

NEWSLETTER



The Fall 2022 "Welcome Back" pizza party attracted CNS students from all four departments. Attendees enjoyed pizza and played trivia for prizes.

Dean's Message

DR. CHARLENE WOLF-HALL

Our college has had a busy September and October with events such as our welcome back event for students, One Day for State, our second annual college scholarship brunch, West River Alumni event, Senior Day, the Girl Scouts BIG event, SD Biotech Summit, Spooky Science, and Hobo Day among others (Phew!). We had more alumni than ever join us at our tent to enjoy the Hobo Day parade.

Several students have had great opportunities to travel, attend regional meetings, and get outstanding recognition for their work. That is part of what makes SDSU so

great, the ability for students to travel and experience professional conferences.

We have also passed the midpoint of the semester and the next couple of months will go quickly. Remember to tap the resources offered to help us all get through the times that can be overwhelming.

The months went by quickly and we have made many new friends and connections. We celebrate our alumni and thank many incredibly generous people who support our students, like the Easts. Thank you, students, faculty, staff, alumni, friends, and supporters, for all you do to make this college the best. Enjoy November and the holidays to come.

Celebrating Work Anniversaries

Sept. - Oct. 2022

Volker Brözel - 19 years
Radhey Kaushik - 19 years
Jason Kerkvliet - 12 years
Lauri Sohl - 10 years
Moustafa Khalaf - 9 years
Anne-Marie Hoskinson - 6

Awards & Recognition

This year's new cohort of CNS Student Ambassadors is up and running! Students are selected at the start of each school year through a competitive application process. The ambassadors already helped with multiple outreach events this semester and have more coming up soon.

Deirdre Cross, Human Biology
Courtney Currier, Human Biology
Tyffani Hanson, Human Biology
Madison Higbee, Biology
Mark Kalyegria, Biochemistry
Himesh Parmar, Microbiology & Biotechnology
Olivia Petrik, Biotechnology
Paige Wood, Human Biology

A special thanks goes to **Clara Greenhagen**, Spring 2022 graduate from the Department of Biology & Microbiology and current GTA. She has taken a leadership role in assisting **Brandy Netty** with coordinating this group!

Congratulations to the Chemistry Club on receiving two awards from the American Chemical Society!

Outstanding Chapter Award

This award is the highest level of honor presented to student groups by the ACS and represents acknowledgement of a high quality, active program.

Green Chemistry Award

The Green Chemistry Institute awards this through ACS. Among the green activities last year was a presentation by Dr. John Warner, who, along with Dr. Paul Anastas, created the framework around which green chemistry has evolved over the past 25 years.

"Congratulations to members of the Student Affiliates of the American Chemical Society, aka the Chemistry Club, and especially to their advisor, Dr. Jewell, their president, Aubrie Franken, and the club officers," said Dr. Doug Raynie, Department Head of Chemistry & Biochemistry. "Aubrie and her team have worked hard to ensure that the club provides a mix of fun activities and professional development opportunities."

Club leadership:
President - **Aubrie Franken**
Vice President - **Jordan Traub-Jensen**
Secretary - **Macy Winslow**
Treasurer - **Libby Gregg**
Faculty Advisor - **Melody Jewell**



ASM Awards

Three students from the Department of Biology & Microbiology received awards at a regional American Society of Microbiology meeting! Read more on page 4.

- **Armaan Kaur Sandhu**: 2nd place graduate oral presentation
- **Isaac Kovash**: 2nd place undergraduate poster presentation
- **McKenzie Brown**: 3rd place undergraduate poster presentation

AAG GPRM Award

The South Dakota State University student team won the GeoBowl competition for the third year in a row at the American Association of Geographers Great Plains Rocky Mountains regional competition! Read more on page 5.

- **Colton Aftanski**
- **Kaila Brudellie**
- **DeAndre French**
- **Elijah Myers**
- **Ashish Pandey**
- **Natalie Toben**

Midwest Regional ACS Meeting

Three undergraduates and four graduate students traveled to Iowa City, IA to present their research results at a regional ACS (American Chemical Society) meeting. Trevor Ostlund, pictured 3rd from the left, presented on the design and synthesis of a set of Triazole-Estradiol analogs as a potential cancer therapeutic.

