

# LEADING THE WAY IN BIORENEWABLES

2023 ANNUAL REPORT



NCERC at SIUE

Advancing Biorenewables Research

July 2022 - June 2023



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# A Letter from our Executive Director

## To Our Advisory Board Members & Stakeholders

We appreciate you taking the time to read the National Corn-to-Ethanol Research Center's Fiscal Year Review. FY23 was another one for the memory books as we saw the continuation of contractual research at a record pace, while complimenting that research with unprecedented success in both grant funded research and self-initiated research.

FY23 began with a new program as we launched a "**Careers in Biotechnology**" Job Shadow program. The first participant in the program was Kennedy Voelker, an incoming Senior at Waterloo High School, Waterloo, IL. Throughout the fiscal year, NCERC hosted numerous Job Shadow participants, all seeking the opportunity to see what a day in the life of biotechnology has in store.

Throughout the second quarter, we had sustained **contractual research at both the pilot and demonstration scale**, with work in biopolymers leading the way. With the demands on both time and assets, we once again had no choice but to become creative in our staffing along with staffing schedules and our hours of operation. For the first time in the history of NCERC, a full pilot plant campaign was conducted utilizing two full time staff, along with two research fellows and two contractual employees. The second quarter of FY23 challenged NCERC staff to their limits, but, as always, the team powered together to complete numerous successful projects.

The third quarter of FY23 saw the Fermentation Laboratory and Fermentation Suite (Intermediate Scale Fermentation), with unprecedented levels of opportunity. The goal of taking contractual projects from Laboratory scale to Pilot scale was achieved with a number of **corn starch-based projects as well as alternative feedstock-based projects**. At the demonstration scale, NCERC saw the entire quarter filled with contractual research, as well as an entry into contractual production of a soon to be launched biopolymer.

NCERC finished FY23 on a high note, in that, we **signed our first ever, demonstration scale project in the area of Green Chemicals**. This novel work, which will come to fruition in FY24, will see NCERC simultaneously produce both ethanol and a green chemical. The work in this area is not only new to NCERC, but, it's the first of its kind, at this scale, in the world. NCERC looks forward to assisting our contractual partner in the successful commercialization of this novel technology.

In summary, FY23 can best be described as **the year of the great rebound**. This great rebound is not without challenge, in that, the competition to hire, within the St. Louis region, is at a level I've never seen in my professional career. That being said, as always, NCERC will continue to be creative in the manner in which we seek and recruit personnel in order to not only achieve, but exceed all expectations of our clients as well as ourselves. 💧



