KU GEOGRAPHY & ATMOSPHERIC SCIENCE

2019 NEWS

SNAPSHOTS

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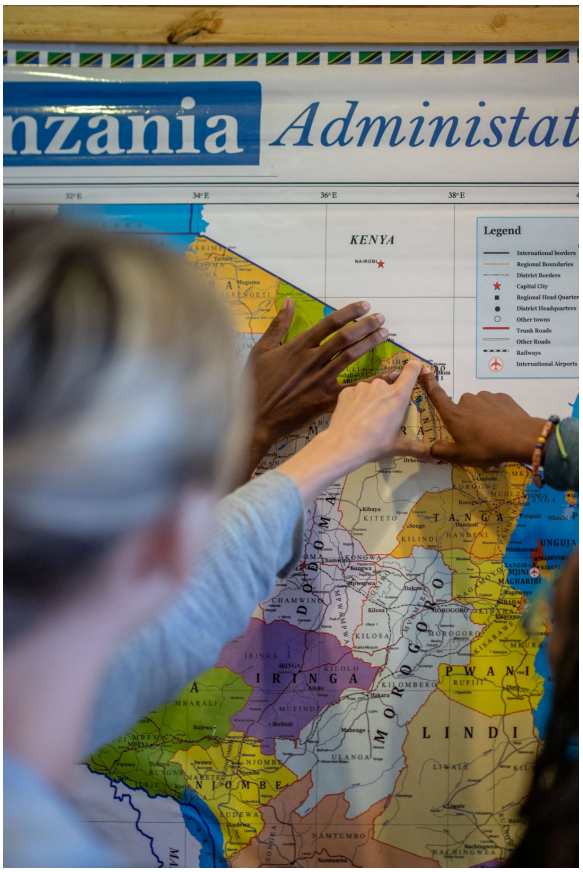
Students participate in a field trip in Tanzania. **Kathryn Rhine**, who joined the Departments of Geography & Atmospheric Science and African & African-American Studies as an Associate Professor in Fall 2019, assisted with the trip.



At left: students participate in a field trip in Tanzania.

At right, above: A student enters Lindley Hall on the first day of school.

At right below: Students attend the Geography and Atmospheric Science Graduation.

MESSAGE FROM THE CHAIR

Nathaniel Brunsell

Greetings from Lindley Hall!

This has been a great year for us in the department with many changes.

We welcomed two new faculty members to our department this year. Dr. Bing Pu joined us in January after completing a post-doctoral research position at Princeton/NOAA Geophysical Fluid Dynamics Lab. She completed her PhD in Atmospheric Science at Cornell. Her research area is primarily in looking at dust transfer and the climatic impacts. Her research created quite a splash here at KU following the publication of an article in Geophysical Research Letters where she looked at forecasting dusty conditions months in advance.

Dr. Katie Rhine joined us over the summer. She had been a professor in Anthropology here at KU, but moved over to begin a joint position between Geography and Atmospheric Science and African and African-American Studies. She adds an incredible wealth of knowledge to our department concerning health and culture in Nigeria. She also serves as co-director of the East Africa's Digital Health Divides: A ColLABorative Analysis.

The department saw the departure of two faculty this year: Dr. Pam Sullivan and Dr. Andrea Brookfield. They have both moved on to other opportunities. The department will greatly miss their contributions to the community in Lindley Hall! We wish them great happiness in all their future endeavors!

Dr. Barney Warf chaired the 2019 Annual Meeting of the Great Plains-Rocky Mountain Division of the American Association of Geographers here at KU in October. This provided us a great opportunity to contribute to host almost 200 Geographers from around the region and see some of the cutting-edge research in human, physical and geospatial geography. A KUdos to Barney and all of the others who helped to ensure that this was truly a great event!

There are a number of new initiatives on the horizon as we move into the new year. We've been hard at work on our curriculum and degrees. We are beginning a process of re-envisioning who we are and how to best serve the students and community in the future. This has required continuing our efforts with new courses, developing new opportunities to fund research and teaching across our student body. I look forward to updating you all on the many new things happening around the building. Feel free to contact me any time.

Rock Chalk!
Nate
brunsell@ku.edu

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Dave Braaten
reports that all is going extremely well with the KU ATMO program, and he is very proud of the program. Great students, energetic faculty, and impressive externally funded research projects. This academic year he has stepped away on sabbatical leave to focus on current research projects and to write proposals for future opportunities. His location this year will be split between KU, University of Alabama, and fieldwork on Grand Mesa in Colorado.

He is currently committed to two research projects as PI, and he has fantastic students helping out. These projects are a surface-based ice penetrating radar mapping of Dome Fuji in East Antarctica, and an airborne radar development program to measure seasonal snowpack thickness in western Colorado mountains. Both projects are associated with CReSIS (Center for Remote Sensing of Ice Sheets), which is housed on West Campus. The Antarctic project collected data at Dome Fuji during December 2018 and January 2019 over an area with the potential for recovering ice core samples as old as 1.5 million years. This ancient ice will contain atmospheric greenhouse gases that should be able to explain climatic shifts around a million years ago that are not currently understood.

This project is an international collaboration funded by the Norwegian Polar Institute (NPI) and National Institute of Polar Research (NIPR) in Japan. His monthly teleconferences are interesting because of the range of time zones, usually around 8 am at KU and University of Alabama, but close to midnight in Tokyo. The Norwegians have the most convenient time - right after lunch. He is now in the process of analyzing the data from Dome F and finding the most promising sites for old ice.

The radar development project for airborne measurement of seasonal snowpack thickness is funded by NOAA, and will provide detailed snowpack data directly to the National Water Model. The project is led by The University of Alabama, with KU as a partner. The first field season at Grand Mesa, Colorado during March 2019 was very successful and he is in the process of analyzing and evaluating all of the data collected. He will soon be in the field again at Grand Mesa during winter 2020.

Chris Brown
Chris Brown continues in his university administrative post as Vice Provost for Faculty Development. He misses the daily work of teaching and research, but during the past year he did make the time to be back in the classroom teaching his grad seminar. He is still working with two MA and two PhD students.

Nate Brunsell
and his family enjoyed a year without a winter by spending a sabbatical in Sao Jose dos Campos, Brazil working at INPE. This was an incredible opportunity watching the toucans and parrots fly past their apartment balcony. They explored a lot of Brazil, with highlights being a week in the Amazon rainforest and time in Salvador. The family returned to Lawrence over the summer and Nate resumed his duties as Chair of the department. In addition, papers were written, conferences attended, etc.