"These analogs were found to be quite potent in being cytotoxic to both ovarian cancer and colorectal cancer. We also found that these analogs were able to prevent certain aspects of drug resistance in cancer by inhibiting ABC transporters, which are proteins that remove drugs from the cell itself, rendering them ineffective."

Some of the students' travel was funded by the East Fellowships. Learn more about the program and the legacy of the donors on page 8.



Pictured left to right: Noe Aparicio, Kakan Sutradhar, Trevor Ostlund, Emily Hedge, Sharmin Sultana, Axel Irianni, Khadija Bilkis

"After graduation, I plan to move into a post-doctoral role to take on a higher level of research and hone my skills in a different research area to eventually move to academia. My goals are to begin grant writing for funding so that I can eventually develop my own research laboratory."

-Trevor Ostlund

Upcoming Dates

- November 11** - Veteran's Day, no class
- November 14-18** - Geography awareness week
- November 15** - Day of Scholars poster presentation
- November 16** - VR lab open house
- November 25** - administrative leave
- December 8-14** - final exams
- December 19** - grades due by midnight
- December 23** - administrative leave
- December 31** - Science as Art submissions due
- December 31** - Wadsworth Research Award nominations due

... and several seminars! CNS faculty and staff can access a full calendar on [InsideState](#). This is a resource to help with event planning and avoiding conflicts.



**SOUTH DAKOTA
STATE UNIVERSITY**

College of Natural Sciences

North Central ASM Meeting

Eight students and two faculty from the Department of Biology & Microbiology traveled to Grinnell College to attend the North Central ASM (American Society for Microbiology) meeting. It was the 82nd annual meeting and was held in Grinnell, IA on October 21 - 22, 2022.

Isaac Kovash, Human Biology B.S., was able to present his research at the meeting and received an award for 2nd place in the undergraduate poster presentations. His research focused on determining the effect of a specific gene on *E. coli* cells developing persistence to antibiotics.

Pictured left to right: Muhammad Yasir Afzal, Sukhvir Kaur, Ruqayyah Amaratunga, Mohammed Salahuddin, Isaac Kovash, Dr. Nicholas Butzin, Derek Follett, Armaan Kaur Sandhu, McKenzie Brown, Dr. Volker Brözel



"I learned so much about topics that I do not have the opportunity to pursue in my daily life. My favorite had to be a talk on CAR T-cell therapy!" Kovash said. During the trip, he also enjoyed the feeling of community and the positive atmosphere at the meeting. "Everyone was supportive and there were plenty of opportunities to have fun amidst all the science being discussed."

McKenzie Brown, Human Biology B.S., received third place in the undergraduate poster presentation. "For my research, I looked at the surface properties and root adherence properties of the *Bradyrhizobium diazoefficiens* USDA 20 strain of bacteria and how these properties are altered in the presence of different root exudates, or differing compounds present in the root environment."

Armaan Kaur Sandhu, pictured 4th from the right, received 2nd place in the graduate student oral presentations. She is working on her Ph.D. in Microbiology.



"The annual meeting provided a great opportunity to learn about microbiology research others are performing throughout the region. I enjoyed listening to the keynote speakers who talked about prion diseases and bacterial interactions that occur with cystic fibrosis disease."

-McKenzie Brown

Geography Department Travel

The Geography & Geospatial Sciences Department traveled to Denver, CO for the AAG (American Association of Geographers) GPRM (Great Plains / Rocky Mountains) regional conference. 27 students and six faculty were able to go. Trips like this one are possible thanks to donations! Knowing the impact that experiencing new places can have students, many Geography alumni have come together to sponsor a travel fund for the Department.

"I learned and saw many new things in Denver and during the course of our trip. I saw firsthand how different places can be, not only in the environment, but the people as well," said Natalie Toben, a sophomore majoring in Geography and Sociology. "I was very fascinated with the differences in what people in Denver considered normal and part of everyday life, compared to what I considered part of everyday life."

Students gave both oral and poster presentations at the conference, and a special highlight of the trip was the GeoBowl. SDSU's team beat BYU 110 to 80 in the final round to win the trivia match! This was the third year in a row our team has taken home the title.

