

# THE GREEN LEAF

Department of Environmental Science  
University of San Francisco

Spring 2009

## Inside this issue:

Undergraduate Alumni	2-3
Graduate Alumni	4-5
2008 MSEM Projects	5
ENVS 410 and Redwood Creek	6
ENVA 450 and Plastiki	6
Faculty Profile	7
MSEM Courses	8

## Important Dates:

1/24/09	Session A starts
1/26	Undergraduate classes start
2/05	National Teach-In on the Environment
2/13	Census day
2/25	Jose de Acosta lecture with Peter Gleick
3/21	Session B Starts
4/13	Last day to drop classes
4/20	Fall registration
5/14	Last day of classes
5/22	MSEM Project Presentations

## Second Annual José de Acosta Lecture by Dr. Peter Gleick The Future of Water: Finding a Path to Sustainability

The annual José de Acosta lecture series was initiated through the generous donation of USF Alumna and Board of Trustees member Michelle Skaff and her husband Dan.

This year's de Acosta lecture will be given by Dr. Peter Gleick on February 25<sup>th</sup> in the McClaren complex. Dr. Gleick's presentation will start at 7 pm, preceded by a reception at 6 pm.

Dr. Gleick is co-founder and president of the Pacific Institute for Studies in Development, Environment, and Security in Oakland, California. His research and writing address the critical connections between water and human health, the hydrologic impacts of climate change, sustainable water use, privatization and globalization, and international conflicts over water resources. His work in water has been recognized on an international level; he received a

MacArthur "genius" fellowship and was dubbed a "visionary for the environment" by the British Broadcasting Corporation. Dr. Gleick is a member of the National Academy of Sciences and



Dr. Peter Gleick

was elected an Academician of the International Water Academy in Oslo, Norway.

Dr. Gleick received a B.S. from Yale University and an M.S. and Ph.D. from the University of California, Berkeley. He serves on the boards of numerous journals and organizations, and is the author of many scientific

papers and six books, including the biennial water report, *The World's Water*, published by Island Press, most recently in December 2008.

A recent San Francisco Chronicle story identified Dr. Gleick as one of the nation's leaders in the shift towards a green economy and infrastructure. Dr. Gleick is quoted in that article: "The basic philosophy of water management in the 20th century was, let's find more supply. That brought us great benefits, but also great problems - it came at the expense of our environment. Twenty-first century water policy is going to have to look at much more than that - improving efficiency is the cheapest, fastest, most sound option we have." We invite you to his presentation on the 25<sup>th</sup>, as we all look forward to learning more about the critical issue of water in California and beyond.

## From the Chair and Graduate Program Director...

Welcome to the Spring 2009 issue of the USF Department of Environmental Science's Green Leaf newsletter. As in the past, we continue to highlight alumni of both our undergraduate and graduate programs. We're always looking for additional alumni to feature, so please contact us if you'd like to put together an alumni profile for a future issue.

We hope that you can join the Department on Wednesday February 25<sup>th</sup> for the second annual José de Acosta lecture featuring Dr. Peter Gleick. It's sure to be an outstanding event. See the cover story for more details. At the end of the semester, we will have a large number of Masters Project Presentations: please mark your calendar for presentations on Friday, May 22<sup>nd</sup>.

This spring the Department is receiving more new instrumentation that will be used for both teaching and research: in addition to the new GC/MS, we will soon be installing a discrete analyzer for measuring nutrients in water, as well as other analyses, and a carbon-hydrogen-nitrogen analyzer for soil and tissue analysis. These instruments will add significantly to the analytical capabilities of the Department and will create great opportunities for student training.

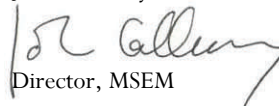
In Fall 2009, Rob Toia will be back from his sabbatical, and Tracy Benning will be returning from a 2-year leave at Spelman College. We look forward to their return and to welcoming a new faculty member (our faculty search is in progress, and the new faculty member will start in the Fall). As always, we would love to hear from you. We encourage all of you to use the form on the back of the newsletter to keep us updated.

