



U THE UNIVERSITY OF UTAH®

un|bounded

FALL 2010 | vol. 1 no. 1





Welcome to the University of Utah, one of the nation's premier public institutions of higher education.

The U has long attracted students looking for an inspiring backdrop to their educational experience. For those in the know, Utah offers stunning recreation choices: freshly powdered slopes, desert red rock, crystalline lakes. But the U offers much more than a great place to recreate; it is powerhouse of academics, research, and service.

As a university increasingly focused on internationalization, we strive to prepare all of our students to assume roles of leadership and responsibility throughout the world. Our international emphasis helps students immerse themselves in different cultures, languages, and systems of governance; to become socially and politically literate and economically aware—all in an effort to further expand their view of the world. For example:

The University's Middle East Center is one of only fifteen national resource centers in the U.S. devoted to the academic study of the region. Resident experts routinely inform policymakers and educators through conferences, publications, and interviews.

Our new Confucius Institute augments a historic partnership between Sichuan University and the University of Utah to promote Chinese language and culture, and to strengthen mutual understanding between China and the United States.

Since the 1960s, the Hinckley Institute of Politics has connected University students with the politics of our country and the world. Whether through its long-established internship program in Washington D.C., or the new Campaign Management Minor, HIP engages university students in the political process.

The International Opportunities Assistance Fund, launched by ASUU, Undergraduate Studies, Study Abroad, and the Hinckley Institute of Politics, offers financial support to students eager to live and learn in an international setting.

Reach for more information about the U's international opportunities by using the International Gateway website at <http://international.utah.edu>. Then drop by the University's A-Z index and explore even more of this great institution. Or schedule a campus visit and discover for yourself why I believe the University of Utah is a place where extraordinary people are daily achieving extraordinary things.

Sincerely,

Michael K. Young
President

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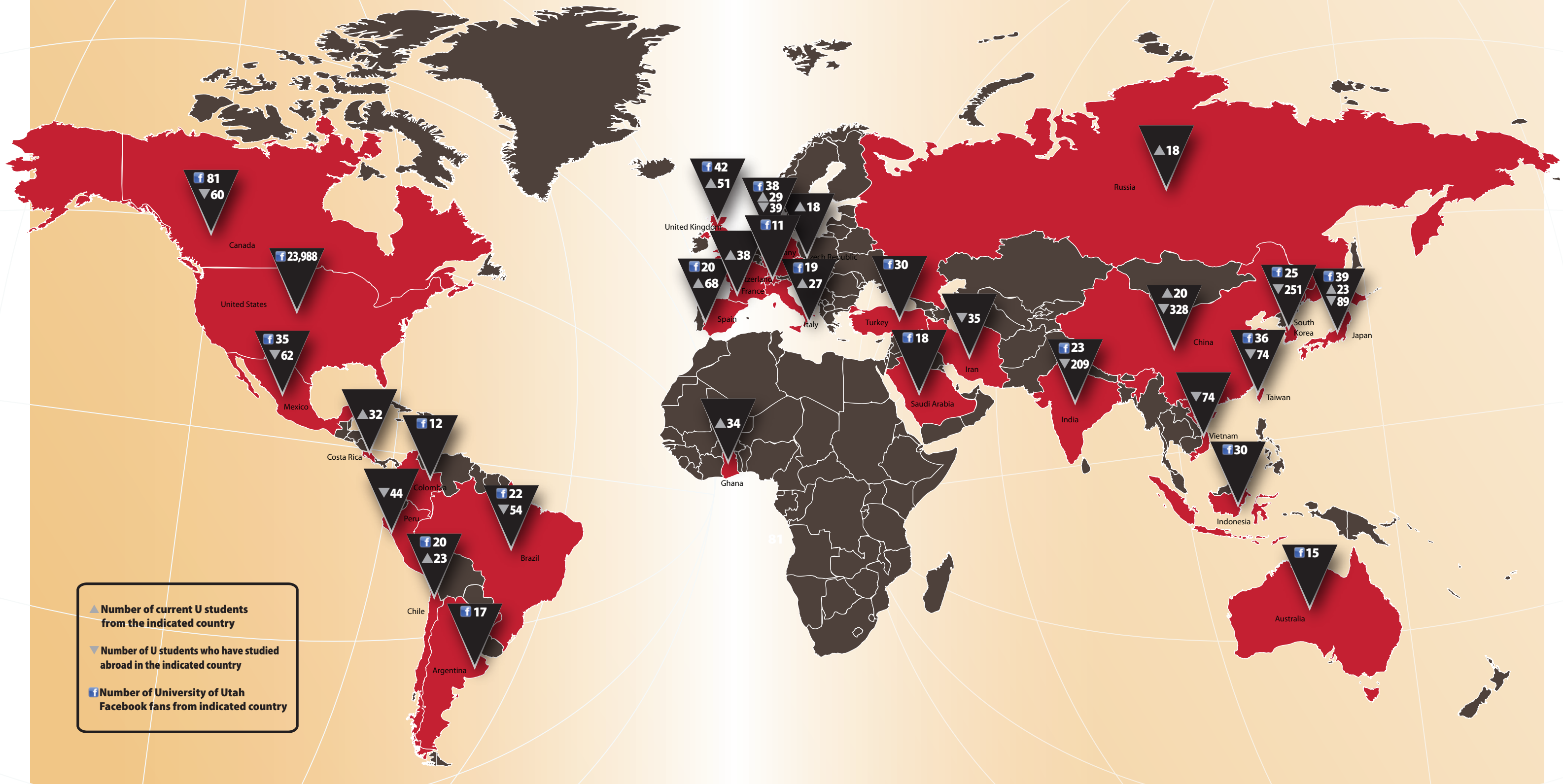
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The University of Utah's Global Reach, by the numbers





GHANA: The U's Global Health Initiative Flagship

■ Drew Thompson

The Ghana program through the University of Utah Global Health Alliance has become the flagship of global health efforts on campus and a model that is spreading to other parts of the globe through the Global Health Initiative.

"The students want to help somebody," said Dr. DeVon Hale, and this altruistic approach sprouted the global health endeavors of the U School of Medicine in the early '90s. Dr. Hale and his colleagues at the School of Medicine obliged these students and arranged for them to travel across the globe to help those in need of medical attention.

Unfortunately some of these students found themselves in situations that

required skills beyond their training, Dr. Hale said. They were expected to perform medical procedures they were not qualified to do and often offset the medical care equilibrium by displacing local doctors.

"There was no way to evaluate what we were doing," said Dr. Hale, and he decided to find a better way, which he found through a model already in use at the University of Indiana. Indiana's approach focused on establishing a long-term relationship in one part of the world, which for them was Kenya. "The longer they've been there the better the program has gotten," Dr. Hale said.

The focus then became establishing a vibrant, sustainable relationship in one part of the globe rather than scattering students to the four winds



in hopes that they would help someone somewhere. Ghana became the testing site of the U's Global Health Initiative and has proven to be fertile ground for research and learning to build capacity in the developing world rather than dependence. What began in the School of Medicine with a handful of medical students has spread throughout the health sciences at the U and will soon include collaboration across many disciplines. The program in Ghana combines medical exchange work, working with the national health priorities and community health development in a development site of 20 villages with a total of about 30,000 Ghanaians.

