

SCOOOP

DNAS SCIENTIFIC

Greetings Science Friends!

First and Foremost, I hope that this message finds you, your family, and your friends doing well.

To say this past semester has been interesting would be a mild understatement. In January I was handed the Department of Natural and Applied Sciences (DNAS) Head position from Dr. David Koch, who served the students well in his three years in the role. I don't even think he knew how sage his words of wisdom would turn out to be, "You never know what is going to happen, but you will stay busy!"

It has been a privilege to serve my peers, my institution, and most certainly our students. The pandemic proved to be quite the disrupter and the always bittersweet spring semester saw us virtually celebrate a great group of seniors. Soon however, we will be welcoming a whole new group of budding Spartan scientists.

I hope you enjoy the inaugural issue of our semesterly DNAS newsletter. I am very much looking forward to building, retaining, or making connections with you all. Please feel free to contact me -- ahoffman@dbq.edu -- with any questions, comments, or just to say hello.

Lastly, thanks to all the students --- past, present, and future -- you are the reason we do what we do!

Yours in science,




Adam R Hoffman

Professor of Environmental
Chemistry
DNAS Department Head

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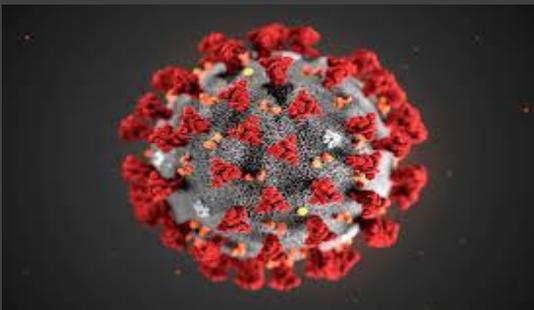


Teaching Spotlight

Disease Ecology



Kelly Grussendorf
Associate Professor of
Biology



The semester started with excitement, intrigue and a plan. A plan that ended up changing. During Spring 2020 semester I offered a new course -- Disease Ecology! This isn't a course you would commonly find on the schedule at many universities, however, I predict this will change. Disease ecology is an area of science that addresses the relationships between pathogens, hosts and their environment. The questions that a disease ecologist may study include: what is causing a disease? Where did this disease come from? How does this disease spread? And what types of factors can alter these different components? By having an understanding of disease ecology we can work toward efforts to control, prevent, and/or predict the emergence or reemergence of diseases.

THE PLAN: discuss all of the intriguing and interesting relationships of the hosts! Of the pathogens! And of the environment! We started out discussing many different topics, such as why do organisms that are infected with the rabies virus develop a fear of drinking liquids and swallowing? And why are we seeing an increase in the geographical range of Lyme disease? And because I don't want to leave you hanging, the rabies virus replicates in the salivary glands of organisms and by not swallowing liquids the virus number doesn't 'wash out' and the organism maintains a high number of copies of the virus to be able to pass onto another organism. The virus 'tricks' the brain to fear swallowing, and though this is very scary, it is also very fascinating. And some of the reasons we are seeing an increase in the range of Lyme disease may be due to increased populations of white-tailed deer, the increasing warmer temperatures, suburbanization as well as other factors.

We were going to have long, exciting, in-person discussions and presentations on various diseases such as Panama disease of bananas, chronic wasting disease (CWD) that is affecting deer in the area, and the always intriguing bubonic plague in humans. The plan was to spend our time primarily discussing diseases of the PAST.

THE PLAN CHANGED! At the end of the first lecture of this course, I had one slide dedicated to this new virus that was affecting individuals in China, and starting to spread to other countries. Then a couple weeks later the number of slides, and amount of time in the lecture, dedicated to a discussion of this new virus increased, until the point where students were not able to sit in the classroom anymore and discuss this new virus. Because of this virus!

Spring 2020 will always be the first time I taught this class. A class with a plan that was changed because Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) that causes the disease, Coronavirus disease 2019 (COVID-19)...but wow, what a great example of how important a class like Disease Ecology is.