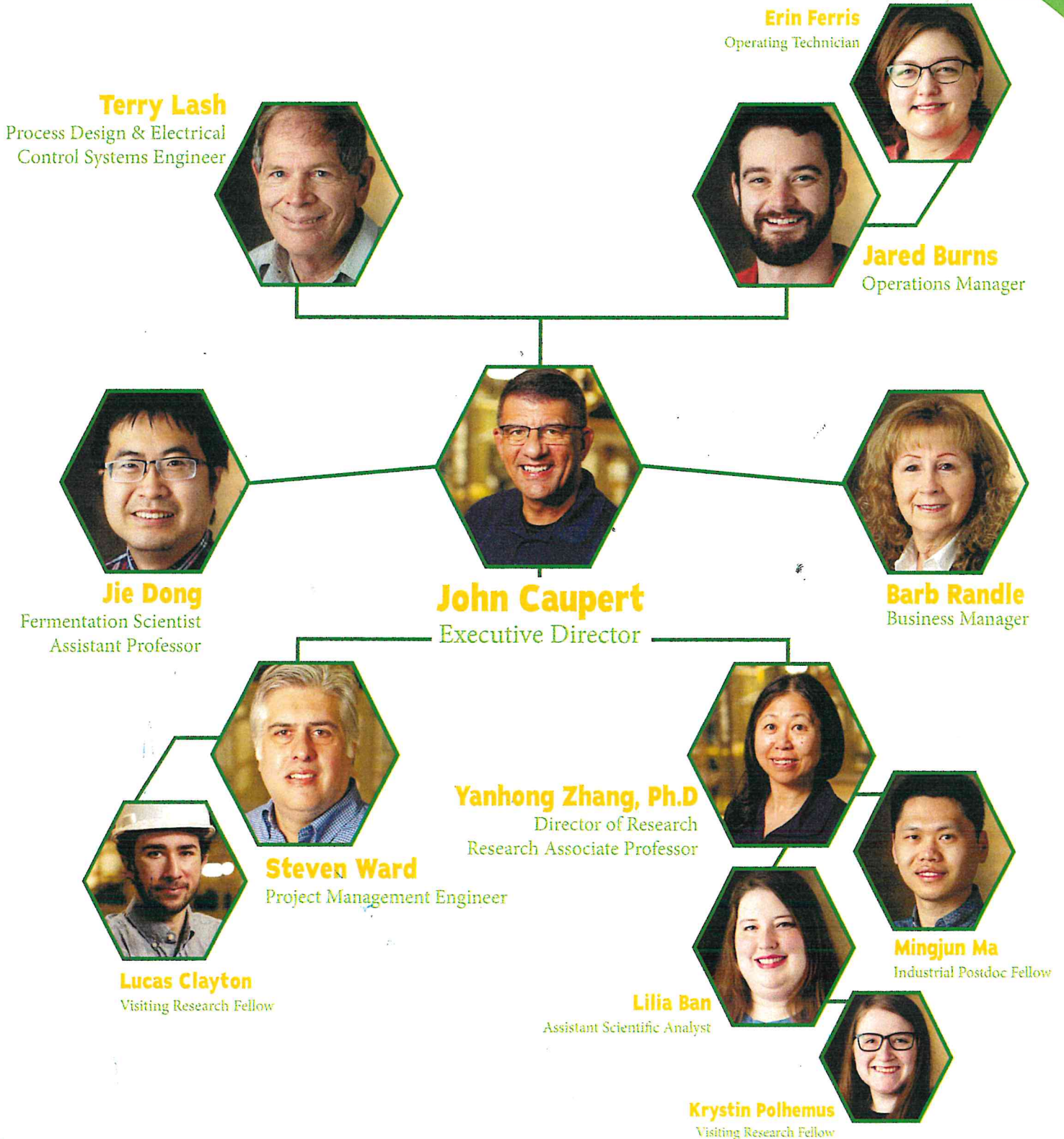
Many thanks for your support,

A handwritten signature in black ink that reads "John Caupert". The signature is written in a cursive, flowing style.

John Caupert  
Executive Director, NCERC

# NCERC — ORGANIZATIONAL CHART

DELIVERING INNOVATION, DATA & RESULTS



# NCERC Partners With BioMADE To Advance Research In Biobased Products

Through funding provided by BioMADE; NCERC, Valerian Materials, the University of Minnesota, and Scientific Bioprocessing Inc. (SBI) have partnered to perform research and development on novel sustainable materials solutions.

Launched in 2021, BioMADE is the most-recently established Manufacturing Innovation Institute. By supporting the development of biomanufacturing technologies, BioMADE and its network of 150+ members are strengthening American competitiveness, creating a more resilient supply chain, and helping the U.S. becoming more self-sufficient. This project is one of several being funded by BioMADE as part of its mission to secure America's future through bioindustrial manufacturing innovation, education, and collaboration.

“Projects like this are a perfect example of the research we do in the bioproducts space,” said John Caupert, NCERC executive director. “Creating value for our partners who are scaling up novel biotechnologies is what we do best and we're eager to be part of this next generation of bioproducts. We are excited about this new partnership and to be working with a dynamic group of researchers with similar missions in mind. This is our second BioMADE-funded project and we are extremely appreciative of their ongoing generosity and support of NCERC.”

Valerian Materials, an emerging company focusing on the development of bio-derived, recyclable, and sustainable polymers, will lead the partnership that will optimize and scale the production of betamethylvalerolactone (BMVL), a bio-based molecule with potential to be converted into several different types of polymeric materials and products. The fermentation and downstream processing will be performed at NCERC, a globally-recognized research institution dedicated to the commercialization of



**NCERC's Fermentation Alley includes four 22,000 liter bioreactors.**

biobased fuels and products. Scientific Bioprocessing Inc., a leading-edge instrumentation company focused on connecting sensor technology to data analytics, will work in tandem with NCERC to provide equipment and expertise related to fermentation monitoring, analysis and control. 🔥

# NCERC — LAUNCHES JOB SHADOW PROGRAM FOR HIGH SCHOOL STUDENTS

As part of its ongoing efforts to provide hands-on training for all students, NCERC has launched a job shadowing program for high school students interested in learning about careers in biotechnology.



**Kennedy Voelker (left), High School Senior at Waterloo High School participates in Bioeconomy Job Shadow Program.**

The Careers in Biotechnology job shadow program will facilitate on-site learning opportunities at the NCERC facility for students who want to learn about how biotechnology intersects with several different career fields, including chemistry, biology, engineering, business,

communication, marketing, and others. The new program will pair high school students with NCERC's individual staff members and give students exposure to different career paths in an innovative research environment.