The Ghana program combines the threefold mission of the U, education, research, and service, according to Dr. Stephen Alder, who is a co-leader of the Global Health Initiative with Dr. Hale. He sees the work in Ghana as being less about philanthropy and more about scholarship that brings "back to Utah what the world has to offer."

Dr. Hale and Dr. Alder visit Ghana regularly and take a large group of U students there every summer. They bring with them innovation and enthusiasm but rarely any kind of medical supplies.

"You can never have enough supplies. You can never fill that need," said Dr. Hale. The purpose of the group's annual trips to Ghana is not to provide medical equipment or even medical care but to build capacity and foster scholarly exchange. Supplies create dependence, but helping Ghanaians solve the problems facing Ghana will do more than any amount of

medical equipment or any number of foreign health care professionals. "They will one day not need us, which is what we want," said Dr. Hale.

Community-Based Participatory Research, which Dr. Alder describes as the use of scientific approaches combined with community development efforts, forms the base of the Ghana program. "We work with [community members] to identify needs," said Dr. Alder, "which builds our capacity to work with them while building their capacity to help themselves. In tandem with these objectives we learn how to apply the research we do there to address concerns in Utah."

Often when assessing needs they find that the people of Ghana require more than improved health care. The people of one of the 20 villages involved in the program expressed a desire to build a school for their children. While building schools is a common theme of global philanthropy, Dr. Hale and Dr. Alder took a unique approach to the situation that reflected the philosophy behind the program.

Many of the schools in Ghana built by nonprofit organizations are now used for office space or other general purposes. To avoid this outcome Dr. Hale and Dr. Alder worked directly with the local government, the Ghanaian educational system, and the people of the village to ensure the school would be built by the people and for the people of the village.



The district education department gave insight on ensuring the schools would meet standard requirements, and the district government furnished engineering and architectural support. The villagers themselves provided the labor. From conception to construction the people of Ghana owned the project. The U merely offered support. The schools now highlight the educational system of the area, and are being used to improve the education of village children and adults. "We don't build a building until we build capacity," said Dr. Hale.

The Ghana program also impacts the economy of the people they serve. One village needed a way to generate revenue and provide employment for the people. The planting of a citrus plantation grew from this need, and the success of the plantation ultimately resulted from connecting and energizing multiple levels of the local community. The district government executive officer of agricultural led the project while the local agricultural school provided orange tree seedlings. The people of the village again provided the labor.

"We could have done it ourselves in a matter of weeks," said Dr. Alder. The project ended up taking four years. But they were not interested in building a citrus plantation. "We wanted to build their capacity to build something like this," Dr. Alder said.

"Coming from Ghana, this is a very good project," said Steve Manortey, a Ghanaian PhD student in Global Health at the U. Manortey has his master's and bachelor's degrees in statistics and manages much of the data analysis for the project. He also speaks nine of the 47 languages spoken in Ghana and serves as an interpreter when the team makes trips to Ghana.

Manortey sees the benefit of the program on both sides. Helping the locals build schools and plant citrus plantations creates a relationship of trust and understanding that can be utilized to solve some of the more complex problems facing Ghana, like the spread of disease. The graduate and undergraduate students involved in the Ghana program travel throughout the 20 villages the U partners with to conduct surveys and collect census and geographic information. Manortey and others use this data to study the spread of diseases affecting Ghana like schistosomiasis, a water born parasite affecting much of the developing world including the people of Ghana.

"The program helps fill a gap when the government is not in an immediate position to help," Manortey said. He has benefitted personally from the experience and hopes to apply what he has learned while working with the Global Health team at the U to his future career goals in Ghana where he plans on teaching at the university level and conducting research.

Dr. Hale and Dr. Alder hope the impact of their efforts spreads not only to the rest of Ghana through people like Steve Manortey but also throughout the rest of the world. Similar programs in China and India have taken root, where Dr. Hale and Dr. Alder hope to develop the same kind of long-term, scholarly partnership they have established in Ghana. Dr. Alder envisions the program going viral across the globe with activities abroad and in Utah.

Far from medical tourism or simply philanthropy, Dr. Hale and Dr. Alder see themselves as teachers and researchers first and foremost because, "Teaching is better than patient care," Dr. Hale said. 🌐



ENGINEERS WITHOUT BORDERS RETURNS WITH A FLOURISH

■ Drew Thompson

After a one-year hiatus the University of Utah chapter of Engineers Without Borders returned with new leadership and fresh enthusiasm nearly two years ago. Chad Nielson, a mechanical engineering graduate student and current co-president and co-founder of the new chapter, says the group has really started to soar in recent months.

"It's amazing how fast it's grown," said Nielson. The chapter gives engineering students at the U an opportunity to put their minds and hands in the thick of problems facing the developing world. The chapter works closely with the greater Salt Lake chapter of Engineers Without Borders to identify and plan projects at home and abroad.

Vince De Vita, a senior electrical engineering and an active member of the U chapter, has coordinated with the chair of the greater Salt Lake chapter to organize projects within the Navajo Nation, just south of Lake Powell. Their contributions in the area include re-roofing a house, building and outfitting a water storage system, and installing solar panels.

"There is so much work down there to be done," De Vita said. He admits that as an electrical engineer very little of the work he does through the program directly applies to his field of study, but he has seen other benefits to his education.

"Networking has been awesome," De Vita said. He enjoys seeing the fusion of different fields of engineering toward a common goal and learning how to more effectively work in a team. "Everyone so far has really enjoyed it...and the locals down there are extremely appreciative."

Issues relating to water cripple much of the developing world Nielson said. In areas lacking running water women and children often spend a large portion of each day hauling water to their families. Megan Crump, a Senior in Civil Engineering and Treasurer for the chapter, will lead a group of eight students in collaboration with the greater Salt Lake chapter to Honduras to construct a water system to help address this problem.

"The kids can go to school instead of hauling water," as a result of the project Nielson said. The group stresses working with the target population to assess and solve problems first and foremost.

"We place a strong emphasis on community buy in," Nielson said. They only build what the local community can independently maintain and operate. "When it breaks down we wouldn't be making house calls." They would like to do as little as possible and leave the local community in a position to make repairs and modifications as needed. Their water system in Honduras will consist mainly of a pipe and a water storage tank. "It seems simple but it's what the people need."

Nielson attests that the engineering community at the U has a huge interest in what they are doing. "We will see our chapter really grow over the next couple years...our commitment is paying off."





DRUG DISCOVERY IN PAPUA NEW GUINEA

■ Drew Thompson

The College of Pharmacy scours the land and sea of Papua New Guinea for disease-fighting drugs, and the collateral benefits of their search could save arguably the most biologically diverse ecosystem on the planet and drive sustainable economic development for the people who live there.

The rationale of the project headed by Chris Ireland, Dean of the College of Pharmacy, and Louis Barrows, Professor of Pharmacology and Toxicology, is that organisms accustomed to fighting microbial invaders similar to those that plague people may hold the key to curing a number of diseases.

“Biological diversity means chemical diversity,” said Christopher Pond, a postdoctoral research fellow involved in the project. The vast biological diversity of Papua New Guinea, where isolating geographic conditions create an array of niches and subsequent species differentiation, make it a drug discovery hot spot.

“The program started 27 years ago,” said Dean Ireland, “on the idea that marine organisms would be a potential source of cancer drugs.” This

search has taken the project across most of the tropical Pacific and has focused primarily on one of the simplest marine organisms, the sponge.

