Message From the Chair

Greetings!

Yet another academic year has come to a successful completion. Thirty of our undergraduate students graduated in May. Congratulations to all the graduates! It is a gratifying experience to watch our students transition from excited high school graduates to confident college graduates, and move on to the careers of their choice to become successful professionals and community members.

This was a great year for our ABEN department. Several of our faculty and staff members were recognized for excellence. Our faculty are providing leadership on research and education in the application of agriculture technology. Your support is critical in maintaining agriculture with more hands on components. It is a gratifying experience to watch our students matched your contribution.

Why donate?
In order for a program to stay current and relevant, it has to change with the needs of the times. Our labs and course contents have to reflect the current technology, and our students need to be trained to meet the needs of the employers. ABEN has been proactively addressing the challenge of updating our teaching labs. Recently, we have expanded our "Instrumentation and Measurement" lab to increase the lab capacity to 24 to accommodate the growing enrollment in our programs. Currently, ABEN is working on generating support for equipping a much needed hydraulics lab with the state of the art technology. We are also addressing the need for expanded offering in precision agriculture with more hands on components. It is a huge challenge to stay ahead of the curve on precision agriculture technology. Your support is critical in maintaining current technologies in our teaching labs. Your contribution is also used to fund the internships given to our students, sponsor Ag Tech Expo, recruiting, and other teaching and student activities.

Lots of exciting things are happening at ABEN, and your contributions play a vital part in supporting ABEN activities. Thank you for your support of our great department!
Unconventional oil and gas production in U.S. has increased dramatically since 2008 due to advancement in hydraulic fracturing technology. According to Time Magazine (October 14, 2013), the oil production at the Bakken Shale of western North Dakota increased about ten times since 2008 while the combined oil production at the Permian Basin and Eagle Ford Shale in Texas more than doubled in the same time period. This project is a pilot study for the energy-water nexus at the Bakken Shale of western North Dakota, using a quantitative modeling approach to gain a better understanding of the complex interactions between socioeconomic and natural systems surrounding the unprecedented economic and water resources developments in the region. This interdisciplinary study will also shed light on the existing gaps between current industry practices and government policy. Given that the use of hydraulic fracturing is still on the rise, the findings from this Bakken Shale study will be of great importance to policymakers and communities in and around the hydraulic fracturing oil regions in the country. The rapid expansion of unconventional oil and gas production in western North Dakota, a region rich in energy but scarce in water, has given birth to a novel water allocation system – water depots, to distribute a large quantity of freshwater for industrial uses in rural areas. The region’s largest aquifer – the Fox Hills-Heil Creek (FH-HC) aquifer – is the sole reliable water source for livestock watering in rural North Dakota and Montana. However, there are growing concerns about the existing and potential water withdrawal from the FH-HC aquifer due to the large-scale water demand by the oil industry. It is imperative to understand the dynamics of the water depot-based water allocation system and its interactions with the underlying groundwater systems. This project will develop a hydro-economic integrated model to study the dynamics of the coupled water depot-groundwater system so that appropriate policy tools may be devised to manage the regional groundwater resources for long-term, sustainable use. National Science Foundation http://www.nsf.gov/news/news_images.jsp?cntn_id=132412&org=NSF
Donor contributions

Thanks to Our Donors! Donors make important contributions to the scholarship program and activities that enhance the student experience. Below is a list of donors who made gifts and memorials to the NDSU Development Foundation designated to ABEN in years 2013 and 2014.

2013 Donors

Agricultural & Biosystems Engineering Dept Fund

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ABEN leads Unmanned Aerial Systems Research

John F. Nowatzki, an Agricultural Machine Systems Specialist with the NDSU Extension Service, has been conducting exciting research using Unmanned Aerial Systems (UAS) for Precision Agriculture uses. John, along with his team, are planning to conduct several UAS research activities in 2015. These projects will demonstrate how UAS research can be used to enhance economic development in North Dakota. Project activities include using selected UAS to enhance oil development activities, crop and livestock production, and agricultural service industries. UAS will be used to monitor the impacts of oil drilling on livestock activities, wildlife activities and movements, and crop and native plant growth, development and yields. Oil development activity involves significant ground activity, often resulting in increased dust. Investigators will use ground monitoring and UAS sensors to inventory dust particles in the air and on plants in rangeland. UAS will also be used to monitor livestock movements and pattern locations. The results will help evaluate the impacts of oil development on beef cattle grazing activities.

John Nowatzki

The team will also be collaborating with the North Dakota National Guard on a project in Mckean County that will use color and infrared sensors on UAS to collect high-resolution imagery to identify critical habitat for Piping Plover and Dakota Skipper, and map areas of noxious weeds such as leafy spurge. John was recently featured in an article in Unmanned Unplugged magazine. His quote from the article sums up the need for UAS research best, “UAS will provide timely, high-resolution imagery and a real-time eye in the sky for agricultural producers to use to more precisely apply crops, to validate past management decisions and to adjust in-season practices.”

