OBJECTIVES

The goal of the Salmon Camp project is to create a continuum of culturally relevant, information technology (IT) focused, science experiences for middle school through high school age students with Native American community affiliations to address their educational and career needs.

The objectives of Salmon Camp are to:

1a. Develop and disseminate a model science IT camp that addresses national and state education standards and is relevant to the cultural experience of Native American students.

1b. Immerse students in a culturally relevant, IT intensive, scientific research experience that will allow them to apply information technology to the resolution of real-world natural resource problems.

2. Enable students to gain experiences and skills necessary to obtain science and IT-related internships and jobs.

3. Enable students to work together with educational and professional mentors through cooperative hands-on, inquiry-based research activities.

4. Provide students with opportunities to interact in a positive and supportive learning and work environment.

SCRT SUMMER 2005 HIGH SCHOOL CAMPS

Three SCRT high school camps were held in the summer of 2005. The camps were held in three different geographical locations – Oregon, California, and Washington. Each camp was three weeks long and all shared common curriculum goals related to technology and natural resource management. That is, despite the unique geographical regions, they were not intended to have a unique focus on any particular area of technology or science.

IN-CAMP INTERVIEW OBJECTIVE

The in-camp interviews were conducted with participants near the end of the camp experience. They were intended to yield data related to all four of the Salmon Camp objectives. Results from the interviews should help staff members better understand participants' interests in careers and job skills and how to adapt the camp to serve those interests.

In-camp interview method

PARTICIPANTS

There were seven participants in the Oregon camp, five participants in the California camp, and 12 participants in the Washington camp for a total of 24 SCRT high school participants (14 male and 10 female). One participant attended both the Oregon and California camps and completed an interview for each camp. For the purposes of this report she is counted separately in each camp attended and treated as two participants because some of her responses to the interview questions differed between the camps. Interviews were conducted with all 24 participants (Table 1).

Table 1. Participation in summer 2005 camps and in-camp interviews.

Location	Female	Male	Total
Oregon camp participants	2	5	7
California camp participants	3	2	5
Washington camp participants	5	7	12
Total camp participants	**10**	**14**	**24**

Half of the participants had attended other SCRT camps or programs during the 2004–2005 academic year. Of these, a total of eight participants attended a 2004 summer camp, six attended a weekend enrichment program, and seven attended a spring break program.

IN-CAMP INTERVIEW INSTRUMENT

The in-camp interview guides were created to learn more about the participants' interests in science careers, computers and technology, work experience and skills, the relationship of SCRT to success in school, and future plans. The in-camp interview guides were based on the instruments used for the 2005 spring break program interviews with slight modifications, most notably, a question was added about the integration of traditional Native American knowledge and modern science (Appendix E.A).

In-camp interview procedure

The in-camp interviews were conducted near the end of the camps so that participants could share their interests after exposure to SCRT. The SCRT coordinator conducted all 24 interviews using his laptop computer to directly type in the responses as he talked with the participants.

In-camp interview results

Each section of the interview guide contained both categorical and open-ended questions. The responses are totaled for the categorical questions for each section. The open-ended responses are totaled and grouped by any meaningful groupings. Totals may not add up to 24 because not all participants answered every question and in some cases participants gave multiple responses.

SCIENCE CAREER INTERESTS

Camp participants were asked if they could see themselves working in a science career some day. The majority of the participants (19 of the 24) said yes, three said no, one said not sure, and one said maybe (Table 2). It is important to keep in mind that only applicants that were interested in careers related to science and resource management were invited to participate in the camp.

Table 2. Responses when asked if participants could see themselves working in a science career some day.

Response	Total
Yes	19
No	3
Not sure	1
Maybe	1

Next, participants were asked to name the science career they could see themselves working in one day. The most frequent answer was marine biology/fisheries (nine of the participants). Interestingly, marine biology/fisheries was also the most frequent response of the participants during the 2004 pre-summer camp phone interviews and during the 2004 spring break interviews. Careers related to wildlife were the second most frequent response. See Table 3 for all responses.

Table 3. Science careers participants could see themselves working in one day.

Category of response	Total
Marine or fisheries biology	9
Wildlife biology	4
Chemistry	2
Not sure	2
Ethnobotany Forestry General biology Human anatomy Nursing Park ranger Salmon Camp counselor Zoology	1 each

In order to gain insight into how participants' science and career interests are served by SCRT, participants were asked if Salmon Camp helped them explore their career interest a little bit more and, if so, how. Almost all participants (21) said that Salmon Camp had helped them explore their area of interest, and three said no, it had not (Table 4).

Table 4. Responses when asked if Salmon Camp had helped participants explore their career interests.

Response	Total	Comments
Yes	21	
No	3	It hasn't helped because I'm planning on doing something in business.

When asked how Salmon Camp has helped them explore their area of interest, the responses fell into four categories: 1) expanded thinking on career options; 2) gave experience in the field; 3) met real scientists; and 4) helped gain knowledge. See Table 5 for all responses by grouping.

Table 5. Responses when asked how Salmon Camp helped participants explore their area of interest.