These very primitive animals do not have an immune system like that of humans, which primarily utilizes antibodies and an army of infection-fighting cells. “Rather than using antibodies like we do to defend themselves, they make small molecules, and these small molecules look a lot like the drugs we use to treat antibacterial infections or to treat cancer,” said Dean Ireland.

As an immobile animal, the sponge must fend off other organisms that would encroach on its territory and overrun it. To defend itself, the sponge secretes a number of chemicals that inhibit the growth of adjoining animals.

“The parallel there is that those compounds are growth inhibitory and they have the same type of properties that one would want if you wanted to inhibit the growth of a tumor,” said Dean Ireland.

Under the same rationale as the marine drug discovery program, Prof. Barrows targets his search for new drugs within the flora of Papua New Guinea. The tropics can be a chemical warzone. Plants, like sponges, are sessile and must release a number of chemicals to fight foreign invaders while holding their ground.

“A chemical that the plants produce for defensive purposes to kill a nematode could possibly also be used to treat malaria, or a chemical that retards bacterial leaf rot may also kill tuberculosis,” Prof. Barrows said. This concept of exploiting evolution to solve scientific and medical problems is gaining traction for more than just the pharmacological benefits but also for the environmental and economic implications of such a paradigm.

Since its beginning with sponges, the program has expanded through the help of an International Cooperative Biodiversity Groups grant funded through the National Institute of Health and the Fogarty International Center. The purpose of the grant is threefold: conservation, sustainable development, and drug discovery.

Papua New Guinea is rich in both biodiversity and natural resources, and the latter seems to have an adverse effect on the former. The old means of economic development in Papua New Guinea include gold, oil, forestry, and tuna, said Prof. Barrows, and “there is pressure on Papua New Guinea to exploit these resources.” Deforestation can often go unchecked by both government policy and local officials susceptible to bribery and corruption.

“If this continues only one tree out of five will be left,” said Prof. Barrows. Mining has a similar degenerative effect on marine life by releasing harmful substances into the ocean and killing the coral reef and the organisms that thrive in it. By illustrating the connection between drug discovery and biodiversity, the group hopes to make conservation more practical and economically viable for the people of Papua New Guinea.

The grant that funds this research encourages the discovery of treatments beneficial to the people of the country where the drugs are found. Tuberculosis, HIV, and malaria plague Papua New Guinea, and the efforts of the group focus most heavily on finding cures for these diseases. After discovering and isolating active tuberculosis, HIV, or malaria-fighting drugs, the group hopes to put together a simple protocol for preparing the drug that the natives could utilize on site.

“We’re trying to do first world science in a third world country,” said Pond. Creating an alternative to costly drugs will open up a number of health care and economic doors for Papua New Guinea and may “give some wealth to the people.” The University of Papua New Guinea, the flagship institution of the country, leads the plants harvesting and cataloging aspect of the project. This collaboration incorporates the local people into the project and has helped train a number of scientists, who can be scarce in Papua New Guinea.

Randomness guided the initial approach to harvesting plants, but the group recently adopted a more effective and integrative



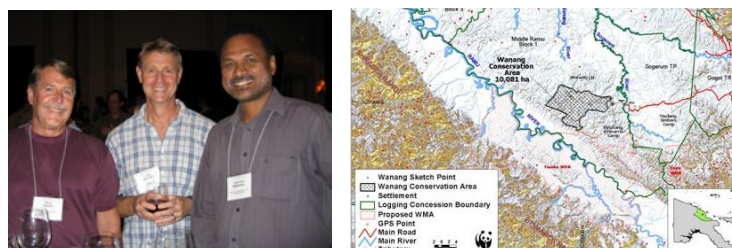
approach by working with locals, tribal shamans in particular, to identify and harvest traditional herbal remedies found in the jungle for analyzation.

"[This approach] has turned out to have more interesting chemistry for us," said Mary.

Kay Harper, the director of the lab that isolates drugs from the plants and marine organisms.

Without the right connections working in the jungles of Papua New Guinea would be impossible. The University of Papua New Guinea has helped put the group in contact with the right people to gain access to areas that would otherwise be potentially hostile and dangerous to outsiders. Dean Ireland and Prof. Barrows recently began collaborating with another professor at the U with connections in Papua New Guinea, Prof. Polly Weissner from the Anthropology Department. She has works with the people of the Highlands of Papua New Guinea, an area yet untouched by the group's pharmacological inquiries, and as an anthropologist has a unique relationship with and perspective on the people of Papua New Guinea.

"One of the biggest ways to impact developing countries is through education... that's our approach," said Prof. Barrows. He works closely with the University of Papua New Guinea as well as local tribes to harvest, identify, and catalogue plants for further analysis. Many of the students from the University of Papua New Guinea involved with the program in the past have gone on to pursue advanced degrees and even become professors at the University of Papua New Guinea. Some of the students have also had the opportunity to come to the U and learn about the chemical process of isolating and testing potential drugs harvested in Papua New Guinea. 🌍



MENA PEACE SCHOLARSHIP BRINGS STUDENTS TO THE U

■ Drew Thompson

"I always knew America from the outside, through the media, through Americans I met at home. But I wanted to see America on the inside," said



Mariam Bashir, one of six students studying at the U this year through the Middle East North Africa (MENA) Peace Scholarship.

The US Agency for International Development funds the scholarship, which gives 26 students from Algeria, Egypt, Jordan, Lebanon, Morocco, Oman, West Bank and Gaza, or Yemen

an opportunity to study at a university in the United States for one year. Christoph Dressler, who coordinates the MENA Peace Scholarship through the International Center, says the program brings top students to the U and gives those students something to take back with them to their home countries.

"Thousands of students apply for these few (MENA) scholarships," Dressler said. Only highly motivated and academically excellent students receive the scholarship and the U gets brilliant students as a result.

The scholarship allows the recipients to study at any of a number of universities across the country. The U attracts many of these students because of its research reputation, the cultural and recreational perks of living in Salt Lake, and the services at the U available for these students like the Bennion Center, the Middle East Center, and the International Center.

The program requires the students to engage in community service while studying in the US, and the Bennion Center provides a number of options for them. The MENA students also take advantage of

the U's Middle East Center, which helps fuse these students' cultural background with ways of getting involved on campus like language tutoring or scholarly research and presentations.

Mariam Bashir came to the U from Lebanon to study economics. Some of her favorite experiences at the U have been hiking through Bryce Canyon, camping in Moab, ice climbing in Colorado, and, of course, skiing. After her time here at the U she plans on finishing her undergraduate degree in Lebanon. She will work in the private sector initially but said, "My true love is NGOs." She would like to eventually do project planning and fundraising for a none-governmental organization in Lebanon.

Omneya Hesham, also a MENA student, came to the U from Egypt because, she said, "We need language and linguistics professors in Egypt." She studies linguistics at the U and hopes to bring the interactive method of teaching language used in the US to the lectured based system used in Egypt.

Hesham has greatly enjoyed the cultural experience of living in Utah. She has gleaned an important lesson about overcoming stereotypes by observing and befriending many members of the LDS church. She admits that she came here with preconceived notions about Utah and the LDS church but has found the people here to be much different than she expected. Coming from a culture that can also be a victim of stereotypes, she said that mutual understanding is all about "helping others accept you as you accept them."

