

<h1>Oil Spill Recovery Institute Grant Application</h1>		FOR OSRI USE ONLY OSRI PROPOSAL NUMBER DATE RECEIVED	
PROJECT TITLE Oil Spill Recovery Teacher Workshop			
EMPLOYER IDENTIFICATION NUMBER (EIN) or (TIN) 92-0132479		RFP TITLE Technology Education Demonstration	
DATE SUBMITTED November 29, 2007		# OF COPIES 2 hard copies+electronic	IS THIS AWARD <input checked="" type="checkbox"/> NEW <input type="checkbox"/> RENEWAL
NAME AND ADDRESS OF ORGANIZATION TO WHICH AWARD SHOULD BE MADE Seward Association for the Advancement of Marine Science dba Alaska SeaLife Center 301 Railway Avenue PO Box 1329 Seward, Alaska 99664-1329		NAME AND ADDRESS OF PERFORMING ORGANIZATION IF DIFFERENT	
IS AWARDEE ORGANIZATION (Check All That Apply)			
<input type="checkbox"/> UNIVERSITY <input type="checkbox"/> AGENCY <input checked="" type="checkbox"/> NON-PROFIT <input type="checkbox"/> FOR-PROFIT <input type="checkbox"/> INDIVIDUAL <input type="checkbox"/> SMALL BUSINESS <input type="checkbox"/> MINORITY BUSINESS <input type="checkbox"/> WOMEN-OWNED BUSINESS			
CHECK APPROPRIATE BOX(ES) for area to which the proposal applies			
<input type="checkbox"/> FELLOWSHIP <input checked="" type="checkbox"/> Other AWARD Under \$100,000. <input type="checkbox"/> LARGE AWARD Greater than \$100,000.			
REQUESTED AMOUNT \$ 13,500		PROPOSED DURATION (1-60 MONTHS) 12 Months	REQUESTED STARTING DATE July 1, 2008
NAMES		Social Security No.	Telephone
PRINCIPAL INVESTIGATOR Jessica Ryan			907-224-6885
CO-PRINCIPAL INVESTIGATOR n/a			jessica_ryan@alaskasealife.org
To the best of my knowledge and belief, all data in this application/pre-application are true and correct, the document has been duly authorized by the governing body of the applicant and the applicant will comply with the attached assurances if the grant is awarded.			
Typed Name of Authorized Representative Tylan C. Schrock		Title Executive Director	Telephone No. 907-224-6352
Signature of Authorized Representative			Date Signed
*SUBMISSION OF SOCIAL SECURITY NUMBERS IS VOLUNTARY AND WILL NOT AFFECT THE ORGANIZATION'S ELIGIBILITY FOR AN AWARD.			

PROJECT SUMMARY

Alaska SeaLife Center (ASLC) education staff will develop a standards-based curriculum on the science of oil spill recovery and disseminate this curriculum in a three-day workshop for 12 middle and high school teachers. The workshop will provide teachers with the hands-on experience and scientific knowledge needed to present this curriculum to their students. Participating teachers will then utilize the curriculum within the 2008/2009 school year and provide ASLC with feedback on its effectiveness. This feedback will be used by ASLC education staff to modify the curriculum, which will then be made available at no cost through the ASLC web site.

By using national and state standards and grade-level expectations (GLEs) in science and math, ASLC education staff will develop a curriculum for Alaska students in grades 8 to 11. The curriculum will include an overview of the chemistry of oil (liquid petroleum hydrocarbon) and a brief history of past oil spills in Alaska, including its effects on aquatic life such as seabirds and sea otters. Through the use of the scientific method, teachers (and subsequently their students) will observe, test, and make recommendations for oil spill detection and response. These hands-on laboratory exercises will include: testing oil to determine its chemical composition, i.e., is it crude oil, gasoline, diesel, or something else; experimenting with chemical cleanup and containment options based on chemical composition; learning how scientists effectively save and re-release hundreds of marine animals that would die without human intervention; subsurface exploration of oil-spill after-effects with student-built Remotely Operated Vehicles (ROVs); and role-playing scenarios that encourage students to determine a best-management-plan in the event of a local oil spill.

Conducting the workshop on-site at the ASLC will allow teachers to learn how to build ROVs, conduct hands-on laboratory lessons, and learn about oil spill response from Alaska's spill response professionals. In addition, they will observe many of the animals and ocean systems that are most vulnerable to an oil spill and meet with scientists who rehabilitate these animals at the Center. For teachers seeking Continuing Education credit, arrangements will be made with the University of Alaska Fairbanks to offer one credit at the teacher's expense.

