



# Salish Sea Expeditions

(206) 780-7848 • fax (206) 780-9005 • info@salish.org • www.salish.org

Fall 2005

*To inspire a passion for exploring, understanding and respecting the marine environment through hands-on scientific inquiry on Puget Sound.*

## Salish celebrates our Successful Fall program season

Fall is a great time for a Salish program because a Salish Expedition:

**-Encourages students to grow and learn in new ways, and sets the tone for the whole year!** Students design and carry out a research project together, work together to keep themselves and fellow students well-fed and rested, and navigate the waters of Puget Sound together. This once-in-a-lifetime learning experience gives students the chance to stretch themselves in new ways and sets the bar high for stretching and growth for the whole school year.

**-Gives teachers “learning leverage” for the whole school year.** Many teachers use their students’ science research project and experiences together as a touchstone for learning throughout the year, referring back to research methods and results and the many new things students discovered about themselves and the Sound.

**-Gets the class working together as a team!** Students come away from their Salish experience with a sense of belonging and accomplishment that contributes greatly to their classroom experience, and enhances the learning environment.

**-Provides an opportunity to explore seasonal changes,** for teachers who bring students out in both the Fall and the Spring. For example, there are significant changes in the Sound based solely on the amount of sunshine reaching the water.

### Close up a Fall program!

**Who:** Bainbridge Island High School Marine Biology Class

**When:** September 24, 25& 26

**Where:** Departed from Everett, sailed to the mouth of the Skagit River, camped at Camano Island State Park

**What:** Hypothesis Nutrients will increase with depth

Bainbridge Island High School Teacher Tom Armentrout was introduced to Salish in his first few days on the job during last year. Departing Marine Science Teacher Bruce Claiborne had been so impressed with his students’ experience with Salish last year, he actually walked over to our offices to introduce his replacement. We were thrilled to meet Tom and excited to help him plan two expeditions for his marine science classes this year.

Before the first expedition this fall, Mr. Armentrout set the stage by encouraging the half of his students who would be land locked this fall (but get to participate this coming spring) to remember the space travel model – while not all involved in the NASA program visit space, without ground support, there would be no space program.

Through their research, the group determined that they would measure samples from each station collected from the surface, 5 meters, and 10 meters to make comparisons. There were chemical test kits, phytoplankton identification challenges, and the occasional fog horn crafted from nearby bull kelp. This was an expedition to remember and students returning to their ground support peers shared their enthusiasm and learning. Fall sailing scientists are already wondering if, come spring, Houston will need one less technician...

*“I would rank Salish as the best educational experience I’ve ever been able to provide my students. I’m convinced that what my kids got out of this experience will excite and motivate them throughout the year. Right now they are totally absorbed in documenting the results of their research to be published in Salish’s online Journal, Student Research on Puget Sound.”*

*-Tom Armentrout, Bainbridge Island High School Science Teacher*

### Inside...

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## From the Board: Salish meets Jaws

One of my favorite all time marine biologist movie quotes (oh alright, it's probably the only marine biologist movie quote, but it's still a great one) is the line from the Steven Spielberg classic, *Jaws*. The marine biologist, played by Richard Dreyfus, looks over the transom of a modest fishing boat and gets his first real view of the great white shark that the biologist has been tracking. "Captain," he laconically says to the crusty fishermen who chartered Richard the vessel, "We're going to need a bigger boat." Now before faithful readers wonder what the students have been getting into out there on the Salish Sea, let me reassure you that (a) we have not run into any fearsome sharks (great white, or other) in the last season and (b) we don't need a significantly bigger boat.

What we have encountered, however, is a voracious appetite for our programs. Our spring program was fully subscribed for a second year in a row, and we turned away schools for programs this fall because we were at our calendar capacity. This demand, together with our continued search for a suitable research platform for summer courses, has the board examining our vessel needs with renewed intensity.

Among the questions we've been asking ourselves:

If we had access to a second vessel during the spring and fall to compliment *Carlyn*, could we fill it?

If we had significant resources dedicated for a boat, how would we spend it? How about unlimited resources?