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Abel Chikanda giving his opening remarks at the International Metropolis Conference held in Ottawa, Canada in June 2019

Abel Chikanda

During the Spring 2019 semester, Abel Chikanda supervised a group of eight student E-Interns who conducted research on Nigeria and U.S. security cooperation. The products of the research are expected to contribute to the training of U.S. military officers (Security Force Assistance Brigades) who are deployed to the West African nation of Nigeria. He spent his summer working on a research grant application which was submitted to the NSF that seeks to examine urban food security in Harare, Zimbabwe using a city-region food systems approach.

He participated in several academic and policy-oriented conferences including the annual meeting of the American Association of Geographers in Washington, D.C. as well as serving as a panelist on the plenary on Public Confidence in Migration at the International Metropolis 2019 conference held in Ottawa, Canada in June 2019. He also serves as the Program Director for the Multicultural Scholars Program (MSP-Social Sciences) and sat in the committee that recently hired the new director of the University of Kansas' Honors Program.

Alexander Diener

Alexander Diener has been at KU since 2012 and is currently an Associate Professor and the Director of Gradate Studies for the Department of Geography and ATMO. He also serves on several committees including the the University Sabbatical Leave Committee and as a member of the Center for Russian, East European and Eurasian Studies Executive Committee.

In 2019, Alex published "Citizenship's Changing Geographies in the 21st Century" in Global Citizenship Review (4th Quarter 2019), "Axial Development in Mongolia: Intended and Unintended Effects of New Roads" with Batbuyan Batjav in Mobilities (2019/2020 – DOI: 10.1080/17450101.2019.1643163), "Kazakhstan's Evolving Regional Economic Policy: Assessing Strategies of Post-Socialist Economic Development" with Yerken Turganbayev in Eurasian Geography and Economics (v.59 n. 5-6, 2019 pp. 657-684) and "The Varied Geographies of Historical Citizenships" in Global Citizenship Review (3rd Quarter 2019). His co-edited book with Joshua Hagen titled The City As Power: Urban Space, Place, and National Identity was also published with Rowman & Littlefield Publishers 2019 - 978-1-5381-1826-9 pp. 328).

As part of this volume Alex co-authored the chapters "The City as Palimpsest: Narrating National Identity through Urban Space and Place" (pp. 1-22) and "The City as Crucible: Urban Space, Place, and National Identity into the Twenty-first Century" (pp. 253-264). He also published "Border Control as a Technology of Social Control" in Mathieu Deflem's (ed.) The Handbook of Social Control (Malden, MA: Wiley Blackwell, 2019) pp. 403-415 and "The Political Sociology and Geography of Borders" in William Outhwaite and Stephan Turner's (eds.) Sage Handbook on Political Sociology (Thousand Oaks: Sage Publishing 2018) pp. 330-346.

He reviewed several books for journals including: "The Deepest Border: The Strait of Gibraltar and the Making of the Hispano-African Borderland" by Sasha Peck for Journal of Historical Geography 2019, "Area Studies in a Global Age" by Edith Clowes and Shelly Jarrett Bromberg (eds.) Northern Illinois University Press for Region 2018, "Nationalism in Central Asia: A Biography of the Uzbekistan/Kyrgyzstan Border" by Nick Megoran Pittsburg: University of Pittsburg Press for Central Asian Affairs 2019.

A blog submission entitled "The City as Palimpsest and Crucible of National Identity" Global Urban History https://globalurbanhistory.com/2018/11/09/the-city-as-a-palimpsest-and-crucible-of-national-identity/ elicited

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high volume on-line viewing and afforded Alex several opportunities to converse on the subject in the media. During the spring semester 2019, Alex spoke at the Global Opportunities Expo at the University of Kansas (29 March 2019) and in the fall of 2019 was an invited speaker at the AGS Geography 2050 Symposium at Columbia University and at Northern State University in Aberdeen South Dakota.

Steve Egbert

This spring saw the most recent offering of Steve's Geopolitics and Genocide course that is cross-listed with Global and International Studies. As always, the students were highly engaged which resulted in wide-ranging discussions that often went beyond the end of class. (Unfortunately, there were plenty of related current events to provide fodder for our discussions.) He also held the last in a series of readings seminars initiated in 2015 that focused on patterns and impacts of Native land allotments. The seminars have produced numerous conference presentations and one dissertation so far, with one M.A. thesis and another dissertation soon to follow.

This fall, Steve offered a revised introductory drone mapping course co-taught with Xingong Li and Dana Peterson of the Kansas Biological Survey. The class especially enjoyed getting to fly mapping missions over the Baker Wetlands. Steve gave presentations this fall at the GPRM-AAG regional meeting in Lawrence and at the Thirteenth Biennial Native American Symposium. This year, he'll be presenting the Douglas C. Ridgley Lecture at Illinois State University.

He says the most rewarding part of his faculty position continues to be helping graduate students complete their degrees. Steve currently has five graduate students and serves on 15 other graduate committees, and looks forward to seeing them successfully finish soon!

Peter Herlihy

Since 2013, Peter Herlihy and Jerry Dobson, and their team of graduate students have traveled extensively and dedicated their time to researching the intersection of land tenure, natural resource management, and forest conservation in indigenous territories of Central America on a prestigious US DoD Minerva Initiative Grant. They have collaborated with indigenous, university, government, and NGO partners through participatory research mapping (PRM) case studies in Guatemala, Honduras, and Costa Rica. A recent publication detailing some of the novel cartographic results appeared in *Cartographica* 52(1) by Peter and his past and present KU graduate students John Kelly (U. Wisconsin-La Crosse), Andrew Hilburn (Texas A & M International U), Taylor Tappan, and Matt Fahrenbruch.

Matt is now on a Fulbright Grant in Nicaragua doing his dissertation research on niche jellyfish markets, while Taylor is applying for external funding to begin his next year on indigenous territoriality and land use/land cover change in Costa Rica. The team also welcomes a new MA student, John Paul Henry, as he formulates his thesis research on indigenous and and resource management in Honduras using participatory videography.

