

SciComm 2019 Program

Overview

Friday, March 22		
2:00-5:00	Concurrent workshops	
5:00-7:00	Dinner (on your own)	
7:00-8:30	Lightning Talks & Film Festival (Fiedler Hall 1107)	
Saturday, March 23		
7:30-8:15	Light breakfast (Fiedler Hall Atrium)	
8:15-8:30	Welcome address by <i>Peter Dorhout</i> , Vice President for Research at Kansas State University (Fiedler Hall 1107)	
8:30-9:30	Keynote address – <i>Danielle Lee</i> : Building Personal Bridges – Connecting your Science to your Communities (Fiedler Hall 1107)	
9:30-9:45	Break	
9:45-12:00	Concurrent sessions with talks	
	<i>Session 1: Engaging K-12 Audiences</i> (Fiedler Hall 1107)	<i>Session 2: Get Yourself Out There</i> (Fiedler Hall 1052)
9:45-10:15	<i>Paige Mcallister</i> : We Wake up at 5:30 Once a Month to Teach Teens About Relationship Science...Here are 10 Things We've Learned	<i>Hanna Mitchell</i> : The Importance of Branding Yourself & Your Work
10:15-10:30	<i>Nick Barts</i> : Getting extreme: Teaching about extremophile fish in K-12 classrooms	<i>Alex Erwin</i> : Leveraging Science Communication for Success in Diverse Career Paths
10:30-10:45	<i>Kalea Nippert</i> : Girls in STEM	<i>Shelby Astle</i> : Beyond the Journal: Methods for Engaging Researchers in Public Scholarship
10:45-11:00	Break	

	<i>Session 3: Challenges & Solutions in SciComm</i> (Fiedler Hall 1107)	<i>Session 4: From Theory to Practice</i> (Fiedler Hall 1052)
11:00-11:30	<i>Brandon Bretl</i> : Is Science a Moral Issue? The Origins of Anti-Science Beliefs in the Classroom	<i>Kapila Kottegoda</i> : Spanning tree modulus for secure broadcast games
11:30-11:45	<i>Doug Golick</i> : Lessons Learned in Creating a Science Communication Course for Graduate Students	<i>Casey Ackley</i> : Catalytic Complexes Inspired by Nature for the Reduction of Nitrogen
11:45-12:00	<i>Kenneth Sewell</i> : Leveraging Science Communication to Impact Community Engagement	<i>Narmadha Mohankumar</i> : Using Black-Box Machine Learning Techniques to Identify Spatial Dependence in Occupancy Data
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12:00-1:30	Lunch (Fiedler Hall Atrium)	
1:30-3:30	Science Festival at Sunset Zoo, 2333 Oak St, Manhattan, KS 66502	
4:00-5:30	ART(ifacts) at Sunset Zoo, 2333 Oak St, Manhattan, KS 66502	
5:30-8:00	Dinner (on your own)	
8:00	Open Mic Night: Explain it like I'm 5 at O'Mally's Alley, 1210 Moro St, Manhattan, KS 66502	
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Sunday, March 24		
8:00-8:30	Light breakfast (Fiedler Hall Atrium)	
8:30-9:30	Keynote address – <i>Kevin Folta</i> : Rethinking Science Communication to Reach the Concerned Consumer (Fiedler Hall 1107)	
9:30-9:45	Break	
9:45-10:45	Concurrent sessions with talks	
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	<i>Session 5: Engaging Diverse Audiences</i> (Fiedler Hall 1107)	<i>Session 6: Developing Programs & Partnerships</i> (Fiedler Hall 1052)
9:45-10:15	<i>Sam Sharpe</i> : Communicating Biological Sex: Beyond XX and XY	<i>Jeremy Marshall</i> : Using SciComm to Grow a Program
10:15-10:30	<i>Johana Goyes Vallejos</i> : Representation matters: clues from experiences in the classroom	<i>Tom Hallaq</i> : Distributing student videos through NSF Channels