What types of vessel, or vessels are other marine science programs using? What are their pros and cons?

What are the impacts to our organization of mounting a capitol campaign?

Fortunately, our boat musings takes place from a position of relative strength. Our partnership with Camp Four Winds Westward Ho remains vibrant and *Carlyn* continues to draw rave reviews. Program revenues have been solid and Salish has added new funding sources, including the special event. We have recently received a generous grant to add a development associate to our staff.

From its inception, when founding directors Kathy Murphy and Sophy Johnston, approached teachers in the Puget Sound community and asked what the teachers needed to hook kids on science, Salish has based its program on what we hear from the Region's educators. As the board explores the best way to respond to the continued hunger for hands on science and the boat needs this hunger generates, Salish will continue to reach out to the broader community for suggestions and help in answering our questions.

***Eric Laschever, Board President***



*REACH  
students learn  
the rules of  
the water road  
in a nautical  
charting  
leasson.*

## Salish Sea Expeditions

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## From the Director's Desk...

"Lets go find creatures" This request from my three year old son rarely fails to result in us loading up the wagon, heading down the steep trail through the woods to the state park beach near our Bainbridge Island home. As the next hours are spent in discovery and exploration—I'm amazed at his focus, his imagination and his inquisitiveness as he turns over yet another stone, plays *pirate* on driftwood logs and almost always pays the price of a soaked shoe—or more.

The natural exploration that I see in my son is similar in some respects to the learning experiences that I've witnessed aboard the research sailing vessel *Carlyn*—kids and adults engaged in learning about their environment. Salish seeks to capitalize on that natural curiosity, link it more fully to the science teaching efforts of the schools in an effort to boost interest in and ability to understand science. Our belief is that as we harness this energy and channel it toward hands-on science, the science will catch, and that students will be more active learners. WASL tests scores in the last two years indicated that only 1/3 of both 8<sup>th</sup> and 10<sup>th</sup> grade students passed, spotlighting the need to capture children's attention early, and continually nurture their inherent scientific curiosity.

Thrilled by a two-fold increase in this fall's schedule, we have committed to a series of initiatives that we feel will support our efforts to provide a further sense of realness to our marine science experiences, and ultimately the connection of our participants to science. We are most proud of a project where students from all participating schools will create a final research report that explains the findings of their marine research project. As real scientists publish their findings in journals, so, too, will our student scientists. This fall, as students complete the analysis of their data, look for these outstanding papers to be published on our new on-line journal, Student Research on Puget Sound, hosted on our recently revised website. We predict, as do our participating teachers, the process of presenting their findings will connect others to the significant work of the students and may also lead to follow up studies by future Salish participants.

And finally, as I've reflect on my first six months as the new Executive Director, I've come to realize, perhaps like many parents, that I see a bit of myself in my son. Like my son and the sea, Salish, too, fosters a fantastic environment. In this new role I've been supported in my own growth by board, staff and our amazing program team, which ultimately is about taking the sum of my experience and applying it to this new situation with both care and boldness. I turn over "stones" in my own version of playing pirate with the staff and board, and I continue to be thrilled with the opportunity to lead this dynamic organization

As I enter into the next months, I continue to recognize the need for continuing to forge strong connections to the communities surrounding Puget Sound. I welcome and encourage your participation in this exciting time of growth. Please feel free to contact me at any time.  
*Stephen W. Streufert, Executive Director*

### Calling All Volunteers

Salish Sea Expeditions is always looking for excited volunteers. A variety of opportunities are available.