Research Spotlight

Climate Change



Dale Easley
Professor of Geology

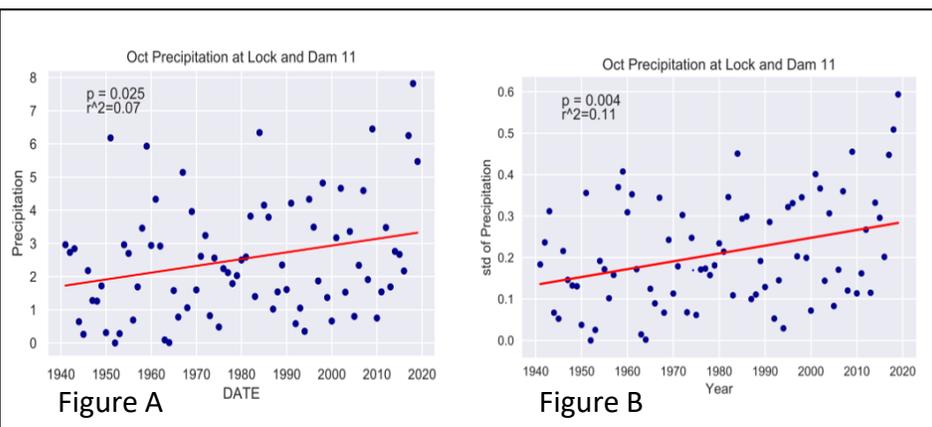


Concern about climate change has been overshadowed recently by the pandemic, but climate change may well prove to be more disruptive in the long term. However, convincing the public and, especially, politicians to take it seriously is difficult. At UD, several students and I have begun analysis of 80 years of local data gathered at the lock and dam and at the airport. We want to show the relevance of climate change to local residents.

Most of the news has focused upon temperature, which is easily understood, but we can always put on shorts or turn on the AC, right? However, what we're finding is a bit harder to deal with, especially for the farmers that form the backbone of the region's economy. For example, in the two figures below, we see an increase not only in the amount of October rainfall but also an increase in the amount of variability in precipitation. In a nutshell, what this means is that ***it's getting tougher for farmers to harvest their crops.***

Remember, this is from Dubuque data, not some world average that people ignore. Our own farmers are committing suicide at a rate far above the national average, and climate change will only add to their stress. We can do better.

Iowa is already a leader in wind energy. We're making rapid progress in solar energy and battery storage. Dubuque has been recognized for its emphasis on sustainability. Embracing the need for transforming our use of energy is an opportunity for Dubuque, not something to fear. We need to get past denial and embrace new possibilities. Once this pandemic is passed, our students hope to start speaking at public meetings and conferences about their findings.



Eighty years of data from the Lock and Dam in Dubuque show (Figure A) the amount of October precipitation has increased significantly, while (Figure B) variability has also increased (as indicated by an increase in standard deviation). These and other changes make farmers' lives more stressful.

Faculty Spotlight

2020 Faculty Hall of Fame

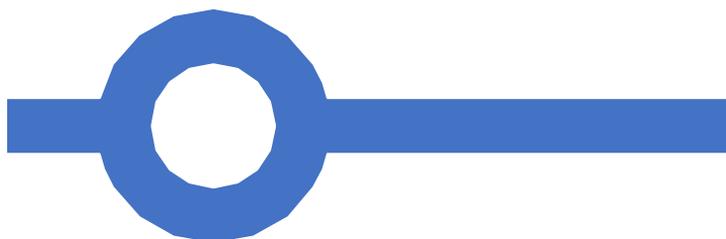


Ken L. Turner, Jr.
**Associate Professor of
Science Education**

Ken L. Turner, Jr.

Associate Professor of Science Education

Awarded the John Knox Coit Prize
John Knox Coit Prize: An integral member of the Philosophy Department from 1955-65, Coit was more than a teacher. He became a mentor and friend to his students. Known as a “man of wit,” he made a lasting impression on his students.