Category of response	Total	Responses
Expanded thinking on career options	12	• It's broadened my ideas of what's out there, there's many specific areas of careers that relate say to water for example. • It has showed me that there are other things that are out there in the science field. It showed me the fisheries stuff, and river surveys, and timber company issues. • It got me open minded about science, and made me like it more. • By showing me different jobs that I could do in the science field. • It helped me learn different things about science jobs. • I never even knew this stuff about science existed. I didn't know that all these science careers existed, it's really opened my eyes. • It opened my eyes to more science careers that I didn't know were out there. • It's shown me how to get jobs on the path that I want. It has opened up career opportunities. • I've learned that you can be very broad in your knowledge, you can do lots of different stuff. I never actually thought that you can do lots of different stuff. I also learned that volunteer work can help you advance your career as you learn about more stuff. • It like gives me a better view of what my options are in the science field. • At first I was interested in being a marine biologist, but I have changed my mind. I think it has opened up a lot of doors, because there are a lot of science jobs that I didn't realize they were science jobs. It has helped me figure out what I like and what I find interesting. • By just getting a feel for all the different job types and different activities.
Gave experience in the field	4	• We went and did snorkel surveys, learned about different fish species, visited fish hatcheries. • Varied experiences in different circumstances. • Doing hands-on work and looking at jobs I might want to do in the future. • It taught me about the life around me, as in nature and stuff, and it got me more involved in what it's like to work in fisheries biology.
Met real scientists	4	• Meeting the different scientists and researchers. • I have learned how a lot of the people got to the jobs they have today. • We've been going around to lots of different places and meeting lots of different people and having them teach me about what it might be like to do what they do for a living. • I saw lots of different people doing their jobs, and I got a better feel for what it would be like to be involved with those careers.
Helped gain knowledge	3	• It makes me learn more about science. • It helped me learn skills that I think could be useful in the future. • By teaching me more about science and nature.

Then participants were asked if they had suggestions on how Salmon Camp could help them explore their career interest more. Half of the participants (12) did not have suggestions or were satisfied with how Salmon Camp was helping them explore their career interests. One of these participants specifically mentioned that the "level of staff interaction has been great." Several participants made suggestions to involve more researchers and offer more activities. A specific suggestion was made to show participants a flyer or booklet of activities ahead of time. This comment is of particular of

interest because research has shown that people learn more from an experience when they are given some orientation in advance (e.g., Balling, Falk, and Aronson's study as cited in Falk & Dierking, 2000, p.117). SCRT instructors may want to consider providing more information to participants ahead of time about specific topics or activities they will explore during the camp. The suggestions and comments from the participants are listed in Table 6.

Table 6. Suggestions for how Salmon Camp could help participants explore their interests more.

Category	Total	Suggestions
Researchers	5	• Get the person's name and address in case you want to contact them later on. • By getting more scientists to come out. • Meet more people with stronger science backgrounds. • Get more of the researchers' backgrounds. • Maybe have time to do a little more in depth exploration/discussion with the different scientists so you can get a better feel for their jobs.
Activities	5	• I think we should do journals, maybe not a forced thing, but give us the option. • Maybe try to get a little more variety in the activities. • Just more hands-on experience. • If we did more with the fish. • I think it would be interesting to expand the places that we go, I think that would create a better understanding of more areas of science, try to have a broader focus. This trip in particular is different than other camps I have done, it was very focused on plants.
Other	3	• Be a bit more organized, maybe have some sort of a booklet/flyers prepared ahead of time. • More experience that I can put on my resume. • Talk about jobs, and tell us about things.

The final question in this section was *"What have you learned about the integration of traditional Native American knowledge and modern science?"* This question was new to the interview guide and had not been asked at previous camps or programs. A little over half (14) of the participants were able to give specific responses about what they had learned and these are listed in Table 7. These are grouped into the categories: specific traditional methods, traditional versus modern, and traditional integrated with modern. Of the remaining 10 participants, seven answered that they had not learned anything or did not know if they had learned anything about the integration of traditional Native American knowledge and modern science, two gave answers that were very general, and one did not understand the question.

Interestingly, four of the 14 (almost 30%) who answered this question gave responses that could be categorized as traditional Native American knowledge *versus* modern science rather than *integrated* with modern science. Three of these four were participants from the California camp (only three participants from the California camp answered this question and all of them fell into this category). This difference can be attributed to a particular presenter at the California camp.

If SCRT staff had intended to stress that traditional knowledge and modern science are integrated, then they might consider how to increase the likelihood that all of the participants take away that message.

Table 7. What participants learned about the integration of traditional Native American knowledge and modern science.

Category	Total	Responses
Specific traditional methods	6	• By putting native plants back in the river, and monitoring fish populations in a non-obtrusive way. • How fire was used to control brush/grasses, and how they are using it now. • They have combined in the hatcheries, figuring out the kind of food they need. • They used a lot science in their methods. • I learned that a lot about traditional foods and ecosystem management and how living in different areas meant different things, and how the life style of natives lives relates to different seasons and how it relates to resource utilization. • I've learned about fire ecology and Native Americans used fire to clear forests and manage ecosystems.
Traditional versus modern	4	• I think I learned more from the native peoples, they know how to help this fish, and they know they know what to do, it's just that the government isn't listening to them, like Bush is like what ever, nobody cares what's happening. • I've learned how the cultures are now being affected by government, and how you have to try and please the government and try to get things done for your tribe. • How tribal scientists are trying to restore the native ways that relate to fish and forestry stuff. How tribal staff is trying to get native traditional knowledge and belief ideas across to political folks in Washington DC, and how native knowledge can be used to help restore ecosystems. • That modern western life style is very wasteful and heavily impacts the environment, and Native Americans were much more resourceful and frugal.
Traditional integrated with modern	4	• Usually if you combine the two you have an excellent result. • I learned how many traditional practices are reemerging in modern times and are still relevant despite technological advances. • That they are trying to get science back to the way that Native Americans treated the land. • I learned about different plants that natives used and how they are being used in modern medicine.

Computer and technology interests

The next section of the interview explored the computer and technology interests of the participants. First they were asked if they thought that Salmon Camp had made them more aware of how computers and technology are used in science/resource management. The majority of the participants answered yes (19), three said sort of, and two said no (Table 8).

Table 8. Responses when asked if Salmon Camp had made them more aware of how computers and technology are used in science/resource management.