*If you are interested in finding out more about volunteer opportunities contact Lorrie Kalmbach-Ehlers at (206) 780-7848 ext. 3# or email her at [lorrieke@salish.org](mailto:lorrieke@salish.org).*



*REACH students participate in a science data question and answer session to determine the afternoons sample station plans.*

### 2005 Program Participants

- Brighton Elementary School – Lynnwood, WA
- Bainbridge High School – Bainbridge Island, WA
- Cedar Way Elementary – Mountlake Terrace, WA
- Dearborn Park Academy - Seattle, WA
- Eastside Preparatory School – Kirkland, WA
- The Island School – Bainbridge Island, WA
- Lighthouse Christian Academy - Gig Harbor, WA
- Mt. Baker Middle School – Mt. Vernon, WA
- North Central Educational Service District – Wenatchee, WA
- Pacific Science Center – Seattle, WA
- Pathfinder K-8 - Seattle, WA
- POSSE Program, Forks High School – Forks, WA
- Rainier Scholars – Seattle, WA
- REACH Program – Port Susan and Stanwood, WA
- Room 9 Journey School – Shoreline, WA
- Skyline High School – Sammamish, WA
- St. Catherine of Siena Parish School – Seattle, WA
- Trafton Elementary – Arlington, WA
- Wilderness Inner-city Leadership Development - Seattle, WA

## Creature Feature: *Sea Pens! An Amazing find near Discovery Park*

The weather in April on Puget Sound is, well, thermostatically dynamic; yet, April is also in the heart of Salish's spring program season. As an expedition participant it is time to get underway and begin your exploration of one of the most productive and biologically majestic estuaries in the world.

Just as April was winding down this spring, the 4th and 5th graders from the Pathfinder School of West Seattle donned their yellow rain gear, readied their sampling equipment and steadied *Carlyn* just north of Discovery Park in Seattle to collect their first set of data. This was the first of six sample sites they chose to test their ideas about the relationship between benthic substrate and plankton abundance. Specifically, the student scientists sought to answer the question, "Are there more plankton in areas over a shallow, rocky bottom than over a sandy bottom?"

To study this question, the students deployed the Eckman dredge, a contraption that oceanographers use to sample the benthos (bottom of a water body) that resembles a silver toaster with a large open mouth. As the three students employed in determining the sediment makeup drew the equipment to the surface, they noticed the gumball sized soft orange base ensnared in the sampler. Quickly they released the jaws of the Ekman dredge and a completely intact sea pen, *Ptilocarcu guerneyi*, lay in the sample bucket! These gentle, sessile soft corals, are in fewer numbers than ever before in Puget Sound, and are certainly an astounding catch for a small grab sampler deployed from 35 ft. above.

Named for the delicate feathery protrusions that resemble a feathered quill pen, these benthic sea creatures have many nick names such as sea pens, sea fans, and sea feathers. They are certainly majestic when inadvertently captured in a mass of soft muddy sediment. These pastel to bright orange creatures look feeble, yet when the sea pen was released from the dredge it quickly regained its full shape, emerging from the sudden disturbance completely intact! The relatively long-lived (15 years) sea pens are frequently preyed upon by sea stars, who strip them of their feathering feeding and spawning polyps, leaving only the slightly rigid stalk, or pen.

The sea pen was returned shortly to the Sound. Being slightly mobile, the Salish students hoped that as they released their amazing discovery, the sea pen would find a new, even more ideal resting place than it had when the young larvae first settled.



*Students raise the Eckman dredge from the depths of Puget Sound*



### **S**ea Pens...

- are both male and female.
- are octocorals, having eight branches of polyps.
- can produce up to 200,000 eggs during spawning season in late March.
- can live to be 15 years old!
- are bioluminescent when disturbed.
- encounter SEVEN major predators; four types of starfish including the red star, and the leather star and three types of nudibranchs which are the most likely diners.
- are most vulnerable during their first year, and 97% of all mortality is due to grazing sea stars.
- commonly have parasitic isopods in their tissue.
- are free swimming larvae for seven days before settling into suitable substrate.
- occur in "sea pen communities" of all ages, yet rarely are found singularly.
- randomly disperse in the marine benthos which is thought to contribute to their survival, as predators have difficulty happening upon the orange feathery creatures.
- are armed with nematocyst (stinging cells) feeding polyps that alternate along the stock and fan out to create a feathery array of cells that capture passing plankton. These are the same type of cells on the tentacles stinging Jellies (like the Lions Mane of Puget Sound).