To view the complete article: http://increasinghumanpotential.org/news/unmannedunplugged/-/johnnowatzki-north-dakota-state-university/
Dr. Kenneth Hellevang inducted as a 2013 ASABE Fellow

Ken Hellevang was inducted by ASABE as a Fellow at its 2013 Annual International Meeting in Kansas City. A Fellow is a member of unusual professional distinction, with outstanding and extraordinary qualifications and experience in, or related to, the field of agricultural, food, or biological engineering. A Fellow shall have had 20 years of active practice in, or related to, the profession of engineering; the teaching of engineering; or related curricula. The designation Fellow shall have honorary status, to which membership or distinction may be elected, but for which they may not apply.

Dr. Hellevang was honored for his outstanding educational and extension contributions worldwide involving crop post-harvest engineering, structures and indoor environmental engineering, flooding preparation and recovery, energy efficiency, and service to ASABE.

Dr. Hellevang led a task force of representatives from agencies and organizations interested in biomass for energy in North Dakota. Several action items developed by the task force have resulted in legislation, such as the creation of the Renewable Energy Council, $5 million in funding for renewable energy grants, and creation of the NDSU Bioenergy and Product Innovation Center, of which he was director for two years. He has authored or coauthored more than 150 technical publications. He was the lead author of the Midwest Plan Service’s Dry Grain Aeration Systems Design Handbook.

In his 34 years of ASABE membership, Hellevang has provided leadership to Food and Processing and Systems Design Handbook. He has authored or coauthored more than 150 technical publications. He was the lead author of the Midwest Plan Service’s Dry Grain Aeration Systems Design Handbook.

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Journal Articles


Promotions and Tenure

Dr. Jiacheng Shen joined the department January 2, 2014 as a Research Specialist under the supervision of Dr. Igathinathane Cannayen. He is located off-campus at NGPRL, USDA-ARS, belongs to the NDSU research group. Dr. Shen’s current project is the utilization of flood affected woody biomass and was funded by North Dakota Forest Service, wherein educational materials, workshops, and demonstrations will be developed and delivered. His previous experience involved bio-fuel production from lignocellulosic materials using both biochemical and chemical methods. He holds PhD in Biological Systems Engineering from Virginia Polytechnic Institute and State University (Virginia Tech), USA, MSc in Chemical Engineering from McMaster University, Canada, MSc in Environmental Engineering from the University of Ottawa, Canada, and BSc from Tianjin University, China.

Dr. Shafiqu Rahaman, former professor effective July 1, 2013. Dr. Rahaman’s Research and Extension activities include animal manure management, nutrient dynamics, composting, anaerobic digestion of manure and agricultural wastes, best management practices for mitigating nutrient runoff from feedlots and land application of manure. In addition, his research activities include monitoring of air and water pollutants and greenhouse gases (GHGs), and evaluation of new technologies to mitigate odor and air emissions from livestock production facilities. Dr. Rahaman is currently conducting research on dust quantification in western North Dakota. He also mentors graduate and undergraduate students.

Congratulations Dr. Jiacheng Shen and Dr. Shafiqu Rahaman!
Dr. Jia is an associate professor who joined the Agricultural and Biosystems Engineering Department at NDSU in 2007 as the first female faculty member. She received an M.S. and Ph.D. in Agricultural and Biosystems Engineering from the University of Arizona, with a research focus on evapotranspiration and nutrient management. She worked as a postdoctoral research associate on water resources at the University of Florida. Dr. Jia’s research addresses drainage, evapotranspiration, subirrigation, water recycling, water quality, snow hydrology, and soil freeze and thaw, with a goal to optimally manage water resources to improve crop production and soil/water quality for sustainable agriculture. Installing drain tile and controlling the water table by “shutting off” drainage flows at the outlet optimizes moisture conditions in the plant root zone throughout the growing season. Irrigation water can be added to the tile systems to provide more water to the root zone during high watering needs through a process called subirrigation. The research will help develop scheduling systems for conventional tile drainage and for subirrigation, a system similar to the Checkbook Method currently used for Irrigation Scheduling by ND producers. The Red River Valley is inherently flat and land is frequently flooded, making agricultural drainage water management one of the fastest growing practices, Xinhua strives to provide answers to important questions on the feasibility of subirrigation and its impact to soil and water quality, the rates of crop evapotranspiration rates between tile drained and un-tiled crop fields, how a conservation drainage management scheduling practice will help control drainage and subirrigation practices, and the impact of tile drain age on snow melt runoff, freeze, and thaw, and the infiltration process. Dr. Jia has two MS graduates working on drainage and subirrigation. Their projects are featured on the National Institutes for Water Resources page: [www.ndsu.edu/wrri/fellowship/Kelsey%20Kolars.html](http://www.ndsu.edu/wrri/fellowship/Kelsey%20Kolars.html). Dr. Jia teaches Natural Resource Management Systems; Drainage and Wetland Engineering; and Small Watershed Hydrology and Modeling.
### Research and Education Grant Portfolio (total grant portfolio 2014 = $2,674,017)

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### Faculty News

#### Dr. Shafiqur Rahman Receives Grant Funding for Research on “Quantification of Road Dust and its Effect on Soil Quality”

