



Tufts Institute of the **ENVIRONMENT**

2013—2014 ANNUAL REPORT



Laura Read

Doctoral Candidate
Civil and Environmental Engineering
Tufts University

Many Andean communities in rural Peru are experiencing water quality and quantity issues with their local water supplies. In summer 2013, Laura Read, a Ph.D. student in Environmental and Water Resources Engineering, and Devyn Powell (Tufts '14) conducted water assessments with seven communities to help plan for future water services.



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ABOUT TIE

HISTORY OF TIE

The Tufts Institute of the Environment was created in 1998 to formalize and expand on the missions of the Center for Environmental Management (CEM), founded in 1984, and the Tufts Environmental Program Council (TEPC). In partnership with the US Environmental Protection Agency, CEM promoted interdisciplinary environment-related research in all of Tufts's schools. TEPC was charged with identifying opportunities for creating interdisciplinary programs. In 2007, TIE's role as a critical cross-school academic center was recognized, tasking TIE with reporting directly to the Office of the Provost and Senior Vice President. With this shift in leadership, the work at TIE is supported by a University-wide commitment to sustainability, citizenship, and excellence in academics. Documents - integral to shaping the long-term vision of TIE - include:

- + The Taillores Declaration, 2005
- + Tufts University Environmental Policy
- + Summary Review of External Review Committee, 2005
- + Tufts Climate Initiative: 5 Year Report Reflecting on the Past, Looking to the Future, 2004
- + Tufts Institute of the Environment Assessment, 2007

TIE MISSION STATEMENT

The Tufts Institute of the Environment (TIE) is an interdisciplinary university-wide institute that initiates, facilitates, and supports environmental education, research, outreach, and service toward a sustainable future. TIE's strategic goals are based on the larger University Environmental Policy, which states that Tufts University will strive to:

- + Foster an understanding of and a responsibility for the physical environment;
- + Ensure that individuals are knowledgeable about environmental health issues that affect their discipline;
- + Encourage environmental research;
- + Conduct research and teaching in an environmentally responsible way;
- + Provide a forum for the open flow of information among governments, international organizations, industry, and academia to discuss and study environmental issues and their relationship to other social issues¹.

¹<http://sustainability.tufts.edu/greenhouse-gas-emissions/environmental-policy/>

MESSAGE FROM THE TIE DIRECTOR

Antje Danielson, TIE Administrative Director

Dear Friends of the Tufts Institute of the Environment,

The past year has been remarkable for Tufts and the Institute of the Environment (TIE). TIE programs place a heavy focus on preparing Tufts University's students to face the complex challenges of a changing world. TIE supports research that is scholarly, typically interdisciplinary, and use-inspired. With the new T10 plan in place for the University, we are now able to create a long-term strategy for TIE in order to advance the student experience even further and to continue to support world-class environmental research.

Since 2008, Tufts Institute of the Environment has initiated and supported curriculum development and has facilitated the success of a number of interdisciplinary environmental degree programs by providing space and administrative assistance to the Water Diplomacy program, the Master's of Conservation Medicine, the Water: Systems, Science and Society graduate certificate program, and the Environmental Studies program. Last year, in order to accommodate students and faculty from these programs, we increased the TIE space by a third.

Last spring we had our first water-related faculty retreat. Water problems are complex because they cross physical, disciplinary and jurisdictional boundaries. Water, viewed as a fixed resource needed for all life and livelihood, lends itself to conflict over its division. Underlying most water problems is the coupling of human and natural systems. Without considering societal drivers, solutions for water problems cannot be found. Knowledge from the natural, technical, and societal domains is needed to transform fixed quantities of water into a flexible resource. Energy, food, and human wellbeing are all intimately related to water resources and distribution, which has led TIE to build a strong community around interdisciplinary water research. The water community at TIE is based on an exchange between knowledge and action. Knowledge is generated by the scholarly activities of faculty and Ph.D. students from across all Tufts's schools in research areas such as "integrated water resource management," "water in the urban environment," "cross-boundary water issues," and "One Health." The research is supported by fellowships and grants. The generated knowledge is distributed through traditional academic channels as well as the WSSS annual symposium, civic engagement, and exchanges with the more applied community members at TIE and beyond.

Over the past year, TIE has funded students to pursue ambitious, field-based research projects in virtually every region of the world. These opportunities have empowered Tufts students to conduct cutting-edge research, and augment traditional education methods with global and local internship opportunities. You can see an excellent example of the global impact of our program by the map on page 19.

In order to support interdisciplinary research and teaching, the Provost Office has established a new Bridge Professorship program, which will ensure a world-class interdisciplinary faculty body. Last year TIE successfully facilitated an application from the Fletcher School of Law and Diplomacy and the School of Arts and Sciences for a Bridge Professorship in Water Security. This new senior faculty member will be hired during the academic year 15/16. Finally, I would like to mention ROGUE, a new TIE-initiated clearinghouse designed to enhance the research experience of Tufts undergraduate students. It will give graduate students the opportunity to mentor undergrads, and enable undergraduates to be part of exciting, cutting-edge research.

While reading this Annual Report, you will see that the projects that TIE funds – all of them pursuits in the area of socio-environmental analysis and synthesis – speak for themselves. Looking forward, the TIE office will continue to initiate, facilitate, support, and connect environmental education and research towards a sustainable future at Tufts and in the world.

