Illuminated Magazine

FROM THE SCHOOL OF GRADUATE STUDIES

The East Tennessee State University School of Graduate Studies is proud to present ILLUMINATED, a magazine that showcases the excellent work of our graduate students and their faculty advisors.

There are over 2200 students enrolled in graduate programs at ETSU. ILLUMINATED presents some of our students’ research and creative works that make meaningful contributions to various disciplines, and contribute to our strong graduate programs. ILLUMINATED features research and creative projects that are currently happening on campus, and provides updates on alumni of ETSU graduate programs.

ENJOY!

Celia McIntosh, Ph.D.                Karin Bartoszuk, Ph.D.
Dean                            Associate Dean

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For current graduate students and their advisors:
Are you or one of your graduate students working on a culminating experience (e.g., thesis, dissertation, capstone)? Your research could receive additional exposure through Illuminated Magazine and help educate the rest of the campus about your department and program. This is a unique opportunity to get your work recognized!

For current graduate students and their advisors:
Did you or one of your students get into an excellent doctoral program or get an excellent position? We want to hear about it! Share your story in the “Where Are They Going?” section.

For former graduate students and their advisors:
Did you know an outstanding student who graduated from ETSU more than a year ago? We want to hear from them! The “Where Are They Now?” section features former ETSU graduate students who are now professionals in positions across the country.


For more information on nominating students or getting featured in Illuminated, please contact: Dr. Karin Bartoszuk, bartoszu@etsu.edu
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*Illuminated would like to extend a special thank you to Larry Smith, Director, ETSU Photographic Services, for providing help with the archived photos

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INTERSTATE CONSTRUCTION continues to spawn research on local creek

by Mariam Ayad

More than 15 years after the road construction on I-26, a student returns to see if the nearby aquatic habitat has recovered.

The pounding of jackhammers, glares from reflective orange and white barrels, and the sight of sticky black tar are sources of frustration for more than just highway traffic. Road construction can severely alter, and sometimes permanently damage, nearby wildlife habitat because of rock blasting and polluted run-off from the asphalt.

When Tennessee was building a section of Interstate 26 in the early to mid-1990s, the construction dramatically affected nearby South Indian Creek. Soil clouded the water and harmed underwater creatures. Pollutants entered the streams and fish died. Almost 20 years later, Clara McClure is examining the creek again, to see if it is still having trouble getting back to normal. Clara, a master’s student in Environmental Health, is exploring ten of the most impacted sites along South Indian Creek. These are some of the same sites the environmental health team looked at when the highway was being constructed,” said Dr. Phil Scheuerman, the leader in a series of water quality studies on the creek in the 1990s (and Clara’s thesis advisor).

“Those are very fragile ecosystems and very fragile streams because they’re at the very top. They’re the headwater first-order streams, so they have very little buffering,” Dr. Scheuerman explained. “Any small change has a big impact and then it cascades down because if you hurt the headwater, then you’re going to hurt the waters down below them.”

Clara, who received a research grant from the School of Graduate Studies and Graduate Council, has gone to the creek once a month since June to collect water quality data. She and a partner take water samples and sediment samples to bring back to the lab to test for microbial enzyme activity, which tells the researcher a great deal about the life in the creek. She also collects data on the water’s pH, conductivity, temperature, dimensions and other details. Clara will focus much of her research study on microbial activity because of its significance to life in the creek.

“Microorganisms are the base of an ecosystem,” Dr. Scheuerman said. “Energy and nutrient movement into an ecosystem, aquatic or terrestrial, starts with the microbial population.”

Clara will compile her data collection in May. Although she has yet to run her formal analysis, she is hypothesizing that the creek has not recovered completely since construction began in 1990.

“I expected it to have not recovered because of increasing traffic volumes on the interstate; and that’s still a lot of instability on some of the sites because of the interstate construction,” Clara said.

It’s likely that the sites haven’t recovered completely because of the dramatic changes in the environment brought on by the interstate highway’s construction. The mountainside that was blasted for construction contained a rock called pyrite, better known as fool’s gold. When pyrite interacts with bacteria, oxygen and water, it produces sulfuric acid. In addition to erosion into the stream, researchers were also concerned about this acid leaching out into the environment and destroying the habitat.

“It slowed the construction down quite a bit because they had to do a lot of things to make sure they removed the pyrite correctly,” Dr. Scheuerman said.