Teachers will leave the workshop armed with five classroom lessons. ASLC staff will determine curriculum effectiveness in the classroom through follow-up contact. ASLC will refine the curriculum based on this feedback and produce an online oil-response curriculum available at no cost through an ASLC education website download.

By teaching teachers, ASLC will disseminate information about oil spill history, response, and recovery methods far beyond our doors. For each of the 12 teachers who attend this workshop, approximately 25 students will receive classroom instruction within the year. This amounts to about 300 students total—a very cost-effective distribution of knowledge about oil-response and clean-up measures.

PROJECT DESCRIPTION

Objectives/goals:

The Alaska SeaLife Center (ASLC) education staff will develop and deliver an Oil Spill Response and Recovery Curriculum designed for Alaska's middle and high school students. The objective of this curriculum is to educate students about (1) the importance of protecting Alaska's 44,000 miles of coastline, (2) the chemical properties of different petroleum products found in oil spills, (3) methods of oil spill detection, (4) current containment technology based on the chemical properties of the spill and environmental conditions, (5) methods used to treat and care for oiled birds and animals, (6) exploration of subsurface oil-spill aftereffects through the use of student-built Remotely Operated Vehicles (ROVs), and (7) effective problem-solving skills through role-playing scenarios that encourage students to determine a best-management-plan in the event of a local oil spill. The curriculum will be broken into five lessons. Each of the lessons will be designed to be completed in a 50-minute class period, except the ROV-building lesson which will take up to three class periods to complete.

This curriculum will be standards-based, with specific information on which state and national standards and grade-level expectations it addresses. Designed to target students in grade levels 8 to 11, this curriculum will be appropriate for inclusion into ongoing science curriculums throughout the state and beyond.

The ultimate objectives of this curriculum are (1) to make students aware of the current state of the science of oil spill response in order that they may participate effectively in the event of a local oil spill, and (2) better prepare students to pursue science education and/or emergency response training beyond the high school level.

Methods:

The education staff at ASLC will research and write a standards-based curriculum for grades 8 to 11 on the science of oil spill recovery. The curriculum will be refined and reviewed by consulting with the Oil Spill Recovery Institute (OSRI), University of Alaska Fairbanks science faculty, ASLC research and rehabilitation staff, and local United States Coast Guard personnel.

The curriculum will include four hands-on laboratory experiments using the scientific method for observation, documentation, and conclusions about: (1) the chemical properties of different forms of liquid petroleum hydrocarbon, (2) methods of containment and cleanup, (3) methods used to clean and re-release marine animals, such as loons and sea otters, affected by oil spills, and (4) the construction and use of ROVs to explore subsurface oil contamination and problem-solve oil recovery from submerged vessels.

The curriculum will be disseminated through a three-day workshop for 12 middle and high school teachers from Seward, the Kenai Peninsula, and Anchorage. Teachers will

participate in each of the hands-on exercises and learn directly from experts in the field about the history, cleanup methods, and recovery of oil spills in Alaska. Equipped with five lessons, hands-on laboratory experience, and sound science practices used by scientists in the field, teachers will have the knowledge and skills needed to deliver the curriculum in their own classrooms.

By following national and state standards and grade-level expectations (GLEs) in science and math, this curriculum will gain the acceptance of area educators and supervisors. The curriculum addresses hard-to-teach concepts, such as applied chemistry and technology, making it a valuable addition to the classroom.

The workshop will be conducted at the ASLC, allowing teachers to observe the animals and ocean systems that are most vulnerable to an oil spill. They will interact with scientists who rehabilitate marine animals at the Center and have ample opportunity to engage with scientists in order to ask questions and make scientific observations. Housing in the nearby University of Alaska apartments and at a local hotel will be included, as will all meals during the teachers' stay. Grant funding from OSRI will cover housing and food. Teachers will be responsible for any travel costs to Seward. For teachers seeking Continuing Education credit, arrangements will be made with the University of Alaska Fairbanks to offer one credit at the teachers' expense.

Through follow-up e-mail contact with workshop attendees, ASLC staff will gain valuable insight about the effectiveness of the curriculum after it is delivered in the classroom. Feedback from both the workshop and classroom delivery will be used to deliver an online oil-response curriculum at no cost through a download off the ASLC education website.