Peter and students are also working with Costa Rican geographers to organize the May 2018 35th Conference of Latin Americanist Geographers in San José, Costa Rica. Please come, to enjoy or present/publish your geographic research on Latin America. See website at http://clag-2018costarica.ku.edu/

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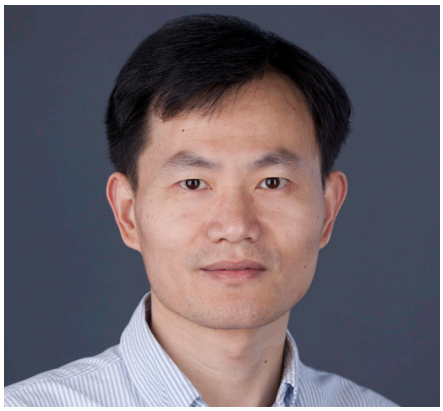
Jay T. Johnson

During this past year, Professor Johnson continued his collaborations with Haskell as the co-director of the Haskell Environmental Research Studies internship program. During the summer of 2019, we hosted 15 interns from across the country at Haskell campus with trips to visit Konza Prairie and the National Center for Atmospheric Research in Boulder, Colorado. The interns are currently presenting their research projects at a variety of conferences including the American Indian Science and Engineering Society and American Association of Geographers. Professor Johnson was chosen to serve as the Integrated Arts Research Faculty Fellow at the Spencer Museum of Art for the fall of 2019.

As the Faculty Fellow, Professor Johnson is co-teaching a dual KU/Haskell course with local artist Dave Loewenstein, KU faculty member Joe Brewer, and Haskell faculty member Cody Marshall. The students are creating a poster campaign to engage the Lawrence community concerning the threats posed by urban development to the Wakarusa Wetlands. The posters are available for viewing at http://ipsr.ku.edu/cfirst/projects/wearethewetlands.shtml.



Ting Lei

Ting Lei has worked on a research project on conflating map data. This is an on-going effort he undertook since 2017, which involves developing methods for combining two or more maps to produce a better.

The project leverages his prior work on spatial optimization and databases. In 2019, he has published a paper in Transactions in GIS on initial results as well as an UCGIS Body of Knowledge article for conflation.

He has also published an article on the reliability issue of location of transportation hubs. In teaching, he has re-developed the spatial databases class -- a core class for the graduate GIS certificate program -- from scratch. The experiments have been rewritten using new technology so that the lab sessions can be completed by students from a web browser.

Xingong Li

is back to the normal after his sabbatical in the previous academic year at the Nanjing University. Collaborative research in the sabbatical has led to three significant publications in 2019: "Assimilating remote sensing into GIS-based all-sky solar radiation modeling for mountain terrain" on the journal of Remote Sensing of Environment, "Variations of Lake Ice Phenology on the Tibetan Plateau From 2001 to 2017 Based on MODIS Data" on the Journal of Geophysical Research-Atmospheres, and "Error Assessment of Grid-Based Terrain Shading Algorithms for Solar Radiation Modeling over Complex Terrain" on the journal of Transactions in GIS.

Working with PhD student David Weekly, they published the first part of David's dissertation research, "Tracking Multi-Decadal Lake Water Dynamics with Landsat Imagery and Topography/Bathymetry" on the journal of Water Resources Research. Dr. Li also published two journal articles with two visiting scholars from China in 2019.

In total, six high quality publications in 2019 make it one of the

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most productive years Dr. Li had at KU. Jim Coll, Dr. Li's PhD student, has become an ABD after passing his comprehensive exam and successfully defending his dissertation proposal on studying river channel geometry using drone. Regina Thomas, Dr. Li's Master student finally defended her thesis proposal and plans to finish her degree this fall. Dr. Li also had two new graduate students this year, Chen Liang (a PhD student from China) and Kenneth Ekpetere (a Master student from Nigeria).

David Mechem

Dr. Mechem served as Acting Chair for the 2018–2019 academic year and then returned to 'regular' faculty status on July 1st. Highlights included research collaboration trips to Brookhaven National Laboratory and Michigan Tech University (see photo of their Pi Chamber where they study aerosol–cloud interactions in a lab setting).

The past year was another busy one for the Cloud Dynamics and Microphysics Group. Last fall, Masters student Laura Tomkins participated in the RELAMPO field campaign in Argentina, helping to sample some of the strongest thunderstorms on the planet. She defended her Masters thesis on cloud-clearing events over the Southeast Atlantic and has returned to NC State for a Ph.D. Jordan Eissner, another Masters student in the group, is working to improve observational techniques to quantify entrainment rates in convective clouds, a project in collaboration with scientists at Brookhaven. Luke McMichael is well into his Ph.D. research on exploring mechanisms governing entrainment for individual cumulus clouds. He is also lead author on a manuscript summarizing research findings from a Department-of-Energy-funded summer school investigating subsiding shell structures around cumulus.

In the coming months, the group will be finishing up a number of article manuscripts, setting up a series of simulations in support of the recent ACE–ENA field campaign in the Azores, and working with collaborators on a proposal for an aircraft field study over the Southeast Atlantic off the African coast of Namibia and Angola.

Shannon O'Lear

Shannon O'Lear is on sabbatical this fall to work on two book projects. The first is an edited volume, A Research Agenda for Environmental Geopolitics, involving 21 contributing authors writing about a range of research projects and approaches. This book will be hot off the press in spring 2020, and there are plans for a book launch session at the upcoming Denver AAG meeting. The second book project is on geographies of slow violence. This edited volume highlights a variety of ways in which geographers make slow or structural violence visible.

Both of these book projects were invited by Edward Elgar Publishers. Prof. O'Lear has co-authored a paper, "Science, Technology, and Society: Approaches to Fieldwork in Geography" with Nate Pickett (Ph.D. candidate) and Sam Henkin (successfully defended his dissertation!). This paper was published in The Professional Geographer in August. Prof. O'Lear traveled to the U.K. while on sabbatical to work with collaborators at the University of Sheffield and at Glasgow Caldonian University on projects

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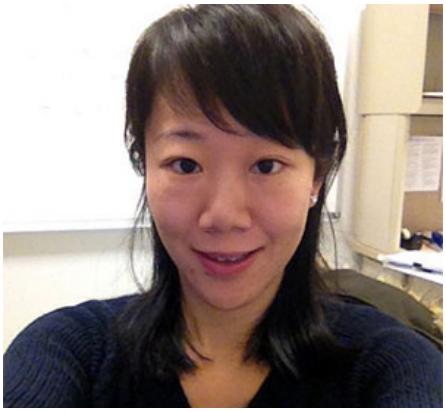
related to environmental harm and climate justice, respectively. She is pictured here in Glasgow on the River Clyde near the 'La Pasionaria' statue memorializing the 65 Glaswegians who went to Spain to fight fascism 1936-1939: "Better to die on your feet than live for ever on your knees" -- Dolores Ibarrurui.