Despite the precautions, researchers were still concerned about the pyrite that was newly-exposed after the side of the mountain was blasted to make way for the new road. Construction workers also used some of that rock for the bridge abutments. Some of the bridge abutments were made with layers of pyrite.

Dr. Scheuerman said. “They cover it over and use that as the abutment for the bridges to stabilize them going over the creek.”

“There’s a lot of concern because nobody knows how long that lasts.”

Another major concern was the erosion along the side of the steep mountain. Because the construction crew was removing brush up to the edge of the creek, there was a lot of silt and debris running into the water.

“One of the problems with the silt is that in those streams, there’s no sediment at the bottom. The aquatic insects live on those rocks and they serve as food source for the fish. Well, when you put sediment on that, that kills all of them,” Dr. Scheuerman explained.

“Those are very fragile ecosystems and very fragile streams because they’re at the very top. They’re the headwater first-order streams, so they have very little buffering.”

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“I’ve always wanted somebody to go back, and Clara found it interesting enough to go back at about 20 years after the construction,” Dr. Scheuerman said.

Clara has several elements she can include as she begins processing the data. Because the previous studies on the creek were conducted quarterly, she can compare her data with those reports and examine the temporal effects. She can also compare the upper stream to the lower stream to see the differences between those two sections of the creek. She will likely analyze the interaction of the temporal and spatial data.

“I’ve always been interested in science, and I want to help people somehow, but I didn’t want to go the doctor way,” Clara said. “Environmental health is broad enough to where I don’t have to be specific and choose because it’s such a broad field.”

“I’ve always been interested in science, and I want to help people somehow, but I didn’t want to go the doctor way,” Clara said. “Environmental health is broad enough to where I don’t have to be specific and choose because it’s such a broad field.”
Aiming for AGILITY

Student hopes to improve training for soccer athletes.

by Mariam Ayad

Joel Cowan has been playing soccer for more than twenty years. An avid soccer player and fan, he wanted to learn what makes some players better than others. Because it is so important to the game, Joel investigated what factors affect a soccer player’s agility. His exploratory study will help soccer and strength and conditioning coaches to incorporate more meaningful exercises to improve athlete performance.

“I grew up playing soccer, so I always had an interest,” said Joel, a master’s student in Kinesiology and Sport Studies with a concentration in Exercise Physiology and Performance. “I was always trying to find ways to better my performance, so coming from that and being a part of this program that strives to improve athletes’ performance, this might be a good avenue for me.”

Previous research has shown that professional soccer players use their agility to quickly change direction on the field an average of 1200 to 1400 times per game. “It’s a huge part of soccer, so being able to improve agility performance would definitely have some positive effect on the overall soccer performance,” Joel said.

Joel wanted to see if three variables in particular correlated with a player’s agility. These include limb length, power and strength. Most athletes at ETSU are tested for these three measures each year as part of a sports science monitoring program.

“athlete monitoring and sports science studies are very, very rare in the United States. This is the only doctoral program in the U.S. that does purely sports science,” said Dr. Kimitake Sato, Assistant Professor in the Department of Exercise and Sport Science.

Joel used data from this year’s men’s and women’s soccer teams and men’s soccer teams from the previous four years. He hopes to find a way to narrow down the best way to seek out good talent, and help soccer players improve their performance.

“Joel is taking a step to find how physical demands and actual body stature influence the agility movement,” said Dr. Sato. “This becomes such a good factor for talent identification. When we’re looking at teenagers, if you have a certain body structure and body stage and strength, chances are that you can be good in certain sports.”

Joel used the data taken each year by the sports science program. The program uses the Arrowhead Agility Test as well as a repeat agility test to determine athlete agility. The peak power output is determined by two jumping tests, a static jump and a countermovement jump. Strength is measured using a test called the isometric mid-thigh pull. As athletes pull harder on a stationary bar, they push harder on the ground with their feet, which lets researchers measure their strength. For the limb-length, Joel used leg length, thigh length and shin length.

Joel is taking a step to find how physical demands and actual body stature influence the agility movement.

“We used the results from those tests, and then checked if the athletes that have good results in those tests also have good results in agility tests,” Joel explained. “Although he still has to incorporate previous years’ data, initial results show that peak power output is a good indicator of agility movement. Joel’s research will serve as an additional tool to sport science literature, because there is little previous research correlating physical characteristics and agility performance, especially studies that take limb length into account.