“This opportunity has given me a significant advantage in refining what career path I want to pursue,” said Kennedy Voelker, a senior at Waterloo High School and the first participant in the NCERC job shadow program. “I’ve found that hands-on learning is critically important as it allows you to find what you will enjoy in your career and determine what you can be successful at. After having spent time with the NCERC staff, I’m eager to enter my senior year of high school and pursue a college degree in environmental science.” 💧

# NCERC — RESEARCH TEAM PARTICIPATES IN SIUC HEMP SYMPOSIUM



In September, NCERC's research team, consisting of Drs. Yan Zhang, Jie Dong, and Mingjun Ma, participated in series of hemp-focused events at the SIUC Hemp Symposium. These visits included a meeting with Dr. Carla Gage at her USDA-sponsored hemp plot, where they discussed further collaboration and exploration of converting various fractions of the dual-purpose plant to biofuel.

On Friday, September 16, they met with multiple members of the SIUC faculty to learn about their research and discuss opportunities for future research and collaboration.

The next day, NCERC showcased its research at an exhibit and was one of ten booths featuring services and research opportunities related to hemp. 💧



**Drs. Yan Zhang, Jie Dong, and Mingjun Ma, participated in series of hemp-focused events.**

# NCERC — HOSTS ANNUAL MEETING FOR STAKEHOLDERS

On Thursday, October 6, the NCERC leadership team held its Annual Meeting for Advisory Board members and stakeholders in a hybrid format, hosting attendees in-person at its facility in Edwardsville, IL and virtually via Zoom.



NCERC presents U.S. Congressman Mike Bost; IL 12<sup>th</sup>, with a Certificate of Appreciation for his support of Agriculture, Ethanol and U.S. Veterans.

To kick off the discussion, Illinois Department of Agriculture Director Jerry Costello provided a state of the industry update. Most importantly, he reinforced the importance of agriculture and those who make use of its products given the state's importance to the industry as the number one state in soybean production, the second in corn production and the third in ethanol.

**ILLINOIS IS:**  
**#1 IN SOYBEAN PRODUCTION**  
**#2 IN CORN PRODUCTION**  
**#3 IN ETHANOL PRODUCTION**

Director Costello was followed by a large format discussion with all attendees about the various federal- and state-level policy opportunities that will be presented to the biofuels and agriculture sectors in 2023.



Jerry Costello (left), Director of Illinois Department of Agriculture, at the NCERC Annual Stakeholders Meeting.

Following the policy discussion, NCERC staff, including Executive Director John Caupert, Director of Business Development & Client Relations Jackie Hayes, and Director of Research Dr. Yan Zhang, provided NCERC-focused updates on the Center's FY22 financials, its business development and industry relations efforts, and its research activities.

At the end of the meeting, representatives from key NCERC stakeholders, including Sarah McKay of National Corn Growers Association, Paul Bertels of Farmgate Insights, and Gary Most of Marketicity provided summary remarks following the updates provided in the second half of the meeting. 💧

# NCERC — STAFF PRESENT AT

## AFCC CONFERENCE (Alternative Fuels & Chemicals Coalition)

On November 7, Director of Research Dr. Yan Zhang presented on her research at the Alternative Fuels & Chemicals Coalition's annual conference in Washington, DC. Dr. Zhang showcased her cellulosic material pretreatment method that provides a low cost, low carbon pathway to produce cellulosic sugars and ethanol from municipal solid waste. Her presentation sparked conversations with potential collaborators in the audience.



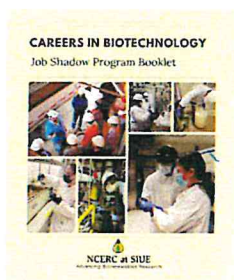
**Dr. Yan Zhang presenting at the AFCC Conference on the “Process Development Tools for Advanced Biofuels” panel.**

In addition to her presentation, Postdoctoral Research Fellow Dr. Mingjun Ma presented a poster with an overview of NCERC's research converting corn bran into Sustainable Aviation Fuel.

This conference sparked a lot of opportunity for NCERC as the final conference in 2022! Stay tuned for more updates as we build up our business development calendar for the future. 💧

# NCERC — CAREERS IN BIOTECHNOLOGY

## JOB SHADOW BOOKLET: A TOOL FOR STUDENTS



### The Careers in Biotechnology Booklet

Earlier this year, NCERC launched its “Careers in Biotechnology” job shadow program for high school students interested in pursuing careers in biofuels or other fields in the bioindustrial manufacturing sector. The program includes a one-day experience at NCERC, job shadowing our staff and seeing what their day-to-day roles look like in this career field. They're paired strategically with staff whose interests align with theirs, so that they can envision what their potential career might look like.

As part of the program, we recently published a booklet that the student can use to learn more about NCERC and these career fields, and take notes during their job shadow experience.