William Karney



Chair, ENVS

John Callaway



Director, MSEM

## Undergraduate Alumni Profiles

### ENVA: Kim Campbell White



Kim Campbell White graduated from USF in 2003 with a Bachelor's degree in Environmental Studies and was hired as an environmental scientist with an

international environmental consulting firm in San Francisco. Operating as a consultant for the US EPA, CA DTSC, US Forest Service, US Navy and several other private companies, Kim's work involved site assessments for hazardous contaminants, educational outreach, and even emergency response training. She went on to become the health and safety manager for an asphalt and emulsion company in the Bay Area, carrying out on-site train-

ings, water and soil sampling, air quality permitting, and daily management over three work sites.

After five years in the environmental field, Kim decided to go back to USF and integrate her love for science with her desire to teach. She enrolled in the School of Education to receive her Master's of Arts in Teaching and the California teaching credentials in Science and Elementary Education. Kim completed her student teaching at two public schools in San Francisco and found joy in educating bilingual students in urban areas. Finishing her Masters degree in Spring 2008, she developed curricula for teaching inquiry-based science to English Language Learners in California for her thesis.

Kim currently teaches at Holy Name School in San Francisco. She teaches seventh and eighth grade Science and English.

She loves the challenges of teaching 12 to 14 year old students and has found the perfect way to combine her passion for science with her desire to help the community. Kim loves sharing her stories from USF and her fieldwork with her students. They think her stories are "really cool!" Together, Kim and her students have adopted a sponsor class in Indonesia to assist through raising money to pay for school tuition, sending care packages, and providing English instructional materials. Kim works with her students on volunteer activities such as the San Francisco Food Bank, beach clean up, grade level book clubs, and a youth program that encourages young women to pursue careers in science and math.

Kim still lives near the USF campus in San Francisco with her husband David and their cat, Jersey.

## Undergraduate and Graduate Alumni Profiles

### ENVA: Lisa Cieko



Lisa Cieko received her BA in Environmental Studies in 2003 from USF. She returned to Seattle after graduating and is currently working towards a

Masters of Science from the College of Forest Resources at the University of Washington. In San Francisco, Lisa developed her commitment to community-based restoration and environmental stewardship.

Between USF and graduate school, Lisa

spent several years in the non-profit field. As a Program Manager for the Student Conservation Association's Native Plant Corps, Lisa implemented volunteer-based restoration projects on federal lands throughout the United States. Her projects focused on native plant seed collection and invasive plant removal. In the last couple summers, Lisa has led youth trail-building crews in Alaska's interior. More locally, she spent a year working with a garden-based employment-training program for homeless youth and received her certification as a Master Gardener.

These positions solidified her interests in plant science and ecological restoration, prompting her return to school. Lisa's MS graduate work focuses on horticulture and ecological restoration. Her thesis

project looks at methods for successfully establishing conifer seedlings as part of the City of Seattle's effort to restore 2,500 acres of urban forests and greenspace. To compliment her coursework and research, she is currently working at the University of Washington Botanic Gardens as part of the Native Plant Propagation Program, an effort to involve local youth in producing plant material for on-site restoration projects.

### ENVA: Amanda Parrish



After studying at the University of San Francisco for four years, Amanda Parrish received her Bachelor's degree in Environmental Studies. During her junior year

she spent a semester studying comparative ecology and conservation in Ecuador through the School for International Training (SIT). Traveling to such places as the cloud forests, the Amazon, and the Galapagos Islands instilled in her a deep passion and commitment for working outdoors and conserving our natural resources.

After graduating in May 2008, Amanda took an internship through the Student Conservation Association in Northern Idaho. During this internship she spent six months living on the Coeur d'Alene In-

dian Reservation and working in the tribal department of forestry. Along with a crew of four other interns, Amanda used a variety of field methods to gather data on local forests. This data set will be compared to data from prior years in order to assess the effectiveness of applied silvicultural methods and enable the tribal forestry department to adaptively manage their natural resources.