“There’s a big chance that their training in the weight room might change depending on his research results, and that will further help our ETSU athletes and other levels of athletes,” Dr. Sato said. After obtaining his master’s degree, Joel hopes to further his education in athlete rehabilitation, and study biomechanics or physical therapy.

“I want to work at keeping the athletes healthy, and if they get injured, how to bring them back as quickly as possible and prevent any further occurrence of injury,” Joel said.
Most graduate students are thrilled about their research topic, but are often misinformed about how to initiate a human subject study. Before any study involving human subjects can be started, approval from the Institutional Review Board (IRB) must be obtained.

Although IRBs around the country are sometimes seen as hurdles in the research process by graduate students, they serve an important purpose. They aim to protect participants, researchers, and their institutions by upholding ethical principles in academic research. ETSU is one of only two universities in Tennessee that are accredited by the Association for the Accreditation of Human Research Protection Programs, or AAHRPP.

“We’re not here to stop research from going forward, but to assist the researcher in implementing it in a fashion that ensures human subjects protection,” said Dr. Bill Duncan, Vice Provost for Research and Sponsored Programs. A lot of times, that means following rules about ethics and consent that many graduate students, who are new to academic research, are still learning. The IRB can help you understand and follow these rules. ETSU’s Institutional Review Board, part of the Office for the Protection of Human Research Subjects, wants to make the process as painless as possible. Janine Olive, Director of the Institutional Review Board Program, and Dr. Duncan offered some great advice on the best way to approach an IRB submission.

Tip #1: Think about principles of ethical research as you’re designing the study

“Keep in mind the ethical principles of research, and think about the consent process in terms of what will be required of you,” Ms. Olive said. “Students often ask questions about what will be a good IRB application, and the best thing you can do is start with the ethics. This is a good foundation to get the process going in a positive direction.”

Tip #2: Talk to the IRB staff before you submit your application.

After you’ve laid out your research design with the help of your advisor and committee, email the IRB staff and set up a meeting. Although this is not a requirement for the submission process, connecting with the IRB beforehand can help provide guidance to you on the best way to fill out the forms. The level of review – exempt, expedited or full – may have a major impact on the amount of time it takes for the IRB to get back to you. If it’s possible to complete a study with a lower level of review, it can mean an abbreviated process and shorter time frame. For example, an expedited review requires additional information on the informed consent and takes an average of one month to process. A study that meets the qualifications for an exempt review usually has an abbreviated consent process and the average IRB review time is cut in half to an average of two weeks.

“Make sure you have a good idea of what’s going to be involved in the study and what’s going to require IRB approval,” Ms. Olive said. “It’s important to talk through this with the IRB so you can get an idea of the time frame.” Another tip related to reducing processing time is responding quickly to questions and requested changes from the IRB. This helps speed the process from the time of submission to approval.

Tip #3: Submit your application online

The IRB office now offers an online submission option so that students and faculty can submit all their paperwork online and track the status of their application. To submit IRB applications online, students and their faculty advisors must first become certified for the process. The IRB offers training in university classes when requested, and also offers one-on-one training over the phone, which takes about 20 minutes.

“The advantage of submitting your study electronically is we’re able to embed in the questions a lot of helpful text, as well as links to other information, in a way that you can’t do in a paper application as much,” Ms. Olive said. “That’s been really helpful.” Along with text and links, the online form also offers examples of what information the IRB requires, which can help students formulate more complete answers. Also, rather than turn in multiple forms, the online system formulates all the relevant questions in one form, adding to the precision of the application.

Tip #4: Ensure your application is clear and complete before submitting it

Although it seems simple enough, double-checking the application to make sure you’ve answered all relevant questions, and that there are no inconsistencies can make a big difference. If there’s a question on the application that’s required, but left blank or labeled as not applicable, the IRB has to send it back to the researcher and the process takes more time. Similarly, if different parts of the application contradict each other, the IRB has to send it back to the researcher for clarification.