Five research proposals were selected to receive seed funding to research the impact of road dust issues in areas of energy development across western North Dakota. Here is a brief summary of the research award, areas of study and those leading the project for Dr. Rahman, NDSU, AGEN:

- **Quantification of Road Dust and its Effect on Soil Quality**
  - **Research Principal Investigator:** Dr. Shafiqur Rahman
  - **Research Team:**
    - Kris Ringwall, Director, Dickinson Research Extension Center
    - Bernie Saini, Geosciences
    - Larry Chiacek, Soil Science
  - **Grant Funding:** $59,956
  - **Description:**
    - Description of the research award, areas of study and those leading the project for Dr. Rahman, NDSU, AGEN:

#### Study Abroad

- **Scott Pryor**
  - Co-led a group of 16 students (1 ABEN student) on a study abroad course (PLSC 379/779: Bioenergy Crops: The European View) to Austria, Germany, and Italy for 2 weeks in late June and early July.
  - They visited bioenergy crop production research sites as well as facilities for biomass gasification, anaerobic digestion of animal manure and energy crops, composting and biochar production.

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**Photo:** Liz Morrison

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**Subirrigation featured in Corn + Soybean Digest**

#### Subirrigation featured in Corn + Soybean Digest

Xinhua Jia (left), an agricultural engineer in collaboration with North Dakota State University Extension, is testing combined subsurface drainage and irrigation on this 108-acre cornfield, with Fairmount, N.D., farmers Alicia Miller Holubok (center) and Amanda Miller Fisher.


**Photo:** Liz Morrison
Awards

The 2013 NDSU Agriculture and Extension Faculty/Staff Awards Program was held December 12, 2013. Ken Grafton, VP for Agricultural Affairs; dean of CAFSNR; director of the North Dakota Agricultural Experiment Station, presented the awards.

Jim Moos, Rick and Jody Burgum Staff Award
This annual award recognizes significant contributions to the mission of NDSU Agriculture and/or Extension. The purpose is to encourage and reward excellence in job performance by support staff in technical and para-professional; crafts/trades; or services. Selection will be based on significant contributions by the nominee to the mission of the College of Agriculture, Food Systems, and Natural Resources; North Dakota Agricultural Experiment Station; or NDSU Extension Service.

Dr. Tom Bon receives Teacher of the Year Award, 2014

Dr. Tom Bon, recognized with the Teacher of the Year Award for his teaching accomplishments and impact on students. Dr. Bon joined NDSU as a faculty member in 1989. Dr. Bon helped develop the Finite Elements course and Fluid Power Systems. He teaches Electrical Energy Applications, Agricultural Power Systems, Machinery Design, Fluid Power Systems Design, Instrumentation and Measurements, Engineering Ethics, and ABEN 496 Ag, Tech Expo. He has also taught numerous other ABEN and ASME classes in the past.

He advises approximately 32 students. He is affiliated with ASABE, TBH, and ASME.

Elton Solseng receives Teaching Award of Merit, 2014

Elton Solseng, long time instructor in the ASM program, was presented by Dr. Sreekala Bajwa with the North American Colleges and Teachers of Agriculture (NACTA) award for the “Teaching Award of Merit” at the 2014 annual spring picnic.

In conjunction with NACTA, the College of Agriculture selects one faculty member each year to present the award to for their meritorious efforts in college teaching. Elton joined the department in 1972 and has been an integral part of the ASM program since.

He currently advises approximately 21 students. Congratulations Elton!

Scott Pryor, Larson/Yaggie Excellence in Research

Research findings judged to make significant contributions either in addressing an applied problem or to the basic knowledge of the area investigated. Significance of the research, verified by supporting letters from three individuals with expertise to evaluate the research submitted.

Research results for which the nominee was primarily advanced for this award must be in press or published. If published, the article must have appeared within the two years preceding the nomination for this award.

He/she has received outside invitations for the presentation of results of research which has been cited as the significant contribution by this person or team.

Weddings

Wallace-Muhl
Nicole Wallace and Kelly Muhl were united in marriage on June 29, 2013. Nicole graduated in 2008 from Frazee High School and in 2013 she graduated from North Dakota State University with a bachelor’s degree in agricultural engineering. Kelly graduated from West Fargo High School and in 2007 he graduated from Minnesota State Community and Technical College, Moorhead. He is a diesel technician at RDO, Casselton, N.D. Nicole and Kelly enjoy attending steam shows and are active volunteers at the Western Minnesota Steam Threshers Reunion, Rollag, MN.

Buchholz-Lund
Lisa Buchholz and Taylor Lund were united in marriage on September 13, 2014 in Cooperstown, ND. Lisa graduated from North Dakota State University with a degree in Agricultural Engineering in 2013. Taylor graduated from Minnesota State University Moorhead in 2009. Lisa is currently employed as a Manufacturing Engineer for John Deere. The couple has made their home in Gackle, ND.

New Bison

Marlee Grace Beckstrand was born at 5:30 p.m. on April 25, 2013 to Calby (ABEN ’14) and Cierra Beckstrand. The 7lbs. 9 oz. bundle of joy has turned into a bundle of energy! She likes pretending to be a princess and watching movies. She can’t wait for the warmer weather so she can go for longer walks and play outside with her favorite puppy, Moose!