The winning team members, pictured left to right, are: Kaila Brudelie, Elijah Myers, Ashish Pandey, Colton Aftanski, DeAndre French, and Natalie Toben.

Elijah Myers was the second leading point earner in the GeoBowl and was selected to be on the regional GPRM team that will compete in the World GeoBowl competition this spring.

"During GeoBowl, I became aware of not only how much I don't know, but how much some of my teammates do know. But I was very proud of myself for getting one question right for my team in the final round!"

-Natalie Toben



Media Coverage of CNS



Two of the team members are alums from the Department of Geography & Geospatial Sciences! Jeffrey Irwin, '14 & '18, and Jerad Shaw, '04. [Click to read the whole article.](#)

Landsat Calibration / Validation Team Earns NASA Award: "NASA

has recognized the contributions of the Landsat 9 calibration / validation team with the Robert H. Goddard Award—Science.

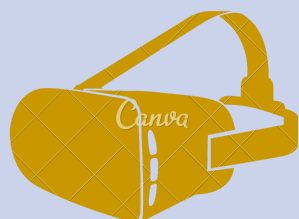
The combined Landsat Cal/Val Team is led by NASA Goddard Space Flight Center and the USGS Earth Resources Observation and Science (EROS) Center and also includes South Dakota State University, Rochester (New York) Institute of Technology, the University of Arizona, and NASA Jet Propulsion Laboratory. Also included in the award for Landsat 9 efforts is the Operational Land Imager team at Ball Aerospace."

SDSU readies for 'metaversity' through virtual classes, campus: "SDSU's metaverse classrooms are online this semester as professors explore a new frontier of education: virtual reality. At the cutting edge of classroom innovation is Sara Madsen, a senior lecturer in the department of chemistry and biochemistry. This semester, she's trying something few instructors have had the opportunity to do: teach organic chemistry in the virtual-reality metaverse.

'Space is an issue because students are taking molecules and objects that seem really small at first, but students can make them as big as they want,' Madsen said. 'They can make them 100 times their body size, so we go out to these other spaces that give us the space to do that.'

This semester, SDSU has allocated an anatomy course and organic chemistry course 50 headsets (headsets for 24 students and one instructor for each course) and had them shipped to students. Another six headsets went to the Washington Pavilion, 16 at the American Indian Student Center and 10 in a mobile lab that can be taken to recruitment events."

[Click to read the full story in The Collegian, SDState's student-run newspaper!](#)



Want to see a preview of our metaversity?

Of course the best way to experience it is in 3D with the VR goggles, but [this YouTube clip](#) offers a glimpse into what our partner, VictoryXR, has been working on!

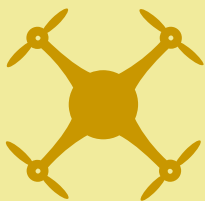


Media Coverage of CNS, cont.

Drones working to detect crop disease early, propel ag research forward:

"We are trying to develop robust, rapid, accurate and operational solutions and tools to detect and diagnose crop water stress, nutrient deficiency, and crop health and diseases—especially early detection," Maimaitijiang said. 'We are trying to develop some new algorithms using satellites, using drones, using artificial intelligence, using different types of information, to detect this in advance before the symptoms become visible. Because once it becomes visible, the control could be too late.'

Once the disease becomes visible on the leaf level, even spray may become useless, Maimaitijiang noted."



Click to read more about the research project and learn about flying commercial drones!

Drone technology reaches new heights at SDSU: "At South Dakota State University, the use of drones is not a new concept. However, the curriculum is growing, and researchers are working on ways to collect more data sooner so that the data can be used by farmers to assess things like crop diseases, water stress, nutrient deficiency and more." Click to watch the whole story by KELOLAND News, including an interview with our very own Dr. Maimaitijiang!



REMAST Program at SDState receives national spotlight

The Robert Noyce Teacher Scholarship Program is celebrating its 20th anniversary! The program works hand-in-hand with AAAS (American Association for the Advancement of Science) and NSF (National Science Foundation) and provides funding to institutions of higher education to provide scholarships, stipends, and programmatic support to recruit and prepare STEM majors and professionals to become K-12 teachers. The program seeks to increase the number of K-12 teachers with strong STEM content knowledge who teach in high-need school districts.