"I want to not only use the methods I learn here but to use my cultural experience as a student to teach them something that can be useful to their studies and life," Hesham said in reference to her future students in Egypt. She has already taken the opportunity to teach here at the U by tutoring Arabic to seven students through the Middle East Center. Hesham completed her undergraduate degree in Egypt and hopes to stay in Utah to earn her master's degree.

Dressler said that these MENA students will be "forever thinking about the University of Utah", and the more positive the experience the better the impact our institution can have on their lives and their countries.





U OF U STUDENTS DISCOVER SPANISH LANGUAGE, CULTURE IN OVIEDO

The Study Abroad Office's most popular program introduces beginner and intermediate Spanish students to the lively culture and history of Spain.

■ Maxine Marshall

Nestled in the dynamic geography of Northern Spain—varying from the hiker's paradise of Picos de Europa to the popular beaches of San Sebastian—is the city of historic Oviedo, and the destination of University of Utah's Intensive Spanish Language Study Abroad Program. Students spend five weeks becoming acquainted with local history and culture while studying Spanish Language; the city itself is a great teacher, allowing program participants with opportunities to experience tradition and custom alongside the residents: "Oviedo is an exciting and romantic city with tons of shops, parks, panaderias and more... Oviedo is intimate and yet has a lot to do. The night life was fun and not remotely intimidating... I'll always remember watching futbol (soccer) in the bars late at night and celebrating in the streets afterward. Then, it didn't matter if your hair was blonde and your eyes blue. Everyone was a Spaniard," says Jamie Jaro, a participant in Oviedo Study Abroad in summer 2009.

Oviedo is the capital city of the Principality of Asturias—a title the city earned in 810 after warding off Moorish attacks—in Northern Spain, known for its charming university atmosphere, its architecture and its history. While the Universidad de Oviedo attracts a young and modern vitality to the city, the region's rich past is evidenced through cathedrals, castles, museums and festivals which pay homage to Spanish culture and history.

The Oviedo study abroad program is directed by Fernando Rubio, who is a native of Oviedo and is a professor in the University of Utah Department of Languages and Literature. Professor Rubio's dedication to excellence has made Oviedo the most popular study abroad destination for University of Utah students; last summer (2009) saw a record 49 participants.

The Intensive Spanish Language and Culture trip to Oviedo offers students a full immersion-style experience; while in Oviedo, students are housed with Spanish families where they are able to become acquainted

with the local people and lifestyles and have access to private rooms, meals and laundry. Jamie Jaro emphasizes the value of living with a host family: *"Living with a host family was, I'm sure, the only way I could ever experience true Spanish culture. I was not only immersed in the language, but also their food, lifestyle and habits... I think I had a unique perspective of Spanish life because I lived with a host family who didn't speak English."*

Once in Oviedo and settled with a host family, students attend classes at the Universidad de Oviedo. The university, over 400 years old, is home to colorful student body and prestigious faculty. The curriculum for U of U study abroad students consists of five weeks of intensive Spanish language study—students attend classes taught by Universidad de Oviedo professors while earning University of Utah Spanish language credit including courses in both grammatical rules and conversation skills (from Spanish 1020 through 3060). On average, participants are in class for four hours a day and can receive six to eight credit hours. Past participants enthusiastically describe the unique benefits that accompany studying language in its native environment: "I was actually excited to go to class; the teachers were amazingly helpful and fun. Being able to go to class to learn more Spanish helped me enjoy my Oviedo/Spain experience even more" says Adam Mathis (program participant, summer 2009).

Many adventurous students chose to continue their international experience through independent travel after completing their study abroad in



Oviedo. Near the town itself, there are a few popular day trips, including excursions to the villages of Covadonga and Cangas de Ovis which offer beautiful views of the Picos de Europa mountains. Likewise, a day trip to Gijón includes access to the stunning Spanish coastline. The Spanish cities of Barcelona, Madrid and Seville are all

within two hours by plane from the Asturias airport, which is located 20 miles outside of Oviedo. For those interested in traveling to other countries, the Asturias airport has flights to and from major European cities like London, Amsterdam, Brussels, Lisbon, Milan and Rome, and Zurich. Students are encouraged to take advantage of these travel opportunities—past students note that additional travel helped lend further perspective into Spanish culture by allowing students to observe regional varieties and similarities in tradition, cuisine and geography. Although additional travel plans are not included in the study abroad program, the



program director is always available to recommend destinations and assist in the making of travel arrangements.

When asked whether or not they would recommend the Oviedo study abroad to their fellow students, past participants answer with a resounding “yes!”:

“I would certainly recommend another student to the Oviedo program. It is the biggest, yes, with usually 30 to 50 students, but having so many friends surrounding me in a faraway land was like living a dream. Walking to school each day, learning to navigate the beautiful city of Oviedo and its surrounding areas, I gained life experiences that will never be forgotten. The friends I made in Spain, both American and not, will always be in my life.” —Jamie Jaro

“I can never find anything bad to say about Oviedo or the study abroad program. It changed my life! I got to live in one of the most beautiful cities I’ve seen and experience a completely different style of life. It wasn’t overpopulated with tourists so we were able to feel like a part of the culture.” —Adam Mathis

This summer, a fresh batch of University of Utah students will accompany Professor Rubio to Oviedo to experience the lively culture and to study Spanish language. The summer 2010 dates are May 22 through June 26, and the Study Abroad Office looks forward to another year of record participation. For more information on Oviedo or other study abroad programs, visit the study abroad website at www.studyabroad.utah.edu 



NEW WEBSITE HIGHLIGHTS THE U'S INTERNATIONAL ACTIVITIES

■ Jamie Bowen, Staff Writer

Want to see what kind of research the Law School is doing concerning the Middle East? Or explore the educational opportunities in Argentina through the College of Architecture + Planning? At the International Gateway website — www.international.utah.edu — one can drill down by academic department, specific country, and activity type to find out what the U is doing across the globe.

This portal to international activity is part of the University's emphasis to help students immerse themselves in different cultures, languages, and systems of governance; to become socially and politically literate and economically aware—all in an effort to further expand their view of the world.

The website utilizes both a geographical navigation (in the form of an interactive map on the homepage) option, and a drop down navigational feature, labeled “Advanced Search” (also on the homepage). Users can search for any combination of international activity by region of the world, country, activity type (research, educational, service-based), college, department, and institutional center.

“It provides a fairly simple, clean interface, but also has the links to draw people to the information they need,” says Mark Bean, director of the Office of International Education/Study Abroad.

The site gathers its data from a custom built database that sifts the HUMIS application for relevant information, and therefore faculty are highly encouraged to enter their international activity so that they can contribute to the site.

People around campus are also pleased with the new website. “I think it's a great idea to enable a wide variety of potential constituencies to have one central plane where they can at least start to find out what's going on at the U,” Bean says. “Overall, I think it's a great improvement of what we had before. It will very much ease access to those who need international stuff.”