*Jennifer Wishinski, Program Coordinator*

"My students gained real insights into the complexity of the natural world in an experience that simply could not be matched by traditional classroom learning. They began to think about how a better understanding of the natural world can and should inform decisions we make - as individuals and as communities - about how to care for and manage the health of our environment."

*-Skyline High School Teacher*

**A cluttered driveway?**

**Donate your vehicle or boat to Salish Sea Expeditions, take a generous tax deduction, and feel great knowing you are helping to introduce countless youth to science at sea.**

## Salish's New Web Site to go LIVE in November

Salish Sea Expeditions is excited to announce the launch of its new web site in November, 2005. As part of ONE/Northwest's Get Involved program, which linked donors at Microsoft to local environmental organizations, Salish Sea Expeditions received a web plan free of cost. The partnership, spanning over a year, matched the technical expertise of ONE/Northwest's innovative Program Manager Andrew Burkhalter and Web Designer Laurie Kellogg, with the dedication and vision of Salish staff. The resulting web site is full of new and exciting features including:

- *Expedition Tracking*- A navigational charting software program is used in correlation with our onboard GIS system to track the *Carlyn's* course during an expedition. The coinciding map is turned into a day by day image that will be posted in our Parents Expedition Tracking section, along with an account of the day's weather, scientific discoveries, and other highlights. This will enable parents to understand their child's expedition on a more detailed level.
- *Breadcrumb Trail*- In general, breadcrumbs serve two purposes: 1) they provide information to the user as to where they are located within the site, and 2) they offer shortcut links for users to "jump" to previous categories in the sequence without using the Back key, other navigation bars, or the search engine.
- *Online Journal*- As students complete the analysis of their data, look for these outstanding papers to be published on our new on-line journal, Student Research on Puget Sound.
- *Event Calendar*- A month by month calendar that will highlight upcoming expeditions, events, and dates of interest.
- *Online Donations*- Feeling generous after perusing our beautiful new web site? You will now be able to make your donation online. The service is provided by an industry-leading online fraud prevention system that will ensure a fast, easy, and secure transaction.
- *Photo Album*- The Salish family will now be featured in our online photo album. Pictures of our expeditions arranged by groups, as well as albums dedicated solely to sailing, science and fun allow our viewers to immerse themselves in the Salish action.
- *E-newsletter/Newsletter sign up*- Would you rather save a few trees and receive your newsletter online? Now you will have that choice by going to our web site and signing up. Perhaps you have someone that's been stealing your newsletter? Now you can sign them up to receive their own! Featured on every page, just enter your email address and fill in the blanks.

We hope you enjoy your cyber experience on our new web site and we encourage your feedback. Please direct comments and suggestions to our web master, Lorrie Kalmbach-Ehlers at [lorrieke@salish.org](mailto:lorrieke@salish.org) or (206) 780-7848 x 3#.



*Cedar Way Elementary students discuss water collection using the Niskin bottle with Salish Marine Science Educator Sylvia Graham.*

### Join us for a Program!

#### Sea Investigators

**For:** Groups of up to 30 students, including classrooms, community groups, home school associations, scouts, etc.  
**When:** mid-March through mid-October

Using an inquiry based learning approach, we guide students of all ages through the process of designing, conducting, and presenting a real marine research project. What's more, we work with your group to tailor our programs to meet your special interests and needs, which makes every program unique.

#### Team Building AdVentures

**For:** Professional and Executive Groups  
**When:** March through October

Salish Sea Expeditions presents an adult team-building program aimed at professional and executive groups. Through daylong adventures on a 61' sailing vessel, corporate and other adult groups will engage in hands-on team building practices. Participants will experience unique and effective learning opportunities through group development challenges, facilitation, and processing, improving your team's effectiveness back on land.

#### Sea Educators for Teachers!

**For:** Educators  
**When:** Spring & Fall

Salish Sea Expeditions is offering a chance for teachers to learn first-hand about our unique Inquiry-Based program. You will have the opportunity to use our oceanographic sampling equipment, tour the 61' sailboat, *Carlyn*, discuss Inquiry-Based science education with the staff, help with sailing and talk with other teachers who have taken students out with Salish Sea Expeditions!