Bing Pu

A recent paper entitled "Seasonal Prediction Potential for Springtime Dustiness in the United States" by Bing Pu, Paul Ginoux, Sarah Kapnick, and Xiaosong Yang was published on the Geophysical Research Letters. And the work was reported by KU news "Researcher hones model to forecast dusty conditions and air quality months in advance" in August.

David Rahn

Another year has gone by so fast! Over the last year, Dave has collaborated on a couple of papers focused on coastally trapped wind reversals along the coast of California and another paper exploring how winds along the subtropical west coasts of the continents are projected to change in the future. Last spring, Dave enjoyed participating in the new class model for ATMO 605: Operational Forecasting that was designed and ran by staff from the National Weather Service office in Topeka who have a broad range of expertise. It was a unique opportunity that allowed students to learn more about how to apply the meteorological concepts that they learned in other atmospheric science classes. Their energy and enthusiasm for the program is greatly appreciated!

The new model will be presented at the upcoming annual American Meteorological Society's Annual meeting and is an excellent example of how to foster a NWS-University partnership.

Also at the annual meeting, M.S. student Joe Wermter will present his work examining the urban boundary layer with aircraft observations alongside results from the Weather Research and Forecasting model, which will highlight the impact of low-level mixing on surface temperatures. Dave's looking forward to a sabbatical ("staybbatical") in the spring to work on a variety of research projects.

Katy Rhine

Kathryn (Katie) Rhine joined the Departments of Geography & Atmospheric Science and African & African-American Studies as an Associate Professor in fall 2019. She received her Ph.D. in anthropology from Brown University in 2010, and has lived and worked in Nigeria for nearly four years over the past 15 years. She has written a book titled, The Unseen Things: Women, Secrecy, and HIV in Northern Nigeria, based on her fieldwork.

Rhine teaches courses on global health topics as well as co-directs KU's first humanities-based lab, colLAB: Bridging East Africa's Health Divides, with AAAS faculty members, Elizabeth

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MacGonagle and Peter Ojiambo. ColLAB provides undergraduates the opportunity for collaborative and mentored research in Tanzania, while developing fluency in Kiswahili. This July, six KU students (including Joseph Clark, AAAS MA student) spent two weeks collaborating with students at the University of Dar es Salaam to develop research, language, and professional development skills in health and development fields. This lab was supported by grants from the National Endowment for the Humanities and the Hall Center for the Humanities.

Over 2018-2019, Dr. Rhine was awarded two major external grants. These include a $175,000 grant from the Consortium for Humanities Centers & Institutes (CHCI) and the Andrew W. Mellon Foundation to run a Global Humanities Institute in Dar es Salaam, Tanzania over summer 2020. The Institute, Chronic Conditions: Childhood and Social Suffering in Global Africa, will bring together approximately 30 interdisciplinary scholars affiliated with the University of Kansas, the Universidade Federal da Bahia, Brazil, the University of Dar es Salaam, Tanzania, and the Université Cheikh Anta Diop in Senegal, as well as other universities across Africa. Rhine also partnered with GEOG (and AAAS) faculty member, Abel Chikanda, and Cassandra Mesick Braun, curator of global indigenous art at the Spencer Museum of Art, to win a grant from the Mellon Foundation to support the University of Kansas's first John E. Sawyer Seminar on the Comparative Study of Cultures. The Seminar is titled, Chronic Conditions: Knowing, Seeing & Healing the Body in Global Africa, with the Kansas African Studies Center (KASC), the Hall Center for the Humanities, and the Spencer Museum of Art as its institutional partners. As part of this $225,000 grant, Rhine, Chikanda, and Braun are co-directing a year-long speaker and seminar series bringing scholars and creative specialists from around the world to venues across Kansas. You can read more about the series on our website chronicconditions.ku.edu and follow us on social media @KUSawyerSem (twitter and facebook) and on Instagram @ku_sawyersem.

Justin Stachnik

Justin Stachnik is in his fourth year in the Department of Geography and Atmospheric Science at KU. He leads the Clouds, Climate, and Precipitation group with students researching topics from tropical meteorology to mid-latitude hailstorms. Over the last year, he and his students gave talks at the American Meteorological Society (AMS) annual meeting in Phoenix, AZ where he also ran the Department's graduate student recruitment booth at the AMS Career Fair for the third consecutive year. His undergraduate research assistant, Jacob Asherman, was also one of five students from KU selected to present and share their work with legislators at the Kansas Undergraduate Research Day at the Capitol.

As an assistant professor, Justin stays busy with developing new classes and expanding his group's research endeavors. He is currently teaching a new course in Tropical Meteorology, which is offered for both undergraduate (ATMO 531) and graduate (ATMO 731) students during Fall 2019. This is the second graduate-level course he has developed and the first time that a dedicated elective in tropical meteorology has been offered at KU!

Justin is particularly excited to be working on a NASA sponsored project examining the precipitation and heating characteristics of tropical easterly waves using the Tropical Rainfall Measuring Mission (TRMM) and Global Precipitation Measurement (GPM) satellites. His first graduate student, Brett Chrisler, will defend their MS in Fall 2019 and is focused on the termination of the Madden-Julian oscillation (MJO) events in the tropical Indian Ocean and west Pacific. Justin plans to take his entire research group to the 34th AMS Conference on Hurricanes and Tropical Meteorology in Spring 2020 where they will present their work on tropical variability and climate dynamics.

Outside of teaching and research,

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Justin continues to work on his forehand slice and backhand down-the-line at the Jayhawk Tennis Center in Lawrence. On weekends, he often can be found at the Kansas City Curling Club where he's already taught several other faculty in the Department how to curl.

Cornelis van der Veen

Professor Van der Veen has been studying fast-moving outlet glaciers in Greenland and Antarctica for more than three decades. He recently wrote a review paper on "Glacier Flow" which led him to evaluate some of the models that have been proposed in recent years for why and how glaciers are changing so rapidly.

His conclusion is that the glaciological community has a long way ahead in unravelling the mysteries of glacier flow and glacier behavior. Indeed, an admittedly controversial paper published in Science last year together with his KU colleague Leigh Stearns (who resides in the Geology Department), concludes that even a process as basic as how glacier slide over their bed is not understood. Using observations from almost 200 glaciers draining the Greenland Ice Sheet showed that the commonly-used sliding relation does not apply to these glaciers.