Timeline:

TASK	July 2008	Aug	Sept	Oct	Nov	Dec	Jan 2009	Feb	Mar	Apr	May	June
Research and write curriculum												
Arrange speakers for workshop												
Workshop announcement And registration												
Hold three-day workshop												
Conduct follow-up surveys												
Revise curriculum based on surveys												
Post curriculum on ASLC website												
Write grant final report												

Results:

- At the conclusion of the grant year 12 teachers will have received training in the delivery of the ASLC Oil Spill Response and Recovery curriculum.
- Approximately 300 students in grades 8 to 11 will have participated in five hands-on lessons and will have a working knowledge of the science of oil spill recovery.
- Teachers and students will engage in hands-on learning to understand the properties of oil found in a spill; different spill containment methods used; the history of oil spills in Alaska; methods used by scientists and technicians to clean and stabilize animals affected by a spill; how to build and operate an ROV to explore subsurface spill impacts; and problem-solving skills to utilize in the event of an actual oil spill.
- A fully-developed and field-tested science curriculum based on current national, state and GLEs will be available for download from the ASLC website.

Products:

A scientifically reviewed, and field-tested science-based curriculum which adheres to current national, state and GLEs will be available for download from the ASLC website. This curriculum will contain five lessons:

- 1) “What Do We Have Here?” – Watch brief a PowerPoint outlining the history of oil spills in Alaska, and investigate the methods used in oil spill detection. Conduct laboratory experiments to determine the different chemical properties of petroleum-based spills.
- 2) “The Clean Team” – Roll up those sleeves and explore the current containment and cleanup methods used in oil spills.
- 3) “Sea Shore Rescue” – Learn how scientists assess and care for oil-coated marine animals during a simulated oil spill response activity.
- 4) “Build an ROV” (three class periods) – Build your own Remotely Operated Vehicle and use it to explore oil spill impacts and recovery underwater.
- 5) “Oil Spill Response Squad” – Engage in this role playing game to develop the skills needed to respond effectively to an oil spill in your community.

Each lesson will contain a list of the standards and GLEs it addresses, a list of supplies needed, and useful websites for finding additional information.

RESUME/CURRICULUM VITAE

Jessica A. Ryan

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Seward AK 99664
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WORK EXPERIENCE:

Alaska SeaLife Center; PO Box 1329; Seward, Alaska 99664

Education Manager November 2007 – Present

- Manage programs for the Education Department to ensure optimum delivery of the ASLC mission while achieving financial objectives.
- Supervise personnel within the Education Department and provide a positive working atmosphere by empowering and mentoring staff.
- Oversee and participate in development of educational programs and curricula that meet Alaska's education standards.
- Maintain and develop the programs, infrastructure, and partnerships needed to build an exceptional distance education delivery program.

Ocean Technologies Information Coordinator November 2006 – October 2007

- Achieved outreach objectives for the Alliance for Coastal Technologies (ACT) by conducting annual stakeholder workshops on technology use and application.
- Produced a manual of workshop results for written and web-based distribution.
- Worked with area teachers and the University of Alaska Fairbanks to offer education credit for participation in the lecture series.

Geophysical Institute; University of Alaska; PO Box 757320; Fairbanks, Alaska 99775

Science Writer September 2004 – October 2006

- Researched and wrote science and mathematic curricula for Alaskan and Hawaiian middle and high school students on diverse subjects including the aurora, the solar system, volcanoes, plate tectonics, and global warming.
- Interviewed University of Alaska Scientists for curriculum material accuracy.
- Wrote and edited dozens of lesson plans that incorporated multi-media products, and internet based science websites.
- Presented complex scientific, technical, and mathematical information, both orally and in writing, in a manner appropriate for a variety of audiences.

Friends of Creamer's Field Nature Center; PO Box 81065; Fairbanks, Alaska 99708

Executive Director October 2004 – October 2006

- Planned, organized and conducted an ongoing schedule of public programs that emphasized nature observation, wildlife management practices, local history,

environmental science, and the arts. Annual events included the three-day Tanana Valley Crane Festival.

- Researched program topics, secured speakers and presenters, and advertised through mailings, newspaper and radio announcements, and news releases.

University of Alaska Museum; PO Box 756960, Fairbanks, Alaska 99775-6960
Educational Program Leader February 2002 - January 2004

- Researched and wrote new programs on the aurora, Alaska's Native cultures, and current art exhibits for visiting school groups based on Alaska's state standards.
- Revised Museum's existing docent school tour programs for quality and effectiveness, and made programmatic changes to better meet mission statement and state curriculum standards.
- Supervised docent leader and 25 volunteer docents who were responsible for daily school tours at the Museum throughout the school year.
- Trained 15 - 20 new docents each spring and fall in interpretive skills and curriculum content in order to provide quality hands-on educational programs for visiting school groups.