Response	Total
Yes	19
Sort of	3
No	2

As a follow-up question, the participants were asked if they could give an example from the camp of how computers and technology are used in science/resource management. Almost all (22) of the participants were able to give at least one specific example of technology they used during the camp. The remaining two participants gave more general answers about the use of technology in science/resource management. The most frequent technology mentioned was GPS, which was also the technology most frequently mentioned during the 2005 spring break program interviews and the 2004

summer camp interviews. Participants also mentioned water quality monitoring technologies, fish tracking, GIS, Excel, presentation software, and bat monitoring. See Table 9 for responses.

Table 9. Participant's examples of how computers and technology are used in science/resource management.

Category of response	Total	Sample responses
GPS	12	• Using GPS units, and satellites and pinpointing exact locations and stuff. • By showing me that GPS systems, and how fancy they can get. Plotting oak trees, and entering the data into the computer. • Using the GPS units, and how you can observe change over time. • Using GPS to plot transects and run surveys. • We've done a lot of GPS work in different settings, using PDAs, and learning how computers have made things a whole lot easier. Using the GPS units to vegetative sampling and habitat monitoring. Using the Trimble GPS units to create maps of sampling plots on the computers. Using the GPS units in Idaho to map Camas.
Water quality monitoring (Washington camp)	6	• Using the YSI probes, and entering the data onto a computer. • I didn't know that those things could be used, and I didn't know they existed, it's more complicated than I thought it would be. • Using the turbidimeter, and the other probe stuff.
Fish tracking (California camp)	4	• For example the fish tags, how they each have numbers and how they know where that fish came from based on the fish tag number. The company that makes the tags has a database and anyone can access this information. • Like with the fish tags, using pit tags, and sonic fish counting, radio telemetry.
Excel	3	• Mapping the water quality graphs, using the excel spread sheets. • Entering the data we collected in Sisters into excel programs, and making graphs of the data.
GIS	3	• GIS software to look at maps of the areas. Doing vegetative surveys/sampling work, monitoring soil density, mapping different survey plots.
Bat monitoring (Oregon camp)	2	• Looking at the sonograms of the bats on the computer and how to ID species based on frequency of the bat's call.
Presentation software	2	• I've been collecting lots of information from the internet for my presentation. • Using computers to do presentations for ourselves and seeing professional using them to present to us.
General	2	• Because we use the computers for a lot of different things. To help us understand about the salmon. • I already knew that a lot of these technologies were used in science, but I didn't really know how. Now I have a better understanding of how these technologies are used.

Participants were asked how Salmon Camp could help them learn more about computers and technology. Of the 23 participants who answered this question, 13 responded that they would like the opportunity to use the technology more/have more hands-on time, five did not have suggestions, and two would like to use more types of technology. Three participants gave other specific and unique suggestions. See Table 10 for the complete list of responses.

Table 10. Responses when asked how Salmon Camp can help participants learn more about computers and technology.

Category of response	Total	Responses
Use technology more/more hands-on	13	• I think we should carry around our own computers and write down different journals type things in our computers. • A smaller more focused GPS survey of an area, more in depth exploration. • We could do a lot of things, I would like more practice GPS units. • Have more hands-on working with scientists to learn how they are using computers and technology. • Giving us computers to work on, doing more software training. • Use more computer software. • By spending more time on the computers. • Spend more time on the computer I guess. • By doing more computer work, spending more time on it. • By working on it more. • Use more of them. • Do more hands-on stuff. • More hands-on experience.
Use more types of technology	2	• Taking us to go see different areas of science where we might see areas of technology we haven't already learned. • Have a period of time set aside for different technology systems like you did for the GPS systems.
Other	3	• Make sure the SCRT GPS units are working better. • Maybe, bring computers out into the forest, and enter the data directly onto the computer, that's where it's going to be eventually, so maybe that makes a little bit more sense. • Maybe create a network with all the laptops, let everyone have a computer and GPS units so we could all learn how to use them as a team and get a better understanding of how to use them as a group.

Work experience and skills

The work experience and skills section of the interview started by asking participants if Salmon Camp has helped them build skills they might be able to use at a job later on. Almost all of the participants said yes (23 of the 24), one participant was not sure. Next the participants were asked to name the skills Salmon Camp has helped them build. Participants brought up experiences and skills related to hands-on/real-world experience, communication/teamwork, and general experiences and skills. The responses are grouped by experience or skill in Table 11.

Table 11. Skills participants might use in a job later on.

Category of response	Total	Reponses
Hands-on/real-world experience	15	• By learning about the different types/options in fisheries biology, and by using the GPS units. • Yes, like using GPS or YSI probes. • The GPS stuff, and the overall experience. • Like the fish hatcheries, and how to feed the fish, and how to take care of fish and raise them. • Like what they do at hatcheries. • Learning experience, hands-on fisheries experience. • Like working doing the snorkel surveys. • Using Powerpoint, learning about the Elwah Dam issue, learning how they are using technology to map out the changes that will occur. • We've been going around and getting the hands-on working knowledge of working with the different researchers. • All the technology I've been exposed to, all the stuff I can write down on my resume, and it's introduced me to people like Joseph Jones that want to hire me. • I learned a lot about vegetative sampling techniques. • Like knowing what different trees and animals are. Presenting in front of my peers will help me prepare for the future. Learning about vegetative sampling is used in science and how it relates to other areas of science. • We experience different parts of resource management jobs such as surveying and testing. • I live around salmon and wildlife in Alaska, and I got some exposure to different careers, now I can say that I have experience in wildlife biology and other sciences. • All kinds of stuff, doing the hands-on stuff with park service staff, basically everything we did this trip.
Communication and teamwork	5	• Working with groups and having to deal with things that you might not want to do. Communication skills and learning to deal and live with people that you might not necessarily want to deal with. • Social skills, communications skills, listening and respecting different perspectives. Understanding group dynamics a little better. • Interacting with people in the field, working as a team. Social skills, cooperation, multitasking. • I have also learned about good communication skills are really important. • Communication.
General	2	• Science stuff, even though I don't think I'll have a science career. • To do as much as you can, get as much out of life as you can.