“If there is confusion about the research activity, it will delay the review,” Dr. Duncan said. “The IRB can’t approve a study until every-thing is clear.”
Richard Nixon left quite a legacy. But few know the details of how the former U.S. president conducted his campaigns and selected his staff. Niklas Trzaskowski, a master’s student in the Department of History, examined archival records, consumed oral histories from Nixon’s staff, and read memoirs to give historians a comprehensive view of what Nixon’s campaigns really looked like from an insider’s perspective.

“The thing that always fascinated me was looking at campaigns and looking at the behind-the-scenes stuff … and I wanted to know how did these [political staffers] come about,” Niklas said. “Nixon is the perfect example because he relied on these people a lot, so I wanted to give a behind-the-scenes look at the political campaigns of Richard Nixon.”

Nixon ran for different offices many times, including the House of Representatives, the Senate, Vice President, Governor and President. By looking at the details of all of Nixon’s campaigns, Niklas learned more about Nixon’s style of campaigning and how he selected his staff.

Niklas found that Nixon had a unique set of staff that had different backgrounds than those of many other modern presidents. Nixon admired the rags-to-riches stories of his appointed aides, who, much like himself, were born into poor households and worked hard to secure financial success. Nixon’s staff consisted of business-minded individuals, rather than experienced political aides.

“Throughout his career, Nixon always wanted to have people on his staff that worked themselves up and were as far removed from politics as possible,” Niklas explained. “They would not be working with

By Mariam Ayad

Richard Nixon

On the campaign trail with

Niklas Trzaskowski, Graduate Student.
Daryl A. Carter, Ph. D., Faculty Advisor

MARIA JULIA PESTALARDO

Degree:
Master of Arts in Professional Communication

Department:
Communication department

Year of graduation:
2006

Current job:
The National Council of La Raza

Location:
Chicago, Ill.

What are your work responsibilities?
Monitoring United States Department of Labor Career Pathways grantees to ensure compliance with federal regulations and achieving proposed goals.

What’s your favorite part of the job?
Knowing that what you do makes a difference in people’s lives. Career Pathways advance low-income, low-skilled workers through education and training to high-wage jobs that lead to economic self-sufficiency. The NCLR Workforce Development Department supports organizations that offer a variety of services to their participants that help them successfully complete their training, get placed in jobs, and stay employed.

How has your master’s degree helped you (personally and/or career-wise)?
Professionally, I was able to be promoted as a Department of Education Regional Coordinator, not only because of my achievements, but also because I had a master’s degree. It depends on each industry, but typically, you will need a master’s degree to apply to senior-level positions. Personally, it gave me the opportunity to meet local and international people, some of whom became lifelong friends.

What advice would you give to current graduate students?
Build your network and professional experience. Ask a professor to be your mentor. Professors are well connected and can always lead you to job opportunities. Participate in activities that build your professional potential, including participating in departmental events, joining professional associations, networking at conferences or campus activities and seeking opportunities to present projects. Enjoy the ride. Graduate school is a great time. You meet interesting people and have the chance to challenge your own ideas. Do not take everything too seriously and make use of your free time.

Final thoughts:
Go Bucs!!
him because they wanted to advance their own political standing but instead wanted to win it for Nixon.

Not only was his staff different, but Nixon also conducted his 1960 presidential campaign very differently from those who came before and after him – he ran the campaign himself. Most of Nixon’s campaign staff was handed down from Eisenhower’s administration because Nixon was the vice president of the administration. Because he hadn’t hand-picked the staff himself, Nixon distrusted the aides and chose to make all the calls in the campaign, an unusual move for presiden-
tial candidate.

The thing that always fascinated him was looking at campaigns and looking at the behind the scenes stuff… and I wanted to know how did these come about.

Throughout all of Nixon’s campaigns and during his years in office, he trusts only a few people and is always suspicious of the “lib-
eral elite” of the time.

“Nixon’s whole life, not just his political campaigns, but his entire life, is ‘me versus the elite’ or ‘me versus the so-called educated.’” Dr. Carter explained. “Nixon relies heavily, at any given time, on a few indi-
viduals and no more. Sometimes it’s only a handful.”

In conducting his research, Niklas had to use archival material that was sometimes difficult to obtain. Many of Nixon’s records are ar-
chived at the Nixon Presidential Library and Museum in Yorba Linda, California, which was previously run by Nixon’s most ardent support-
ers. Much of the material on Nixon’s earlier years is still owned by the
Richard Nixon Library and Birthplace Foundation, and the organiza-
tion is not required to release the information.