The Beckstrand family have made their home in Fargo, ND. Welcome to the Herd, Marlee!

Theodore (Theo) Kent Hellevang
Ken Hellevang’s first grandchild was born April 3, 2014 to parents Ryan and Jessica Hellevang. Theo arrived weighing 9 lbs. 10 oz. but has grown into a very active little boy! He keeps his parents guessing where he will be climbing next. He knows some sign language to communicate and is starting to talk.

The family lives in Duval, WA. Welcome Theo!

Breck Hudson Hellevang
Ken Hellevang’s 2nd grandchild was born April 28, 2014 to parents Brandon and Mikaela Hellevang. Breck surprised mom and dad and arrived early! He was a peanut at 6 lbs. 3 oz and 19.5 in., but has grown to be a big boy. Breck is always smiling and enjoys all his toys that make noise. Grandma and Grandpa enjoy keeping connected via Skype, as the family lives in Lincoln, NE.

Welcome Breck!

Obituaries

Gloria Krohn Wiesenborn
passed away on November 17, 2014. She is survived by her husband of 61 years, Robert Wiesenborn; daughter Robin (James) Pike; sons, Mark Wiesenborn and his wife Kristen, Dennis Wiesenborn and his wife Diane. Grandchildren Scott and Amanda Wiesenborn, Kyle and Lindsey Wiesenborn, Jason and Cinny Pike, Paul Wiesenborn, Jared Pike, and Jesse Wiesenborn; Great-grandchildren Dustyn Pike, Caleb Pike, Carson Wiesenborn, Zoey Wiesenborn, Ella Wiesenborn, and Katelyn Wiesenborn. Sister, Ruth (John) Meyer. Our condolences to the Wiesenborn family.

Lisa Buccholz and Taylor Lund were united in marriage on September 13, 2014 in Cooperstown, ND. Lisa graduated from North Dakota State University with a degree in Agricultural Engineering in 2013. Taylor graduated from Minnesota State University Moorhead in 2009. Lisa is currently employed as a Manufacturing Engineer for John Deere. The couple has made their home in Gackle, ND.

Congratulations Elton!
Cody Montgomery elected to Foster County Soil Conservation Board

Cody Montgomery is an NDSU alum with a major in Ag Systems Management, and Animal Science and Ag Econ minor. He is currently working for Titan Machinery at the Jamestown location.

Cody and his wife Kim decided to move back to the Carrington area to reside and become more involved on the family ranch. They recently welcomed baby Layne to the family.

Cody says “On the ranch we have become more aware of the need for conservation and the unique programs that encourage these practices. This led me to become interested in the vacant supervisory board position. I look forward to promoting conservation and how it can be tailored to assist producers in preserving our natural resources while still remaining economically viable.”

December 2014

Alumni Experience as an Agricultural Engineer by Shane Kjellberg, P.E., K2S Engineering Inc.

Shane is a 1993 ABEN NDSU graduate and worked in the construction and engineering field. Shane founded K2S engineering in 2003. His company provides a range of services primarily for the rural and ag sector. Shane is a licensed professional engineer in MN, ND and SD trained in wetland delineations through the Minnesota Board of Water and Soil Resources. Shane has over 20 years of experience in the agricultural and environmental fields in MN, North & South Dakota and NY state. He has engineered and implemented hundreds of practices: animal waste, livestock water supply systems, stream bank and shoreline restoration and stabilization, natural channel restoration using “Rosgen” concepts, wetland restorations/creations (dams & stream analysis), sediment control basins, odor management plans, assisted with regulatory permitting, construction management, operation and maintenance plans and other environmental related work. Shane has done several environmental assessments and impacts on existing and proposed animal feeding operations, and developed several sediment control plans for permitting compliance. He covered engineering, ethics, lessons learned and providing testimony in his seminar.

New Faculty and Staff

Harjot Sidhu
The National Sunflower Association sponsored funding to Dr. Dennis Wiesenborn’s project “Coated, hulled confection sunflowers for precision planting”. Harjot is the research specialist on the project for 2014.

Departures and Retirements

Roxanne Johnson’s position ended in November, 2013 after working as an Extension Water Quality Associate since November 2006. We bid her farewell and wish her the very best in the next chapter in her life.

Staff Recognition

Staff recognition luncheon: The following staff members were recognized for their years of contribution. We congratulate them!

Nurun Nahar was recognized for 5 years of service.
Jana Daeuber was recognized for 15 years of service.
Melanie Ziegler was recognized for 15 years of service.
Deb Baer was nominated for the individual staff recognition award.

Sara Ogundolani
Sara Ogundolani joined our department in 2013 as our Account Technician. She previously lived in Houston, TX before coming to Fargo. She and her husband, Olusayeji, have 2 daughters and a little boy on the way. Welcome!