Participants were then asked about how the camp has helped them develop these skills. This follow-up question was not asked of every participant. The four responses are listed in Table 12.

Table 12. Participants' responses to how the camp had helped them develop job skills.

Responses (4)
• It shows me that science isn't boring, it's showing you how fun it can be, and that's why I like it, it's fun.
• By really doing the activities, getting out there and seeing the fish.
• By giving me first hand experience using them.
• Because you have to work together in a group or else it won't work.

For the final question in this section, participants were asked what Salmon Camp could provide to help them build job skills further. Half of the participants (12) did not have suggestions; the other half would like the camp to basically provide more of the types of experiences already provided. One participant requested that SCRT provide help on resume writing. The responses are listed in Table 13.

Table 13. Suggestions for what Salmon Camp could provide to help them build job skills further.

Responses (12)
• Work on leadership skills, more science.
• Probably do more teamwork oriented activities.
• More thoroughly, explain things, explain things for different types of learning styles.
• Maybe narrow the focus, choose an area that really interests you and explore it further.
• Maybe having more of a focus in wildlife biology.
• Do more math type activities, because there's math in science.
• It could provide more diversity in the interactions with professionals.
• Work on resumes, and how SCRT could help on resume.
• Experience using more programs and instruments.
• Teach me more.
• More hands-on stuff.
• I always like hands-on work.

Connections to school

The connections to school section had two slightly different sets of questions, one for participants who had attended a Salmon Camp program before, and one for new participants. Half of the participants were new and half were returning. The responses are combined in this report because there was no difference in how each group answered the questions; the only difference is in how the questions were worded to each group (to acknowledge previous participation or not). See Appendix A for both versions in the Connections to School section.

Participants were asked several questions related to Salmon Camp and its connections to success in school. Participants were also asked if they were receiving school credit for their participation and if they were interested in having mentors and internships.

First, participants were asked if their participation in Salmon Camp helped/will help them succeed in school. Eighteen participants answered yes, four said sort of, and two said no. As a follow-up, the participants were asked why or why not (Table 14).

Table 14. Responses when asked if Salmon Camp had helped participants succeed in school and why.

Response	Total	Why
Yes	18	**General school skills:** • It gives me new goals. When we visited HSU it made me think about how I need to improve, and how I need to be thinking about the future. • It's teaching me lessons like when times get hard don't quit. It's taught me how to focus my energy and keep a long term goal in sight. • It teaches me more detail than what the teacher teaches me in class, it provides a more in-depth exploration. • I usually do good in school, and it has made think more about how I need to do good in school now so I can get what I want in the future. Increase my level of concentration, it has let me actually think about topics more in depth. • It helps me concentrate, and learn skills such as organization. • Due to the fact that I feel I will talk more in class now, I'm usually really quiet, but I've developed social skills and confidence on this trip. **Specific subject matter:** • Geography and some of my specific classes. Like in geography when we're learning about the environment in different areas, and how different land use practices have affected that environment. • It's made me more interested in my biology class. • In natural science and biology. • It goes into detail about things, like ecology issues, water shed management, etc. and you need detail to understand. • In my science courses, and working doing hands-on stuff in science. • It helped me with my science, and a little bit in technology. • It has gotten me ahead in science, I'm taking a junior level class, and I'm a sophomore. • I know more about science now. • In science and maybe a tiny, tiny bit of social studies. • I learned a lot of new things, I've learned more respect and responsibility. **Computer skills:** • The computer stuff I do here is used at school, using Word, Excel, etc. Preparing and presenting the presentations help me a lot. Continuously learning, lots of mental stimulations. Lots of talking, thinking about college and the future, learning about scholarships. Careers, and how to obtain what you want out of life. • It would, through advanced computer skills.
Sort of	4	• It has helped me in certain areas of science. • Maybe in science. • Helps me get more interested in my science classes. • When I take ecology I might have a little bit of a head start on some of the stuff.
No	2	• I'm doing pretty good. • I haven't taken anything that relates to science camp.

Participants were asked if they thought that Salmon Camp was helping them develop the knowledge and skills to take advanced math or science classes. Over half (15) thought it was, six said they were

not sure, and three said no. When asked why, participants mentioned the hands-on experiences from Salmon Camp (Table 15).

Table 15. Responses when asked if participants thought Salmon Camp was helping them develop the knowledge and skills to take advanced math or science classes.

Response	Total	Sample reasons why
Yes	15	• I really did well in biology, because of all the plants and animals I have learned about in SCRT. • Advanced science, just learning about all the different types of plants and animals. By being in the places we went and learning about the animals there and how they live in a certain environment. • The forest sampling tools we used will probably help me in math classes. • Maybe in advanced biology classes in the future. I learned how to use excel, which will be useful in future science classes. • With ecology. • More in depth knowledge on natural science and biology. • I have more direct knowledge about science. • Science probably, math kind of. Helping to create a general knowledge base. • It's fieldwork that you don't get in a classroom. • I'd say so. Learning new things on the computer, getting a broader knowledge base. • Providing more detail, more in depth exploration. • Like I'll have a better understanding of the subject material that my teachers are teaching me about. • It probably is, but I don't want to take them.
Not sure	6	• Depending on what science classes I'll be taking next year. • A little bit, the focus here is a little too narrow.
No	3	• Because I knew a lot of the stuff, it was just review. • Most of the science and math classes I take are more advanced than this, but this helps with real world application.

Participants were asked if they have received school credit for their participation in Salmon Camp and, if not, did they know how to find out if they could get credit. A little more than half of the participants (14) did not know how to find out if they could get school credit, five participants have already received school credit, three think they can and will look into it, and two said no, they cannot get school credit for their participation (Table 16).

Table 16. Responses when asked if they have received or know how to receive school credit for participation in Salmon Camp.