Sincerely,
Antje

PERMANENT STAFF AND FACULTY



Antje Danielson is the Administrative Director of TIE and the Water: Systems, Science and Society (WSSS) Program as well as an Assistant Professor in the School of Medicine. She came to Tufts from Durham University (UK), where, in May 2008, she served as the Deputy Director for Sustainability. Previously, she worked with the Harvard Green Campus Initiative. A long-time resident of Cambridge, Mass, Antje also co-founded the innovative car-sharing company Zipcar. She holds a Ph.D. in Geology from Free University, Berlin



Tim Griffin Faculty Co-Director Associate Professor, Director of the Agriculture, Food and Environment Program, The Friedman School of Nutrition Science & Policy



Colin Orians Faculty Co-Director, Undergraduate Education Professor, Department of Biology, Tufts University School of Arts and Sciences Director of the Environmental Studies Program



David Gute Faculty Co-Director Associate Professor, Department of Civil and Environmental Engineering, Tufts University School of Engineering

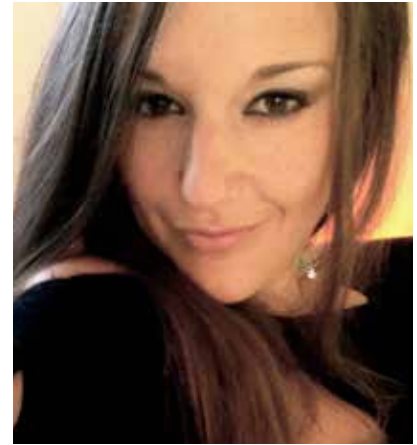


Chris Whittier Faculty Co-Director Research Assistant Professor, Department of Infectious Disease and Global Health Program Director, Cummings School of Veterinary Medicine



Emily Geosling

was the Program Coordinator for TIE. She managed the TIE office in Miller Hall, planned and directed events, and conducted outreach and communication. Before coming to Tufts, Emily worked as a Recycling Coordinator for the City of Monterey, California and as a Graduate Assistant at the Monterey Institute of International Studies. She holds a B.S. in Environmental Science, Policy, and Management from the University of California, Berkeley. Prior to her promotion to Program Coordinator, Emily served as the TIE Office Assistant.



Theresa Silver

is the Office Assistant for TIE, and contributes to its communications and administrative functions through management of TIE-affiliated websites, graphic design, social media strategy, and program / event coordination. She has a background in Computer Science and Electronic Music Production and Design.

INTERNSHIP PROGRAM

STUDENT INTERNSHIPS @ TIE

TIE provides internship opportunities for both undergraduate and graduate students interested in the field of interdisciplinary environmental research, teaching, and service. These students continue to contribute to TIE's growth and have also taken on leadership roles at TIE, organizing TELL, writing and distributing newsletters, creating the Tufts Environmental Alumni (TEA) network, researching environmental initiatives, and planning events.



Denise Chin

provides research assistance to ongoing projects at TIE. She is currently pursuing her masters in Urban and Environmental Policy and Planning, with a focus on sustainable food systems. Born and raised in Malaysia, Denise completed her Bachelor of Arts in Sociology at Washington State University.



Darius Izadpanah

Darius Izadpanah is a Communications Specialist at TIE and the IGERT Water Diplomacy Ph.D. Program Coordinator Ad Interim. He graduated from the Tufts / SMFA Combined Degree Program with a BS in Psychology and a BFA in Studio Art in May 2013.



Panagiota Kaltsa

Panagiota Kaltsa is TIE's Online Education Strategist. At the Fletcher School of Law and Diplomacy she focused on strategic management and communications. Her previous professional experience focused on corporate social responsibility initiatives in banking, marketing, and public relations.



Anastasia Korolov

is currently double majoring in math and physics. In addition to her work with TIE as a social network analysis intern, she also works in the Physics department as the assistant lab coordinator.



Chris Maroshegyi

is TIE's strategic development intern. He is currently pursuing a Masters of Law and Diplomacy at the Fletcher School, with concentrations in international environment & resource policy, negotiations, and international business relations.



Margaret McKenzie

is the Tufts Environmental Literacy Institute (TELI) Coordinator. She is currently pursuing a Masters of Law and Diplomacy at the Fletcher School, with concentrations in international environment & resource policy and security studies



Kate Miller

is double majoring in Environmental Studies and International Relations and minoring in Foreign Policy Analysis. At TIE, she works on the Faculty Research Digest and supports TIE-affiliated research.



Nolan Nicaise

is a graduate intern and the interim WSSS coordinator. He is currently finishing up his thesis (Housewife Data: Citizen Science and the Love Canal) as part of Tufts's Urban and Environmental Policy and Planning program.



A senior from Portland, OR, **Devyn Powell** is currently pursuing a double major in International Relations and Environmental Studies. She is interested in environmental policy and politics, especially in the realms of climate change and energy.



Claudia Schwartz

is a second-year master's student at The Fletcher School and works as the TIE alumni liaison. Prior to graduate school she worked in non-profit international development in East Africa and the Horn of Africa.



Lei Zhu

is double majoring in Quantitative Economics and Math. She works on TIE's Faculty Research Digest and on its new program, Research Opportunities for Undergraduate & Graduate Exchange (ROGUE).