10:30-10:45	Break	Break
10:45-11:00	<i>Sarah Winnicki</i> : Hashtags, captions, albums, lists? Observations about different audience-specific communication styles on Twitter, Facebook, Instagram, YouTube, and Flickr	<i>Jared Bixby</i> : It's Not You, It's Me: How to Work with Community Partners
11:00-11:15:	<i>Shelby Astle</i> : Relevate: A Mobile-based Intervention for Delivering Relationship Education	<i>Michi Tobler</i> : Science Communication in the Age of "Alternative Facts"
11:15-11:30:	<i>Bliss Betzen</i> : Crash-Course Workshop – Scientific Symposium	<i>Sarah Hancock</i> : Lessons from developing the Kansas Science Communication Initiative
11:30	Conference adjourns	

Abstracts for Contributed Talks

Building Personal Bridges: Connecting your Science to your Communities (Keynote)

Danielle Lee (danilee@siue.edu)

Department of Biological Sciences, Southern Illinois University Edwardsville

Science career landscapes may feel rather uncertain right now; however, the need for science outreach to the general public is greater than ever. Communicating science in the 21st century means broadening science participating on every level: media producers, communicators, and consumers. Effective science outreach and communication requires authentic connections with audiences to attract participation and participation from wider demographics. Owning your identity and using it as your center is the key to connecting your science to wider more diverse audiences and serving traditionally under-served groups.

We Wake up at 5:30 Once a Month to Teach Teens About Relationship Science...Here are 10 Things We've Learned

Paige Mcallister (paigemc4@ksu.edu), A Vennum, K Morrison, S Colburn

Family Studies and Human Services, Relevance, Kansas State University

The #RelationshipGoals project was created to address behavioral, sexual, and mental health outcome disparities among youth in Junction City, Kansas. The youth we serve come from a variety of backgrounds and experiences. 59% qualify for free or reduced lunch and almost 25% have experienced homelessness. 49.7% identify as an ethnic minority, 36% identify as LGBTQ, and 56.4% have family members in the military. The goal of the #RG project is to empower youth to make healthy decisions by teaching them the benefits associated with self-regulation, healthy relationships, and goal setting, while also teaching them how to resist sexual coercion, dating violence, and other risky behaviors. We are excited to share the 10 most important things we have learned about helping teens connect with relationship science from why teens are the best and inclusivity matters to specific tips for hands on activities and how to tackle difficult topics."

Getting Extreme: Teaching about Extremophile Fish in K-12 Classrooms

Nick Barts (Barts2@ksu.edu), R Greenway, N Busch, B Steiger & M Tobler

Biology, Kansas State University

The Next Generation Science Standards places a large emphasis on ecology, evolution, and the integration of cross-disciplinary contents. The mastering of these core concepts and understanding their relationship to diverse life science fields are essential to developing a scientifically literate student body. A challenge in science education is to maintain student interest and engagement with these abstract concepts, and a beneficial way to address this is to institute inquiry-based learning into the classroom. This style of learning allows students to gain hands-on experience and investigate important questions related to these core concepts. Working with local high school biology teachers, we have developed activities using extremophile fish as a model to investigate questions in ecology, evolution, and cellular biology. These activities allow students to develop experimental designs to test the influence of environmental toxins on animal physiology and gain hands-on experience working with data collected from many different levels of an animal, including animal morphology, enzyme activities, and genetic information.

Girls in STEM

Kalea Nippert (kalea.nippert@gmail.com)

Rock Creek High School

Studies have shown that girls have less opportunities to be involved in STEM fields, and that most girls lose interest in STEM careers around ages 13 to 17. Girls in STEM is a program designed to give girls in 7th and 8th grade chances to explore different STEM careers. The program also gives girls a chance to meet strong and successful female role models in microbiology, chemistry, engineering, ecology, and physics. Offered six different days throughout the spring, girls will gain experiences and new knowledge that they may not otherwise have access to. During my talk, I will provide an overview of the program and its goals.

The Importance of Branding Yourself & Your Work

Hanna Mitchell (hanna.mitchell@outlook.com)

FEMA

Your work is a part of you, and it should shine through in who you are in social media, because every post, tweet, video, and picture are statements of who you are. Work is only a piece of your life, and that should show up in your brand so that you can build an audience for your work. It is important to build a brand, because your work does matter, and someone needs to listen. Scientist and our colleagues in STEM generally appear most polished when they attend conferences, but in a day of being globally connected via the internet and social media, we're always being asked to appear polished. We'll talk about how strategizes for appearing branded on different social medias platforms and what each platform is most beneficial for your work in science as well as how to really quantify your outreach. This will allow scientist to have a refined voice on social media and the internet so that personnel can push out their message and achieve their outreach goals.