Response	Total
Not sure how to find out	14
Yes	5
Probably and will look into it	3
No	2

Next participants were asked about mentors and internships. When asked if they were interested in having an active mentor this year, fourteen said yes, eight said no, and two did not answer. Several

participants already have a mentor, and many who said they would like a mentor wanted their mentor to be a teacher or someone else they already interact with (see Table 17).

Table 17. Whether participants would like a mentor and who they would want.

Response	Total	Sample reasons why and who
Yes	14	• I have 2 mentors, they teach me things about jobs. One of them is a fisheries biologist, and the other is my science teacher. • I have a mentor. • My biology teacher basically acts as a mentor, he's helping me think about what I want to do for the future, and what I need to. • Probably my math teacher. • Probably some of the science teachers at school. • I don't have an active mentor, but I think that the varsity basketball coach would be a great person to have as a mentor. • I don't have a mentor but I'm interested in it, I'm not sure who I want it to be. • Someone who knows a lot about botany and science. • I don't have one, but I would be interested in having someone fill that role but I don't know who that person could be.
No	8	• I have a school counselor, I can ask SCRT staff about careers, and I can talk to family members about other problems. • My teachers fill that role already. • But if I ever needed help I know that Joseph Jones would help me get further down my career path. • I'm not interested in having a mentor, I don't know why.
No Answer	2	• I did have a mentor in Lego robotics.

When the participants were asked if they would be interested in an internship this year, all but one said yes, they were interested. The participant who said no, qualified his answer by saying not this year because he was too young. When asked what internship they might want, seven participants said marine biology or fisheries related, four others specified internships in other fields of science that were related to Salmon Camp experiences, five were interested in something related to health/wellness, seven mentioned other kinds of internships, and two were not sure what type of internship they wanted (see Table 18).

Table 18. Total responses for participants interested in internships this year and what kinds of internships they are interested in.

Category of response	Total	Types of internships mentioned
Marine biology/fisheries	7	• Like doing some sort of fisheries biology work • Things that I would think about doing in the future, something that relates to water or fish. • Working with a marine biologist. • In some area of fisheries. • Doing something at a fish hatchery. • Doing something like my dad does, doing fisheries biology work. • Working as a marine biologist intern.
Other sciences related to Salmon Camp experiences	4	• Probably something related to chemistry. • In wildlife biology. • I'm interested in an internship in some field of science. • Doing some sort of wildlife biology.
Health/wellness	5	• Something in the health field. • Helping out at a hospital maybe. • Doing counseling. • Probably psychology. • I'd like to be a massage therapist.
Other	7	• Something in business management. • I'm interested in something that would relate to literary stuff, maybe something with book writing. • In design. • Washington state parks, doing trail restoration, or something along those lines. • Landscape architect. • I am doing an internship with a newspaper, I'm an assistant editor. • An internship in law, homicide detective or something along those lines.

The connections to school section ended with the question, *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).* Fifteen participants said no, and the responses of the other nine participants are listed in Table 19.

Table 19. Participants' extracurricular activities.

Responses (9)
• I'm a peer educator for NARA dealing with fetal alcohol syndrome.
• I do take Chinook language classes.
• I do the National Academy of Sciences.
• Lego Robotics.
• Basically an after school science club.
• I do Amnesty International.
• Upward bound, working with the food bank.
• I read and write about animals, and study them on my own time. It's all I do in my free time. Any opportunity I have to study animals I take.
• I did a lot of computer science stuff on my own.

Future plans

The final section of the interview focused on participants' future plans. Participants were asked if they planned on attending future Salmon Camp programs. Only one participant was not sure about attending future camps because he might be moving to Alaska. The other 23 participants (96%) answered yes. Most of the participants who said they planned on coming back said it was because Salmon Camp was fun and educational. Responses for why participants planned on attending future camps are listed in Table 20.

Table 20. Reasons why participants plan on attending future camps.

Responses (22)
• I've done it, I know that you do some pretty cool stuff with wildlife, and you learn a wide variety of jobs, I learned how different fields of science all relate to each other. I learned a lot, but there are still a lot of things I can learn.
• It's fun, and you get to meet other people and learn about their culture, and it broadens your knowledge on different science jobs that are out there.
• They are so much fun, they help keep you in shape, and it's time well spent. It's better than watching TV and getting fat on the couch all summer, and you get to meet all sorts of people, it lets you interact with a wide diversity of people that you might not ordinarily meet.
• It's fun, you can find things that you don't know about, talk to scientists and learn how they do the things they do and learn about that.
• I can get experience from them, and I can see what kind of stuff is out there in the science field.
• They teach me a lot of useful skills that I'll need in the future, and it's good for school, and it's bettering my life.
• It's fun, you get to meet new people, and I feel more connected with nature, and there are cool counselors.
• They're fun, you get paid, and you get more experience and meet new people.
• It's fun and it helps me learn more about science.
• It's fun, and I get to learn a lot.
• They are fun, and I find all the knowledge very interesting.
• I would, because I think they're a lot of fun, and I learn more hand-on application.
• I enjoy it here most of the time.
• It's a great experience and a great opportunity that not a lot of kids have, and I will take this experience and run with it.
• They are fun, you meet new people and make new friends.
• It was fun, good experience, I learned new things, met new people.
• It gives many different resources, gives you a broad exposure, and I like the relaxed ending, it's smooth.
• It's good experience.
• It's fun, you let us get away with much more things.
• I think it's fun.
• They're fun (2).

Next, participants were asked about their plans after high school. Twenty-one of these participants plan on going to college, two did not know, and one was considering a career in cooking. Some mentioned attending particular colleges or pursuing specific programs (wildlife biology, other biology, nursing, English literature, business).

Table 21. What participants plan to do after high school.