“Ken is a wonderful example of a student first educator. He is dedicated to student learning and works tirelessly to connect students to the content. Ken’s impact to the chemistry field goes beyond UD students as he initiated a chemistry tutoring program for area high school students led by Ken and a compadres of UD chemistry majors. In addition, Ken has interacted with thousands of Chemistry students across Iowa, Illinois, and Wisconsin during his chemistry outreach efforts over the past five years. Our chemistry program and our science departments have been significantly strengthened thanks to Ken Turner’s tireless work.”

Adam Hoffman, Professor of Environmental Chemistry
DNAS Department Head

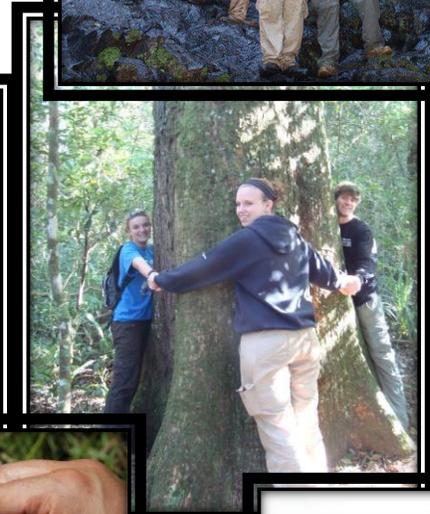
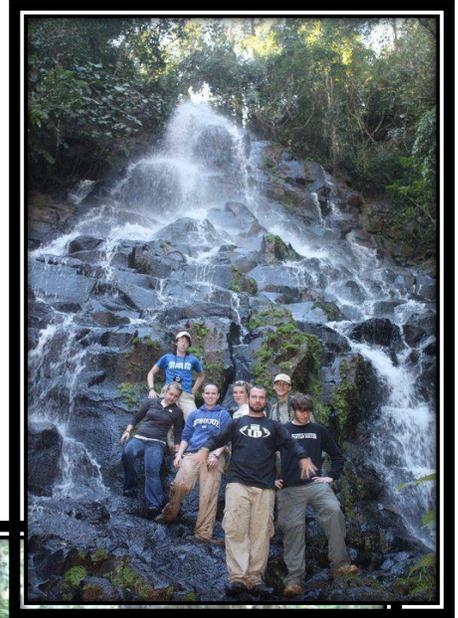
From the Vault

Paraguay Trip 2011

Environmental Science Field Studies – Paraguay is offered every other year. We spend one full month travelling Paraguay and studying different parts of history, culture, and many different animals.

"The Paraguay Field Class has allowed UD students to directly enhance the biodiversity knowledge of Paraguay. Numerous fish species in the Mbaracayu Forest Biosphere Reserve have been identified for the first time as a result of surveys conducted during these trips."

Dr. Gerry Zuercher, Environmental Sciences



Clockwise from top:

- Elizabeth Bainbridge (C'13), Mackenzie Kissell (C'12), Megan Johnson (C'13), Aaron Matthews (C'13), Jake O'Rourke (C'14), Christine Grannis (C'12), Arthur Magee (C'12)
- L to R: Christine Grannis, Megan Johnson, Jack O'Rourke
- Tropical screech-owl (*Megascops choliba*).
- This fish, a tetra in the Genus *Astyanax*, was a new species discovered for the reserve by UD students in 2011
- Christine Grannis with Woodcreeper
- Megan Johnson and Arthur Magee preparing to survey a small stream in the Cerrado region of the Mbaracayu Forest Biosphere Reserve.

We are
the scientists,
trying to
make sense of
the stars
inside
us.

*Christopher
Poindexter

In The Field

"The 2019 Chlapaty Fellowship Field Ecology student researchers formed a unique team. Their support for each other allowed them to accomplish much more together than any of them could have accomplished alone."