As part of the anniversary celebration, they selected some schools, including South Dakota State University, to feature. REMAST (Rural Enhancement of Mathematics And Science Teachers) has been funded through the Noyce Program since 2007 and has some impressive stats:

- **Current Scholars:** 6
- **Graduated Scholars:** 69
- **Accomplishments:** 52 (75%) of the 69 teachers who have graduated are still teaching secondary math or science. We have awarded \$1.1 million in scholarships and \$800,000 has been repaid through teaching. Putting everyone together, our alumni have 353 years of teaching experience.

[Click here](#) to learn more!

Celebrating the lives of those who touched the College

Mary Ellen (Kub) East of Ann Arbor, MI passed away at the age of 72 years on October 25t, 2022. Mary received her Chemistry B.S. from South Dakota State University and went on to have an impressive career. She was the sixth woman to complete a general surgery residency at University of Michigan and one of the first woman surgery faculty at UM. She practiced general surgery at the University of Michigan Hospital and at the Ann Arbor VA Medical Center until retiring in 2014. She was awarded the general surgery residents' teaching award in 1987 and 2007 and the Veterans Affairs "Hearts and Hands" award in 1997. Mary also served as the Ann Arbor VA Associate Chief of Staff for Education for 15 years. [Click here](#) to read the full obituary.



Mary, pictured center in the front row, and her husband Jack have been strong supporters of the Department of Chemistry & Biochemistry for many years. They funded four research fellowships every summer for undergraduate students to get hands-on experience in a lab. Their program included a stipend, supply funds, and travel funds so students could go present their work at a national ACS (American Chemical Society) meeting. Mary and Jack were able to visit campus this past September, share lunch with some of their fellowship recipients, and hear about their research experiences.

Thank you for all the support on One Day For State! The College of Natural Sciences raised \$253,967 which was the second highest amount for an academic unit, right behind the College of Engineering at \$264,078.



6,825
GIFTS 

5,144
GIFTS WERE
\$100 OR LESS

 **449**
STUDENTS
DONATED
8,657

 **555**
FACULTY & STAFF
DONATED
\$105,425



**SOUTH DAKOTA
STATE UNIVERSITY**

College of Natural Sciences

Innovative Learning Spaces

The College of Natural Sciences Associate Dean, Dr. Greg Heiberger, was invited to provide a keynote at the 2022 Innovative Learning Spaces Summit in September in Amsterdam. Dr. Heiberger's talk focused on SDSU's work in outreach, curriculum and future research in the application of virtual reality in higher education.

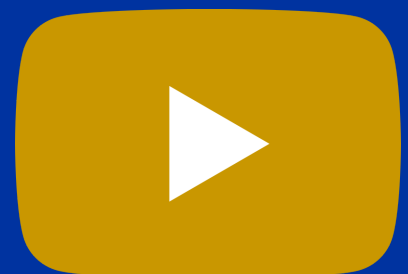
South Dakota State University was recently named one of the first 10 Metaversities and launched two classes this fall with virtual reality as a part of the curriculum. Throughout the '21-'22 academic year SDSU used VR to engage over a thousand middle school and high school youth showcasing exciting and innovative methods of teaching and learning science.

Dr. Heiberger's talk can be found on YouTube and has led to engagement with peer institutions across the world. SDSU's leadership in Virtual Reality in Education has garnered the attention of 25+ news articles and interviews, and many alumni, donors and local businesses and industry look to SDSU to provide leadership in their VR applications. SDSU's CNS will continue to apply this technology in strategic and meaningful ways to address challenges in our state and region.

We see VR having potential to help us teach in more hands-on and engaging ways with students in rural settings as well as with our students on campus – helping us to do things in VR we can't do in real life. Holding and manipulating magnified DNA, having 24/7 access to cadaveric learning experiences, and being able to safely repeat chemical experiments as many times as needed without laboratory supervision adds to our robust portfolio of science experiences as a land grant university – extending our “hands-on” approach to learning outside the classroom and laboratory walls!



Click to watch Dr. Heiberger's keynote!



Open PRAIRIE Data

What is
"Open PRAIRIE"?

The **Open Public Research Access Institutional Repository & Information Exchange** tracks publications from within Natural Sciences throughout the year, showing where and when articles were opened all around the world.