Similarly, glaciologists do n not understand the process of iceberg formation at glacier termini ("calving") works. Since this calving process accounts for more than half the mass loss in Greenland, one may well ask how well we can model and predict future behavior of this ice sheet and the consequences for global sea level.

Barney Warf

Barney was busy teaching, editing, and conducting research in the 2018-2019 academic year. His book Global Corruption from a Geographic Perspective (Springer) appeared last year. He has four books forthcoming, including a monograph, Geographies of Cosmopolitanism (Edward Elgar), two edited volumes (Geographies of the Internet and Political Landscapes of Donald Trump, both with Routledge), and a co-edited volume (with Paul Adams), Handbook on Geographies of Media (Routledge). His paper "Teaching digital divides" appeared in the Journal of Geography.

He had five book chapters appear and has five more forthcoming, as well as three encyclopedia entries. His term as editor of The Professional Geographer expired in July, but he continues to edit Geojournal and co-edit Growth and Change.

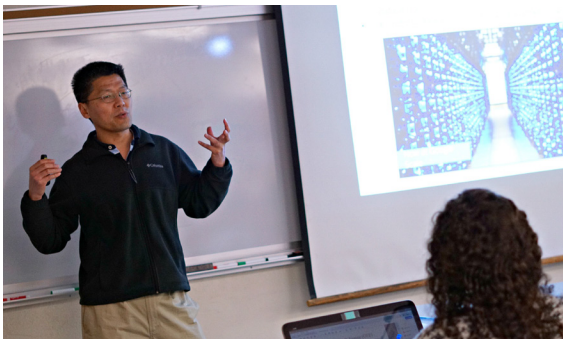
He also edits book series for Springer and for Rowman and Littlefield, as well as the Oxford Bibliography Series Online for geography. Barney served as head of the Great Plains/Rocky Mountain Division of the AAG and organized its regional conference in Lawrence, which was held in October. He presented a paper at the AAG meeting in Washington, DC, and traveled to India as a tourist in May.

GREAT PLAINS ROCKY MOUNTAIN

The KU Dept. of Geography and Atmospheric Science was pleased to host the 2019 meeting of the Great Plains / Rocky Mountain Division of the AAG on Oct. 11-12 at the Oread hotel.

The conference saw 110 registrants, including 60 faculty and 50 grad students, numerous concurrent paper sessions, 15 poster presentations, student paper/poster competitions, and Geobowl. Papers and posters covered a wide range of topics, including GIS, urban and political geography, tourism, Himalayan geographies, and indigenous politics. KU's Cheyanne Sun Eagle won first place for paper presentations!

The conference included an opening reception on Friday night and a banquet on Saturday, both with musicians; the banquet's keynote speaker was Dr. Amy Lobben of the University of Oregon, VP-elect of the AAG.



GPRM 2019 WORKSHOPS

Dr. Kirk McClure of the KU Dept. of Urban Planning organized a tour of Kansas City.

Dr. Jay T. Johnson of the KU Geography and Atmospheric Science Department guided a tour of Haskell Indian Nations University and the Wakarusa wetlands.

Dr. Xingong Li of the KU Geography and Atmospheric Science Department lead a workshop on cloud-based geospatial analysis using Google Earth Engine.

GEOGRAPHY CLUB

Above: Students participate in Global Brunch.

2019 saw the rebirth of the KU Geography Club. The founding members are Sean Kulig (President), Bethany Green (Vice President) and Sam Prusak (Secretary). They have had a handful of meetings and are still recruiting. With solid members on board and students stepping up to leadership roles, the Geography Club is looking forward to a great year!

FACULTY FOCUS BING PU

Southwestern Kansas in the 1930s saw some of the worst dust storms ever recorded in the U.S., when apocalyptic clouds of heavy dust terrified and even killed people, livestock and wildlife.

Long ago, farmers phased out the kinds of practices that brought about the Dust Bowl, but dust still can harm health, agriculture and transportation while exacerbating environmental problems. Indeed, dust storms may increase as climate change causes drier conditions. (The National Oceanic and Atmospheric Administration asserts windblown dust storms increased 240% from 1990 to 2011 in the southwestern United States.)

Today, a researcher at the University of Kansas has developed an advanced technique for forecasting dusty conditions months before they occur, promising transportation managers, climatologists and people suffering health issues much more time to prepare for dusty conditions. By contrast, common methods of predicting dust in the air only give a few days of advance warning.

Bing Pu, assistant professor of geography & atmospheric science at KU, is lead author of a new paper in Geophysical Research Letters detailing a long-range dust-prediction method her team used to accurately predict dustiness in the southwestern and central United States.

"We use a statistical model constrained by observational data and the output of a state-of-the-art dynamic seasonal prediction model driven by observational information on Dec. 1," Pu said. "We found using our method, we actually can give a skillful prediction for the dustiness in springtime, one of the dustiest seasons in the U.S., over the Southwestern and Great Plains regions — two of the dustiest areas in the U.S."

Pu and her colleagues, Paul Ginoux and Sarah Kapnick of the NOAA Geophysical Fluid Dynamics Laboratory, and Xiaosong Yang of NOAA and the University Corporation for Atmospheric Research, were able to predict "variance," or days when there was more or less dust in the air than average.

"Over the southwestern U.S., our model captured the variance of the dustiness over the time period from 2004 to 2016 by about 63%," Pu said. "Over the Great Plans, about 71% of the variance is explained."

Pu said factors influencing amounts of dust in the air can include surface winds, precipitation and amount of bareness of the landscape. These kinds of data were incorporated as key variables into the prediction model.

According to Pu and her collaborators, high levels of airborne dust can affect individual people,

transport systems and agricultural production.

"Small dust particles are very easily taken into your breathing system and then could cause lung diseases like asthma — and some studies suggest there might be some connection with lung cancers," Pu said. "There's a study finding dust storms are related to valley fever in Arizona as fungi can attach to dust particles. And when there's a severe dust storm, visibility is reduced so it can increase car accidents on the highways. In 2013, there were severe dust storms in western Kansas that reduced visibility and caused problems for local traffic. In Arizona, when there's a strong dust storm usually called a 'haboob,' the dust wall goes up to a few kilometers high, and this can affect airports —airports have to close due to the dust storms. Fortunately, these storms are moving quickly and dissipate after a few hours."