Response	Total	Sample responses
Go to college	21	• Go to college and study wildlife biology. • To go to college and get a degree either in nursing or some type of biology. • Go to college, maybe Humboldt State. • Go to college, either Stanford or Yale, and then go to the other as a graduate student. • Apply to Stanford. • I want to go to nursing school. • Go to college, hopefully a big university. • Go to college, start a business. • I want to take a year off and go to college, and I want to do literature stuff like English. • I want to go to college after taking a year off. • I'm going to wait a year to make some money and then go to college.
Don't know	2	
Other	1	• I'm gearing towards cooking, but I'm still thinking.

The final interview question was to ask if participants were interested in helping Salmon Camp as a counselor. Most of the participants said yes (19), three said no, and two said not sure. Most of the participants who answered yes, said it was because it would be fun and they could teach other kids. See Table 22 for responses.

Table 22. Response when asked if interested in helping Salmon Camp as a counselor and why.

Response	Total	Sample responses why
Yes	19	• Because I can help show other people what kind of science is out there and help them get interested in it. • It's the opportunity to share what I've learned, and to meet new people and to keep on going to salmon camp after I'm out of high school. • I practically grew up with SCRT, I've done it every summer for so long, and I'd like to meet and help lots of new people. • I went to outdoor school in 6th grade and I've thought about it ever since. This is one of the best camps I've been to and it might be nice to try it out. • To help people that are younger than me learn what I have learned. • To hopefully make their experience as good as mine was when I came here. • I'd like to help students experience what I've experienced, especially this year. • Because I get to tell the kids what I know about stuff, and I can also learn as well about being a counselor. • Because I think I can teach and help people learn about lots of different things. • Because it looks fun, and you could probably actually teach other people stuff and learn more. • Because it would be fun to travel around and interact with the kids. • So I can boss people around. • Because I'm liked by a lot of people.
No	3	• Too much responsibility • I don't like kids.
Not sure	2	

At the end of the interview, participants were asked if they had any other suggestions, comments or questions. Only one participant responded and suggested that the camp develop a clean-up crew for the van.

Summary of participants' interests

The results presented in this report can help OMSI staff better understand and describe the participants in the SCRT high school camp. Although this report does not contain specific recommendations, it is expected that this general information might benefit staff as they make decisions about curriculum, extra-curricular support, and educational techniques. In addition, the information can be used to describe the SCRT participants to future candidates, guest speakers, and camp partners. This report may also bring up questions that can be explored through future interviews or other evaluation techniques. The results of the 2005 SCRT summer camp interviews are very similar to the results from the previous two interviews conducted during the 2004 SCRT summer camps and the 2005 spring break programs.

Note: All 24 high school summer camp participants were interviewed. All of the numbers and the percentages below are out of 24.

Science career interests

- The majority of participants (79%) can see themselves working in a science career some day, and marine biology/fisheries continues to be the science career interest mentioned most by participants (9 participants).
- Most participants (88%) think Salmon Camp is helping them explore their career interests. When asked how, participants responded that Salmon Camp has expanded their thinking about career options (50%) and provided them with hands-on experience with real scientists (33%).
- When asked how Salmon Camp could help participants explore their interests further, most responses were about more exposure to researchers (21%) or activities (21%). One participant suggested that SCRT staff prepare some written information to distribute ahead of time. This has happened in past camps and SCRT staff may want to consider this request.
- When participants were asked what they had learned about the integration of traditional Native American knowledge and modern science, there appeared to be a difference between the experiences provided at the camps. While six participants gave responses about specific traditional methods, and four talked about the traditional integrated with modern, another four gave responses that could be categorized as traditional Native American knowledge *versus* modern science rather than *integrated* with modern science. Three of these four were participants from the California camp (only three participants from the California camp answered this question and all of them fell into this category). This difference can be attributed to a particular presenter at the California camp. SCRT staff might consider how to help all participants take away the message that the two methods can be integrated.

Computers and technology

- Salmon Camp is making participants more aware of how computers and technology are used in science/resource management. Almost all participants (92%) were able to name a specific example of a technology they had used during the camp. GPS technology was the most frequently mentioned example (12 participants) as it has been during previous programs.

Participants also mentioned specific types of wildlife or water monitoring technology, and software such as Excel, PowerPoint, and GIS.

- When asked how Salmon Camp could help them gain more experience with computers and technology, participants were interested in having more time and opportunities for hands-on use of computers and different technology (63%).

Work experience and skills

- The work experience and skills participants said they gained during the camp were related to having hands-on/real-word experience (63%) and communication/teamwork (21%).
- When participants were asked how Salmon Camp could further help them with work experience and skills, 11 participants suggested that the camp could provide more of the types of the experiences already provided (e.g., more science and math activities, more hands-on experience, and more interactions with professionals). One participant requested SCRT staff help with resume development.

Connections to school

- Most participants (75%) said that Salmon Camp is helping/will help them in school, and also that it will help them develop the knowledge and skills to take advanced math or science classes (63%).
- Few participants are receiving or think they can receive school credit for attending Salmon Camp (33%). Most simply did not know if they could and were not sure how to go about finding out. SCRT staff may want to consider further supporting participants in getting school credit for their attendance.
- When asked if they would be interested in having internships and mentors, almost all participants would like an internship (96%), while just over half are interested in mentors (58%). Some participants already have mentors or people who fulfill that role. However, there was more enthusiasm for internships—particularly in marine biology/fisheries (seven participants). Internships may appeal to participants more than having mentors because internships can provide hands-on experiences that let participants explore different options, while having a mentor may force them to be more focused on a particular area.
- Salmon Camp staff could consider ways to help participants find relevant internships. Perhaps weekend enrichment programs could be used to teach participants how to pursue an internship, practice interview skills, and help them develop resumes.

Future plans

- Almost all of the participants (96%) plan on attending future SCRT camps because they found the camps to be both fun and educational.
- When asked about their plans after high school graduation, most participants said they wanted to go on to college (88%) and some mentioned pursuing specific programs or careers (wildlife biology, other biology, nursing, English literature, business, cooking).