In 2013 it was the first time TELI fostered international participation with 26 faculty members from 10 countries. This year's goal was to promote "One Health" thinking and engage participants in the climate change discussion, in collaboration with RESPOND USAID. The theme of "One Health" opened the floor to insightful discussions about the intersection of human, animal and environmental health.

The TELI curriculum helped participants develop breadth of knowledge around their areas of health expertise and understand how those are connected. One of the highlights of TELI are the environmentally themed fieldtrips that in 2013 brought the participants to the Deer Island Waste Water Treatment Plant, the Tufts School of Medicine in Boston and the Cummings School of Veterinary Medicine in Grafton. The new communication technology sessions, such as Geographic Information Systems, Crisis Mapping and Digital media Story Telling gave everyone a new perspective. Participants unanimously acknowledged the value of cross-cultural interaction, the exchange of ideas, as well as the uniqueness of the US educational system to synthesize disciplines.

You can view a video about TELI 2013 here:
https://www.youtube.com/watch?v=DDy_LevAqHw



ONE HEALTH

One Health is a collaborative effort across multiple disciplines and geographical boundaries to attain optimal health for people, animals, and our environmental ecosystems by facilitating partnerships between groups like physicians, veterinarians and public health officials and ecologists, environmental, engineers, and environmental planners. Significant, long-standing barriers to collaboration between health professionals and members of other disciplines have limited our understanding of etiology, constraining the development of balanced, effective solutions to One Health problems.

Antje Danielson
was recently elected
to the University
One Health Commission.



TUFTS ENVIRONMENTAL LITERACY INSTITUTE (TELI)

The Tufts Environmental Literacy Institute (TELI) is a multi-day faculty development workshop aimed at enhancing faculty environmental literacy, and encouraging participants to incorporate these themes into existing or new courses. The ultimate goal of TELI is to ensure that all Tufts students are aware of and will be able to effectively engage with the issues that will shape their generation. Emphasis is placed on recruiting faculty participants from a wide range of disciplines.

TIE oversees student interns involved with TELI implementation and works with Faculty Directors or teaching teams to develop the institute's theme and content. TIE also organizes two follow-up meetings for TELI participants to share their progress and to provide feedback so as to improve TELI.

TELI-G 2014

This past year, TELI expanded its reach with a special conference aimed at graduate students. TELI-G ("Graduate") brought together 17 graduate students from diverse disciplines, including environmental engineering, public health, veterinary medicine, and even English. Students appreciated the opportunity to exchange knowledge and ideas with each other, learn from the variety of speakers' presentations, and engage in a simulation activity as well as designing a hypothetical course. After the workshop students shared their reflections on the experience.



"Over the course of three days, I learned about Systems Thinking, Systems Mapping, and Social Network Analysis, all under the umbrella of environmental water concerns but capable of being adapted to any field of study. We were even instructed by one of Tufts's highly skilled librarians on utilizing online technology for finding research. Overall, by the end of one weekend, I found myself resolved to study the issue further. I came out of TELI-G not only with the ability to speak credibly on the complexity of water issues, but also with developed skills useful across academia. Most importantly, I learned about a complex issue and was taught to look at the concept from multiple perspectives in order to create an effective solution."

Timothy Grant

Master's Candidate
The Fletcher School of Law and Diplomacy
Tufts University

TIE FELLOWSHIPS

TIE FELLOWS 2013-2014

Matriculated graduate students at any of Tufts University's graduate programs and professional schools are eligible to apply for a TIE fellowship to conduct interdisciplinary environmental research. This is an opportunity to support and publicize stellar interdisciplinary students and their work. Selected students receive funding toward a research stipend and materials, are listed on the TIE website, and are invited to present final reports to the Tufts community.



DOCTORAL STUDENTS



Carolyn Bauer

Biology Department,
School of Arts and Sciences
*Does the Stress Response
Correlate with Survival in
the Degu (*Octodon degus*)?*



Laura Read

Department of Civil and
Environmental Engineering
*Assessing Risk and Adaptation
Needs for Climate Change and
Water Resources Protection in
Rural Andean Communities*



Jennifer Bogle

Urban and Environmental
Policy and Planning (UEP)
*Conflict Assessment of Oil
Exploration in Southern Belize*



Robert Burns

Biology Department
*Utilizing Differential
Transcriptomics to Understand
the Habitat Selection of the
Marine Pollution Indicator
*Polychaete Capitella teleta**



Lai Ying Yu

Department of English,
Graduate School of Arts
and Sciences
*Promise of the City: Intimate
Publics and Urban Space
in 20th Century American
Literature*



Tori Okner

Friedman School of
Nutrition Science and Policy,
Fletcher School of Law
and Diplomacy
*The Role of Normative
Frameworks in Municipal
Urban Agriculture Policy:
Three Case Studies in the
United States*

WATER PROGRAMS

WATER: SYSTEMS, SCIENCE, AND SOCIETY (WSSS)

is a graduate certificate program housed at TIE. Founded in 2004, it is aimed at providing students with the interdisciplinary perspectives and tools necessary for managing water-related problems around the world.

In order to reach this goal of providing interdisciplinary perspectives, WSSS enlists students from across the spectrum of masters and doctoral programs at Tufts University, including Civil and Environmental Engineering, Food, Agriculture, and the Environment, and Urban and Environmental Policy and Planning. Students from these diverse academic programs are united by their intellectual passions for water. They bring

their specialties together for more holistic water-related discussions, presentations, and research projects. Guest speakers at campus seminars and symposia support current interest areas and introduce new topics from water and public health to water and food supplies to water and the urban environment.