Leveraging Science Communication for Success in Diverse Career Paths

Alex Erwin (alex@biokansas.org)

BioKansas

BioKansas helps educate students on diverse careers in the life sciences. This presentation aims to familiarize trainees with data on communication skills organizations seek (based on sector), and assist them in understanding the specific values of effective scientific communication skills for success in diverse careers and career transitions.

Beyond the Journal: Methods for Engaging Researchers in Public Scholarship

Shelby Astle (sastle@ksu.edu), K Anders, A Vennum

Family Studies and Human Services, Relevate, Kansas State University

Training scholars in public scholarship and community engagement can increase the relationship science field's ability to do scholarship that is relevant to people's lived experience. However, there are few direct professional incentives for researchers to participate in public scholarship and little available resources for guiding them in this process. In its mission of making empirical relationship science accessible to everyone, Relevate has not only developed a platform for aggregating empirical research but has worked to engage scholars from across the nation in sharing their work in a public-friendly format. In this presentation, the Relevate team will be sharing specific methods for introducing scholars to science communication, motivating scholars to contribute, and providing helpful resources for

scholars as they ease into the sometimes-daunting and unfamiliar process of sharing their research with the public.

Is Science a Moral Issue? The Origins of Anti-Science Beliefs in the Classroom

Brandon Bretl (bretl.b@ku.edu)

Educational Psychology, University of Kansas

For people who hold strident anti-science beliefs, no amount of evidence can sway their convictions. My research seeks to explain this by looking at how humans form and maintain beliefs in various social and cultural contexts and how our evolutionary history has shaped our psychology. My work is especially focused on how political identity formation and other developmental factors in traditional educational settings influence subsequent conceptual change in individuals and groups.

Lessons Learned in Creating a Science Communication Course for Graduate Students.

Douglas Golick (dgolick2@unl.edu)

Entomology, University of Nebraska Lincoln

This talk presents one approach in implementing a graduate-level Science Communication course with the central goal of improving students' science communication skills. This presentation will discuss the course design, course activities, and teaching strategies that have worked (and those that have not). The talk will finish with takeaway points for instructors hoping to teach a semester-long science communication course.

Leveraging Science Communication to Impact Community Engagement

Kenneth Sewell

Vice President for Research, Oklahoma State University

Over the past two years, Oklahoma State University has taken a more strategic and invigorated approach to Science Communication. Through the development and implementation of programs such as OSU Research on Tap, to a new video series, Straight Talk About Research (STAR), the Office of the Vice President for Research has created multiple avenues for faculty to share their research with a broader audience. Additionally, the creation of a Tier 1 Research Initiative program is structured to create a greater interface between researchers and the outside world, and to cross-leverage PR efforts with increased interdisciplinary collaboration. Finally, we brought in the Alan Alda Center for Communicating Science to train an initial cohort of interested faculty, and we are now considering a "train the trainer" model to further support Science Communication.

Spanning Tree modulus for Secure Broadcast Games

Kapila Kottegoda (kotteg1@ksu.edu), N Albin, P Poggi-Corradini

Mathematics, Kansas State University Discipline-based education research

The theory of p -modulus provides a general framework for quantifying the richness of a family of objects on a graph. When applied to the family of spanning trees, p -modulus has an interesting probabilistic interpretation. In particular, the 2-modulus problem in this case has been shown to be equivalent to the problem of finding a probability distribution on spanning trees that utilizes the edges of the graph as evenly as possible. We use this fact to produce a game-theoretic interpretation of modulus by employing modulus to solve a secure broadcast game.