Toby Burnside
Toby Burnside joined our department in December 2014 as custodian, having previously worked in Sheppard Arena. Toby is married with two children, daughter Liberty (8) and son William (20 months). In his spare time he likes to hunt, fish, camp, enjoy the outdoors and spend time with his family. Welcome!

Julie Bietz
Julie Bietz joined our department in May 2014 as Student Coordinator. She lives in West Fargo with her husband, Glenn, and sons Gavin, 8 and Henry, 4. She enjoys gardening and camping. Welcome Julie!

Myron Flaagen
Retired on June 30th, 2013. Myron gave us 12 years of service as our custodian. Now he has plenty of time to follow the Bison.

David Fahey
Dave retired on November 7, 2014. Dave was our custodian for a year and half. He is now living in Denver, CO
Seminar Series

Mar 2013. Greg LaPlante, Director of Research, North Dakota Corn Growers and Utilization Council. Increasing research opportunities through better understanding of all interested groups.


April 2013. Mansur Amonov, visiting Fulbright Scholar. Agricultural Engineering Program at the Tashkent State Agrarian University where he is employed as a senior lecturer.

April 2013. Atikur Rahman. Ph.D. Vegetative filter strips for controlling feedout runoff pollution in ND.

May 2013. David Dvorak, founder of Field of View, a company that designs and sells remote sensing products and provides consultation in this growing industry. UAS seminar


Sept 2013. Dr. Shafiqur Rahman. Research and Extension Activities in the Last Five Years. Dr. Rahman’s research program focuses on air and water quality relating to livestock facilities and land application of manure. Rahman also conducts research on dust and particle matter.


Oct 2013. Blaine Schatz, Director, Carrington REC. The Carrington Research Extension Center and Collaborative Research Opportunities.

Nov 2013. Eric Althoff. Area Engineer, NRCS. Engineering Projects Installed by NRCS.

Nov 2013. Dr. Marat Khazimov. Professor of Engineering in Kazakh National Agrarian University (KazNAU), Almaty, Kazakhstan. Dr. Khazimov specializes in Agricultural Machinery in Engines. His presentation was on the collaboration between NDSU and KazNAU.


Feb 2014 Mehmet Odabas, PhD. The Turkish Culture and Studying at Turkish Universities.

Mar 2014 Josh Lien. Digital Strategy, Director, AgFarm Wearable Technology. Josh develops digital strategy for clients with tactics including websites, social media, online media, mobile, and email. Josh was chosen by Google to be one of the original Explorers or beta testers for Google Glass.

Apr 2014 Kris Ringwall. Overview of NDSU Dickinson REC.


Sep 2014 Kris Poulsen. North Country Ag Services, Farm Intelligence. Ag Drones and Big Data.

Sep 2014 Dr. Matt Sanderson, USDA, ARS, Mandan. The USDA Long Term Ecosystem Research Network.

Oct 2014 Randy Mehlhoff. Langdon REC Director. Langdon REC, Serving ND for over 100 years.


Nov 2014 Steven Edwardson, ND Barley Council. Crop Enterprise Selection Factors Farmers Use in Deciding Which Crops to Plant.

Dec 2014 ABEN 790 Graduate student seminar.

Alumni

Eric Halvorson promoted to CEO of Black Gold Farms

Black Gold Farms is a multi-state potato production organization, headquartered in Grand Forks ND, growing in excess of 20,000 acres of potatoes in 10 states. Eric was promoted to CEO of Black Gold Farms in October of 2014, succeeding his father Gregg Halvorson.

Eric graduated from NDSU Agricultural and Biosystems Engineering in 1999. He was active in the Alpha Gamma Rho fraternity. Eric graduated from the Executive Program for Agricultural Producers (TEAP) in 2004. He was elected Grower Leader for 2009 at the Potato Industry Leadership Institute in 2008. He represented North Dakota on the US Potato Board in 2008 and served on the Administrative committee in 2009. He serves on the Executive Committee of the US Potato Board, and is co-chair of the International Marketing Committee.

Eric helped with the design and implementation of the Black Gold Systematic approach protocols, one of the systems that helped Black Gold Farms win the National Potato Council Environmental Stewardship Award in 2008. He successfully headed a team to design the first bulk chip potato hydro-cooler in the industry which resulted in Black Gold Farms winning the Clem Kuehler Worldwide Innovation Award from Frito Lay. Eric was chosen as a panelist on the Sustainability Panel at the 2012 Potato Expo in Orlando, FL. He was named to the 2012 “40 under 40” list by Business Watch Magazine of ND. Eric was awarded Spudman Magazine’s Emerging Leader Award in 2013 and named to the 2014 class of “40 under 40” by Produce Business magazine.

Eric is the son of Gregg & Linda Halvorson, the fourth generation of the Halvorson family (Black Gold Farms) upon graduation from college. He married Yvette Heiser November 1, 2003. They have 3 daughters: Lucy age 10, Stella age 8, and Ruby age 5. They are members of Calvary Lutheran Church in Grand Forks.

Eric’s interests include spending time with his family, hunting, cooking, and tailgating at NDSU football games.