All students must complete one of two curriculum tracks, the Research Track or the Practicum Track. In addition, students can build knowledge and skills by attending the program's regular meetings and guest speaker series, the annual student-produced WSSS Symposium, and by winning the WSSS Water Research Fellowships. A sampling of the curriculum tracks, fellowships, and research projects are highlighted below.



WATER FACTS

More than 3.4 million people die each year from water, sanitation, and hygiene-related causes. Nearly all deaths, 99 percent, occur in the developing world.² 780 million people lack access to an improved water source; approximately one in nine people.³

RESEARCH TRACK

Students pursue in-depth water research, culminating in a thesis, directed study, or dissertation. The research is focused on one of six areas in which Tufts has well-established courses and strong faculty support:

1. Water, Climate, and Environmental Change
2. Water and Public Health
3. Water Pollution and Remediation Science
4. Watershed Management
5. Water, Food, and Livelihood Security
6. Water and National and International Security

These students must publish a paper in a professional journal and present their research at the annual student-produced WSSS Symposium or at another national or international conference. Recent student research has focused on water resource decision-making and the water-food-energy nexus in conflict-prone transboundary regions.

PRACTICUM TRACK

Students engage with the study of water through practical application and experiential learning. Each year, students engage in one of several practica. In the spring of 2014, for example, students worked with three agencies, the Mystic River Watershed Association (Arlington, MA), the Cape Cod Commission (Barnstable, MA), and the Lajee Center (Aida Refugee Camp, Palestine). In addition to working with important organizations on specific projects, these students complete 150 hours of work at a water-related internship of their choice. The Interdisciplinary Professional Experience often happens over the summer between students' first and second years of the program. During the summer of 2013, students were active employees and learners at a variety of locations, including Clean Water Action (Boston, MA), IDEXX Laboratories, Inc. (Westbrook, ME), and the Sanitation District No. 1 (Ft. Wright, KY).

WSSS SYMPOSIUM

Every year, second-year WSSS students organize the WSSS Symposium, a day of lectures, discussions, and networking focused on a current water issue. WSSS students, as part of the requirements of the Practicum Track, raise funds, reserve the space, arrange for travel for speakers, develop the program, operate the event, and provide catered food for the attendees. This year, the 5th Annual WSSS Symposium, "Water and Cities: Shaping the Flow of Our Urban Future," focused on the fact that more than 50 percent of the world's human population now lives in urban environments. Speakers came from across the US, from agencies such as the New York City Department of Environmental Protection, the Massachusetts Water Resources Authority, and the Arup firm. Panel discussions included topics such as "Urban Resilience and Disaster Management" and "Urbanization and the Water Cycle." The 215 Attendees included students from area schools, professionals from the private and public sectors, and members of the general public.

²Diarrhea: Why children are still dying and what can be done. UNICEF, WHO 2009.

³Joint Monitoring Programme (JMP) for Water Supply and Sanitation. UNICEF, WHO 2012.

WATER DIPLOMACY

Water Diplomacy is an innovative and integrative approach to addressing complex water problems. We teach students that water is not a fixed resource, but rather, a flexible and sustainably shared resource. Our students learn to be water diplomats who will create new avenues for negotiating and resolving water conflicts. Tufts University's Water Diplomacy Integrated Graduate Education and Research Traineeship (IGERT) doctoral program creates reflective water professionals who think across disciplinary and geographical boundaries and link knowledge and action from multiple perspectives to help resolve water issues through mutual gains negotiations.

The Water Diplomacy IGERT program at Tufts is a growing and welcoming community of students and faculty from a variety of disciplines across the university, including the School of Engineering, the School

of Arts and Sciences, the Friedman School of Nutrition and Food Policy, and the Fletcher School of Law and Diplomacy. Currently, 14 Ph.D. students conduct research in Hawaii, Peru, Norway, and other locations. The Water Diplomacy program hosted three international scholars this past year: Mark Zandvoort from Wageningen University in the Netherlands; Hojjat Mian Abadi from Delft University of Technology in the Netherlands; and Mahdi Zarghami from the University of Tabriz in Iran.



Water Diplomacy@ Tufts

waterdiplomacy.tufts.edu

Greg Sixt at the United Nations Office in Geneva, Switzerland



2013-2014 WSSS FELLOWS

Nolan Nicaise

Urban and Environmental
Policy and Planning (UEP)

*Water for Healing: An
Exploration of Health Baths
and the City of Hot Springs,
Arkansas*

Matt Simon

Civil and Environmental
Engineering

*The Effect of Precipitation on
Atmospheric Particle Number
Concentrations*

Greg Sixt

Friedman School of Nutrition
Science and Policy

*A Framework for Assessing
Transboundary Water-Food-
Energy Nexus Challenges
in Central Asia: Mitigating
Ecosystem Damage and
Preventing Conflict*

Greg Sixt,
Doctoral Candidate
Agriculture, Food and
Environment Program
Tufts University

“I spent summer 2013 working with the United Nations Economic Commission for Europe (UNECE) Task Force on the Water-Food-Energy-Ecosystems Nexus assisting in the development of indicators for the thematic assessment on the Nexus in transboundary basins. The project recognizes that, often, development in one economic sector negatively impacts water quality or quantity in shared waters. The goal of the Nexus assessment is to identify intersectoral synergies that can be further explored and utilized in select transboundary river basins. These synergies can be used to develop policy measures and actions that create mutual gains across sectors and that ultimately support transitions to a green economy. This work with UNECE led to the development of a systematic review paper (currently in progress) that I am co-writing with another Tufts student (Graham Jefferies) assessing the current state of the literature on this nascent field. The field work experience with UNECE has also advanced the development of my Ph.D. dissertation proposal.”