*Three Washington State Clock hours are available to participants for a fee of \$10.00, payable to Puget Sound ESD. (For those not wishing to register clock hours, the sail is free.)*

**Please contact Lori Mitchell for exact dates and availability for the above programs at (206) 780-7848 ext. 2# or [lori@salish.org](mailto:lori@salish.org).**

## Colleague's Column: *Citizen Science at the Seattle Aquarium*

*Salish Sea Expeditions is proud to feature an article every newsletter from a partner organization in the environmental or nautical education community. By doing so we hope to present additional opportunities available in the Puget Sound region to our readership. The Seattle Aquarium has not only partnered with us in our Joint AdVenture programs, but was also a sponsor for our first annual benefit dinner and auction; the aquarium was an ideal venue, for which we are ever grateful. Note: In September, the Aquarium realized the long sought after dream of expansion. During construction the Seattle Aquarium's exhibits are fully open during the normal business hours of 10:00 - 5:00.*



**Citizen Science** is a science education program designed to collect long-term, scientifically significant data on the nearshore habitat and wildlife of seven Seattle area marine reserves and Seahurst Park in Burien. This project bridges the gap between the need for habitat protection and public involvement in wildlife management.

The purposes of the project are to: (1) utilize trained high school students to determine the baseline for normal population sizes and (2) to begin monitoring trends in the ecological condition of Puget Sound beaches using selected flora and fauna as indicators of change from 2005-2020. Partners include: Seattle Aquarium Society, Discuren Foundation, City of Seattle, City of Burien, King County, Univ. of Washington, Environmental Science Center, Highline Schools, Seattle Schools, WSU/Island County Beachwatchers.

Citizen scientists are local high school students and teachers, assisted by trained adult volunteers, gaining "real world" experience with science and conservation while also sparking wonder about the marine environment. After a pilot year in 2004 at Seahurst Park with the City of Burien, Environmental Science Center and the Highline School District, the program expanded to Seattle in 2005 with the following accomplishments:

- Twenty hours of training and eight hours of data collection for 125 high school students from five high schools, with an emphasis on traditionally underserved populations. The schools included: Tyee and the OSC/Marine Tech Program in the Highline District plus Ballard, Garfield and West Seattle in the Seattle District.
- Data collected with student assistance included:
  - Number or percent cover of 24 selected species or groups of species of marine flora and fauna on 13 beach units covering seven sites. Beaches include: Carkeek Park, Golden Gardens, Discovery Park, Alki Beach, Schmitz Memorial, Lincoln Park and Seahurst Park.
  - Beach characteristics such as slope, substrate, and habitat type at all 13 units
- Biodiversity surveys conducted by Aquarium staff, colleagues and trained adult volunteers at all beach units. Over 80 species of invertebrates, fish, seaweeds and eelgrass documented at study sites.
- Development of a 14-person scientific advisory committee to ensure scientific credibility of the program
- Establishment of a data management system to ensure timely and accurate data entry/analysis. Data is to be shared with the City of Seattle Public Utilities Science Team, King County Dept. of Natural Resources and Parks, Univ. of Washington, Washington State Dept. of Fish and Wildlife and all schools/partners
- Formation of the "Salish Sea Consortium" to share nearshore monitoring results, procedures and funding between the Citizen Science Program, WSU/Island County Beach Watchers and the Fisheries and Oceans Canada Shorekeepers

Those seeking further information from Citizen Science are encouraged to contact me at mark.plunkett@seattle.gov or 206.386.4344.