“It’s a very tricky situation which is another reason that Niklas's work stands out as noteworthy, because he’s had to negotiate through
all this,” Dr. Carter said. “The issues at the Nixon library, you do not encounter at the Johnson, Clinton, Kennedy, Carter, Hoover libraries. You only encounter them at the Nixon library, which makes it difficult.”

Niklas explored the Nixon library last summer with a grant through ETSU’s history department. Because of the difficulties in ob-
taining archival material on Nixon’s early years, Niklas relied in huge
part on oral histories left by Nixon’s staff and their memories to com-
plete his thesis.

“People haven’t looked at Nixon in terms of what Niklas has put together, meaning these issues regarding Nixon’s persons, Nixon’s staff, the people around him, the people that he needed to function,”
Dr. Carter said.

Nixon conducted his 1960 presidential campaign very differently from those who came before him — he ran the campaign himself.

Niklas became interested in studying Nixon because his favorite author, Hunter S. Thompson, abhorred him and wrote about Nixon ex-
tensively.

“I didn’t know a lot about Richard Nixon, so I finally said to myself, I want to find out more about this man that my favorite author
absolutely despised,” Niklas said. “Ever since then, I started to be more interested in American political culture, especially in the 1960s when Nixon is so important.”

Niklas was awarded best graduate paper at the Ohio Valley History Conference in October. He also presented his work at the Phi Alpha Theta Tennessee Regional Conference and the University of
Alabama at Birmingham History For-
rum.

“It’s an important piece of political history. I’m very proud of Niklas. He has worked his heart out to do this,” Dr. Carter said. “Niklas has engaged quite extensively in archival research, and research just generally, which is not typical of a lot of our MA students here. He is one of our bright lights in the department.”

Sarah Welborn, Graduate Student
Michelle Lee, Ph.D., Faculty Advisor

Sarah discovered that she and most of her fellow nutrition students were unknowingly discriminating against overweight and obese individuals by stereotyping them. Known as obesity bias, this type of disposition leads people to treat overweight and obese people differently and cause them to feel uncomfortable.

“I had never heard of obesity bias, but after taking the survey I felt very shallow and re-
said that this is a prob-
lem,” Sarah said. “I had two [overweight] cli-
ents that year, and they were some of the
most working people I’ve ever met. I may not have thought that if someone hadn’t brought it to my at-
tention that there was an issue [of bias].”

Obesity bias can lead people to assume that the overweight and obese are undisciplined, in-
active or eating too much stereotyp-
es that may or may not be true of any-
one. Even indirect cues, such as fa-
cial expressions or a chair that’s too
small, can make the overweight and obese uncomfort-
able in a dietician’s office.

“If they’re not comfortable there, they’re not going to come back, and that’s really alarming to me,” Sarah said.

The study that she participated in dur-
ing her undergraduate course surveyed only nutrition students. Sarah was interested in learning if obesity bias decreased during the progression of a nutrition student becoming a registered dietitian. She conducted a cross-
sectional study and compared the obesity bias attitudes of undergraduate dietetic students, dietetic interns and practicing registered dieti-
tians. The participants were all from southern universities — ETSU, Mississippi State Uni-
versity and Middle Tennessee State University.

Sarah used two previ-
osely-validated surveys to capture obesity bias in the
participants. One was the fat
phobia survey, which asked participants to rate how they believed obese individuals
ranked between two opposite adjectives, like hardworking and lazy. The other survey was
the anti-fat attitudes scale, which asked par-
ticipants the same types of questions. Rather
than just marking between words, however, this scale required participants to read a sen-
tence and rate how much they agreed with it. Sarah hypothesized that the undergrad-
uate students would have a higher obesity bias than interns, who would have a higher obesity bias than registered dietitians. This would show that dietitians learned to over-
come obesity bias as they progressed in their

“Unfortunately, there was no statisti-
cal significance between it, but we did see a trend where obesity bias did improve,” said
Sarah. She also presented her work at the Ohio Valley History Conference and the University of
Alabama at Birmingham History For-
rum.

The study also yielded other interesting
results. For the 26 registered dietitians in
the study, Sarah also categorized them based on their workplace, such as clinical, hospital and

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many more co-morbidities that go with it, a problem in the healthcare field overall. We know with overweight individuals and especially obesity, there are so many more co-morbidities that go with it.