Robert Burns

Utilizing Differential Transcriptomics to Understand the Habitat Selection of the Marine Pollution Indicator Polychaete Capitella teleta (Boston, Massachusetts, USA)

Matthew Simon

The Effect of Precipitation on Atmospheric Particle Number Concentrations (Boston, Massachusetts, USA)

Carla Stoffel

Lead-Free Fishing Tackle (Milwaukee, Wisconsin, USA)



Wisconsin, USA

Chicago, USA

Los Angeles, USA

★ Massachusetts, USA

New York, USA

Arkansas, USA

Belize

Panama

Peru

Chile

Nolan Nicaise

Water for Healing: An Exploration of Health Baths and the City of Hot Springs, Arkansas (Hot Springs, Arkansas, USA)

Lai Ying Yu

Promise of the City: Intimate Publics and Urban Space in 20th Century American Literature (New York, Los Angeles, and Chicago, USA)

TIE - WSSS · FUNDED

Marcy Ostberg

Recycling Association Entrepreneurship Training Modules (Cartí Islands, Panama)

Jennifer Bogle

Conflict Assessment of Oil Exploration in Southern Belize (Belize)

Laura Read

Assessing risk and adaptation needs for climate change and water resources protection in rural Andean communities (Huaraz, Peru)

Quang Truong
Evaptainer (Nigeria)

Gregory Sixt
*A Framework for Assessing Transboundary
Water-Food-Energy Nexus Challenges in
Central Asia: Mitigating Ecosystem Damage and
Preventing Conflict (Kyrgyzstan, Tajikistan, and
Uzbekistan)*

Matthew Hazel
*Data Gathering and Observation
of Chinese Tea Production in the
Context of a Changing Climate
(Beijing and Hangzhou, China)*



Vivek Freitas
*Looking Laterally:
Environmental Justice
and Postcolonial Literature
(Navdanya, Dehra Dun, India)*

Denise Chin
*The Impact of Supermarkets
on Contract Farming in Malaysia
(Malaysia)*

Tori Okner
*Lessons from Lima, Peru: Urban
Agriculture Policy as a Strategy
for Food Security and Sustainable
Development (Lima, Peru)*

David Sussman
*Community Mobilization in Response
to Mining and Development Pressures
in Peru (Arequipa and Moquegua,
Peru)*

Carolyn Bauer
*Does the stress response correlate with
survival in the degu (Octodon degus)?
(Santiago, Chile)*

OTHER SUPPORT

TIE'S SUPPORT OF UNDERGRADUATE AND GRADUATE STUDENTS

Because TIE recognizes that graduate students are future environmental leaders, both within the academy and in the world outside the halls of academe, it supports graduate students at Tufts in a number of ways: internships (already discussed), conference travel grants, data collection grants, fellowships, and co-sponsorship of graduate conferences. TIE also works with the U.S. Department of Energy's annual Better Buildings Case Competition, and partners with Dow to give out their Sustainability Innovation Student Challenge Award (SISCA).



The Better Buildings Case Competition presented a unique opportunity to interact and work with people from different departments at Tufts like Urban and Environment Planning, Engineering, the Gordon Institute, and the Fletcher school. It also provided a platform for us to combine our ideas to address a complex, dynamic problem. Working as a team, understanding perspectives, and presenting our proposals to real stakeholders made this case the perfect opportunity for me to understand current key energy policy issues.

Adithi Murthy
MS Candidate, Economics
Graduate School of Arts and Sciences
Tufts University

TIE-SUPPORTED GRADUATE CONFERENCES

BETTER BUILDINGS CASE COMPETITION

The U.S. Department of Energy's (DOE) annual Better Buildings Case Competition engages the next generation of engineers, entrepreneurs, and policymakers to develop creative solutions to real-world energy efficiency problems experienced by businesses and other organizations across the marketplace. By participating in the competition, interdisciplinary teams of university students gain critical skills and experience that helps them start careers in clean energy. Since its launch in 2012, the competition has supported the Obama Administration's Better Buildings Initiative goal of reducing energy consumption in commercial and industrial buildings across the U.S. by at least 20 percent by 2020.



FOOD SECURITY

TIE provides support to the many researchers and graduate students at Tufts who are passionate about creating resilient and sustainable solutions for global food security. 842 million people worldwide – about one in eight– the majority of whom live in developing countries, lack sufficient food. The world’s food supply faces several threats: increasing global population, shifts in crop productivity due to climate change, and volatile markets. Conventional food production, distribution, and consumption practices have far-reaching and devastating environmental implications.