Catalytic Complexes Inspired by Nature for the Reduction of Nitrogen

Casey Ackley (caseyahoward@ksu.edu)

Chemistry, Kansas State University

Climate change is currently one of the most talked about topics in the government and media. A large contributor to climate change is greenhouse gas emissions coming from fossil fuels. Because of greenhouse gas emissions, the Earth's atmospheric temperature is projected to increase by 1.5 degrees Celsius by the year 2040. Higher temperatures are a likely cause for a longer growing season in the Midwest, which would be a major contributor to a decline in productivity. Droughts, forest fires, flooding and other natural disasters are also thought to be consequences of climate change and greenhouse gas emissions. In order to halt these negative impacts, alternative fuel sources must be explored. Ammonia is a favorable fuel source because it will release nitrogen gas as a byproduct, and it has very similar characteristics to petroleum gas. They are both stored, transported, and handled very similarly, which would make the transition to ammonia fuels much easier. Current production of ammonia is unsustainable so new methods for making this potential fuel are needed. Many scientists have used inspiration from an enzyme called nitrogenase to design catalysts that will produce ammonia from nitrogen. Inspired by nature and research done by the Love group, a catalytic complex will be synthesized using a ferrocene backbone to aid in electron transfer. While working on the synthesis of the targeted ligand, two additional ligands were discovered. All three ligands have the potential to be used in catalytic complexes that will be able to convert nitrogen to ammonia.

Using Black-Box Machine Learning Techniques to Identify Spatial Dependence in Occupancy Data

Narmadha Mohankumar (meenu8912@gmail.com), TJ Hefley

Statistics, Kansas State University

In ecology, occupancy data are a contaminated binary response that is used to map the presence or absence of a species. Models for occupancy data are used to estimate the occurrence of a species, where the true presence of a species is a function of a spatially varying process. In the standard spatial occupancy model, most researchers assume that the spatial component is a Gaussian process. This assumption leads to an inability to identify nontraditional spatial dependence such as discontinuities and abrupt transitions which are common in ecological data. Bayesian machine learning techniques have the potential to identify non-traditional spatial structure, but these technologies do not account for contamination in the binary response. We embed Bayesian machine learning methods into the hierarchical occupancy model to account for non-traditional spatial dependence and contamination in the binary response. We conduct a simulation experiment by selecting a few commonly encountered cases of traditional and nontraditional spatial dependencies in ecology.

Communicating Biological Sex: Beyond XX and XY

Sam Sharpe (sharpes@ksu.edu)

Stigmatization and invalidation of queer, transgender, and intersex identities are often justified by appeals to the supposed biological immutability of sex binaries and the utility of heterosexual reproductive pairings. As scientists and educators, we have the opportunity to use our science communication, research, and curricula to challenge these misconceptions while incorporating and exploring the diversity and complexity of sex, gender, and sexuality in human biology and across taxa. This presentation will explore strategies for utilizing science communication and science education as a source of empowerment for, rather than invalidation of, queer, transgender, and intersex individuals.

Representation Matters: Clues from Experiences in the Classroom

Johana Goyes Vallejos (goyes.johana@gmail.com)

Biodiversity Institute, University of Kansas

Despite the efforts to increase diversity in STEM, the number of minority students who major in STEM fields is not rising as expected. High school students are an important demographic as they will go into higher education institutions in hopes of obtaining a degree. The lack of representation of groups historically underrepresented in STEM halts the number of minority students pursuing a career in these fields. The problem then relies on the lack of role models for minority students before and during their college years. As a Latina and as a Woman in Science, I am committed to increasing diversity and inclusion in STEM. Inspired by the 'draw a scientist' exercise, I visited a High School in New York City with a majority of Hispanic students. The goal was to foster interest in science. Before I talked to the students, their teachers asked them to write down their own definition of a scientist. We made a word cloud with the words they used, and the words 'old', 'white' and 'lab coat' were the most common. We repeated the exercise after I had talked to the students and the new word cloud revealed new words, such as 'person' and 'anyone'. For most of them, realizing that someone with a similar background has overcome struggles and challenges, changes their expectations of what they can achieve. Small actions can generate change.

Hashtags, Captions, Albums, Lists? Observations about Different Audience-Specific Communication Styles on Twitter, Facebook, Instagram, YouTube, and Flickr

Sarah Winnicki (skwinnicki@ksu.edu)

Biology, Kansas State University

Effective science communication depends on communicators' understanding of their audiences' level of interest, preferred communication style, and previous knowledge. Accounting for different audiences is difficult in person but can be even more complicated in online interactions where audience identities can be much more ambiguous or completely unknown. Personal websites and blogs are often targeted to a specific audience and formatted to facilitate accessibility to that audience, but this level of customization is unattainable on commercial social media sites because of the restricted capacities of each different platform. How do Twitter lists differ from Facebook groups and what are the needs of individuals participating in each? Why do most tweets reach their maximum engagement in hours while YouTube videos acquire views years later, and how should you adjust your messages accordingly? What are the benefits and drawbacks of scheduling tweets or linking social media platforms? In what ways can you make your communication more accessible to differently abled audiences using accurate closed captioning and picture labels? How can you reach out to under-represented groups on social media? I will use examples from my years of research communication to offer perspective on these and other questions regarding the most effective ways to communicate science on social media platforms.