AUGUST 2022

Data across the whole College of Natural Sciences:

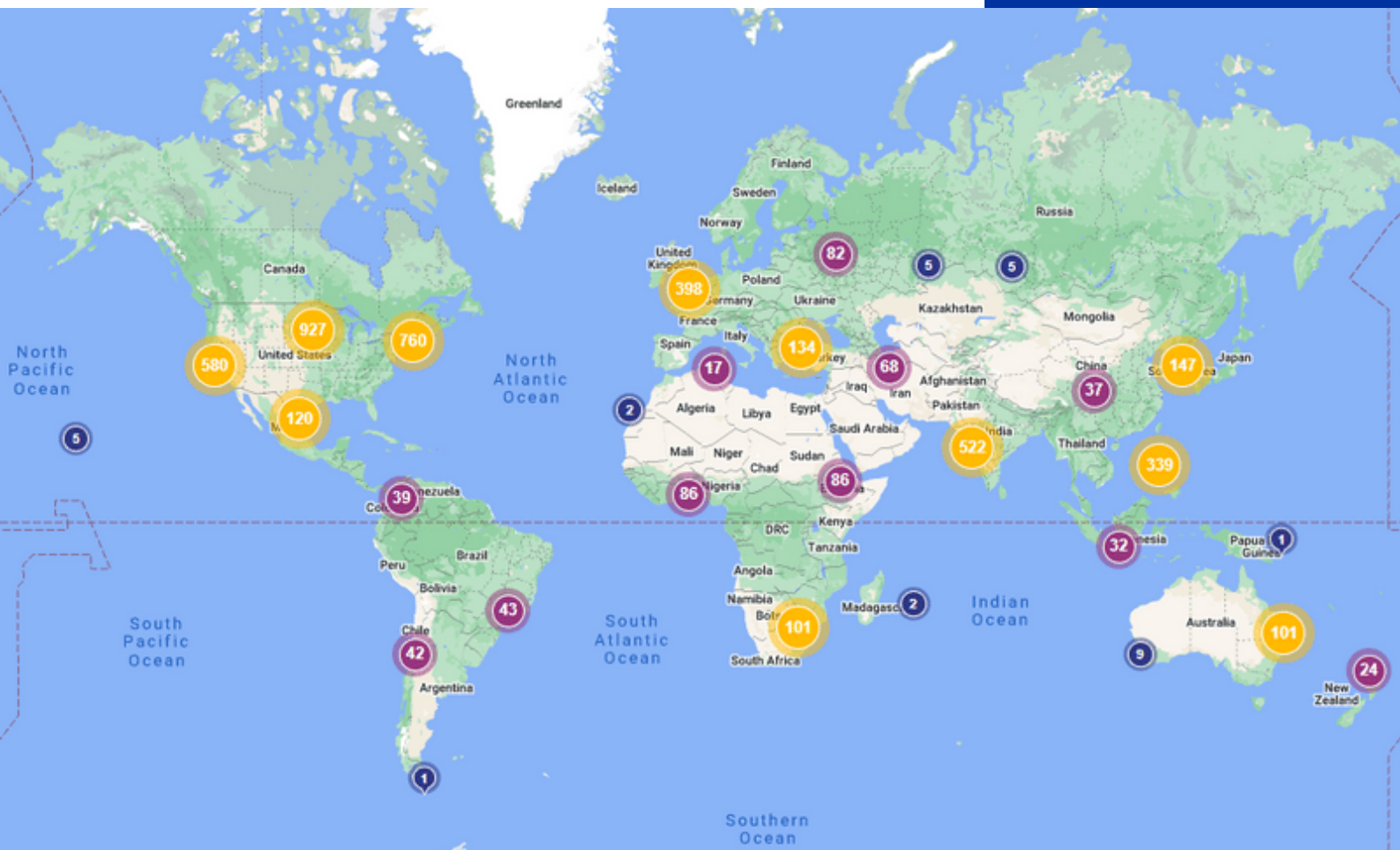
- 2,216 downloads at 361 institutions in 105 countries
- 3 new works posted
- *Conductance Studies of Concentrated Solutions of Sodium Hydroxide and Potassium Hydroxide Electrolytes* was the most frequently downloaded piece at 102 downloads. This Master's thesis was published in 1968 by Andrew Ling-Wei Woo.