Dr. Gerry Zuercher, Environmental Sciences



Clockwise from lower right:

- Hayli Wolf (C'20), obtaining DNA from a ring-necked snake, Wolter Property, Dubuque County
- Julia Rodewald (C'21), Wolter Property Prairie Patch
- Alyssa Skrove (C'20), Swiss Valley Nature Center, Flying Squirrel
- Isabella Metcalf (C'21), Wolter Property, 6' Black Rat Snake
- Gemma Keegan (C'20): 2019 Chlapaty Fellow: Project: Impact of Nocturnal Insect Light-Traps on Bats in Dubuque County, Iowa, Alyssa Skrove, Isabella Metcalf, Dr. Gerry Zuercher, Mines of Spain, Dubuque

DNAS 2020 HONORS



THE WILLIAM N. BERG AWARD FOR EXCELLENCE IN STUDENT ENVIRONMENTAL RESEARCH

Gemma Keegan

ENVIRONMENTAL SCIENCE STUDENT LEADERSHIP AWARD

Isabella Metcalf

THE ROBERT M. MILLER AWARD FOR EXCELLENCE IN BIOLOGY/ ENVIRONMENTAL SCIENCE

Julia Rodewald

THE DR. RICHARD E. COWART AWARD FOR EXCELLENCE IN BIOLOGY

Paige Brown

Reegan Sturgeon

AWARD FOR EXCELLENCE IN STUDENT BIOLOGICAL RESEARCH

Hayli Wolf

AWARD FOR EXCELLENCE IN STUDENT CHEMISTRY RESEARCH

Vanessa Fortney

WILLIAM C. AND MARY HELEN NEUMEISTER SCHOLARSHIP

Julia Rodewald

Samuel Zebarth

DR. CARL OSUCH SCIENCE SCHOLARSHIP

Sally Lambie

Butler Fellows

Taiana Butler

Environmental Science

Natalie Dienstbach

Biology

Jenna Meyers

Biology

Sam Zearth

Environmental Science

Congratulations 2020 Summer Fellowship Recipients!



Chlapaty Fellows

Madison Bowers

Biology

Levi Buchholtz

Environmental Science

Josie Coglianese

Biology & Chemistry

Zach Elias

Biology

Megan Gille

Biology

Lyndy Holdt

Biology & Environmental Science

Katelyn Howe

Biology

Megan Kennedy

Biology

Sally Lambie

Biology & Chemistry

Kathleen Messino

Biology & Psychology

Joshua Nsenga

Biology

Livia Schutz

Chemistry

Zac Simanski

Biology

Reegan Sturgeon

Biology

Isaiah Williams

Environmental Science

The Chlapaty and Butler Summer Research Fellowship Programs provide students with the opportunity to engage in tailored scholarly and professional development activities to position themselves for success in post-graduate studies and employment.

Upon approval of their research proposal, Fellows in each program commit to 400 hours towards their proposed research over a 10-week period during the summer. Fellows receive a \$4,500 stipend and \$500 for research associated supply and travel costs. Fellows are required to present the results of their research during the following academic year at a local, regional, or national conference.

"The University is humbled by the generosity of Joe and Linda Chlapaty and John and Alice Butler for their financial support of these important and transformative student programs. With that support, the University is able to provide students with extremely valuable research experiences, professional development skills, and one-on-one mentoring that prepares them for success in future post-graduate studies and employment."

Mark Sinton, Ph.D., Director of the Chlapaty and Butler Summer Research Fellowship Programs.



WOMEN IN SCIENCE



Left to Right: Front Row: Lyndy Holdt, Kathleen (Kate) Messino, Emily Griggs, Tiffany Limmex

Second row: Megan Kennedy, Madison Bowers, Natalie Dienstbach, Isabella (Izzy) Metcalf

Third row: Alyssa Sommerfeld, Reegan Sturgeon, Sydney Steivang, Katelyn Howe

The Monticello College Foundation Grant provides funding for women in the science majors to be able to carry out independent research projects. The undergraduate students that are supported through this funding are also working to initiate an outreach program within the local Dubuque community to help immerse young females into the scientific field of research in hopes to inspire excitement about science but also decrease the gender-science stereotypes that currently exists.