When her internship was complete Amanda decided to serve for a year as an AmeriCorps member working through a non-profit organization called the Lands Council in Spokane, WA. As the Restoration and Volunteer Coordinator she is responsible for assisting and monitoring the planning and progress of local riparian restoration projects. She also gains experience in environmental education through volunteer training and outreach.

Amanda's passion for wise natural resource management and community outreach, which stems from the multidisciplinary

degree she received at USF, continues to shape her career and lifestyle. After serving her country during this year, she will pursue a graduate degree in Natural Resource Management. She continues to welcome experiences that broaden her knowledge of environmental concerns and enable her to positively contribute to our global community.

## Graduate Alumni Profiles

### MSEM: Rick Champion



Rick Champion's first love is mathematics. Serendipitously he stumbled upon climate change as a way of combining math and environmental science. While

studying the physical basis of climate change at USF, Rick wondered about the computations and the statistics that went into the predictions and assessments of climate change. Rick's Master's report (Spring 2008) was on phenology, how organisms respond to seasonal cues in the environment. Phenology can help track

the effects of climate change on the Earth's biosphere.

Rick attended a summer course on the mathematics of climate change at the Mathematical Sciences Research Institute (MSRI) at UC Berkeley. The math of climate change is unique and difficult, and amazingly, given high performance computing systems and massive data bases and extensive remote sensing, much of the math actually works. Rick is following up on one of the topics of the MSRI summer course, a technique of time series analysis based on the Hilbert Transform, an arcane technique that is well suited to dealing with the quirky behaviors commonly found in real environmental and ecological time series. Rick is writing a scientific investigations report for the US Geological Survey illustrating the Hilbert Trans-

form approach to time series analysis using some data sets from current environmental research and some classic data sets. One current data set is a phenological time series which shows the advance of the coming of spring in the Mid West; one is a remote sensing data set which measures greenness by satellite; and another consists of monitoring data for assessing the suitability of a site in Nevada for use as a nuclear repository.

Natalie and Rick are looking forward to a honey moon in Paris.

### MSEM: Tim DeGraff



One month before Tim DeGraff's classes were scheduled to begin in the MSEM program, he was offered a full-time job at WRA, Inc., an

environmental consulting firm specializing in wetlands, wildlife biology, and habitat restoration in California. Though he was hesitant to accept the position immediately prior to attending graduate classes, Tim couldn't refuse. The position as a wetland scientist allowed him to work in a variety of California wetland habitats such as coastal salt marshes, vernal pools, freshwater marshes, alkaline seeps, and riparian areas. Tim's experience in wetland regulations and wetland restoration also enabled him to prepare wetland restoration/

mitigation plans and negotiate permit conditions with regulatory personnel.

Since graduating from USF in 2004, Tim has become a Certified Professional Wetland Scientist and is instructing classes through the Romberg Tiburon Center Wetland Science Series. He has recently become the Senior Vice President of WRA, Inc. and is now additionally responsible for business development and marketing the firm's services.

Tim supervises over 13 biologists and manages large, complex projects involving wetland and endangered species issues. His regulatory expertise and biological background have enabled him to complete projects that achieve both client and regulatory staff goals. Currently, Tim is working on developing wetland mitigation and wildlife conservation banks in California. Prior to agency approval of the bank, Tim supervises the completion of biological

surveys and develops the habitat restoration plans. He assists land owners in permanently protecting the bank by recording legal instruments such as a conservation easement. Furthermore, Tim analyzes long-term costs necessary to manage the sensitive habitats in perpetuity. This is achieved through the establishment of an endowment, an interest-bearing account of an amount sufficient to generate yearly income to fund the annual management of the bank.

Although habitat banking projects are demanding, Tim finds them exciting due to the interaction between land owners and regulatory agency staff. Such projects require analysis of the biological value, archaeological resources, water rights, and legal status of properties proposed as banks.

## Graduate Alumni Profiles

### MSEM: Bridget DeShields



Bridgette DeShields graduated from USF's MSEM program in 1998 after receiving a B.S. in Biochemistry in 1986 from UC Davis and working as a

consultant in aquatic toxicology and risk assessment for 10 years. Ms. DeShields joined Harding Lawson Associates (HLA) in 1994. HLA and the Army Corps of Engineers supported her in completing the MSEM program, including her thesis project that focused on the uptake of metals into plant tissues at a small arms firing range. The work provided for the cleanup and restoration of 800 acres at Fort Ord in Monterey, California that has now been transferred from the Army to the California State Parks.