INTERNATIONAL GATEWAY
THE UNIVERSITY OF UTAH

campus: [a to z index](#) | [map](#) | [directory](#) | [calendar](#)

[HOME](#) | [EDUCATION ABROAD](#) | [INTERNATIONAL STUDENTS & SCHOLARS](#) | [CENTERS, INSTITUTES, & PROGRAMS](#)

International Web
International Updates
Facts & Figures
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International Calendar of Events
FAQ's

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EAST ASIA & THE PACIFIC

The U.S. Sino-Pathways Program will greatly expand the number of students from China studying at the U in the coming years, strengthening an already well-established bond between the U and this burgeoning nation.

UTAH INTERNATIONAL GATEWAY

"We strive to prepare all of our students to assume roles of leadership and responsibility throughout the world," said the President of the University of Utah, Michael K. Young. The International Gateway connects all international activities at the University of Utah to foster collaboration on campus and beyond, publish educational, research, and service efforts generated on campus that span the globe, and ultimately help create opportunities for students at the University of Utah to become informed members and leaders of the international community.

Do you know of a University of Utah endeavor that has an international scope? [Submit it here](#) to be included in the international report.

**ACADEMIC PROGRAMS +
CENTERS AND INSTITUTES +
LANGUAGES +
STUDY ABROAD OPPORTUNITIES
OFFICE OF INTERNATIONAL
EDUCATION**



AN EVOLUTION ARMS RACE

■ Jamie Bowen, Staff Writer

“**W**hat earthly good is that,” are the words that have rung in the ears of Phyllis Coley and have become a driving point for her research for the past 30 years. Her mom says those words about her research on plant ecology and how tree leaves defend themselves against predators. Coley and her husband, Thomas Kursar, are both professors in the biology department at the University of Utah. Together they have

been researching plant ecology and defenses in rain forests from Africa to South America. With a new way to apply their research, they have been able to make new discoveries in the world of medicine and in rain forest conservation.

Tree leaves are divided into two categories: the young ones and the mature ones. Young leaves only are young for about three weeks before they become mature. The young leaves hold up to half their weight in chemical defenses to defend themselves from the insects. By the time

they are mature, they become hard and that is the best defense in itself, says Coley. This is called “the battle to be eaten and not be eaten” as Coley describes.

The small insect herbivores are the ones that do the most damage to the plants. The plants constantly are evolving to create new defenses against the insects. One of the major defenses is attracting ants. The leaves excrete small pools of sugar water that attract the ants. The ants act as a defense and kill any insect or egg that gets in their way. Young leaves store many different chemicals and Coley’s research is set out to find out what chemical toxins are in the leaves. “A single leaf can be a chemical warfare store house,” Coley says.

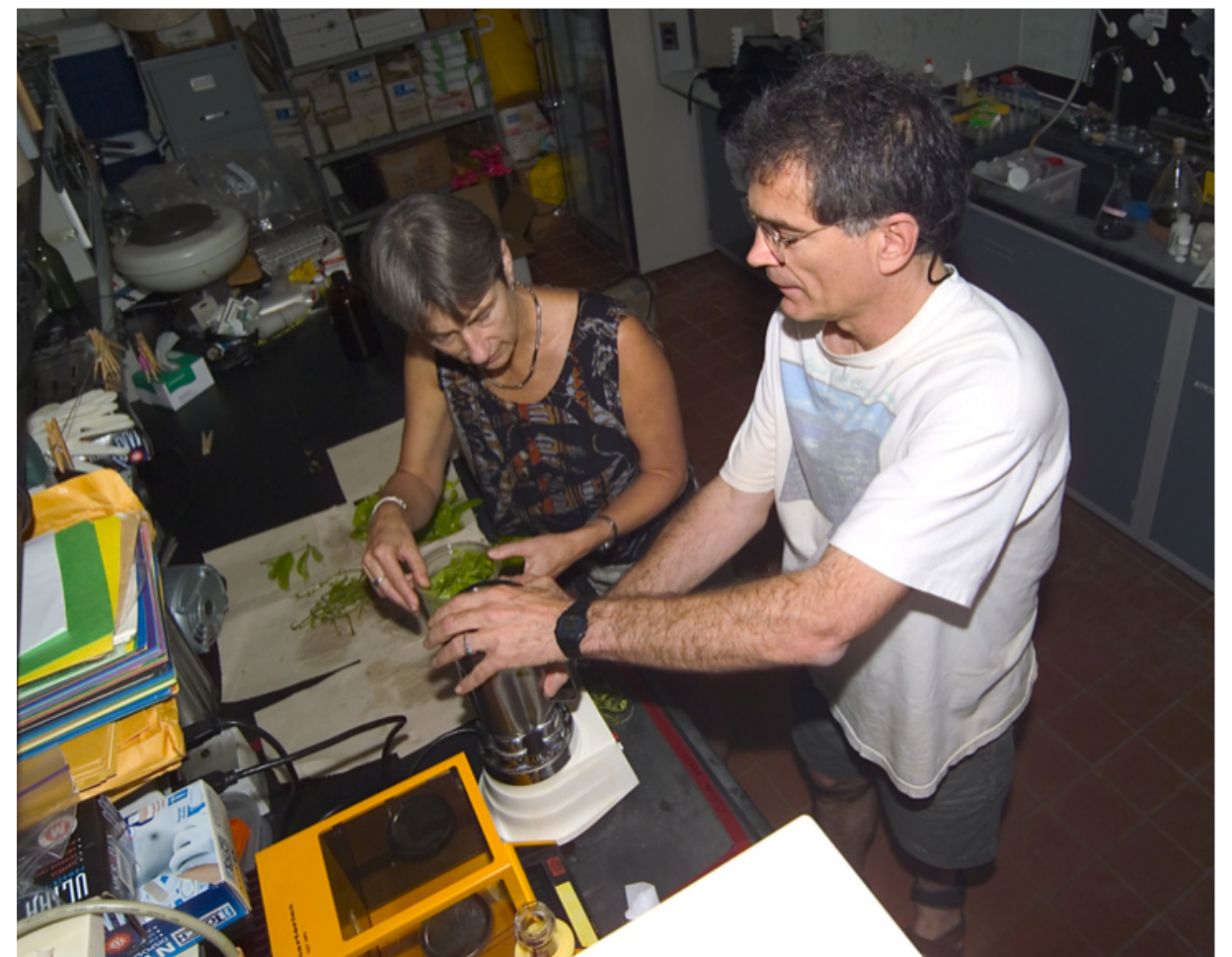
The insects are constantly evolving and the average life span is only three weeks. The question that boggles Coley’s mind is “How can a tree that lives 100 years or more, evolve as quickly as the insects?” Through her research, Coley discovered that trees can mutate through simple changes and chemical mutations. Many mutations take shape in spikes and hairs.

Other questions that have developed and are being answered by Coley and Kursar are why is the rain forest so diverse and how can so many different species co-exist? Their research shows that plants have many different defenses with many different strategies making it possible for them to coexist. When defenses differ among plant species, they cannot be eaten by their neighbor’s predators. Therefore, being different allows many species to coexist.

All their basic research on young leaves was just the beginning of something that would change rain forest conservation and the economy of Panama. In 1992, Coley and Kursar wanted to help save the rain forest; they would even take their vacations to the forests. “We were hooked on them,” Coley says and they wanted to conserve them. “We would see forests that we once loved were disappearing,” she says. Then one day they thought, “maybe we could use this information we’ve gathered over 25 years to protect the forest by discovering medicines.”