**Mark Plunkett, Conservation Coordinator**



*Wind and Water Watch-Shipmates from Bainbridge High School show differing watch group responsibilities as one uses water chemical test kits while the other mans the helm*

### Do You Have an Item on our Wish List?

#### Office Needs

Collator  
Laminator  
Envelopes-all sizes  
*Rite in the Rain* paper  
Recycled Copy Paper  
CompactFlash Cards

#### Camping/Sailing Equipment

Warm Hats and Gloves  
Inflating Life Jackets  
Sleeping Bags  
Firewood Bundles  
*Sierra* Camping Cups  
Propane Stove Canisters

#### Miscellaneous

Dish and Hand Soap  
Sharp Kitchen Knives  
Buckets  
Matches  
Gardening Tools  
Outdoor Furniture  
Gas Grill  
Grocery Store Gift Certificates

**Salish Sea Expeditions thanks the following groups and individuals for their generous contributions received between 05/01/05 and 09/30/05.**

**Foundations**

Bainbridge Island Community Endowment-Donor Advised Funds  
The Bainbridge Foundation, Inc.  
Bill & Melinda Gates Foundation  
Eulalie Bloedel Schneider Foundation  
Washington Foundaiton for the Environment  
D.V. & Ida J. McEachern Charitable Trust  
The Paul G. Allen Family Foundation  
The Seattle Foundation  
Windermere Foundation

**Government Agencies**

Washington Sea Grant

**Businesses**

Blue Sky Printing  
DigitalAid  
Horton Lantz & Low  
ProNet, Inc.  
Stoel Rives, LLP

**\$1,000-\$2,499 Tide**

Judy Beck & Tom Alberg

**\$500-\$999 Breaker**

Sharon & William Farr Jr.

**\$250-\$499 Crest**

Patrick Berkley  
James Johnston  
Carlyn Stark

**\$100-\$249 Swell**

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Judy & Tom Curran  
Mary Anne & Roger Dane  
William Davis  
Tracy Dickerson & Frank Petrie  
Molly & Frank Lawrence  
Channy & Berry Peters  
Lynn & Steven Rowe  
Clarissa & Warren Wooster

**\$99 & under Wave/Ripple**

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**In Kind**

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**Volunteers & Valuable Advice**

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Gretchen Stuppy

*We gratefully acknowledge the many alumni, parents, educators, staff, board and friends who generously contributed their money, time and efforts to Salish Sea Expeditions. Donation acknowledgments do not include those by staff or board members. Every effort has been made to list all contributors accurately through April 30, 2005. If, however, an error has been made, please accept our apologies and notify us at (206) 780-7848 ext. 3# or lorrieke@salish.org.*

**How to Donate**

**It is easy to donate to Salish!**

Send a check, made out to Salish Sea Expeditions, in the enclosed donation envelope.

**Donate by credit card online**

**beginning November 1st on our new web site.**

Just go to [www.salish.org](http://www.salish.org) and click the donate tab.

Online donations are secure and private.

**You can also donate through our planned giving program!**

For more information on how to do this, please contact the office and we will give you simple, detailed instructions.

**And please don't forget to see if your company will match your donation!**



*Bainbridge Island residents participate in a "citizen science" program generously funded by the Bainbridge Island Community Endowment Fund-Donor Advised Funds. This program allowed participants to examine water quality parameters in the waters of Puget Sound that surround their island home.*



## Salish Sea Expeditions

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Inspiring a passion for learning ...



*Carlyn, with a verticle clearance of 70', passes beneath the Agate Pass bridge, with 75' extreme mean high tide, on the north side of Bainbridge Island.*

### Fun Salish Facts

Estimated amount of hot chocolate consumed over course of typical Salish program year, in gallons - 120

Average number of hours spent in the classroom with participants by Salish educators prior to expedition - 4.5 hours over 2 or 3 visits

Number of phyto and zoo plankton species identified by Salish participants on typical three day research expedition - 20

Total number of attendees at Salish first Annual Dinner and Auction - 200  
Anticipated total in 2006—300

Estimated distance the research vessel, Caryln, sailed on the waters of Puget Sound during 2005, in nautical miles - 1368

Number of successful proposals submitted to foundations and total funding received for 2004 to support Salish -27 applications yielding \$160,000

Number of research sites across Puget Sound where participants sampled dissolved oxygen levels in the course of the history of Salish Programs -581

Targeted increase in dedicated, visionary individuals to join current eleven member Salish Board of Directors by end of 2006 - 8

Number of amazing scientific and personal discoveries made by youth on the waters of Puget Sound - Countless