Beyond safety for people, Pu's team detail in their study how high dust levels can sway the environment as a whole.

"Dust particles absorb and scatter both solar and terrestrial radiation, thus affecting the local radiative budget and regional hydroclimate," they wrote. "For instance, dust is found to amplify severe droughts in the United States by increasing atmospheric stability, to modulate the North American monsoon by heating the lower troposphere, and to accelerate snow melting and perturb runoff over the Upper Colorado River Basin by its deposition on snow."

Pu said she hopes someday an organization or government agency could run the model she's developed and issue seasonal dust predictions months in advance, especially if the potential for high levels of dust cause concern.

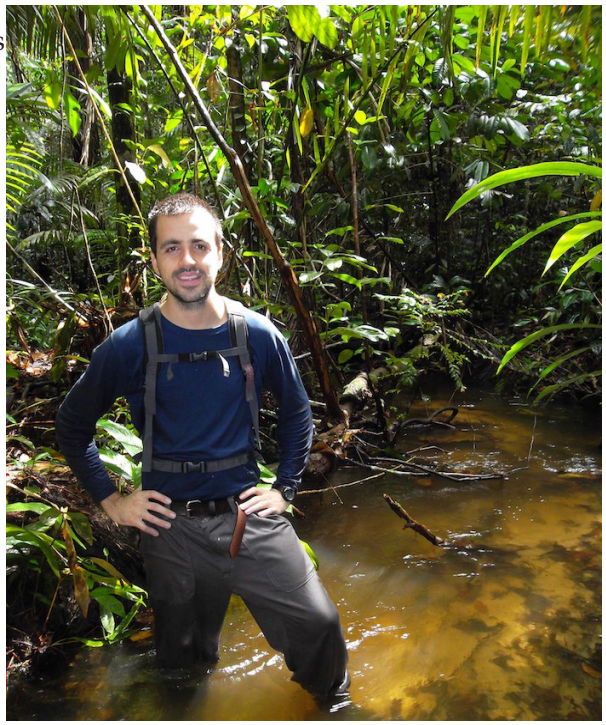
"Traffic systems and human health would benefit most from this long-term prediction ability about dust and air quality," she said. "I think it would be great if an institute would try to give regular predictions of dustiness variations that could be helpful for airports or road traffic or transportation managers. Facilities could plan for times when there could be a lot of dust in the local area. It could even affect the plans of local farmers."

For the time being, Pu aims to continue to refine the dust-prediction model to include atypical weather influences and human activity that could contribute to dust patterns.

"We want to continue to understand what other factors haven't been explored in the seasonal variation of the dust," she said. "For instance, those large-scale factors such as the El Niño-Southern Oscillation, and also anthropogenic factors, how people's influence through agriculture or construction projects, might affect dust emission in the future. Of course, we want to also keep collaborating with people at NOAA GFDL to give dust predictions."

IN THE NEWS

GABRIEL DE OLIVEIRA



Throughout August and early September 2019, media around the world have reported on the extensive forest fires ravaging Brazil's Amazon rainforest. Much of the concern stems from the Amazon's significance to regulating the world's climate. According to the Associated Press, the Amazon absorbs 2 billion tons of carbon dioxide every year — about 5% of global emissions. Thus, fires in the region eat away at this carbon-absorbing capacity while at the same time adding carbon to the air through burning.

A recent study in the peer-reviewed journal Ecohydrology headed by University of Kansas researcher Gabriel de Oliveira gives important context to the fires burning big swaths of the Amazon today, most of which were set intentionally by farmers and ranchers to convert forest into land suitable for grazing animals or growing crops. The researchers sought to discover how these changes to land cover affect the exchange of water and heat between the surface of the Amazon and the atmosphere overhead.

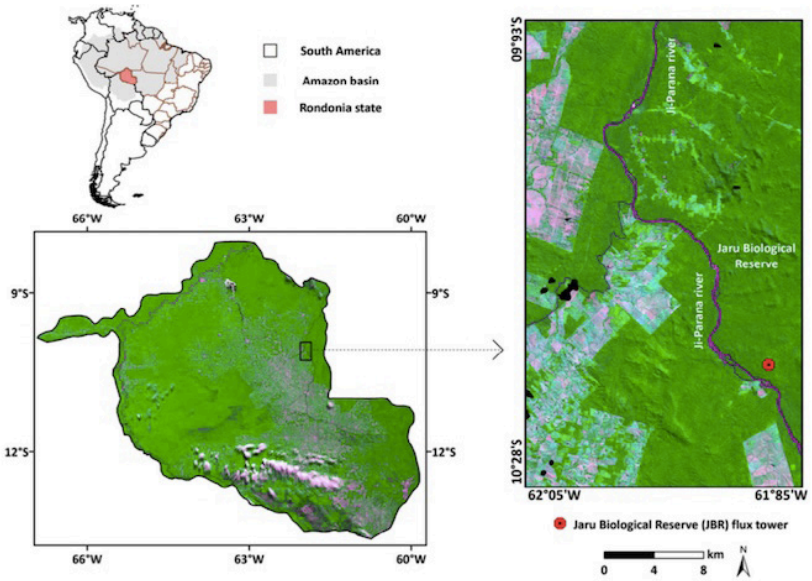
"This is the first study to examine the biosphere-atmosphere interactions in the Amazon with such high spatial resolution satellite imagery," said de Oliveira, a postdoctoral researcher in the Department of Geography & Atmospheric Science at KU. "We tried to understand the impacts of land-cover changes and deforestation in general. When you clear-cut the forests, and you convert it either to pasture or agriculture — or cut the forest, but for some reason don't plant anything and then have a type of vegetation called 'secondary succession' — our idea was to try to understand how that impacts energy, like the radiative fluxes and water fluxes, or evaporation in general."

In the paper, de Oliveira and his colleagues analyzed information from both satellites in space and weather stati ons on the ground in the Amazon. With data from the Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) and Large Scale Biosphere Atmosphere Experiment in Amazonia (LBA), they examined

"There are no natural fires in the Amazon. They're all set by human beings."

surface energy and water changes over different land cover types in one wet year and one drought year in eastern Rondônia state, Brazil. The team also found statistically significant differences in several important measures prior to and after one year of deforestation.

"Using NASA satellite images with high spatial resolution (15m) obtained by the ASTER sensor in Rondônia state, in the south-western Brazilian Amazon, we found that deforestation and consequent transition to pasture or agriculture to grow soybean tend to increase in two to four times the soil and air temperatures in the region," de Oliveira said. "We also observed an approximately three times higher evapotranspiration over forested areas in comparison with nonforested areas."