They started working on conservation in Panama just after the Biodiversity Conference in Rio de Janeiro in 1992. They implemented the concept of finding uses for biodiversity and non-destructive sustainable uses, says Kursar. Coley remembers reading an article in “Newsweek” on bio-prospecting. Bio-prospecting is where people go out searching for chemicals in plants that may have agents in them that can be produced into medicines. After reading the article, Coley remembers thinking that the bio-prospectors were looking in the wrong places. The bio-prospectors often collect the mature leaves, but they are tough and don’t have many chemicals. “It’s the young leaves that have all the chemicals,” she says. “Being tender and full of protein, all the insects want to eat them.”

They decided that they should be looking at plants for medical discoveries and what better place than nature. “Nature is a good place to find medicines,” says Coley. According to Coley, more than 50 percent



prescription drugs come from nature and plants have been used for medicine for many years. The Native Americans discovered that the willow tree is a source of aspirin. Today major discoveries in medicine have been made through biodiversity. One of the best success stories was the discovery that Madagascar periwinkle can cure childhood leukemia or Hodgkin’s disease.

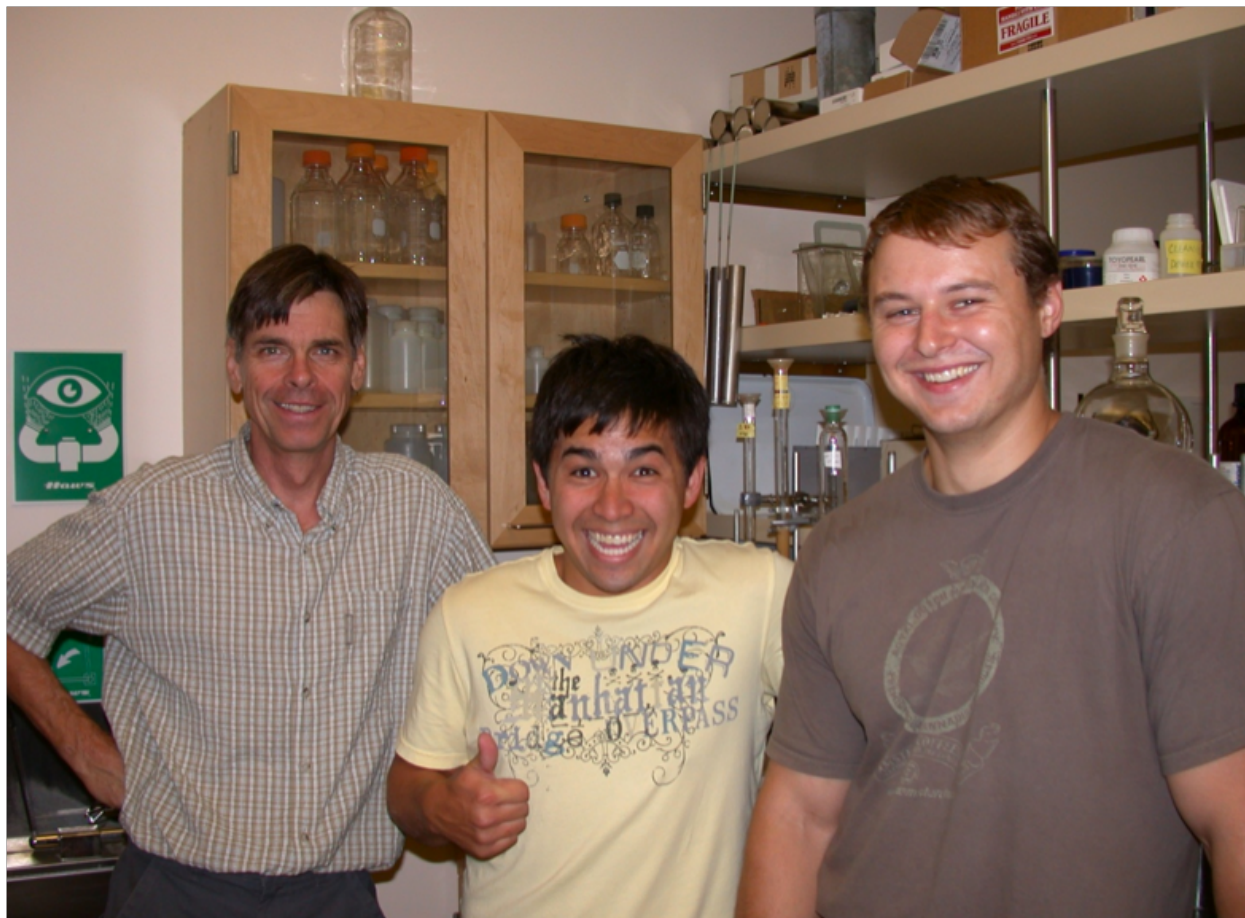
Finding the young leaves is hard though, says Coley. “It’s a needle in a haystack” or as her students say, “it’s a jungle out there.” Though the work is hard to find the leaves and find the chemicals that have medi-

cal agents, they have been very successful in their research and in discoveries, says Kursar. The major problem is making the transition from discovery to marketable prescription. The bioprospecting steps are collecting plants, then testing the crude material, identifying the active ingredients, then animal trials, followed by human trials and finally, a new drug.

Their research has helped out the world of medicine by finding both anti-malaria and anti-cancer compounds, but they have also helped out the country of Panama. Because of their research in Panama, they have been able to help conserve the rain forest. Ten years ago, Panama was focused on logging and other extractive industries, but now the bioprospectors have a voice in the country, says Coley. The research and lab has produced more jobs than logging has been successful at getting rain forest lands to be protected.

Many Panamanian students who have worked in the lab have been able to get accepted to universities outside of the country to get graduate degrees. Panama does not have any PhD programs in the country and by having students get PhDs abroad, science has grown in Panama. The program has also been able to receive a grant from 1998-2013 giving them \$500,000 per year to do the research. Panama is also a great place to do this research because of its richness in biodiversity and the fact that you can be in the forest in the morning and back in the lab by the afternoon, Coley says.

The research that was questioned to have any earthly value has turned into something life changing for parts of the world and also for Coley and Kursar. "We never would have thought of this idea of looking at baby leaves without our 25 years of study of basic science. If you try, you never know what you can accomplish," says Coley. 🌍



NEW SOFTWARE HELPS STUDENTS IDENTIFY STUDY ABROAD OPPORTUNITIES

■ Chris Vincent

An inquisitive face appears through the double doors. Their pace slows as they glance around the colorful pamphlet- and poster-filled walls. Slightly overwhelmed, they approach the front desk. They are here to study abroad.

This scene is played out numerous times a day at the University of Utah Study Abroad Office. Some students know exactly where they want to go and what they want to study, but the majority are certain of little else than their desire to spend some time in a foreign country and experience a different culture. Despite the hurdle of uncertainty and the twinge of anxiety that comes with the excitement, hundreds of students embark every semester on a journey that will alter their perspective, and possibly even change their lives. Our Study Abroad Office hopes to provide everyone with easy access to the many opportunities available to them. As part of this effort, a recent change has been made in the application process for Study Abroad programs.