Reference

Falk, John, & Deirking, L. D. (2000). Learning from museums: Visitor experiences and the making of meaning. Walnut Creek, CA: Alta Mira Press.

Appendix E.A

Salmon Camp Research Team
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

Do you plan on attending future Salmon Camp programs? YES NO NOT SURE

Why or why not?

What are your plans after high school?

Are you 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 F
SCRT Sample Detailed Agenda
Spring Break 2005

Friday March 18

4:30 Meet at OMSI and Depart for Cave Junction
Go to Selmac Lake Campground

Saturday March 19
7:00 Wake Up
7:30 Breakfast
8:30 Depart for Cave Junction
9:00 AM meet Rich Nawa at Coffee Heaven in Cave Junction (South end of Town, has angle on the roof)
Spend the day with him doing stream/riparian surveys in the Biscuit Fire
12:00 Lunch
4:00 Return to camp

Sunday March 20
7:00 Wake Up
7:30 Breakfast
8:30 Depart for Cave Junction
9:00 meet Rich Nawa in Cave Junction, do stream surveys and learn about fire ecology
3:00 Visited Cave Junction Monument

Monday March 21
8:00 Wake Up
8:30 Breakfast
9:00 Pack up Camp
9:30 Depart
12:00 Lunch at Castle Crags State Park
6:00 Arrive in San Francisco
6:30 Sunset at Marin Headlands
7:30 Check into Hotel
San Rafael Inn 415-454-9470
865 Francisco Blvd E

Tuesday March 22
5:00 Wake up pack up room
5:30 Depart for Muddy Hollow
6:15 Breakfast in the Van
7:30 Learned about bird banding from Point Reyes Bird Observatory
12:00 Lunch
12:45 Depart for Bolinas Lagoon
1:30 Met with Great White shark researchers
6:00 Depart for Sausalito Check into Hostel
7:00 Dinner
9:00 Dinner

Wednesday March 23
7:30 Wake Up
8:00 Breakfast

8:45 Depart for San Francisco
9:15 Arrive
9:45 Ferry departs for Alcatraz
10:00 Arrive on Alcatraz, meet Dave Gardner and Benny Batom
10:00-10:20 Introduction to the Island
10:20-11:45 Seabird Research Interpretive Walk by Dave Gardner
11:45-12:45 Lunch
12:45-1:30 Tour of the Cell House
1:30-2:15 Native American Interpretive Walk-Benny Batom
2:45 Ferry to San Francisco
3:00 Arrive in San Francisco
3:15 Drive to Marin Headlands
3:45 Hike at Marin Headlands Army Base
5:00 Depart for Hostel
5:15 Arrive at Hostel
6:30 Dinner
9:00 Bed

Thursday March 24
7:00 Wake Up
7:30 Breakfast
8:00 Pack
9:00 Depart
11:00 Stop at Beach for Hike/Lunch
1:00 Arrive at the Monterey Bay Aquarium
    Free Admission
    Rita Bell
    831-648-4845
    or 831-963-9645
    rbell@mbayaq.org
3:00 Depart for MLML collection site
3:30 Arrive and collect mussels w/ Tonatiuh from MLML
4:30 Depart for Sunset Beach State Park
5:15 Arrive
5:30 Set up camp and cook dinner

Friday March 25
7:00 Wake up
7:30 Breakfast
8:15 Depart for Monterey
9:00 Arrive at Monterey Bay Kayaks
12:00 Depart for Elkhorn Slough
12:15 Arrive and eat lunch
1:00 Activities w/ Kenton @ Elkhorn Slough-monitoring invasive marine species, observing shore birds and otters
5:00 Depart for camp
5:30 Cook dinner and relax

Saturday March 26
7:00 Wake up
7:30 Breakfast
8:30 Depart for MLML
dissected mussels, learned about DNA synthesis using computers
9:00 Arrive @ MLML
12:00 Lunch
5:00 Depart MLML
5:30 Dinner/closing ceremonies

Sunday March 27
5:00 Wake up
5:30 Depart
DRIVE, DRIVE, DRIVE, DRIVE
6:30 Arrive in Portland

Appendix G
ITEST Poster

Salmon Camp Research Team

Oregon Museum of Science and Industry (OMSI)

Northwest Regional Educational Laboratory (NWREL)

Funded through the National Science Foundation Program: Information Technology Experiences for Students and Teachers (NSF ITEST)

Participants

140 Students participated to date

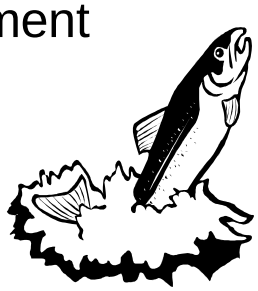
- 74% attended 1 session only (68% MS)
- 26% attended>1 session (15/36 >=3 sessions

2005

- 103 Total students (64% Male)
  - 60% Middle School
  - 40% High School

Evaluation Strategies/Instruments

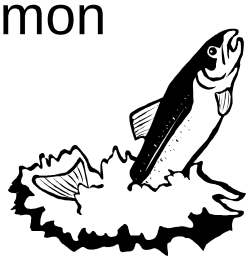
- Repeated Measures Student Assessment
  - Use laptops in field
  - Pre-involvement and annual benchmarking
  - Contents:
    - » Attitudes toward science
    - » Technology skills
    - » Experience with science
    - » Workplace and basic academic skills from SCANS



- End-of-session feedback forms
- In-camp interviews (formative, mid-session)
- Post-camp parent interviews
- Counselor debriefing

Additional Evaluation Strategies

- Review of student-developed PowerPoint presentations on research topics
- Shared OMSI-NWREL database to track student participation, experience, internships, and mentors
- Informal debrief at Culminating Salmon Bake