If the dietitians that are teaching them have the most bias then that poses a big problem to me as far as future dietitians

like cardiovascular disease, hypertension, diabetes, cancer, so really they could be the population that really needs help the most and needs help the most," Sarah said. After obtaining her MS in Clinical Nutrition, Sarah wants to work in a clinical setting for a few years and then return to school for a PhD. She hopes to continue her research on obesity bias and educate future dietitians.

I think it's so important because we need to be aware of our personal bias and in turn help other people be aware of their own. If we can do that, it can help them in turn help their clients succeed and that should be the reason that we're practicing.

JOHN WYATT GREENLEE
Degree: Master of Arts in History

What doctoral program will you be attending?
Cornell University, the Medieval Studies program, with a concentration in Medieval and Renaissance history.

Will you receive funding?
Yes. The offer from Cornell included five years of guaranteed funding, including two years of funding through a Fellowship and three years funded through a Teaching Assistantship.

How has your master’s degree helped you?
My classes and my professors at ETSU opened up new avenues of study for me while helping me to sharpen the focus of my research interests. The faculty of the History Department has pushed me to think about ideas and issues in new ways, and has never stopped challenging me to grow as a historian. I believe that my work at ETSU has laid a strong foundation for doctoral work and beyond.

I would also add that the Graduate School and the History Department made available funding opportunities for conference travel and research trips. This helped me to be able to engage in the field on a more professional level and to demonstrate to doctoral programs that I have the ability to make meaningful contributions.

What professors/advisors were instrumental in helping you?
Dr. Brian Mason and Dr. David Ocker.

Newcomer have been especially helpful in shaping how I understand the study of history, both men also proved instrumental in directing me through the process of researching and applying to doctoral programs. Dr. Doug Burgess has been an inspiration and instructive to my goal of becoming an excellent classroom instructor.

Last, Dr. Thomas Crofts’ classes in Latin language work I will have to do in the future. In my master’s degree, I have had two intensive and three years funded through a Teaching Assistantship.

I hope to continue with the work I have begun at ETSU. I believe that my master’s thesis ties into broader argumentative and research questions about early nationalism and imperial ambitions in medieval Europe. I look forward to investigating those connections.

What advice would you give to current graduate students who would like to pursue a doctoral degree?
With your advisor to figure out what you want in terms of a doctoral program and how best to work toward finding the best fit for your scholarship. Then, craft a strong writing sample that will show potential schools that you have something valuable to bring to the academic conversation.

Anything else you would like to share?
ETSU offers great opportunities to its graduate students to go on to succeed in doctoral programs that I have the ability to be able to engage in the field on a more professional level and to demonstrate to doctoral programs that I have the ability to make meaningful contributions.

Why did you choose to pursue a doctoral degree?
I came back to school after a ten-year professional career with the hope of going into doctoral work. I am interested in teaching history at the collegiate level.

Will you expand on the topic you worked on during your master’s?
I hope to continue work on the topic I worked on during my master’s, which was on the role of the historical profession as an essential commodity in the 20th century. My research focused on the role of the historical profession as an essential commodity in the 20th century, and I want to continue this work in my doctoral degree.

Emma will use the PADM to develop a descriptive piece around behavioral response to the earthquake and tsunami. Emma’s research is unique because the model has never been applied to a tsunami or to a non-Western culture.

"Traditionally, these models have not been used in diverse settings. They’ve been used predominately in Western cultures in the continental U.S.," Emma explained. "Being able to use this data set in a different setting will definitely help us understand more about the cultural nuances that the model needs to address."

There is no way to tell that there will be an impending tsunami until after the submarine earthquake has already occurred. There are three waves of energy that run through the ground after an earthquake begins. The primary wave, also called a compression wave, is the fastest, travelling at several kilometers per second. Compression waves

Public Health major studies human response that took place immediately after residents of American Samoa learned of an impending tsunami wave.

In 2009, a tsunami caused by a 8.1-magnitude earthquake swept over the islands of American Samoa, a U.S. territory in the South Central Pacific Ocean. The giant waves caused 34 deaths in American Samoa and nearly 200 total deaths across all the islands in the South Pacific Ocean. The tsunami reached heights over 12 meters and swept inland up to 600 meters. It arrived on American Samoa’s coast in as little as 15 minutes after the preceding earthquake, leaving very little time for coastal people to evacuate to high ground.