Ms. DeShields has continued her work in environmental toxicology and the area of bioaccumulation, focusing on the uptake

of lead into plant and animal tissues and also conducting similar studies on other chemicals, such as those associated with munitions. This includes conducting *in vitro* studies on the bioavailability of lead in soils from both firing ranges and petroleum refineries.

In 2002, Ms. DeShields joined Blasland, Bouck & Lee, Inc., a consulting firm headquartered in Syracuse, NY. In 2006, they were acquired by ARCADIS ([www.arcadis-us.com](http://www.arcadis-us.com)), a Dutch firm that started in the 1800s and now employs over 14,000 scientists and engineers worldwide. Ms. DeShields serves as a Vice President and Principal Scientist with the firm and manages a group of 40 scientists that conduct human health and ecological risk assessments, biological assessments, and restoration planning for a variety of private and public sector clients. Ms. DeShields manages ARCADIS' account for Georgia-Pacific, including managing a large investigation and cleanup program in Fort Bragg, CA (see [www.fortbraggmillsite.com](http://www.fortbraggmillsite.com)). The project involves managing the cleanup program

while supporting redevelopment of the 415 acre site, which makes up over a third of the land mass and the entire coast of the town, so it is a vital part of the future of this small town. She and her staff also manage several other large cleanup programs, primarily in California but also in other areas of the U.S and abroad.

In addition to her work, Ms. DeShields has been active in the Society of Environmental Toxicology and Chemistry ([www.setac.org](http://www.setac.org)), a nonprofit, worldwide professional organization "dedicated to the study, analysis and solution of environmental problems, the management and regulation of natural resources, research and development and environmental education." She served as committee chair and board member of SETAC. She currently resides in Santa Rosa, CA with her husband and daughter.

## MSEM Master's Projects

### Fall 2008

Christin Anderson	<i>Effects of Synthetic Polymers on Marine Life in the Pacific Ocean</i>
Charina Camangon	<i>Behavior Based Safety: an Effective Approach to Injury Prevention within the Workplace</i>
Marcus Cole	<i>Vitamin Additions to Activated Sludge Treatment of Refinery Wastewater</i>
Amber Finley	<i>Exploring the Possibilities of Fitting Traditional Ecological Knowledge into Ecosystem Management</i>
Eva Kissova	<i>Effects of PCBs on Thyroid Functions</i>
Jessica Range	<i>CEQA and Climate Change: an Evaluation of the Effectiveness of the California Environmental Quality Act (CEQA) to Mitigate Climate Change</i>
Aron Selby	<i>Ranching in the US Southwest: Strategies for Adaptation to Climate Change</i>
Caleb Shaffer	<i>Strategies to Reduce Fugitive Methane Emissions at Municipal Solid Waste Landfills</i>
Jason Triolo	<i>Sustainable Subsurface Remediation Strategies</i>

## Environmental Monitoring Class Set to Complete a 6-year Study of Redwood Creek



*Gabe Turner samples Redwood Creek.*

The assessment started with the 2004 monitoring class and has continued each spring semester since. Each year

This year the environmental monitoring class (ENVS 410) will complete its 6-year baseline assessment of Redwood Creek, the stream on Mt. Tamalpais that flows through Muir Woods National Recreation Area.

the class has evaluated the water quality of the creek and riparian habitat, providing this information to California State Parks and the National Park Service as part of this service learning course. Moreover, at the request of the National Park Service, each year the class continues to work their way through evaluating water quality of the springs that are the original source of water for this stream network.

A significant milestone for the project was the development of an innovative spring sampling protocol that eliminates atmospheric influences on water quality prior to evaluation of parameters. This protocol allows the class to sample up to ten separate springs in a single afternoon on the

mountain, dramatically increasing sampling efficiency while maintaining scientific rigor of the data.