SEPTEMBER 2022

Data across the whole College of Natural Sciences:

- 2,641 downloads at 435 institutions in 98 countries
- 5 new works posted
- *Conductance Studies of Concentrated Solutions of Sodium Hydroxide and Potassium Hydroxide Electrolytes* was the most frequently downloaded piece at 114 downloads.

COMBINED MAP FOR AUGUST - SEPTEMBER 2022:



2022 CNS Scholarship Brunch



President Barry Dunn and Jane fund a scholarship in the Department of Biology & Microbiology. Dunn received his B.S. from the Department in 1975. They made time on a busy morning to stop by the Scholarship Brunch and say a few words!

Attendees took home plants as memento to help them remember their SDSU roots and join with us in the Dean's #1 goal for the College - grow!



October 1, 2022
McCrary Gardens



Bottom left: Bhawandeep Kaur, pictured right, received the Ernest J. Huggins Endowed Scholarship in Biology. This award is brand new for AY23 and is awarded through a competitive process. **Bottom right:** this endowment was established by Mildred K. Huggins, pictured left.



Fall 2022 Outreach Events

It has been a busy semester for outreach events! Many thanks to everyone who has pitched in to make these events a success. Enjoy some photos from all the activities.

1. One Day for State (9/8): CNS ambassadors conducted VR demos during the Yellow & Blue Block Party.

2. Science at the Pub (9/13): Dr. Matt Miller and Dr. Larry Browning, along with students from the NSTA Club (National Science Teachers Association), put on a science show for adults at Severance Brewing in Sioux Falls.

3. Scrubs Camp (9/22): this camp took place in Watertown, SD and was aimed at high school juniors and seniors who are interested in pursuing careers in healthcare. CNS ambassadors demoed relevant VR programs and spoke with prospective students about their coursework and experiences as pre-health college students.

4. West River Alumni Social and Pumpkin Festival (9/24): both events took place in Rapid City and were great opportunities to build awareness and name recognition in a part of the state we don't reach very often.

5. Senior Day (10/1): hundreds of high school seniors went through the Miller Wellness Center, learning about all the programs offered at SDState. Faculty, staff, and students spent time talking to attendees about degrees and career paths in the sciences.

6. Girl Scouts BIG event (10/1): Dr. Matt Miller and Dr. Larry Browning attended the annual BIG (Believe In Girls) event to offer hands-on science demos for the Scouts and their parents.

7. Promising Futures Fund visit (10/8): 250+ middle schoolers from Sioux Falls visited campus for tours with the football team, Pride of the Dakotas, and more. Folks from CNS provided a VR scavenger hunt in the metaverse and science demos.

8. South Dakota Biotech Annual Summit (10/11): a variety of faculty, staff, and student ambassadors pitched in to staff an exhibitor table at this event. We offered VR demos, graduate school information, and connected with industry partners.


9. Spooky Science (10/15): Dr. Matt Miller and Dr. Larry Browning have put on shows at the Washington Pavilion's "Spooky Science" event for over 20 years. This event regularly sees over 1,000 participants.

10. Nebraska Physics and Astronomy Fall Summit (10/22): Dr. Larry Browning attended this event at University of Nebraska-Lincoln and offered a workshop for high school physics teachers to build solar telescopes.



Outreach Events, cont.





"I really loved getting to bring some exciting science to all sorts of new people, it is always a great time to show others how exciting and explosive chemistry can be!"

-Carter Koons,

Chemistry Ed major



Hobo Day Parade & Alumni Tent



Clockwise from top left: 1 & 2: the annual alumni tent's new location, in front of Wecota Hall. 3: Alum Ron Hayes lends his truck and trailer for the Geography Club float. #78 on the Jackrabbit cutout is for John O'Bryan, current Geography student and offensive lineman. 4: Dr. Wolf-Hall waves from the Deans' float. 5: past support staff join the fun. Left to right: Jan Matson, Carol Doyle, Sharon Ellens. 6: Julie Leibold joins the parade dignitaries as the Fishback Honors College Teacher of the Year. 7: Andy Ellis joins the parade dignitaries as the CNS Teacher of the Year. 8: attendees enjoyed donuts and more.