The researchers discovered significant variances between areas on opposite sides of the Ji-Paraná River, one side of which had suffered more deforestation than the other side, located within the Jaru Biological Reserve protected area. They measured spatial variation of albedo (or the fraction of the incident sunlight that the surface reflects), net radiation (or the total energy, derived from sunlight, that's available at the surface), soil and sensible heat fluxes (or how much heat is transferred from the surface to the atmosphere), and evapotranspiration (the process by which water is transferred from the land to the atmosphere by evaporation from the soil and by transpiration from plants).

De Oliveira, who was raised in Brazil, said the rest of the world depends on the Amazon region to help moderate global climate. "It's important because it's the largest rainforest in the world," he said. "Precipitation in the tropics, all the water fluxes that go on in the tropics, affect the whole world. The Amazon has a very important role in that. There's no other area in the world like the Amazon's unique ecosystem. It's pretty fascinating. I'm from South Brazil, a totally different environment than the Amazon. You could compare it with Kansas. But when I started studying for my master's degree, my adviser told me, 'You're going to work in the Amazon rainforest.' And I told her I'd never been there. But I spent two months in the rainforest doing research. And of course, you know, I fell in love. I'm very passionate about the Amazon and have been there so many times since then, so I have a lot of experience and stories of things that have happened there."

The KU researcher cautioned that although forest fires in the Amazon have received attention in the media this year, the fires happen to a greater or lesser degree every year. "Fires in the Amazon happen every year during the dry season," de Oliveira said. "We have agricultural areas, areas that were deforested in the past — but in order to clear the area for the next year, or to make the soil a little bit better for the next year, they set a fire. They claim they're only setting fire to burn agricultural lands. But sometimes the fire gets out of control, and it plays a part in more deforestation. Fires get out of control in agricultural land and reach the forest and burn the forest. But these fires happen in the Amazon every year, so it's pretty straightforward. The worst years were in 2005, 2010 and 2015 because of severe drought events. Everything was really dry, and the fires would get out of control. There are no natural fires in the Amazon. They're all set by human beings."

ALUMNI BOARD

From Dan Rose, Chair of the Geography & Atmospheric Science Alumni Board

The Department of Geography & Atmospheric Science Alumni Board held its annual Career Night on October 18th, in an effort to always continue improving students' experience with career planning. The panelists spoke about their career paths and advice they could give to students.

Career Night is a great opportunity for KU GAS students to get their questions about careers answered and make connections with professionals, while simultaneously learning how networking with employers can help them reach their goals and gain skills to succeed.

Efforts are continuing to create an interactive and easily-updatable alumni map that shows the spread of our graduates across the globe.

The Board is poised once again to hold its annual Mock Interview Day in February or March 2020. Mock Interview Day is free and available to all KU students. Board Members and local employers will provide students an opportunity to go through a 30-minute mock interview session, which includes questions + feedback.

BOARD MEMBERS

Dan Rose, Chair of Alumni Board

Heather Putnam
Brian Thomas
Alexandra Ubben
Nathan Wendt
Jeff Krecic
Hannah Weekley

THANK YOU FOR GIVING

Your gift makes all the difference in the lives of our students, our faculty, and our classrooms - both inside Lindley Hall and in the field. Contributions have helped undergraduate students with tuition, research funds, special events including our colloquium series, and more. We are so grateful for alumni contributions of any amount and we thank you for your generosity. Don't see your name below? Let us know! Email us at kugeog@ku.edu. These alumni and friends helped make the next academic year shine for our department:

Very special thanks to the following recent contributors:

WALTER KOLLMORGEN GEOGRAPHY FUND

J. Christopher Brown and Denise L. Perpich
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Walter Kollmorgen Fund
The Walter Kollmorgen Fund honors the university distinguished professor who grew the department and served as chair from 1947-1967. The fund supports a myraid of uses, projects both large and small. It can be used for student or faculty travel to professional conferences and new equipment.

George F. Jenks Fund
The George F. Jenks Fund is used for Cartography and GIS-related equipment, mapping, and traing-ing.

Atmospheric Science Fund
This fund provides essential resources for a variety of programs and student scholarships.

Walter Bohnstengel Fund
The Walter Bohnstengel Fund is used for a variety of expenses and equipment in the Atmospheric Science program. It can also be used for student and faculty travel for field work and conferences.

Contributions can be made to the Walter Kollmorgen Geography Fund, the George F. Jenks Fund, the Atmospheric Science Fund, the Bohnstengel Fund, or our upcoming "Launch KU" computer campaign. General donations to the Dept. of Geography & Atmospheric Science are also welcome.

Please indicate the Dept. of Geography & Atmospheric Science and which fund, if any, on your donation. Send your gift to:

The Kansas University Endowment Association
P.O. Box 928
Lawrence, KS 66044-0928
or donate online at **kuendowment.org**
or contact the department at **kugeog@ku.edu**

ALUMNI NEWS

JOHN BIERSACK

When not enjoying the mountains of Colorado, I have been doing consulting work and teaching World Regional Geography at Red Rocks Community College in the Denver area. I have recently begun a collaborative article project with fellow Geography alum Dr. Austin Charron as well as Drs. Shannon O'Lear and Alex Diener. We will draw from our respective research interests to argue for the importance of a critical qualitative lens as a way of complementing existing scholarship within political geography of Ukraine and the broader region associated with the former Soviet Union. I look forward to seeing friends and colleagues at the AAG Annual Meeting this coming spring in Denver.

ALUMNI NEWS

CARLY FISH

Since finishing my master's degree with Dr. Mechem a little over 5 years ago, I've been working as an air quality specialist at Black & Veatch. My primary job functions include air dispersion modeling, air permitting/regulatory review, and meteorological studies for design wind and temperature values for projects. We also work with the B&V wind team to help process meteorological tower data and determine the best placement of wind turbines. Additionally, we have been able to assist construction projects with legal challenges regarding lost work days due to flooding. As the power industry evolves, our team of air quality specialists are always finding new ways to utilize our meteorological backgrounds within the engineering world. I've really enjoyed my time at B&V so far and learn something new every day.