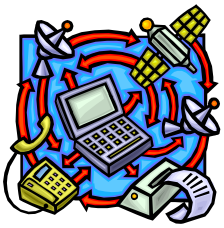


Findings from Baseline Survey Data

- High levels of agreement for the need to know science, interest in using technology in science/resource management (70%)
- About 25% undecided on self-efficacy as science students
- Generally weak in workplace skills (teamwork, creative problem solving, logical reasoning)
- Half of students gave weak ratings on basic skills with exception of math (66% good or great, 12% bad news)

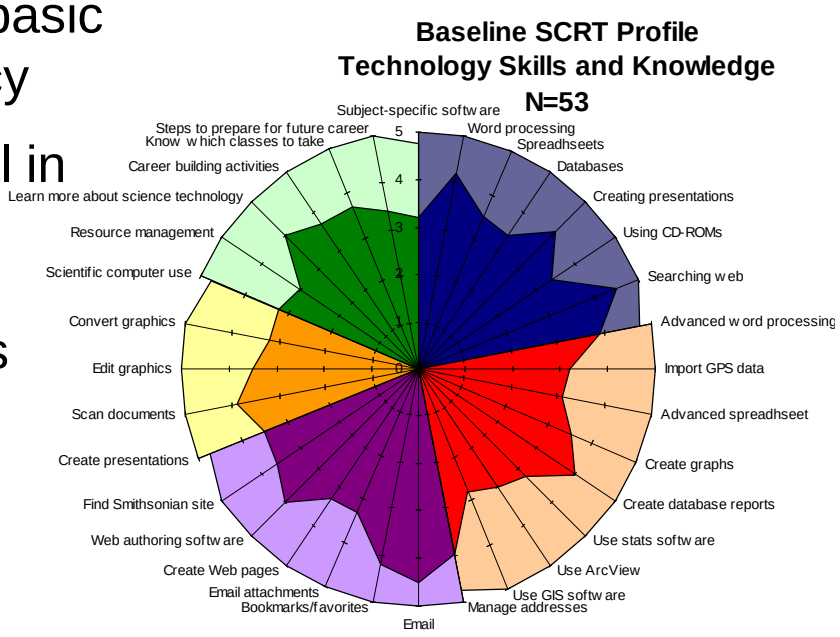
Findings from Matched Y1-Y2 High School Survey Data (N=10)

- Higher confidence and self-efficacy with science
- Increased Internet proficiency
- Strongest gains in science career preparation



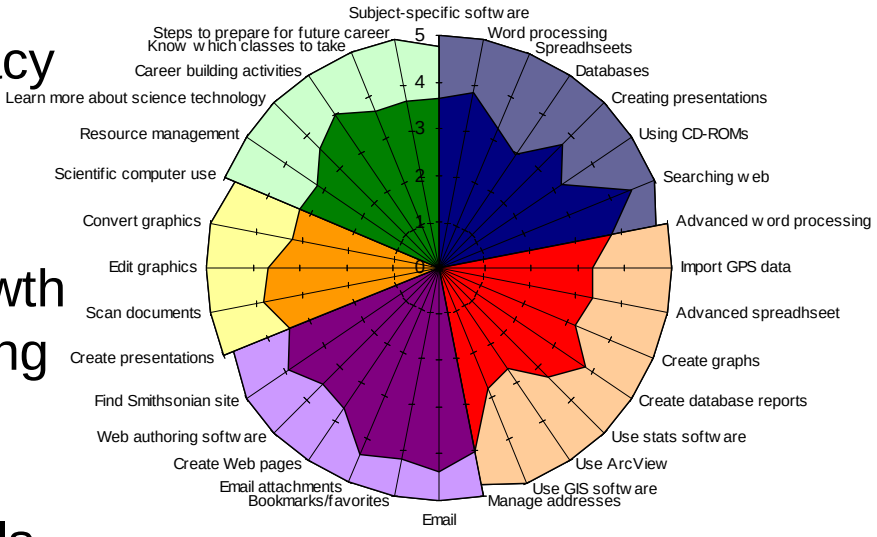
Baseline Technology Skills

- Strong skills in basic computer literacy
- Growth potential in using advanced information technology tools



Y2 High School Technology Skills N=33

- Continued strong skills in basic computer literacy
- Gains in Web-based skills
- Continued growth potential in using advanced information technology tools



Matched Y1-Y2 HS Data (N=10)

Growth across subscales in:

- Confidence and self-efficacy with science
- Internet proficiency
- Science Career preparation

	2004	2005
My teachers have been interested in my progress in science.	40%	70%
I feel confident I can maintain/edit a Web site.	20%	60%
I can explain how computer applications are used in science.	0%	40%

End-of-Session Responses on Interesting Things Students Learned in Camp (reiterated in interviews)

		H.S.	M.S.
• Scientific information (ranging from forest ecology, to field study tests/protocols, and specific facts)	*Y1*	21% (9)	42% (23)
	Y2	67% (23)	65% (10)
• Native American culture/knowledge	*Y1*	35% (15)	7% (4)
	Y2	15% (5)	24% (4)
• How to use technological tools (GPS, GIS, spreadsheets, graphs)	*Y1*	16% (7)	24% (13)
	Y2	26% (9)	8% (2)
• Ecological/Resource management strategies	*Y1*	7% (3)	5% (3)
	Y2	35% (12)	29% (4)

Successes

- Hands-on research, collecting real data with scientists/researchers
- Giving students ownership of their data collection
- Focus on culturally relevant projects for high school projects/presentations
- Laptop assessment in the field
- Data-sharing OMSI-NWREL

Challenges

- Providing more hands-on practice with IT tools
- Not every activity appeals to every student…providing a variety of activities with limited staff members
- Mentorships are proving difficult to arrange when students are in so many different schools
- Small population raises importance of high return rates on feedback measures