Crash-Course Workshop: Scientific Symposium

Bliss Betzen (bmbetzen@ksu.edu), P Silva, E Delorean, E Adhikari, G Cruppe, F Maina, C Cruet-Burgos, U Sahar Rana, Y Li

Plant Pathology, Kansas State University

Science communication is ever-changing due to new technologies such as social media. This advancement allows us to encompass diversity and increase awareness by engaging a larger audience. Scientists strive to be transparent and engage with the community in new and creative ways and to have the same level of communication with our peers. While we act on new avenues of science

communication, there are still effective and timeless ways to do this through scientific symposia. Symposia are an ancient form of science communication. They used to be social drinking parties in Greece that were centered around intellectual discussions. Now symposia give us the opportunity to bring together researchers, leaders, and students to exchange knowledge, create broader networks to build on scientific advancements, and provide a platform to communicate science to the general public through social media. In this discussion, we will go through how our symposium committee has managed to orchestrate a symposium by giving a crash-course workshop including tips, tricks, and important notes our team has gathered. Alongside our workshop, we will give examples from our upcoming biennial symposium, "A New Era for the Green Revolution: Celebrating Women in Agriculture," which will be held at Kansas State University on April 4th, 2019. This symposium in particular offers an entirely female speaker program and organizing committee, highlighting advancements from women in agricultural sciences. Attending our symposium, whether in-person or through distance delivered, offers a valuable educational experience for the science community and students to present their research findings to their peers.

Using SciComm to Grow a Program

Jeremy Marshall (cricket@ksu.edu)

Entomology, Kansas State University

Science communication is only necessary if we have science to communicate. For science to exist, we need strong programs that are not just communicating their findings but convincing students that particular types of science are fun, exciting, and worth building a career around. We can no longer assume that the words Science, Medicine, Research, and Doctors are enough to excite and entice young minds to study a particular type of science. So, while communicating to a larger, diverse audience is important, we need to start by using our communication techniques to grow our own programs. Here, I address our SciComm efforts in Kansas State University's Department of Entomology to grow our Minors program from 5 to 50 students in two years.

Distributing Student Videos through NSF Channels

Tom Hallaq (thallaq@ksu.edu)

Journalism and Mass Communications, Kansas State University

The National Science Foundation operates several media distribution outlets including Science360.gov and The Knowledge Network cable channel. Creating quality content connected to NSF grants can provide an avenue for submitting your content to NSF for distribution through these Channels. I'll tell you how I did it.

It's Not You, It's Me: How to Work with Community Partners

Jared Bixby (bixby@cityofmnhk.com)

Sunset Zoo

Engaging public audiences typically involves a partnership, and the relationship between a scientist and a community partner is central to the success of science communication events that engage public audiences. Furthermore, effective partnerships require mutual respect and an understanding of each partner's institutional culture. Building on this understanding, Sunset Zoo used the Portal to the Public framework to strengthen its relationships with scientists to further the science communication goals of everyone involved. Hear how you too can use the framework to further your efforts in science communication.

Science Communication in the Era of “Alternative Facts”

Michi Tobler (tobler@ksu.edu)