Eric writes “The ABEN department at NDSU is a great place to learn. It was also comforting to be around students with similar interests in agriculture yet with the diversity in the crop types they grew up with, not to mention their native geographies which allowed a cross-pollination of real world experiences. My advisor, Dr. Steele was there to help with any questions i may have had, even if my focus strayed every so often from my basic educational curriculum. The most impactful thing that I learned from my time in the ABEN department was how to solve problems. I learned to look at a challenge in a step by step fashion and dig deep to find the most basic drivers of the issue. We know this as root cause analysis and it is foundational in engineering. Surprisingly it can be overlooked in the business world where the same principles apply. This approach has served me well as an engineer and as a CEO”.

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Ashani Samaratunga, pictured with her advisor, Dr. Scott Pryor, passed her M.S. defense. She participated in NDSU graduation commencement December 2013. Ashani joined us in 2011 from Sri Lanka.

Graduations

Congratulations to our Spring 2013 graduates:
ABEN
Ashlan Abdnasir
Lisa Buczich
Zane Frick
Steve Gruber
Jody Harsan
William Knox
Jacob Livingston
Janelle Mauth
Christopher Mortenson
Joshua Seibert
Nolan Swenson
Nicole Wallace

ASM
Michael Backman
Marshall Bjorklund
Jared Deutz
Kalen Groesser
Brandon Ofte
Ethan Uttmanen
Justin Johnson
Andrew Knox
Jacob Longiet
Jaden Messer
David Staples
Justen Wehr

Congratulations to our Spring 2014 graduates:
ABEN
Hannah Bye
Andrew Church
Sonny Ehi
Jalen Getting
James Johnson
Connor Kelley
Nathan Leingang
Richard Lewis
Tyler Mann
Katherine McKinnon
Derek Olson
Chase Rosenau
Joel Shipley
Eric Velin
David Watson
Nathan Wiese
Thomas Wilen
Derek Zerface

ASM
Matthew Dahlke
Tanner Martinson
Nicholas Morrison
Cade Robertson
Andrew Siemon
Brandon Weber

Congratulations to our Fall 2013 graduates:
ABEN
Calby Beckstrand
Lucas Laudenbach
Derek Olson
Robert Wolsky

ASM
Adam Braegelmann
Cody Brantner
Mitchell Field
Adam Winduje

Congratulations to our Fall 2014 graduates:
ABEN
Tyler Bergh
Jeffrey Dockendorf
Jacob Hanson
Jake Hodoff
Christopher Koudela
Thomas Pederson
Elise Satterfield
Mitchell Sawicki

ASM
Matthew Dahlke
Tanner Martinson
Nicholas Morrison
Cade Robertson
Andrew Siemon
Brandon Weber

Advisory Board started in 2013

An ABEN advisory board was organized in 2013, and the first meeting of this Board was held in June 2013. There was good attendance from alumni and excellent discussion on ways to enhance collaboration with our constituents and to improve our programs. The meeting focused on teaching, research and extension programs. The one-day meeting was very productive, and the group decided to meet again every 6 months.

EPA administrator Gina McCarthy holds energy policy panel in Bismarck

Dr. Igathi Cannayen participated in a discussion panel headed by Senator Heidi Heitkamp on issues surrounding the Renewable Fuels Standard and the production and use of biofuels as part of the all-of-the-above approach to energy policy. The participants were able to give the administrator a thoughtful overview of how EPA actions impact stakeholders in the renewable fuels industry.

The ASABE intersectional meeting was held at SD State on Mar. 28-29, 2014

Ashanis pictured with her advisor, Dr. Scott Pryor, passed her M.S. defense. She participated in NDSU graduation commencement December 2013. Ashani joined us in 2011 from Sri Lanka.
Field Day: Agricultural Drainage Water Management & Subirrigation

Xinhua Jia, Tom Scherer & Dean Steele gave a presentation to tile drainage construction companies, farmers, Natural Resources management and other water management specialists. Participants were taken to the subirrigation research site at Gerry Zimmerman’s farm by Kirgnes, MN.

FFA

Each year ABEN faculty and staff assist with four North Dakota and Minnesota FFA contests. Minnesota Region III Ag Mechanics, Advanced, Intermediate and Basic Ag Mechanics involve 250+ students. The contest includes written and hands on tests. The top individuals and teams go on to compete in state and national competitions. Winners may also receive tool sets.

65th Annual Agricultural Technology Exposition

Growing a New Tomorrow, 2013

Xinhua Jia, Tom Scherer & Dean Steele gave a presentation to tile drainage construction companies, farmers, Natural Resources management and other water management specialists. Participants were taken to the subirrigation research site at Gerry Zimmerman’s farm by Kirgnes, MN.

66th Annual Agricultural Technology Exposition

65th Annual Agricultural Technology Exposition

Students

66th Annual Agricultural Technology Exposition

Harvesting Our Potential, 2014

As always, our students planned, organized and ran a very successful expo. Projects were outstanding and diverse.

Power Div.

1st: John Deere Tier 4 Engine; Joseph Burner, James Johnson and Even Robertson; 2nd: ASM Club H John Deere; Benjamin Dingmann and Nick Steffl; 3rd: John Deere 8360 Tractor; Matthew Luther, Ben Mattson and Ryan Thompson.