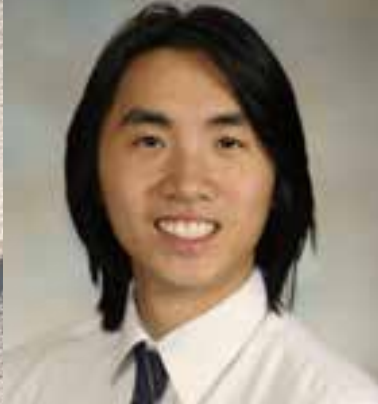


DOW SUSTAINABILITY INNOVATION STUDENT CHALLENGE AWARD (SISCA)

The Dow Sustainability Innovation Student Challenge Award (SISCA) recognizes and rewards students for their innovation and research into sustainable solutions to the world's most pressing environmental challenges. This year has been the fifth in a row that Dow has recognized Tufts's global leadership on issues related to sustainability by including it among the 17 institutions around the world where SISCAs are given out. This year's SISCA at Tufts honored the research of Quang Truong, a graduate student at the Fletcher School, who headed a team of graduate students from both Fletcher and MIT. The team developed the "EvapTainer," an evaporative cooling device that extends the longevity of produce in developing countries. The research prize of \$10,000 will go towards testing the prototype in an environmentally controlled lab.



DOW SUSTAINABILITY INNOVATION STUDENT CHALLENGE AWARD 2013 SISCA WINNER



Quang Truong
Grand Prize winner
Tufts University
Project name: EvapTainer

What did winning the SISCA mean to you? "In a word, winning the Dow SISCA has given our team a fundamental sense of validation. Not only is this endorsement a validation of the countless hours we've put into our work, but it is also confirmation that the problem we are working to solve is in fact an important one. With the funding from SISCA, we will be able to make the initial purchase of materials for our prototype and begin testing our device in an environment-controlled lab. We will continue to enlist the help of professors at both Tufts's Fletcher School and at MIT to ensure that our invention is not only technologically sound, but also contextually appropriate. With the remaining money, we plan to identify a suitable area to conduct a pilot and begin work there early next year."

PROJECT ABSTRACT

In developing countries, agricultural produce is typically delivered in open-air, non-refrigerated trucks. Sadly, this lack of refrigeration during transportation can result in up to 45 percent spoilage. Our team, made up of students from Fletcher, MIT and Wentworth, has been working on an ultra-low-cost cold chain solution for fresh produce in developing countries. We use a modular and expansible container that allows for cooling along all points of the supply chain. Our device consists of a breathable crate with a storage container nested inside. Between the crate and the container is an evaporative medium that is supplied with water by a tank mounted at the top of the crate. When water is evaporated from the medium into ambient air, latent heat is carried by evaporation from the reservoir into the surrounding environment, reducing temperatures in the reservoir. Evaporative cooling has been successfully employed throughout the world for centuries and we hope that our novel application of this phenomenon during transportation will significantly reduce post-harvest losses, improving both food supplies and farmer livelihoods along the supply chain.

RESEARCH OPPORTUNITIES FOR GRADUATE AND UNDERGRADUATE EXCHANGE (ROGUE)

A new initiative for promoting opportunities and collaboration across the university's disciplines is the Research Opportunities for Graduate and Undergraduate Exchange (ROGUE) program. ROGUE has several objectives: to support the environmental research of graduate students by matching them with undergraduate research assistants; to enhance TIE's presence on campus; and to foster a community of vertical interdisciplinary research. The program is aimed at graduate students seeking assistance with their professional research or capstone project, and at undergraduate students seeking professional development as research or field assistants.

Slated to begin its pilot phase this coming year, the program will start by reaching out to undergraduate students interested in environmental research. Interested undergraduates can fill out surveys indicating their interests and skills, allowing them to be matched up with graduate students. After being matched up, each research team will submit a grant proposal for stipend support. TIE itself will be involved only in the facilitation process. Each team will also participate in a final evaluation of the experience at the end of the project. Visit sites.tufts.edu/rogue for more information.

TRAVEL GRANTS

Conference travel grants offset transportation costs for students engaged in research on environmental issues, enabling them to present their research at academic conferences across a variety of fields and disciplines. TIE also supports Tufts students who undertake ambitious, field-based data collection research projects. Each TIE travel grant provides up to \$1,000. In 2014, TIE awarded travel grants for students to travel within the U.S., and to China, Ecuador, France, India, Malaysia, Panama, Peru, Poland, Sweden, Switzerland, and Vietnam.



Denise Chin

Master's Candidate
Urban Environmental
Policy and Planning,
Tufts University

SUPERMARKETS IN MALAYSIA'S FOOD SUPPLY CHAIN: IMPLICATIONS FOR CONTRACT FARMERS AND NATIONAL POLICY.

Urbanization, growing incomes, and changing diets have facilitated the supermarket revolution in Malaysia. This thesis examines the influence of supermarkets on the food supply chain, especially on contract farmers, in order to understand new linkages in Malaysia's food system and agricultural policies. The TIE travel grant allowed Denise to travel to Malaysia and conduct interviews with government and supermarket representatives. This study finds that contract farming is a useful effort to increase farmer involvement in the supermarket supply chain, though there has been little participation from supermarkets. New incentives and policies that promote sustainable business practices and support for local agriculture could encourage supermarkets to source from smallholder farmers. Vertical integration by supermarkets and increasing consumer awareness of the benefits of buying local could change supermarket sourcing practices.