Anticipating the completion of the baseline assessment this spring, the department has started negotiations with the National Park Service to determine future service learning project opportunities for this capstone class. Two interesting possibilities exist, one to evaluate the continued restoration of Redwood Creek at the Banducci Farm site and another to evaluate the effectiveness of the restoration of Big Lagoon, the wetland area where Redwood Creek flows into the Pacific Ocean.

## Environmental Studies Capstone Contributes to Plastiki Adventure

Environmental Studies majors in the Senior Capstone Seminar course (ENVA 450) this Spring are working with an organization called Adventure Ecology. Based in London and founded by explorer/adventurer David de Rothschild, Adventure Ecology is building a boat out of plastic bottles and recycled plastic materials at Pier 31 in San Francisco. The boat, named the "Plastiki," is scheduled to launch on April 28 and sail from San Francisco to San Diego, then to Hawaii, followed by stops at a number of South Pacific islands before arriving in Sydney in August.

The expedition's goal is rooted in Adventure Ecology's mission of drawing attention to humanity's impact on Earth's most remote and fragile ecosystems. The Plastiki itself will serve as an example of how creativity and innovation can lead to design solutions that address many of these problems. Waste, whether in the form of plastic bottles or the CO<sub>2</sub> that we emit when burning fossil fuels, is simply a by-product of poor design.

By sailing this innovative vessel through environments threatened by such

problems as marine debris, coral bleaching, overfishing, and rising sea levels, the Plastiki expedition aims to increase global consciousness of the challenges that our oceans and its inhabitants face while stimulating creative problem solving. The latter will be accomplished through the Plastiki itself. Designed to be completely self-sufficient, the Plastiki's on board systems will provide all of the crew's water, energy and food, as well as recycle all of its waste.

Students in the Senior Capstone Seminar class will be supporting the expedition's goals by developing content for the expedition's website. Students are working on translating complex issues, like rising sea levels and ocean acidification, into text and diagrams that can be easily understood by anyone without scientific training. Students are also doing research to produce profiles of each of the expeditions major stopping points that will describe the specific ways in which each location will be impacted by the various threats to marine ecosystems being highlighted by the expedition.



*Route of Plastiki's projected voyage*

After the website is completed in mid-April, students will shift their focus to creating educational modules, downloadable from the website, that primary and secondary educators can use in their classrooms. The aim is to create lesson plans that allow teachers to teach basic scientific and other concepts by drawing on students' inherent interest in the Plastiki expedition.

Anyone interested in learning more about the expedition or the work Environmental Studies majors are doing can contact Steve Zavestoski ([smzavestoski@usfca.edu](mailto:smzavestoski@usfca.edu)).

## Faculty Profiles

### John Callaway

John Callaway joined the Department of Environmental Science at USF in 1999 and is now an Associate Professor. Prior to USF, John was the Associate Director of the Pacific Estuarine Research Laboratory (PERL) at San Diego State University. He received a Ph.D. in Oceanography and Coastal Sciences from Louisiana State University in 1994.

Over the last 10 years, he's taught courses ranging from Ecoscience and Applied

Ecology in the MSEM program to Ecology and Human Impacts for undergrads, and electives in Wetland Ecology and Restoration Ecology for both undergraduate and graduate students. A strong emphasis in John's classes is field work: exposure to real ecological issues, from restoration sites to natural ecosystems around the Bay Area. Field trips are a key part of his classes, including Point Reyes, canoeing on the Bay, Crissy Field, and other sites, as well as hands-on measurements of soils and plants. He encourages students to dig in the mud, bird watch, play with soil, and get to know local plants and animals.

In Fall 2006, John Callaway took over as Graduate Program Director (GPD) from Tom MacDonald. As GPD, John recruits new MSEM graduate students, organizes course offerings for each semester, coordinates part-time faculty who teach in the program, and meets regularly with students in the program.