Machinery Div.

1st: Round Baler Comparisons; Kade Karsky, Chance Moran and Zachary Rhone; 2nd: Auger Hopper Walker; Kellan Goeser and Cody Jenson; 3rd: Enskie Post Driver; Payton Lautenschlager.

Precision Ag Div.

1st: Chemical Drift Control; Kade Hilde, Yuri Johnson and Christian Ogaard; 2nd: Trimble CFX 750 Guidance Monitor; Daniel Deck; 3rd: Seed Monitor System; Justin Wehri.

65th Annual Agricultural Technology Exposition

Growing a New Tomorrow, 2013

Every February for the past 64 years, the Ag Tech Expo has given students the opportunity to showcase their knowledge by presenting projects dealing with technology and agriculture. Over $1,000 in scholarships are typically awarded.

Power Div.

1st: Hydraulic System Maintenance & Care for Agricultural Equipment; Matthew Dahlke; 2nd: TECStar CVT Transmission; Benjamin Dingmann, Zach Canton, Adam Billings; 3rd: Adjusting Hydraulics for Different Attachments on a Skidsteer; John Sandvig.

Machinery Div.

1st: Kinze Autonomous Grain Cart; Tyson Pflingsten; 2nd: John Deere D-Series Skid Steers; Alex Krebsbach; 3rd: Versatile RT 490 Class 9 Combine; Logan Miller & Nick Steffl.

Precision Ag Div.

1st: Canola Oil; Isaac Bower, Scott Cowan, Brett Wilson; 2nd: Field Drainage Tile; Tanne Perhus, Ryan Johnson, Ted Brandt; 3rd: Accelerated Genetic Intervention; Jonathan Ketterling.


Freshman Champion: Canola Oil Reserve Champion: Hydraulic System Maintenance & Care for Agricultural Equipment; Matthew Dahlke.

Senior Design Champion: Design & Evaluation of a Sunflower Dehuller to Aid in Precision Planting

Grand Champion: Canola Oil

66th Annual Agricultural Technology Exposition

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Precision Ag Div.

1st: Chemical Drift Control; Kade Hilde, Yuri Johnson and Christian Ogaard; 2nd: Trimble CFX 750 Guidance Monitor; Daniel Deck; 3rd: Seed Monitor System; Justin Wehri.

Structures, Electrical Power and Processing Div.

1st: Maple Syrup Production; Tyler Cebullia; 2nd: Grain Enfillment Rescue Tubes; Scott Peterson; 3rd: Vertical Farming; Justin Kiesow and Jason Klebe.

Freshman Champion: Hydraulic Fracturing and the Environment; Logan Brink and Brady Schmitz

Reserve Champion: Round Baler Comparisons.


Grand Champions: Christian Ogaard, Yuri Johnson, Kade Hilde
ABEN Senior Design Projects

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<th>Sponsoring Organization</th>
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<td>Chad Sietsema</td>
<td>Design, Construction and Implementation of a Lab Scale Algae Photobioreactor</td>
<td>Dr. Shafiqur Rahman</td>
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<td>Andrew Kuch</td>
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<td>ABEN Faculty</td>
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<td>Nathaniel Holmes</td>
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<td>Jesse Jungla</td>
<td>Development of an Electronic Seed Singulation Device</td>
<td>Titan Machinery</td>
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<td>Jason Pecaia</td>
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<td>West Fargo, ND</td>
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<td>Ethan Dick</td>
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<td>Joshua Fell</td>
<td>Energy Beet Crushing and Juice Extraction for Biofuels Production</td>
<td>Dr. Igathi Cannayen</td>
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<td>Ethan Liebsweger</td>
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<td>Dr. Dennis Wiesenborn</td>
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<td>Blake Wagner</td>
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<td>ABEN faculty</td>
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<tr>
<td>Steve Gruber</td>
<td>The Use of Urethane Arm on Gate Coulter Disk</td>
<td>Gates Manufacturing</td>
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<td>Michael Woodbury</td>
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<td>Laredo, ND</td>
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<td>Adam Borgerding</td>
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<td>John Morman</td>
<td>Water and Salt Recovery Vs Atmospheric Discharge and Land Filling Feasibility Analysis</td>
<td>Red River Commodities Inc.</td>
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<td>Daniel Mertt</td>
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<td>Fargo, ND</td>
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<td>Jody Hanson</td>
<td>Design and Evaluation of a Sunflower Dehuller to Aid in Precision Planting</td>
<td>National Sunflower Association</td>
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<td>Janelle Mauch</td>
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<td>ABEN faculty, lead by</td>
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<td>Lisa Buchholz</td>
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<td>Dr. Dennis Wiesenborn</td>
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2014 Projects