In addition to the job booklet, we published one pagers that reflect the three different types of paths they can take when completing the job shadow program including Communications, Laboratory Sciences and Engineering and Operations. 💧



# NCERC — FEATURED IN LOCAL NEWS

## CELEBRATING SUCCESSES IN 2022

Multiple Metro-East publications, including the Alton Telegraph and Edwardsville Intelligencer, shared an article on December 28, showcasing important articles and events from the 2022 calendar year. The article written by Edwardsville Intelligencer staff writer Scott Marion in June 2022 about NCERC's upcoming 20th anniversary and previous successes was included in the recap. 🍷



## Waterloo HS Career Fair Features NCERC'S "CAREERS IN BIOTECHNOLOGY" JOB SHADOW PROGRAM



**AJ Sensel (right), sophomore at Waterloo High School visits with John Caupert during the Waterloo HS Career Fair.**

On Friday, February 17, the NCERC team attended the Waterloo High School Career Fair in Waterloo, IL and met with dozens of sophomore and junior grade-level students. During the fair, they informed students about the career opportunities in biotechnology and NCERC's job shadow program, which helps students learn about potential careers through shadowing NCERC staff.

This team, which includes Director of Business Development Jackie Hayes and PR/social media intern Allison Simpson, and Market Research/Business Development Intern Nadia Graber, was also at a career fair at Mascoutah High School on March 10. 🍷

## Caupert Featured on THE CEREAL GRAIN CAFE PODCAST

In his second episode of the Cereal Grain Café podcast, Dr. Kurt Rosentrater talks with NCERC Executive Director John Caupert. They discuss the exciting grain processing projects that happen at NCERC and how they help the bioeconomy evolve.

This is a new podcast about "all things related to cereal grains" and features friend-of-the-Center Dr. Kurt Rosentrater and guests from across the industry. 🍷

# ILLINOIS STATE FFA OFFICERS VISIT NCERC

## PREPARING FOR FUTURE GENERATIONS



**Pictured (L-R) are NCERC Operations Manager Jared Burns, FFA Vice President Derek Sample, FFA Secretary Haley Bode, FFA State Treasurer Kate Colgan, FFA President Rachel Hood, and FFA Reporter Levi Maierhofer.**

On February 14, the 2022-2023 Illinois FFA State Officers visited NCERC to learn about the hands-on learning opportunities for high school students and the exciting ways NCERC is preparing the future generation for careers in agriculture and biotechnology.

During their visit, they took a tour of the facility, which was led by Operations Manager Jared Burns.

A special thanks to Riley Duckworth with the IL FFA Center, and the officers, Rachel Hood, Derek Sample, Levi Maierhofer, Haley Bode, and Kate Colgan. 💧

# NCERC — TEAM SHOWCASES CAPABILITIES

## OF ABLC EXHIBIT (ADVANCED BIOECONOMY LEADERSHIP CONFERENCE)

### Partner with NCERC

*"Commercialization with Confidence"*

**Bench- to Demonstration-Scale Bioreactors**  
*NCERC's team of nationally renowned experts provides services that our clients value through these key facilities:*

**Biofuel & Biochemical Pilot Plant-**  
 30, 40, 150, 1500L Bioreactors

- Pharmaceutical grade
- Downstream processing: centrifugation, distillation, vacuum drying

**Bioprocessing Demonstration Plant –**  
 (4) 22,000L Bioreactors

- Plug and play, modular design
- Downstream processing: centrifugation, distillation, multiple drying options


**Labs: Bench-Scale Bioreactors and Analytical Testing**

- Shaker flask system (250 mL), 5L Bioreactors
- HPLC, GC/MS, LC/MS/MS

**Ease of Doing Business**

- Strong Client Confidentiality and Intellectual Property Protection
- Team with 100+ years of combined experience in research
- Culture of customer service and exceeding expectations
- Accessible location within 30 minutes of STL International Airport
- Strong connections to the industries we serve

Partner with NCERC to advance your R&D projects!  
 Contact Executive Director John Caupert at [jcaupert@ethanolresearch.com](mailto:jcaupert@ethanolresearch.com).

  
**NCERC at SIUE**  
 Advancing Bioeconomics Research

  
**NCERC at SIUE**  
 Advancing Bioeconomics Research

*"Commercialization with Confidence"*

**Full Suite of Research & Development Services**

- Method Development
- Process Control & Automation
- Project Design & Engineering
- Proof of Concept
- Scale-Up
- Third-Party Validation

**Self-Initiated Research Projects**

Pretreatment Method: Cellulosic Materials → Sugars, Ethanol, SAF

NCERC's research team has developed a low cost, low carbon pretreatment method to maximize the breakdown of cellulosic material into processable sugars. Tested on multiple bio-based feedstocks.