John's research has always focused on wetland plants and soils, with particular emphasis on the restoration of tidal wetland ecosystems. He has published a number of review chapters recently, including

a co-authored paper reviewing California's coastal wetlands in UC Press's *Terrestrial Vegetation of California* (co-authored with Brenda Grewell and Wayne Ferren) and another upcoming chapter on conservation challenges for Pacific Coast wetlands (co-authored with Joy Zedler). Collaboration has been a critical part of John's research with regular collaboration with Tom Parker, Mike Vasey, Lisa Schile, and Ellen Herbert at San Francisco State University and Joy Zedler at the University of



*John Callaway sets up stations for measuring sedimentation rates at the Island Ponds, part of the South Bay Salt Pond Restoration Project.*

Wisconsin. Another recent project evaluated the wetland mitigation efforts for the State Water Resources Control Board (co-PI, Rich Ambrose at UCLA). This project supported three MSEM students and included field work across all of northern and central California. A current project supported by CALFED with Tom Parker focuses on the potential impacts of climate change on estuarine wetlands in the Bay-Delta, including impacts on plant productivity and diversity, as well as on fish food webs.

John's most recent project started in December 2008: measuring rates of carbon sequestration in San Francisco Bay wet-

lands. This research is part of a larger effort to identify potential carbon credits for future carbon trading in the state. It is funded by the Moore Foundation and the California Coastal Conservancy and includes collaborators at Louisiana State University (Gene Turner) and the US Geological Survey (Judy Drexler). Evyan Borgnis, a recent Environmental Science graduate, is coordinating the field work for the project as well as processing samples from over 45 sediment cores that will

be collected at seven natural tidal wetlands and two restored wetlands across the Bay. Cores will be dated with  $^{137}\text{Cs}$  and  $^{210}\text{Pb}$  to determine rates of sediment accumulation and carbon sequestration. In 2007, John won the Arthur Furst Award for Outstanding Research for the Betterment of Humanity from the College of Arts and Sciences at USF.

In addition to teaching, research, and work as GPD, John has been active with a number of professional societies and as an advisor to

local agencies. He serves on the board of editors of *Ecological Applications* (Ecological Society of America) and *Wetlands* (Society of Wetland Scientists) and previously was the editor of *Madroño* (California Botanical Society). This year he is working to promote more student involvement in the local State of the Estuary conference, including coordinating awards for student presentations. Over the last two years, John has served on science advisory panels for the South Bay Salt Pond Restoration Project, Elkhorn Slough National Estuarine Research Reserve, Rush Ranch, and the Southern California Wetlands Recovery Project.

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## Masters' Project Presentations: May 22, 2009

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Please join us for the Spring 2009 Master's Project Presentations the evening of Friday, May 22 in Cowell Hall, rooms 414, 417 and 418. There will be a reception beforehand. An official announcement will be emailed in mid-May. We hope to see you there!

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### MSEM Spring Courses

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#### SESSION A COURSES

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Environmental Law	Aaron Frank
Environmental Accounting	Diane Roberts
Environmental Risk Assessment	Stephanie Ohshita
Watershed Management	Amy Merrill
Green Building	Paul Okamoto

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#### SESSION B COURSES

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Environmental Law II	Aaron Frank
Environmental Data Analysis	Harry Allen
Environmental Risk Management	Stephanie Ohshita
Atmospheric Chemistry and Pollution	Brian LaFranchi
Conservation Biology	Andy Chang

#### Environmental Social Gatherings

Our Spring 2009 dates will be announced soon. Please consider attending the José de Acosta lecture on 2/25/09. Questions? Contact [sbohshita@usfca.edu](mailto:sbohshita@usfca.edu).

#### Department Information

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### Environmental Science Alumni Updates and Contact Information

Name: \_\_\_\_\_

Alumni Update: \_\_\_\_\_  
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\_\_\_\_\_  
\_\_\_\_\_

Address 1: \_\_\_\_\_

Address 2: \_\_\_\_\_

City, State, Zip: \_\_\_\_\_

Phone: \_\_\_\_\_

Email: \_\_\_\_\_

We'd like to include a large number of brief "Alumni Updates" in future issues. Please provide a short summary of your current position, new projects, etc. and return (fax, mail, or email) form to the Department of Environmental Science. Please include a photo of yourself with your submission. You can also use this form to update your contact information if necessary.