Emma Apatu, a doctoral student in the College of Public Health, with a concentration in community health, is studying the informal and formal ways in which the residents of American Samoa were alerted to the tsunami and how they communicated with each other about its duration. Her study is guided by a theoretical framework called the Protection Action Decision Model (PADM).

To conduct her research, Emma visited American Samoa twice to organize interviews with the local population and learn about how they reacted to the earthquake and subsequent tsunami. She went to the island in a team headed by Dr. Chris Gregg, an Associate Professor in the Department of Geosciences, who is advising Emma in her dissertation work. Together, with a former classmate, Dr. Rassio Richards, and a team of ten local interviewers, they arranged interviews with 300 local Samoans.

"A lot of people were able to feel the strong ground shaking caused by the earthquake and they evacuated," Emma said. "Also, there were some educational trainings that went on in July 2009 and a week before the tsunami, which really helped people to know that when the ground is shaking strongly, you need to head for the hills."
The closer the island is to the source of the earthquake, the smaller the time interval between the earthquake and the first tsunami. American Samoa was fairly close to the starting point of the earthquake, only 100 miles north of the epicenter. "The time between the passing of the first earthquake waves and then the second and third waves was very quick, so the people were alerted to the fact that an earthquake had happened almost instantly, because they couldn't stand up or their home was shaking," Dr. Gregg said.

"It was really a life-changing experience being able to visit places I never dreamed of seeing before, like China, and to really look internally and really ensure that I have a set of values that I want to go forward with for the rest of my life."  

In addition to studying the formal and informal responses of the inhabitants of American Samoa to the 2009 tsunami, Emma also plans to look at cultural perspectives related to evacuation response.

"A whole series of things start to happen in terms of people responding to the threat of a potential tsunami," Dr. Gregg explained. With a collaboration between the College of Public Health and the Department of Geosciences, Emma was able to work with Dr. Gregg, an expert on earthquakes and tsunamis, while pursuing a degree in public health. When consideringETSU, Emma expressed her interest in exploring public health issues in island settings. When she learned about Dr. Gregg's well-known work on natural hazards on islands, it was easy for her to decide that this is where she wanted to be.

"This kind of interconnectivity is one of the valuable things about being at ETSU," Dr. Robert Pack, professor and Associate Dean for Academic Affairs in the College of Public Health, said. "Dr. Gregg's work is internationally known, and though he is not in the College of Public Health, he works closely with our faculty and students. In fact, while I am Emma's dissertation advisor and chair, Dr. Gregg has served as world-class research mentor to her in the application of public health principles and models to natural disasters of geological origin."

While working on collecting research for her dissertation, Emma also received a fellowship to attend the Asia Pacific Leadership Program, the premier program on Pacific-regional and island leadership travel through the Earth and aren't easily felt by humans. Sensitive instruments, like seismometers, can sense this first wave and so can some animals. The second wave of energy, called a shear wave, is slower than the first. The shear wave actually causes the ground to move enough that people can notice it quite easily.

A whole series of things start to happen in terms of people responding to the threat of a potential tsunami," Dr. Gregg explained. "The closer the island is to the source of the earthquake, the smaller the time interval between the earthquake and the first tsunami. American Samoa was fairly close to the starting point of the earthquake, only 100 miles north of the epicenter. "The time between the passing of the first earthquake waves and then the second and third waves was very quick, so the people were alerted to the fact that an earthquake had happened almost instantly, because they couldn't stand up or their home was shaking," Dr. Gregg said.

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Emma visited American Samoa twice to organize interviews with the local population and learn about how they reacted to the earthquake and subsequent tsunami.

The third wave of energy from an earthquake, called a surface wave, is the slowest and also the most damaging. By this point in the 2009 earthquake, the island's formal alert system was in full gear, with warnings on the radio, TV, and Internet. But Emma's focus is on the informal exchanges between residents and what kinds of channels they used to ensure their safety after the signs of a tsunami threat.

"Many people want to communicate informally," Dr. Gregg explained. "They want to call someone that they know on the cellphone, or on the telephone, or on the radio to find out if they're OK. They want to go physically to the place to see if the people are OK, like a grandparent, a parent, or a sibling."

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