Congrats! 2020

Spring 2020

DNAS Spring Graduates

LOOKING TO THE FUTURE

Yasmine Bargas will be moving to Florida next year and working at an animal sanctuary then applying to graduate school.

Paige Brown will be taking a gap year before attending medical school.

Jake Day will be moving to Columbus, Ohio and attending Ohio State University to work as a research assistant at The Ohio State University Wexner Medical Center while preparing for the MCAT exam.

Brianna Finnegan will be teaching upper level physics courses at Hempstead High School (Dubuque), while also pursuing her Masters degree.

Vanessa Fortney will be attending Oklahoma State University to pursue a Ph.D in Chemistry.

Emily Griggs will be getting a job while preparing for graduate school.

Gemma Keegan will be moving to Russellville, Arkansas to start her Master's degree in Fisheries and Wildlife Management under Dr. Garrie at Arkansas Tech University to study the impact of forest restoration on bats by using acoustic software.

Emily Less will be taking a gap year and working as a behavioral health tech (CNA) in the psychiatric services unit while applying to Physician Assistant schools.

Gabby Marchese will be starting a Doctorate of Pharmacy program at the Medical College of Wisconsin.

TJ McIntosh will continue working at the National Mississippi River Museum and Aquarium.

Addy Schober will be working as an environmental educator at Swiss Valley Nature Center.

Ethan Senesac will be going to paramedic school at Kirkwood community college.

Brandon Sindt will be working in Bettendorf (Iowa) as an Environmental Technician with the environmental consulting firm Terracon.

Alyssa Skrove will be attending the University of Minnesota College of Veterinary Medicine to become a veterinarian.

Benjiman Smith will pursue employment within the environmental science field while looking for a long-term fit working at a zoo.

Kara Wright will be obtaining her Master's degree in Communications in Sciences and Disorders.

CLASS OF 2020 REFLECTIONS

I will miss the people and how friendly everyone is on campus. One of the greatest memories I had was on Fridays at 11 when we all would have coffee and donuts with all the staff and students in the science building being able to meet professors you haven't had and talk about subjects that they are interested in or you are interested in.

The thing I will miss most about UD is the atmosphere. Everyone on campus was always friendly, willing to help, and very supportive.

I will miss the UD community the most! I've met so many awesome people that have impacted and influenced me.

I think one of the biggest things I will miss is everyone. On a small campus like UD you get to know pretty much everyone and I know that won't be the case for me at OSU. I won't be able to walk into a building and know the majority of the people there by name. I will also miss lab days with my professors and friends.

What I will miss most about UD is the research program and all the amazing experiences that have come with it along with all the truly great people that I have come to know.

I will miss the UD community the most! I've met so many awesome people that have impacted and influenced me.

I still remember my first day in the cadaver lab as one of the best!

A memory I have from UD that is my favorite is having a snowball fight with all my friends the first time snow fell my freshman year. Something about this made me realize UD wasn't just a university it is a place I can call home.

I was involved in cross country and track at UD during the first half of my college career. My closest friends came from being involved in those sports. I'm always going to miss being on the team since it is difficult to find a similar experience outside of college.

One of my favorite memories from my time here at the University of Dubuque was right after I found out about my acceptance into the University of Minnesota's College of Veterinary Medicine...It was the goal I wanted to achieve when I came in freshman year, and felt beyond surreal to actually achieve it less than four years later, and all of the genuine happiness people had for me truly validated the relationships I've been able to form here. I will miss it and all of the people, but will forever be grateful for the many lessons and memories I've learned.

I have many memories of UD, but one of my favorites has to be when I drive Alumni around during homecoming and show them new things that UD has done, tell them about myself, why I chose UD, and show them that this school has made a difference in my life.

I will definitely miss the community at the University of Dubuque. Each day I had the opportunity to spend time with my close friends and attend classes in which the professors knew me on a personal level. I believe that the professors and faculty at UD always had my best interest in mind and were always willing to help me during my college journey. I truly felt that the University of Dubuque was a second home to me.