Spring 2010 witnessed the unveiling of a new era for the Study Abroad Office. After six months of thoroughly examining and fine-tuning the procedures of the new software platform Horizons, the long-awaited online application system for study abroad programs went live. Students can now search through all the programs offered with attention to criteria such as destination, field of study, language of instruction, term length, and type of program. Rather than spending hours sorting through endless pamphlets and confusing charts, searches can be narrowed down in a matter of seconds. It is a frustrating experience to finally come across the one program that meets all your needs, your dream program, only to find out at the last minute that it isn't taught in English. By presenting all programs in such a way, this problem will be eliminated. Now, finding the program that is right for you is quicker and easier than ever before.

Another advantage offered by the implementation of this new online system is that it moves us one step closer to becoming a paperless campus. Pages and pages of application materials, including lengthy disclosure agreements and release forms, are now being saved. Less booklets and brochures need to be printed because the information provided in them can now be found online. This new system is helping the Study Abroad Office lower its impact on the environment.

Actions	Provider	Program Name	Host Institution	Location	Language of Instruction	Term	Options
	CEA	2010 Fall Semester Intermediate French Language & Culture	University of Paris IV - Cours de Civilisation Française de la Sorbonne	Paris, France	French	Fall, Spring, Full Year	Apply
	CEA	2010 Fall Semester Macquarie University - International Partnership	Macquarie University	Sydney, Australia	English, Chinese	Fall, Spring	Apply
	CEA	2010 July 4-Week French Language Immersion	Catholic University of Paris	Paris, France	French	Intensive Month	Apply
	CEA	2010 July 4-Week Irish Language & Culture	National University of Ireland Galway	Galway, Ireland	Irish, English	Summer	Apply
	CEA	2010 July 4-Week Irish Studies	National University of Ireland Galway	Galway, Ireland	English	Summer	Apply
	CEA	2010 July 5-Week Business & Economics - A Latin American Perspective (1 or 2 Course)	Veritas University	San Jose, Costa Rica	Spanish, English	Intensive Month	Apply

The future of Study Abroad is here. This new online application system will provide countless services to students and staff alike. By logging in with their CIS uNID number and password, students can have unlimited access to all Study Abroad programs (parents and non-students can create a quick and easy profile that will allow them equal access as well). The search methods and application process have been simplified and streamlined to encourage more students to apply. As a former study abroad student, I consider the experience I had as one of the best ways in which I utilized my time as an undergraduate. We at the Study Abroad Office hope to spread this message of the enriching experiences and broadening horizons gained by studying abroad to everyone. To get a firsthand look at Horizons visit www.studyabroad.utah.edu.



Photo credit: Ken Golden

ANTARCTIC SEA ICE GIVES GLOBAL WARMING CLUES

■ Jamie Bowen, Staff Writer

In 1998, Ken Golden made his third expedition to Antarctica where he was aboard the *Aurora Australis*, an Australian ice-breaker ship. He was rudely awakened one night to the sound of fear. The first mate of the ship announced to the crew in his thick Scottish accent, "Please don't be alarmed, but we have an uncontrollable fire in the engine room." Fifteen minutes later, the first mate got up in front of the group again and made another announcement saying, "Please don't be alarmed, we are lowering the life boats."

The crew made it safely back to Australia on a back up engine, but the expedition was over before it started, Golden said. "Quite an exciting experience," Golden recounts when remembering that first expedition

which was covered worldwide by CNN and many Australian newspapers. He said the first expedition "was over before it even started," but it was the start of many expeditions that would change the way the field of mathematics and the world look at global warming in the Arctic and Antarctic icecaps.

Golden first became interested in climate change and ice packs, or frozen sea ice, when he was a junior in high school in Maryland and pondered questions like: what sort of changes in climate make the ice packs recede? "If you hear that global temperatures have risen on average by a degree over many years you may not worry about climate change. However, if you see satellite images that show that 40% of the summer Arctic sea ice pack has disappeared in just a few years then this geographical

perspective makes you realize how serious climate change really is," he said.

Golden used to go over to NASA when he was in high school and study sea ice. Golden, who is now a professor in the department of mathematics at the University of Utah, has been studying sea ice using mathematics for more than 30 years. His research focuses on the effects of climate change on sea ice.

Sea ice makes up between 7 and 10 percent of the earth ocean surface. It is the boundary between the ocean and the atmosphere and it can serve as a big indicator of global warming and climate change. Sea ice is what protects the polar oceans from solar radiation. When the radiation enters the atmosphere it is reflected by the sea ice and absorbed by the continents and ocean water.

Seasonal sea ice is melting at an alarming rate due to a process called Ice Albedo Feedback. Albedo is how much light is reflected by a surface. The process is a cycle in which warming melts the ice which lowers the albedo so that more light is absorbed, which results in more melting of the ice. As the process continues, the ice gets thinner and more and more disappears, Golden said. "When the sun is shining, an ice pack with lower albedo is reflecting less sunlight, and absorbing more radiation. You're in a much thinner regime now and more susceptible to heating and melting," he said.

Since 1978 there has been a drastic change in the seasonal sea ice levels, mainly during the summer months. This is due in large part to the Ice-Albedo Feedback, said Don Perovich, a research geophysicist. The areal extent of the winter Arctic ice pack has declined gradually about 10% from its average value from 1979-2000. However, in just 10 years the extent of the summer Arctic sea ice pack has declined about 40% from its average value. The changes in the seasonal ice pack are due to two things: 1. the dynamics of the Arctic Ocean which resulted in sea ice being exported into the North Atlantic through Fram Strait, a passage from the Arctic Ocean to the Norwegian and Greenland Seas; and 2. more ice is melting due to the Albedo Feedback.

Though drastic changes in the sea ice have occurred, Golden still feels that we are okay for now. "It appears that we haven't passed the critical threshold, but we have entered into a new regime. Are we going to rebound? Probably not significantly in the near future," he thinks. From models included in the 2007 Intergovernmental Panel on Climate Change AR4 report, run from 1950 to 2080 and beyond, project that the summer Arctic sea ice pack will disappear by the end of the century. But as satellite images have shown, the predictive models are drastically un-

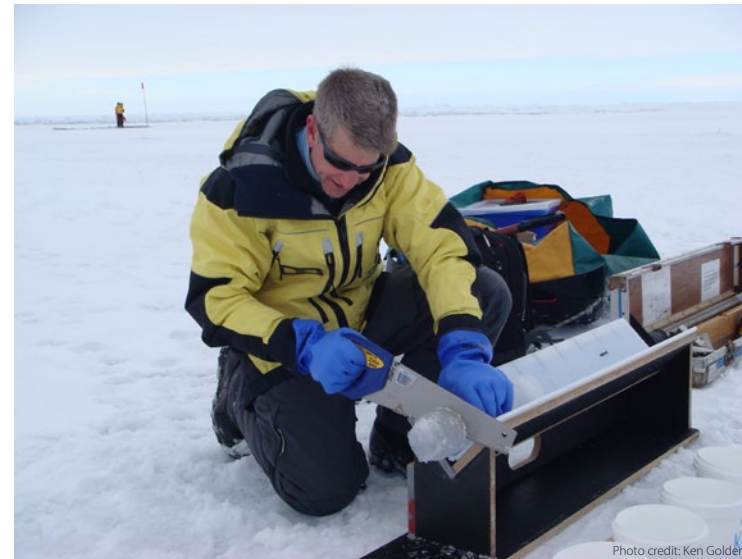


Photo credit: Ken Golden

derestimating the loss of sea ice. The model predicts that right now the sea ice loss for 2010 is around 20 percent, when in reality the satellite images show that it has lost closer to 30 percent. "None of them has actually predicted what happened, although variability in some of the best models comes close," Golden said. "Most of these models don't look at the important processes that we look at in our work."