- Municipal Solid Waste
- Industrial Hemp
- Orchard Waste
- Corn Stover
- Corn Kernel Fiber




During the ABLC Next Conference in San Francisco, NCERC Directors Dr. Yan Zhang and Jackie Hayes showcased NCERC's bench-to demonstration-scale fermentation capabilities through their booth at the conference exhibit, as well as two of NCERC's self-initiated research projects. After attending the conference for several years, this was the first time that NCERC had participated in the conference's exhibit. 💧

Posters the NCERC team showcased at the ABLC Next booth.

# NCERC — CELEBRATES INTERNATIONAL DAY OF WOMEN & GIRLS IN SCIENCE



To celebrate “International Day for Women and Girls in Science”, NCERC’s marketing/PR team featured three scientists on our social media who work in our laboratory and represent women in science at three different phases of their careers.

Violet Swanson is a Chemistry student at SIUE who is currently working at NCERC as an intern.

Krystin Polhemus is a recent college graduate who serves our team as a Visiting Research Fellow.

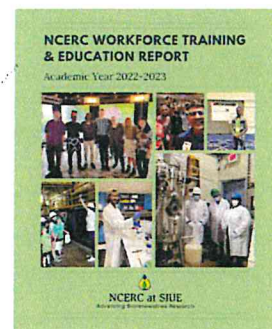
Dr. Yan Zhang serves as NCERC’s Director of Research with decades of experience in science. 💧

Laboratory intern at NCERC, Violet’s role is to assist in the overall operations of the NCERC Analytical and Fermentation Laboratories.

## 2ND ANNUAL WORKFORCE TRAINING & EDUCATION REPORT

As a leading provider of workforce training and hands-on learning in the bioindustrial manufacturing sector, NCERC publishes an annual Workforce Training & Education Report that summarizes various opportunities for students to learn outside of the classroom, as well as NCERC’s programs that train the next generation of leaders in the bioeconomy.

This year’s report features students and staff from the 2022-2023 academic year, including interns, graduate assistants, Visiting Research Fellows, Postdoctoral Research Fellows, and projects that are led by students. 💧



Workforce Training & Education Annual Report

### Social Media Spotlight:

## NATIONAL BIO-BASED PRODUCTS DAY

March 8 marked the first ever [#NationalBiobasedProductsDay](#), an initiative led by the USDA Biopreferred Program. NCERC is proud of our work with companies making the next generation of biobased products and fuels and the novel ways they decarbonize industry. 💧



# NCERC — HOSTS GOVERNMENT OFFICIALS FOR ROUND TABLE DISCUSSIONS



**U.S. Rep. Nikki Budzinski (IL-13), with NCERC Executive Director John Caupert. She addressed issues facing rural communities.**

Congresswoman Nikki Budzinski (IL-13), U.S. Department of Agriculture (USDA) Deputy Secretary Xochitl Torres Small and Illinois USDA Rural Development Director Betsy Dirksen Londrigan met with local

leaders and community partners during a roundtable discussion at NCERC on Friday, March 31. The group discussed USDA grants and common issues facing rural communities in Central and Southern Illinois.

SIUE Chancellor James T. Minor, PhD, and NCERC Executive Director John Caupert were among those who welcomed the government officials.



**(L-R) Betsy Dirksen Londrigan, Illinois USDA Rural Development Director, Katie Stuart, Illinois State Representative 112th District, Wayne Rosenthal, Illinois State Representative 108th District, Nikki Budzinski, U.S. House of Representatives, Illinois 13th District James T. Minor, PhD, SIUE Chancellor, Xochitl Torres Small, U.S. Department of Agriculture Deputy Secretary and Jerry Costello II, Illinois Department of Agriculture Director.**

Budzinski emphasized the many grant opportunities that USDA has to offer and the importance of making USDA's work accessible for the surrounding communities and organizations.

**“To the mayors and community members that are here, we really hope we can have a robust discussion around technical assistance as it is critically important to our rural communities,”** said Budzinski.

**“I have heard about the incredible work SIUE does with workforce development and the cutting-edge work with biofuels,”** said Torres Small.



**United States Department of Agriculture Deputy Secretary Xochitl Torres Small visits NCERC.**

**“When you are aware of all your assets and you work collaboratively, everyone succeeds. As we think about the future of higher education, in suburbs and outside of big cities, having that regional awareness is crucial because you serve such an important role in the workforce.”**

The NCERC at SIUE is the only center of its kind in the world. Located 20 miles from downtown St. Louis in University Park on the campus of Southern Illinois University Edwardsville, the Center supports a diverse clientele, including industry clients, academia, government, technology providers, trade associations, and domestic and foreign ethanol producers. Our capable, skilled staff offers third-party validation and commercial testing of products, technologies, concepts and ideas. 💧

# NCERC — MARCH FULL OF INDUSTRY CONFERENCES AND CONNECTIONS



**Former Illinois Congresswoman Cheri Bustos and John Caupert at the Renewable Fuels Association's National Ethanol Conference.**

NCERC's business development team had a busy month in March, attending three key industry conferences and making dozens of new connections. The month kicked off in Orlando, FL at the National Ethanol Conference, where

Executive Director John Caupert was able to catch up with Ethanol Champion and Congresswoman Cheri Bustos. Director of Business Development & Client Relations Jackie Hayes, hosted an in-person networking event for the RFA's Young Professionals Network.