I WILL MISS MOST THE AMAZING FRIENDS AND CONNECTIONS I HAVE MADE OVER THE YEARS.

The thing I will miss most about UD is the atmosphere. Everyone on campus was always friendly, willing to help, and very supportive.

I will miss the professors and my classmates in the DNAS department! This quarantine and the transition to online classes, has made me realize how lucky I was to have professors that were always willing to help me to succeed in any way possible. Even if that meant meeting up outside of their office hours to explain some concept that I couldn't wrap my head around.

Past



Bridgette Fidder Class of 2012

Tell us a bit About yourself. I am originally from a dairy goat farm in northern Illinois. Following UD, I continued my education earning a master's in environmental toxicology from Texas Tech University. I have been working with marine mammals for about 5 years, starting at the Shedd Aquarium with beluga whales and Pacific white-sided dolphins. I am currently a trainer at the Georgia Aquarium in Atlanta, working with California sea lions and harbor seals. In my spare time I enjoy painting, gaming, and cuddling with my cat, Daniel Simpson Day.

What are your goals? I would like to continue building my knowledge base and understanding regarding operant conditioning and learning to transfer these methods into teaching.

Why UD? I was drawn to UD during a visit to the campus with my parents. I was able to get to know my classmates and professors which made my college experience more personalized. I was also given the opportunity to design and conduct my own research project which helped shape my future.

How has education shaped the person you are? My education has allowed me to feel confident in questioning and researching what I am told by others or have read in the media, which ultimately allows me to make informed decisions.

What is one book you would recommend everyone read? I recommend the book "Whale Done! The Power of Positive Relationships" by Ken Blanchard. It is an excellent book and easy read in which the reader can learn about operant conditioning and positive reinforcement (originally utilized in training marine mammals) and how we can use it in everyday life to build stronger relationships with those around you, animal and human alike.

Present



Julia Rodewald Class of 2021

Tell us a bit about yourself. My name is Julia Rodewald. I am a Biology, Environmental Science, and Chemistry major about to enter my senior year at UD. I was born in Akron Ohio, but I grew up in Dubuque. I have a wide variety of interests including anything outdoor and anything vaguely related to science, but I especially have an interest in birds.

What are your future plans? I plan to hopefully graduate from UD next year and then I would like to go on to graduate school and study something related to birds, specifically avian ecology if possible.

Why UD? I chose UD because I was really excited about all of the research that the science department was doing, and I felt like the teachers were really enthusiastic about the research and their classes. I thought it would be a good place to explore and narrow down my interests.

How has education shaped the person you are? I have always loved school, and science classes in particular. I think school has helped me challenge myself to do better and to keep improving. It has also helped me to hone in on what my interests are and has helped me figure out my career path.

What is one book you would recommend everyone read? The book I would recommend is *Taking on Water*. It is about reducing our water footprint and about all the ways we use water in our day to day lives. I think it will make people more aware of their water use and water footprint.

Future



Joey Wohlers Class of 2025

Tell us a little bit about yourself. My name is Joey Wohlers and I live in a small town named BeeBeeTown on the other side of Iowa. I graduated from Tri-center High School. In high school I played Soccer and ran Cross Country and was also in band. Next year I am planning to run Cross Country and track at Dubuque.

What are your future plans? I am studying Environmental Science. I am not sure what job I wish to obtain, but I want to work in the field of Conservation.

Why UD? I chose UD because I had visited the town a few times before and absolutely loved it. I also believe the college being on the river will make studying environmental science even more fun.

How has education shaped the person you are? I have always been a person who wants to discover answers and always has to ask why. This search for knowledge has helped me gain much needed knowledge in every possible subject. My favorite to learn about was always different types of animals and other things about the environment, which leads me to want to pursue Environmental Science.

What is one book you would recommend everyone read? A book I would recommend for everyone to read is *Of Mice and Men*. The book teaches many valuable lessons about friendship and other important factors of our lives, and was very enjoyable for me to read.

We hope that your summer zooms along!



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