In his work, Golden uses mathematics to study the effective properties of sea ice as a composite. Sea ice is a composite material with brine, salt and air. The sea ice is studied on a micro-scale and that is mainly where the math comes into play, Golden said, although there is also a lot of math that goes into studying sea ice on much larger scales.

Golden's first big discovery in his research came during the 1994 expedition called the Antarctic Zone Flux Experiment. "In a very powerful storm, I saw water percolating to the surface," Golden said. "The

entire sea ice layer became permeable as the storm warmed the ice. As the snow piled up, the weight created a pressure head which forced the water upward, flooding the surface. The water mixed with the snow, and this slushy mixture froze to form sea ice—about a quarter or more of the ice produced in the Southern Ocean forms this way. This was a changing point into my career."

What Golden was discovering was there is a critical threshold for fluid flown sea ice, where it is impermeable for brine volume fractions below about five percent and increasingly permeable above that. He also discovered that the brine volume fraction also corresponds to a temperature of negative five degrees Celsius for salinity of five parts per thousand, which is known as the Rule of Fives. In a landmark paper published in the journal *Science* in 1998, Golden was able to identify this critical behavior as an example of a percolation threshold, an area of mathematics where Golden had done a lot of research in previous years. Sea ice permeability constrains the evolution of melt ponds on Arctic sea ice, which are a key part of the problem in the ice-albedo feedback. They absorb the solar radiation which melts the ice. "If you want to understand the melt ponds, you must understand the permeability," he said. Golden, Hajo Eicken at the University of Alaska Fairbanks, and other colleagues and students have since developed a comprehensive theory of sea ice permeability, as well as X-ray CT imaging methods to study the brine microstructure of sea ice, which controls the permeability. Their work pro-

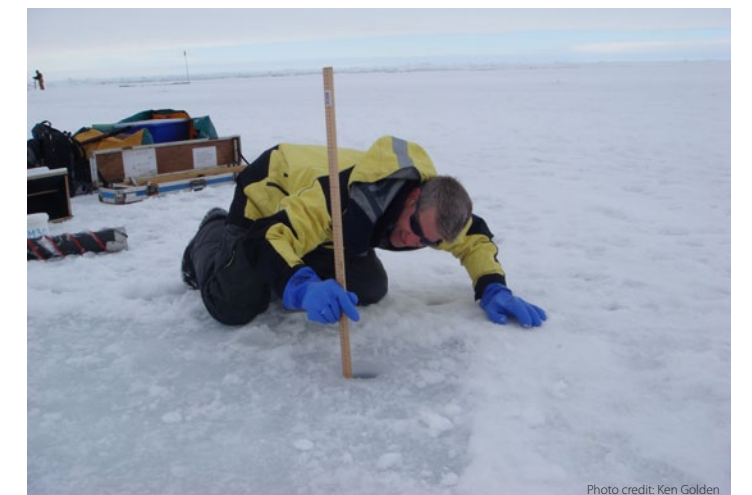


Photo credit: Ken Golden

vides the foundation for studying key processes which must be better understood to improve climate models.

Sea ice permeability also controls nutrient replenishment processes which are vital to extensive communities of algae and bacteria that live in the brine inclusions in sea ice. These communities support life in the polar oceans. It has been observed that the levels of microbial activity in sea ice are closely related to the Rule of Fives. Golden's work helps provide the foundation for studies of how microbial ecosystems may respond to climate change.

In his last expedition to Antarctica in 2007, the Australian Sea Ice Physics and Ecosystem eXperiment, Golden took one of his students, Adam Gully, to help with the experiments. During the expedition, they performed four different experiments on the ice. They made the first measurements of fluid permeability in Antarctic pack ice by drilling holes in the ice and seeing how fast the water filled back in. They extracted vertical cores of sea ice and measured the electrical conductivity to relate sea ice electrical properties to its fluid properties. They also inserted electrical probes into the surface of the ice to reconstruct its electrical profile to help monitor the thickness of the ice, which is a key part in gauging the impact of climate change. Finally, they used tracers poured through extracted blocks of sea ice to examine the flow of fluid through the ice. "A lot of cool stuff came out of these experiments," Golden says.

Golden's research is essential to the mathematic community and he is bridging the gap between mathematicians and climate scientists, Gully said. "I think his research is great and it helps other mathematicians apply these theories," he said. Golden's research is also essential to help the climate models become more accurate. "The work Ken does is really critical to climate modelers," Gully said. With Golden doing the hands on research, he is helping the climate change modelers change so that they are more accurate. 🌐




Photo credit: Ken Golden




Photo credit: Ken Golden




Photo credit: Ken Golden

HINCKLEY INSTITUTE INTERNS LAND SPOTS AT TOP ORGANIZATIONS IN MEXICO

■ Jamie Bowen, Staff Writer



Two Mexican American students at the University of Utah recently had the unique and life changing opportunity to return to their native country of Mexico to work in some of the top organizations in Mexico City. Through the Hinckley Institute of Politics' nationally recognized international internship program Brayan Nava-Solorzano had the opportunity to work at ProMexico, a government entity that promotes international business and commerce, and Eduardo Reyes-Chávez worked with Grupo Estrategia Política, one of Mexico's top lobbying firms. Both students gained great experience from the internships and also strengthened and advanced the university's goal to provide students with broadened international experience and to have stronger international ties among students, staff and faculty.

In summer of 2009, Brayan Nava-Solorzano worked with ProMexico which was created to help stimulate the economy by President Felipe Calderón. Solorzano worked in the international business and promotional unit of ProMexico helping out with the North American region and with the North American Free Trade Agreement. He worked on analyzing imports and exports and venture capital. He analyzed many investment projects and exports to see which ones were the best to concentrate on and support. He also was overall pleased with his time in Mexico. "It is amazing to see a country move forward despite all the challenges. I am grateful to be a part of an

international internship that expands my business, political, cultural, and academic visions," he said in a statement. Eduardo Reyes-Chávez also worked during the summer of 2009, but with Grupo Estrategia Política. GEP works on electoral monitoring, political consultation, legislative analysis and lobbying. Chávez worked on doing a comparison between the US Legislative Branch and Mexico's Legislative Branch. "One of my most life changing experiences has been to come back to my country and, by watching the electoral process, relive the ongoing democratic change currently occurring in Mexico," he said in a statement. He has had the opportunity to work as well on an analytical paper on energy reform in Mexico. While doing the internship, Chávez had the opportunity to visit many universities and colleges around the country visiting classes and taking part in political and economy classes.

The internships completed by both Solorzano and Chávez were a fulfilment of President Michael Young's goal to make this a more international institution, said Courtney McBeth, international internship advisor for the Hinckley Institute of Politics. "For them (Solorzano and Chávez) it was particularly rewarding to return to their home country and to have first hand experience in the top lobbying and economic organizations and experience the dynamic relationship between the United States and Mexico" she says.

The Hinckley Institute of Politics offers many great international, national and local internships and it has become a major part of the experience of students at the U. "The students that do the international internships say that it is the most rewarding part of being at the U and using their skills and applying that internationally," McBeth says.