TIE'S SUPPORT OF FACULTY

Visiting scholars who come to Tufts University have an intellectual home at TIE. TIE connects visiting scholars to the Tufts community and provides space and administrative support for them.

COURSE DEVELOPMENT GRANTS

For the third academic year in a row, 2013-2014, TIE supported its course development grant program. This year's recipient was instructor Andrew Tirrell, who will teach Living on the Edge: Coastal Communities and Marine Resource Management in the spring of 2015.

VISITING FACULTY

Recognizing the central role that faculty play in shaping the intellectual community and environment at Tufts, TIE engages in a number of activities to support faculty innovation, like Course Development Grants and TELI, as well as efforts to connect the Tufts campus with faculty beyond its geographical boundaries.

TIE'S OUTREACH EFFORTS

Tufts's environmental programs and initiatives are diverse and spread widely across its departments and schools. We aim to inform students and faculty about research and teaching opportunities, facilitate cross-program cooperation, discover synergies, advertise TIE's services, and make sure the rest of the world knows about what is happening at Tufts.

PEACE AND JUSTICE STUDIES ANNUAL CONFERENCE

TIE co-sponsored the 2013 Peace and Justice Studies Annual Conference, "Peace Studies between Tradition and Innovation," which focused on the enduring tensions between tradition and innovation, and between continuity and change. The conference included sessions from across a wide range of disciplines, professions and perspectives on issues such as the innovative use of social or communications technology in the promotion of peace, the use of unconventional or unorthodox peace promotion strategies by long-established actors in the field, and on the comparative accomplishments of "new" vs. "old" actors in the field of peace and justice studies.

ENVS LUNCH AND LEARN

The ENVS Lunch & Learn Program creates opportunities for environmentally minded undergraduate students, faculty, and interested staff to meet weekly to communicate about environmental issues. Tufts University alumni, graduate students, faculty, and undergraduates who are actively participating in interesting research and internship topics give weekly presentations. Non-Tufts speakers have also become an integral part of the program as lecturers and by serving as a resource for ideas on future lecture topics. The program attracts 15-30 students, faculty members, and community members every week. In the fall of 2013, the ENVS Lunch and Learn Program featured several local leaders working on sustainability and conservation issues in Massachusetts and highlighted three new faculty members from the cluster hires that occurred over the last two years. Ujjayant Chakravorty began teaching at Tufts in the fall of 2012; Alexander Blanchette and Andrew Kemp began teaching in the fall of 2013.





STORYTELLING INITIATIVE

One of TIE's most recently launched projects, the Storytelling Initiative, presents a compelling and unique combination of communication technology and environmental research to reach wider audiences through storytelling.

CHIXOY: THE STORY OF A DAM

is portraying the life of Maria Eme Yix Ulak, a fictitious character who is experiencing the impact of the Chixoy dam construction in Guatemala. The narrative is based on the empirical research of a TIE fellow recipient, Noah Cohen-Cline, on the impact of hydroelectric dam construction on the Maya Achi language in rural Guatemala. The focus of the research on the cultural impacts of dams is unique, as the economic and environmental impacts of dams have been relatively deeply investigated while the cultural impact has been comparatively overlooked.

At the project inception, during the summer of 2013 World Bank announced its support to new dam construction projects in the developing world, which reaffirmed the selected research topic as an opportunity to teach younger generations about the benefits and drawbacks of dams based on past experience. The story blog, elaborates on a variety of interconnected issues and aims at facilitating discourse around development, renewable energy, and indigenous rights. The profile of Maria, was created to depict the displacement experience of the indigenous (Mayan) people as a result of the construction of the dam on the Rio Negro/Chixoy river. To link the story with Cohen-Cline's work, the Tumblr posts aim to answer a main question with the leading character at center "Will Maria keep her cultural identity in the Chixoy aftermath?" Questions, with which the international development community continues to struggle are also highlighted in this project. The construction of large-scale hydroelectric dams has both positive and negative impacts for developing countries. Unfortunately, the negative impacts of dams tend to fall disproportionately on poor and marginalized communities, who are more likely to be living within flooding distance of rivers, on which they often rely for their livelihoods and way of life. At the same time, the advantages tend to disproportionately fall on urban dwellers or those at higher income levels. However, it is generally understood that access to modern forms of energy is an essential step to overcoming poverty for all in lower income countries. This project seeks to address just some of the complex network of issues related to this paradox, and promote awareness among general public.

The development of the Chixoy project at TIE led to the design of a novice methodology: to transform academic content into a story that can be widely accessible to people through the use of new media. The Internet has become an integral part of the modern student lifestyle; therefore the application of social media and other technology tools in education is to be further explored through similar initiatives. TIE hopes to continue this type of innovative research and dialogue process in the future. The second phase of Maria's life adventures will be unfolding during fall semester 2014. You can follow the story updates on the TIE Tumblr blog at:

www.chixoydamrevisited.tumblr.com

An innovative idea is born at TIE

In June 2013 a team of TIE interns began to experiment with the use of new communication technology to showcase cutting edge environmental research in the form of digital story telling. That is how the Chixoy Dam Project started!

Shifting to a people-centric approach

Among the work of TIE Research Fellows, the study of **Noah Cohen-Cline** met the criteria for this initiative as the topic was relevant to current environmental trends, and could be more easily transformed into a story that people could relate to, and consequently learn about environmental issues. This is the first time a Tufts student's thesis becomes a... story.