EDUCATION:

M.A. University of Alaska, Fairbanks, Alaska Northern Studies (Natural History Interpretation)	2003
Yavapai Community College, Prescott, Arizona 13 semester hours in Wildlife Biology	1992
B.A. University of Colorado, Boulder, Colorado Environmental Biology	1987

BOOKS and PAPERS:

Arctic Climate Modeling Program – a web-based science curriculum on global climate change. See <http://www.arcticclimatemodeling.com> May 2006

A Place for the Birds - the Legacy of Creamer's Field Migratory Waterfowl Refuge
December 2003

A Summary of the Current Spruce Bark Beetle Infestation on the Alaska Kenai Peninsula
September 1996

GRADUATE ADVISORS:

Dr. Terrence Cole, Professor of History, University of Alaska Fairbanks

Dr. Clause Naske, Professor Emeritus, University of Alaska Fairbanks

Dr. Mary Mangusso, Professor of History, University of Alaska Fairbanks

Carolyn Kramer, Professor of Journalism, University of Alaska Fairbanks

Darin James Trobaugh

Education Program Coordinator, Alaska SeaLife Center

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Seward AK 99664

Phone (907) 224-6339 Fax (907) 224-6320

Darin_Trobaugh@alaskasealife.org

WORK EXPERIENCE:

Alaska SeaLife Center; PO Box 1329; Seward, Alaska 99664

Education Program Coordinator 2003 – Present

- Design, develop and deliver marine science education programs to audiences of all ages in person and via live 2-way video conference.
- Manage teams of up to four interns, seasonal staff and volunteers.
- Coordinate reservations for school programs and Elderhostel tours.
- Develop relationships with rural Alaskan villages through customized curriculum.
- Co-developed “Sea Train” (an annual one-day curriculum and field trip) with Anchorage school district staff and delivered to over 3,000 students.
- Coordinated the Northwest Aquatic and Marine Educators Conference.

Dynamic Corporation; Newport, Oregon

Marine Scientist I 2002 –2003

- Lead 6-month research project to collect, identify, and measure burrowing shrimp from three estuaries along the central Oregon coast.
- Lead sampling teams to estuaries in California, Oregon, and Washington to collect benthic invasive species samples.
- Identified and dissected fish and invertebrate species.
- Prepared spreadsheets of collected data and performed preliminary data analysis.

Oregon Department of Fish and Wildlife; Jewell, Oregon

Experimental Biology Aide 2001 - 2002

- Identified and counted spawning Chinook, Coho, and chum salmon.
- Collected scales and tag information from recovering salmon.
- Performed spawning habitat assessment.

United States Peace Corps; Papua New Guinea

Secondary School Teacher 1999 - 2001

- Taught chemistry, biology, physics, and math to grade 11 and 12 students at secondary schools in rural areas of Papua New Guinea.
- Developed curricula and lesson plans.
- Instructed students and teachers in basic computer skills.

EDUCATION:

- M.S. Oregon State University** 1998
Civil/Environmental Engineering
- B.S. University of Illinois at Urbana-Champaign** 1995
Civil Engineering

PUBLICATIONS:

- Sandra L. Woods, **Darin J. Trobaugh**, and Kim J. Carter. "Polychlorinated Biphenyl Reductive Dechlorination by Vitamin B_{12s}: Thermodynamics and Regiospecificity," *Environmental Science & Technology*; 1999; 33(6); 857-863.
- Trobaugh, Darin James**. "Reductive Dechlorination of Sediment-Sorbed Polychlorinated Biphenyls by Vitamin B_{12s}." Thesis (M.S.), Oregon State University, 1999.
- Trobaugh, Darin J.**, Sandra L. Woods, Kim J. Carter, and Darla Workman, "Development of a Vitamin B₁₂-Amended PCB Bioremediation Strategy." *In Situ and On-Site Bioremediation: Volume 2*, Bruce Alleman and Andrea Leeson, editors, Battelle Press, Columbus, Ohio, 1997. 413-418.
- Trobaugh, J. W., **Trobaugh, D. J.**, Richard, W. D. "Three dimensional imaging with stereotactic ultrasonography." *Computerized Medical Imaging and Graphics*; 1994; 18: 315-323.

GRADUATE ADVISORS:

Dr. Sandra Woods, Professor of Civil Engineering, Oregon State University.

REFERENCES CITED

NONE