ALUMNI NEWS

HANNAH CHANDLER-COOLEY

I have been an operational meteorologist with the National Weather Service in Sacramento, CA since January 2017. I am really enjoying my time in Sacramento! The weather in Northern California is not as boring as some might think. The Sacramento forecast office covers much of interior Northern California: from below sea level in the Delta region of the Bay Area all the way up to the crest of the northern Sierra Nevada at 10,000 feet! Much of Northern California has a Mediterranean climate which means we get most of our rain from November to April and little to no rain in the summer and fall. This means our main forecast concerns are wildfires in the summer and fall due to the dry summers followed by winter weather in the mountains and flooding at the lower elevations in the winter months.

Other than forecasting, we are also involved with various project work. We work very closely with our partner agencies, such as state & county agencies, law enforcement, fire agencies, CalTrans, and utility companies, during significant weather events. I have been very busy the past couple of months with outreach events, attending workshops with & giving presentations to our partner agencies, and even providing off-site weather support during significant weather events.

In personal news, I married my wife Kate (who I met playing Quidditch at KU!) in September 2018. We adopted a dog in February, a big, fluffy Malamute, who we enjoy hiking and exploring Northern California with.

CHANGES

TRANSITION

Geography and Atmospheric Science professor **Andrea Brookfield** will begin a new path at the University of Waterloo in Ontario, Canada, in the Department of Earth and Environmental Sciences. She says she will miss interacting with the undergraduate and graduate students.

TRANSITION

Assistant Professor **Pamela Sullivan** is now at Oregon State University at the College of Earth, Ocean, and Atmospheric Sciences.

RETIREMENT

Associate Professor **Steve Egbert** retired in December, but plans on working regularly on campus through next semester to help his remaining students finish up and work on a couple of research projects.

NEW FACES

Assistant Professor **Bing Pu** joined the Department in January. Over the next year, she will continue her work on dust variations in the U.S. and other regions, improving dust seasonal prediction methods, incorporating the newly-developed wind erosion threshold map into the Community Earth System Model, and exploring anthropocentric activities induced dust emission.

NEW FACES

Katie Rhine joined the Departments of Geography & Atmospheric Science and African & African-American Studies as an Associate Professor in fall 2019. She received her Ph.D. in Cultural Anthropology from Brown University in 2010, and has lived and worked in Nigeria for nearly four years over the past 15 year. Rhine is the co-director of KU's first humanities-based lab, colLAB: Bridging East Africa's Health Divides, with AAAS faculty members, Elizabeth MacGonagle and Peter Ojiambo. ColLAB provides undergraduates the opportunity for collaborative and mentored research in Tanzania, while developing fluency in Kiswahili. This lab is supported by grants from the National Endowment for the Humanities ($98,000) and the Hall Center for the Humanities ($90,000).

Below: Katie Rhine in Tanzania

CAREER NIGHT

The Fall 2019 KU Geography and Atmospheric Science (GAS) Career Night was held October 18th at Ritchie Hall. There were about a dozen attendees from both departments, and there were eight panelists in attendance, including:

- Dan Rose (2019-2021 Chair of the Board) - Geospatial Services Manager with the City of Columbia, MO – dan.rose@como.gov
- Alex Ubben (2019-2021 Assistant Chair) - Army Corps of Engineers Geospatial Branch in the Kansas City District – alex.ubben@gmail.com
- Jeff Krecic (Current Board Member) - Manager of Flight Operations at Tukuh Technologies, Kansas City, MO
- Mark Burger (Current Board Member) - Civilian Launch Weather Meteorologist with the U.S. Air Force at Cape Canaveral, Florida
- Nathan Wendt (Current Board Member) - Mesoscale-Asst/Fire Weather Forecaster / NOAA Storm Prediction Center
- Jason Sweet, Project Manager at Stantec, Kansas City, MO
- Lisa Hook, US Army Corps of Engineers
- Vanessa Alonso, Weekday Morning Meteorologist for KQTV (KQ2) in St. Joseph, MO

In an effort to always continue improving your Career Night experience for both employers and students, the panelists spoke about their career paths and advice they could give to students. Career Night is a great opportunity for KU GAS students to get their questions about careers answered and make connections with professionals, while simultaneously learning how networking with employers can help them reach their goals and gain skills to succeed.

Other benefits of the Career Night included:

- An explanation of what the GAS Board does and who/why they exist
- Educating students on how to conduct their job search and the resources available to them
- Networking with potential employers
- Emphasis on getting internships to further their careers after college

COLLOQUIUM SERIES

Our Spring 2020 Colloquium Series features a variety of speakers and topics, from regional and national organizations to our own faculty. All of our colloquiums are open to the public. Colloquiums are generally held at 4:00 p.m. with a meet and greet and refreshments a half-hour prior to the colloquium. If you are in the area, please join us!

Jan. 24

Jan 31

Feb. 7

Feb. 14

Feb. 21

Feb. 28

March 6

March 20

March 27

April 3

April 10

April 17

April 24

May 1

More colloquiums will be announced. Visit the department's website at geog.ku.edu to view the full schedule.

GRADUATION

The Geography & Atmospheric Science Recognition Ceremony was held on Saturday, May 18, 2019 inside Lindley Hall to honor all graduates.

This ceremony was in addition to the traditional walk down the hill, and gave our faculty, students, and families a chance to share time together.

After the ceremony, a barbeque luncheon was served. The graduation ceremony was in part, made possible by contributions to the Kollmorgen and Bohnstengel Funds.

STAFF NOTES

Greetings from the Lindley Hall staff!
2019 has been an exciting year full of changes. After 44 years, Bev Koerner left her position as graduate student coordinator. We were all very sad to see her go. In addition to Bev, Anne Tangeman, our Communications Specials transferred to the Natural History Museum.
While Bev and Anne departed, we gained some fabulous new employees. Ally Smith, our Office Manager, helped hire Xoe Cranberry as our new Faculty Administrative Assistant, Liz Smith as our new Undergraduate Administrative Assistant, Fally Afani as our new Communications Specialist, and Cicily Riggs as our new Graduate Student Advisor. Luckily, Ramia Whitecotton has stuck around as our Facility Manager. It goes without saying, we are all looking forward to 2020 as it offers a fresh start with seasoned staff. - *The Lindley Hall Staff*

KU Atmospheric Science crew at #AMS2019!


Happy Hour at the Burge!


Indigenous Peoples' Science class at the Haskell wetlands


Hawk Week!


Halloween Celebrations!

KU DEPARTMENT OF GEOGRAPHY & ATMOSPHERIC SCIENCE

The University of Kansas

College of Liberal Arts & Sciences

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