A couple of weeks later, John and Jackie were on the road again attending Growth Energy's Executive Leadership Conference in Dana Point, CA and meeting with industry colleagues while continuing to learn about key issues affecting the ethanol industry.



**Growth Energy CEO Emily Skor kicked off the three-day event with a speech that emphasized the hard-won progress made last year and ongoing innovation by Growth Energy's members.**



**Betsy Londrigan; Illinois State Director for Rural Development, Jerry Costello; Director, Illinois Department of Agriculture, and Xochitl Torres Small; Deputy Secretary, United States Department of Agriculture visit NCERC.**

Lastly, John, Jackie, and Director of Research Dr. Yan Zhang headed to the nation's capital to attend the Advanced Bioeconomy Leadership Conference and meet with key staff at the Environmental Protection Agency. During that week, John and Jackie also met

with staff members representing the offices of Congresswoman Nikki Budzinski, Congressman Mike Bost, Senator Tammy Duckworth, and Senator Dick Durbin. 🇺🇸



**Illinois State Representative Wayne Rosenthal visits NCERC.**

# NCERC WELCOMES STEVE WARD AS PROJECT MANAGEMENT ENGINEER



**New hire Steve Ward will oversee research projects and serve as a mentor for NCERC's operations staff.**

The National Corn-to-Ethanol Research Center at Southern Illinois University Edwardsville (NCERC at SIUE) is pleased to welcome Steve Ward, PE as its new project management engineer. In his new role, Ward will oversee research projects

in NCERC's pilot- and demonstration-scale research laboratories while working directly with clients from across the world who come to the center to perform scale-up of commercial-bound biotechnologies. In addition to his role on the research team, Steve will serve as a mentor for NCERC's operations staff and those who participate in the workforce training programs at the center.

"I'm thrilled to be rejoining the NCERC team in this new role as the project management engineer and eager to work with its dynamic staff and clients again," said Ward. "As an

engineer, NCERC is an incredible place to work and I look forward to working with its leadership and operations teams again to see through exciting research in the bioindustrial manufacturing sector."

Ward brings over 15 years of experience in engineering and project management to the NCERC leadership team, including a previous role at the center which he served from 2004 to 2016 in multiple roles. Ward earned his degree in chemical engineering from University of Illinois Urbana Champaign and has his professional engineer's license in Illinois and Missouri.

"We're extremely excited to welcome Steve back to NCERC in the new role of Project Management Engineer," said John Caupert, Executive Director of NCERC. "Steve brings an incredible amount of institutional knowledge about the Center, including several years of experience in corn-to-ethanol operations and research, which will serve us well as we continue to be the leading provider of biofuels research in the United States and beyond. With his leadership, we'll be able to support more projects per year, creating new opportunities for collaboration and revenue generation." 💧

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## MARKETING TEAM EDUCATES FIFTH GRADERS AT LOCAL CONSERVATION EVENT

NCERC's Marketing & PR team led several ethanol-focused demonstrations at a local conservation event, the Monroe County Conservation Day, which provides educational workshops for fifth graders. Director of Business Development Jackie Hayes and interns Allison Simpson and Nadia Graber led the demonstrations, which showcased the environmental and economical benefits of ethanol and future technology opportunities for corn. 💧

# NCERC — PARTICIPATES AT SIU DAY IN SPRINGFIELD, ILLINOIS

NCERC's Marketing/PR team consisting of Director of Business Development Jackie Hayes and Market Research Intern Nadia Graber participated in the SIU Day at the Capitol on April 18 in Springfield, IL.

SIU Day at the Capitol allows members of the SIU system and its three institutions to showcase the great work that they're doing to train the next generation of leaders throughout Illinois. NCERC was one of several booths that were available to educate members of the Illinois General



SIUE Chancellor James T. Minor, PhD, and all SIUE students, including NCERC members who participated in the SIU Day at the Capitol.

Assembly and legislative assistants about their missions and the impact they have on the communities we serve. 💧

## NCERC FEATURED IN SEVERAL PRESENTATIONS AT BIOMADE MEMBER MEETING



Between 300 to 400 bioeconomy professionals were in attendance at BioMADE's Annual Member Meeting.