Story crafting in academia

The pioneer TIE interns working on the project researched historical facts beyond Noah's thesis and brainstormed questions from the stakeholder angle assigned to them. In this way the team gradually developed the story context and managed to blend in important political, social and economic aspects.



CHIXOY DAM REVISITED

a project of TIE using the microblogging platform of Tumblr to showcase innovative graduate student research about environmental issues in the form of story telling.

TIE launched this digital media initiative in March 2014, it was featured in the Tufts Daily and Tufts students followed up with the blog post updates. This story telling project leverages technology to provide alternative means for education about clean energy solutions and social justice. TIE is grateful to have the support of Tufts University in its effort to develop innovative methods to communicate research findings.



Inception of fictitious characters

The image of the leading character, **Maria**, was produced using advanced software. The profiles of all characters portrayed in the narrative encompass traits of indigenous Guatemalans that lived during the Chixoy dam construction. In this way, students can experience the complexity of the issue from a local's perspective.



MARIA'S TIMELINE NARRATIVE

- + Meeting with Alma, the local healer
- + Discovering the world beyond the village
- + The dam construction is announced
- + Dreaming of education and a better future
- + Learning more about the dam and its link to energy
- + INDE promises and relocation of locals to Pacux
- + Living the new reality away from home
- + Life continues despite the civil war
- + Falling in love
- + The wedding in the settlement



Apply technology and social media to Education

At its launch date in March 2014 "Chixoy: The story of a dam" was featured in the Tufts Daily and recorded a high number of page visitors that engaged with the story. Tumblr, a microblogging platform, is hosting the story narrative. The decision on this medium is based on its popularity among college students.

The story continues

Will Maria keep her cultural identity in the Chixoy aftermath? Follow Maria's life events and find out what happens next at

www.chixoydamrevisited.tumblr.com



TUFTS INSTITUTE OF THE ENVIRONMENT INTERDISCIPLINARY LANDSCAPE

Connect: Interdisciplinary	Facilitate: Space and Admin.	Support: Financial	Initiate: Research, Curriculum Development, Professional Development	School / Unit	Agriculture, Food, and the Environment
+				Friedman	Alumni Office
+				Central	Anthropology Department
+		+		Arts and Sciences	Center for International Environment & Resource Policy
+				Fletcher	English Department
+		+		Arts and Sciences	Chemical and Biological Engineering
+				School of Engineering	Civil and Environmental Engineering
+				School of Engineering	Course Development
+		+	+	TIE	Department of Public Health and Community Medicine
+				Medical School	Economics
+		+		Arts and Sciences	Environmental Studies Program
+	+	+		Arts and Sciences	Global Development & Environment Institute
+		+		Arts and Sciences	Institute for Global Leadership
+	+	+	+	TIE	Internships

TUFTS ENERGY CONFERENCE, 2014

“Shifting Dynamics in Emerging Markets,” The 2014 Tufts Energy Conference (TEC), also co-sponsored by TIE, brought together experts from the private, public, and nonprofit sectors with students and professionals to discuss critical global energy issues for two days of conversations and presentations. The conference was entirely organized by students from a broad range of backgrounds in engineering, international affairs, urban planning, and economics. Presentations included a keynote address by Rachel Kyte, Global Master of Arts Program (GMAP), World Bank Special Envoy for Climate Change, as well as a variety of panels focused on energy in emerging markets, from adoption and diffusion of appropriate technologies to natural resource-related conflicts.



Rachel Kyte (GMAP02), World Bank Special Envoy for Climate Change

WEBSITE

In 2008, the website was revamped in order to provide the Tufts environmental community with a portal to TIE and its initiatives. This process involved branding and developing the TIE logo and colors. It was a huge effort to pull together as many environmental programs on campus as possible onto one website. Content is regularly changed and updated.

TUFTS ENVIRONMENTAL ALUMNI “TEA” NEWSLETTER

TIE has been working with the Tufts University Alumni Association to create a new alumni group, Tufts Environmental Alumni (TEA). Beginning with an inaugural issue in May 2009, TIE created a Quarterly Newsletter called “TEA @ TIE” to keep alumni updated and engaged with the university. Each newsletter contains alumni profiles, descriptions of recent and upcoming events, and news related to the environmental community at Tufts. The articles are written and compiled by Tufts students and sent out to alumni at the beginning and end of each semester.

SOCIAL MARKETING

TIE’s Facebook page, managed by TIE interns, reaches out to current undergraduate and graduate students. The page contains information on future and past events, TIE initiatives, and other Tufts environmental happenings. TEA’s Facebook page, managed by the alumni coordinator, reaches out to alumni who might not be accessible through other forms of communication. The TEA page updates members on future and past events, newsletters, and the progress of forming the new TEA chapter.

WSSS NEWSLETTER

A collection of recent and upcoming events in the WSSS program, alumni profiles, and student research, the WSSS newsletter has been published annually since 2010. It features student writers and serves as an annual report both for the program and student research. Newsletters can be found online at www.tufts.edu/water/newsletter.html.

ENVIRONMENTAL COMMUNITY NEWSLETTER

TIE also manages an Environmental Studies Newsletter for undergraduate students interested in environmental issues during this time period. The Environmental Studies Newsletter is sent out



Comments on this Report?

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