Biology, Kansas State University

Science is at the heart of democracy; it provides the basis for an informed citizenry that can make decisions for the common good. However, confidence in science has waned in some segments of the population, and scientific findings on many pressing societal issues clash with public perception, political agendas, and policy initiatives from both conservative and liberal groups. These discrepancies have been fueled by the rise of social media, which provides a stage for the rapid proliferation of misinformation generated by dubious entities with ulterior motives. In addition, we live in a time of increased polarization and partisan bias, where affirmation of people's identity and beliefs can supersede rational evaluation of evidence. These troubling developments present challenges for scientists and academic institutions: How do we bolster the trust that diverse publics put into science? How do we best communicate science, especially those that have been exposed to campaigns of misleading information? And, how do we prepare scientists, so they can effectively engage broader audiences to communicate complex concepts and their relevance to everyday life? I will reflect on existing grass-roots efforts at K-State that have made progress to advance science communication. These efforts have provided new platforms for interactions between scientists and the public and implemented innovative approaches to infuse science communication skills into the continued education of undergraduates, graduate students, staff, and faculty. I will also advocate for our community to play a leadership role in the development and implementation of novel models that promote science communication. Our country is in desperate need for concentrated efforts to learn from best-practices in science communication that happens at a local scale and develop novel models that effectively address misconceptions about science in mass and social media, especially considering the rapid propagation of “alternative facts”.

Lessons from Developing the Kansas Science Communication Initiative

Sarah Hancock (sarhan@ksu.edu), M Tobler

Communicating science helps address the disconnect between the public and higher education, prepares graduate students for diverse careers, and helps meet an institution's land-grant mission, but most institutions don't have a mechanism to support or promote science communication. At Kansas State University, several faculty, staff, graduate students, and community partners came together to create the Kansas Science Communication Initiative. We'll share how we did it, our major activities, lessons learned, and future goals.

Lightning Talks Presenters and Titles

- *John Coffin* (jlcoffin3@gmail.com): Hemorrhaging Heartland: The Backyard Environmental Disaster You've Never Heard About.
- *Gregory Finnigan* (gfinnigan@ksu.edu): Controlling Biological Populations with CRISPR Machines.
- *Kerry McGowan* (Kerry.McGowan@wsu.edu): Evolutionary Education in the Inland Northwest (EvoEd-IN).
- *Sarah Lamm* (slamm@nau.edu): String-Model of Curiosity Rover to Demonstrate Physical Size for Outreach.
- *Hanna Mitchell* (hanna.mitchell@outlook.com): Picture Worth a Thousand Words.
- *Narmadha Mohankumar* (meenu8912@gmail.com): Is My Advisor Hiding in their Office?
- *Anne Schechner* (anne.schechner@gmail.com): What We Lose When We Average: Rivers, Metabolism, Heterogeneity, and You!
- *Sam Sharpe* (sharpes@ksu.edu): Stressed Out Plants.

Short Film Presenters and Titles

- *Tom Hallaq* (thallaq@ksu.edu): Hungry Heartland - The Cuba Story.
- *Jeremy Marshall* (cricket@ksu.edu): Waggle.
- *Alice Boyle* (aboyle@ksu.edu): Gate 5.

ART(ifacts) Presenters and Titles

- *Shelby Astle* (sastle@ksu.edu): Building Blocks: Experiential Learning Activities for Teaching Relationship Science to Teens.
- *Nick Barts* (Barts2@ksu.edu): Conducting Research in a Toxic Environment.
- *Lindsey Bruckerhoff* (lbrucke@ksu.edu): The Largemouth Bass You Love to Catch: Friend or Foe?
- *Sam Fox* (sam1fox25@ksu.edu): Getting to the "Core" of Soil Microbes.
- *Bridget Gross* (bgross3@huskers.unl.edu): Use of Video in Honey Bee Management.
- *Dough Golick* (dgolick2@unl.edu): Building a Better Bumble Bee Domicile
- *Lauren Konrade* (lakonrad@ksu.edu): The Life (and Death) of a Researched Sunflower.
- *Paige Mcallister* (paigemc4@ksu.edu): MyRelevate: Where We Are and Where We're Headed.
- *Dylan Smith* (inkliizii1@gmail.com): Using Radio Waves to Track Animals.
- *Emily Wedel* (erwedel@ksu.edu): Attack of the Clones: How Woody Shrubs Survive the Prairie.
- *Libby Wilson* (ejwilson2@ksu.edu): Microbes of Fish Living in Toxic Springs.
- *Sarah Winnicki* (skwinnicki@ksu.edu): What Can Go Wrong Will Go Wrong: a Field Work Wall of Shame.

Science Festival Participants

- John Coffin (jlcoffin@gmail.com)
- Sarah Colburn (sarahcolburn@ksu.edu)
- Priscila Guzman (pguzman@ksu.edu)
- Ashlee Herken (herken@ksu.edu)
- Garrett Hopper (ghopper@ksu.edu)
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