NCERC Director of Business Development & Client Relations Jackie Hayes actively participated at the meeting, presenting in two separate sessions. As part of three BioMADE-funded projects, NCERC was very visible at the meeting, including a fermentation-capacity series of presentations and a panel discussion around Education and Workforce Development in bioindustrial manufacturing.

In addition to the presentations, NCERC was featured in two posters featuring the ALAKA'I project (Save the Date!) and a technical project with start-up Valerian Materials that is currently scaling the production of betamethylvalerolactone (BMVL), a bio-based molecule with potential to be converted into several different types of polymeric materials and products. 💧

“The conference was great, really great. I am very glad I came out for it. The sessions were fantastic, but most of all is the spirit of it. Everybody was excited, collaborative, open, and creative.”

# NCERC GIVES TOUR TO FARM CREDIT ILLINOIS

SERVING THE RED BUD AND HIGHLAND AREAS



The Farm Credit Illinois Red Bud branch visited the NCERC at SIUE to learn about some awesome research in the Ethanol world.

The Farm Credit Illinois office serving the Red Bud and Highland areas stopped by NCERC for a visit on May 3 and visited with Director of Business Development Jackie Hayes who provided an NCERC overview presentation and Executive Director John Caupert who led the tour.

Farm Credit Illinois is an agricultural financial cooperative owned by 16,000 farmer, rural landowner, and agribusiness voting stockholder members in the southern 60 counties of Illinois. Dedicated to helping farm families exceed, FCI provides competitive and flexible financing, crop insurance expertise, and Rural 1st country life lending. 💧

## NCERC IS BUSY GETTING GRANTS FROM NSF, DOE AND USDA

National Science Foundation (NSF), the U.S. Department of Energy (DOE) and the Department of Agriculture (USDA)



(Top Image) Overall view of the pilot plant at NCERC. (Bottom Image) The shaker flask systems for corn ethanol research at NCERC.

NCERC's research team is busy carrying out five grants awarded by the National Science Foundation (NSF), the U.S. Department of Energy (DOE) and the Department of Agriculture (USDA).

The USDA grant awarded through AFRI (The Agriculture and Food Research Initiative) seeks to study the benefits of producing three bioproducts in one integrated bioprocess.

The DOE grant, awarded through Advanced Research Projects Agency-Energy (ARPA-E) seeks to study the benefits of using microbial consortia to produce n-butanol without CO<sub>2</sub> emission. The other DOE

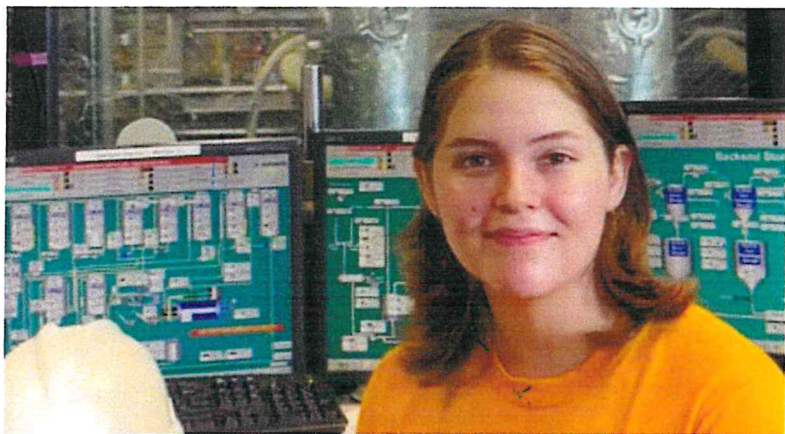
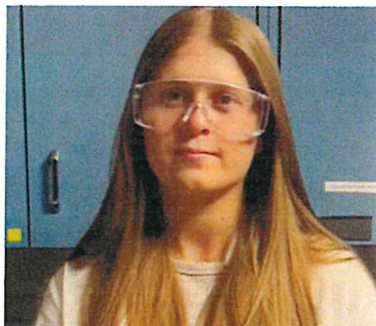
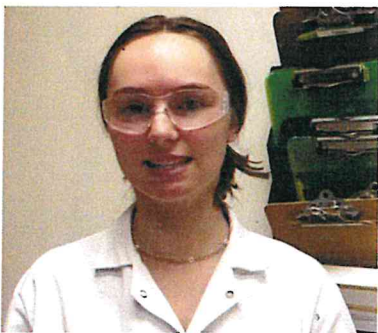
grant, awarded through Bioenergy Technologies Office (BETO), seeks to study the benefits of stable, continuous n-butanol production.

The NSF grant awarded through FMSG (Future Manufacturing Seed Grants) seeks to do workforce training on future biomanufacturing. An NSF grant awarded through Expanding Capacity in Quantum Information Science and Engineering (ExpandQISE) seeks to study the mechanisms of biomass pretreatment using quantum technology. 💧



# NCERC'S — CURRENT & FORMER INTERNS

## FEATURED IN SIUE NEWS RELEASES



(Left to right, Top to bottom) **Marketing/PR Intern Allison Simpson, Intern Will Hicks, Lab Intern Violet Swanson, Former Intern and Graduate Assistant Krista Russell, Intern Alicia Pitkin and Chemical Engineering Intern Emily Smith.**

Current and former interns at NCERC were featured in news releases shared this spring by SIUE's Marketing & Communications Department and featured exciting impacts they're having on the SIUE community.

Current Marketing/PR intern Allison Simpson is taking a course offered by SIUE in collaboration with SIUC and is focused on public relations principles in sports communication. Simpson currently also interns with the St. Louis Cardinals and the STL-based XFL team, the STL Battlehawks. Majoring in applied communication studies on a public relations track and minoring in mass communication, Simpson has enrolled into a sports public relations course at SIUC, matching her professional interests.

Former intern and graduate assistant Krista Russell performed a study that was recently published and shows the lack of correlation between increased ethanol use as a result of the Renewable Fuel Standard and direct land use change. Russell earned a master's in environmental science from the College of Arts and Sciences (CAS) in 2020 and the results of her research shows the scientific community and the public valuable insights into modern agricultural practices as a complex system, where farmers must make decisions using many different skillsets related to science, the economy, and business management, among others. 💧

# NCERC ENTERS ITS 20TH YEAR OF OPERATIONS



**2002 NCERC building being constructed. Despite the changes over the years, our ambition and dedication to our clients remain strong!**

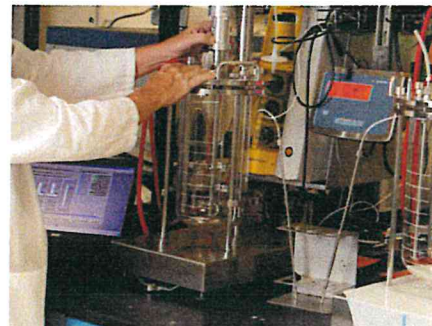
NCERC enters its 20th year of operations in 2023 after two decades of leadership in the biofuels industry. Now, NCERC's clients have evolved to include companies from across the bioindustrial manufacturing sector who benefit from its unique facility and expert staff.

"I am extremely proud of all that NCERC has accomplished over the past twenty years in serving the nation's biofuels producers and corn farmers," said John Caupert, executive director of NCERC. "Since the Renewable Fuel Standard was signed into law, the ethanol industry flourished into a 16+ billion gallon

industry and a critical part of the United States' fuel supply, and NCERC has supported it every step of the way through providing the needed support to innovate and improve efficiency. Now, we are excited to be part of the research in establishing the new generation of corn-to-biotechnologies that will bring the same carbon reduction benefits to new industries."



**Director of Fermentation Dr. Jie Dong (left) and Operations Manager Jared Burns (right) at the 150 liter bioreactor.**



**Sr. Process Design Engineer Terry Lash works at the 5 liter bioreactor in the fermentation lab.**

"I am so proud of the contributions NCERC has made in the U.S. ethanol industry," said Jim Reed, chairman of IL Corn and farmer in DeLand. "Former IL Corn leaders saw a need, pursued their vision, and the end result is 20 years

of corn market demand research and the expertise we can build on to grow corn market demand into the future."

"As we see today, the fight for energy continues to exist," said former Congressman John Shimkus. "My push for energy security revolved around passing the Renewable Fuel Standard (RFS) and landing NCERC on the campus of SIUE. Our country needed a place that filled the gap between desktop research and application. The NCERC has filled that gap while partnering with government, industry and interest groups for 20 years." 🌱

*A delegation of local, state and federal officials on hand for the opening of the National Corn-to-Ethanol Research Center lauded the facility, predicting that it will have both economic and environmental benefits. The center is designed to develop new technologies for producing ethanol more efficiently from corn.*



## One-of-a-kind ethanol plant opens to fanfare at SIUE

**"This plant is a double-good thing for farmers."**

**STL Post Dispatch, September 23, 2003**

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July 2022- July 2023





# NCERC at SIUE

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 NCERC at SIUE



## 20 YEARS OF INNOVATIONS LEADING US FORWARD

While NCERC celebrates 20 years of innovation in 2023, we remain strong, leading the way forward. Thank you to the many stakeholders who helped bring us to this point and who continue their support as we push the cutting edge to advance a brighter future.



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Contact Us  
400 University Park Drive | Edwardsville, IL 62025 | 618.659.673  
info@ethanolresearch.com