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<th>Teams</th>
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<tr>
<td>Elsie Satterfield</td>
<td>Feasibility Study and Design of an Anaerobic Digester as an Alternative Use of NDSU Waste</td>
<td>Dr. Scott Pryor</td>
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<td>Connor Kelley</td>
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<td>Katherine McKinnon</td>
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<td>Matacea Steen</td>
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<tr>
<td>Hannah Bye</td>
<td>Design of a Soil Penetrometer to Reach a Depth of 48 inches</td>
<td>Advisor: John Nowatzki</td>
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<td>Tyler Mann</td>
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<td>ABEN Extension</td>
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<td>Joel Shipley</td>
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<td>Sonny Ehli</td>
<td>Development of Powertrain, Structural, and Electrical Components of a Small Engine Test Stand</td>
<td>Dr. Tom Bon</td>
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<td>Jacob Hanson</td>
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<td>Nathan Leingang</td>
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<td>Chase Rosenau</td>
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<td>David Watson</td>
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<td>Derek Zerface</td>
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<tr>
<td>Andrew Church</td>
<td>Large Round Bale Grapple Developed to Improve Bale Handling Ability with Compact Equipment</td>
<td>Matthew Kaldor, PE</td>
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<td>Richard Lewis</td>
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<td>Product Development Mgr.</td>
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<td>Thomas Wilen</td>
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<td>Tyler Bergh</td>
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International Collaboration

Dr. Marat Khazimov, Professor of Engineering in Kazakh National Agrarian University (KazNAU) Almaty, Kazakhstan, led a group of Graduate Students from KazNAU for a month visit to NDSU in November 2013, hosted by Dr. Ganesh Bora. Dr. Khazimov was part of the Kazakhstan Delegation to Big Iron in 2007, which led to further understanding between NDSU and KazNAU, formally establishing MOU between the two universities and NDSU faculties co-supervising Ph.D. students in KazNAU. He and other faculty members from KazNAU, extensively collaborate with ABEN faculty members especially Dr. Bora and Dr. Tom Bon.

ABEN Faculty members invited to teach in Kazakhstan

Dr. Ganesh Bora and Dr. Tom Bon visited Kazakh National Agrarian University (KazNAU), Almaty, Kazakhstan in May – June, 2013 to teach courses on Advanced Agricultural Technology Management. They are also co-supervising PhD students in KazNAU. Their visit also coincided with visit of NDSU’s Vice President for Agricultural Affairs to KazNAU to renew the existing MOU between the two universities. ABEN hosted one Professor, two PhD and three master students from KazNAU in November 2013.

Dr. Shafiqur Rahman visits Çanakkale Onsekiz Mart and Namik Kemal Universities in Turkey

Dr. Shafiqur Rahman visited Çanakkale Onsekiz Mart Univesitesi (COMU), Çanakkale, Turkey, and Namik Kemal University, Tekirdağ, Turkey from May 31 to June 9. During that time he presented his research to both universities and conducted collaborative research at COMU with Dr. Unal Kizil.

Dr. Halis Simsek visits Balikesir, Namik Kemal, and Selçuk Universities in Turkey

Dr. Simsek’s group met with the university president, vice president and many faculty members. They presented their research and provided information about NDSU. ABEN for future collaboration. Dr. Sreekala Bajwa presented her research and ABEN facts online from NDSU. Based on their visit to Selçuk University, the president and vice president of Selçuk University will visit NDSU to sign an agreement between Selçuk University and NDSU.
Dr. Wiesenborn Visits China

I had the good fortune to spend four weeks at Jinan University in Guangzhou, China late last Fall. This was a “mini-sabbatical,” and a wonderful opportunity to build on professional ties in an increasingly important part of the world. China is already home to some of my family. All of my international exchanges have been positive experiences, and Chinese hospitality is second to none.

My main teaching assignment was three classes a week on food engineering principles for students in the Food Quality & Safety Bachelor’s Degree program. This program is offered under the International School of Jinan University, thus all of my lectures were delivered in English without a translator. Most of the students appeared to understand me just fine. But they were taken aback when I asked them to come to the front of the classroom on that first day to say their names and pose for a photo; they were amazed that I wanted to learn their names. The biggest teaching challenge was that the “three” classes were scheduled back-to-back (45 minutes each with 10 minute breaks) on Monday nights! Food engineering classes are difficult for non-engineering students even when spread out across three separate days, so this schedule was initially a big concern to me. My stay provided very good opportunities to get to know My students even when spread out across three separate names. The biggest teaching challenge was that the classroom on that first day to say their names and pose aback when I asked them to come to the front of the English without a translator. Most of the students appeared to understand me just fine. But they were taken aback when I asked them to come to the front of the classroom on that first day to say their names and pose for a photo; they were amazed that I wanted to learn their names. The biggest teaching challenge was that the “three” classes were scheduled back-to-back (45 minutes each with 10 minute breaks) on Monday nights! Food engineering classes are difficult for non-engineering students even when spread out across three separate days, so this schedule was initially a big concern to me. My first night of teaching was not something I am proud of, but I adapted to this schedule.

My stay provided very good opportunities to get to know Dean ShiQi Gu and Professor Yorg (York) Wang and their graduate students. Faculty and students at Jinan work more closely together within formal teams, compared to my experience in the US, and grad students are often expected to socialize together within their teams outside of work hours. Not uncommonly, such as in the case of one gathering that Diane and I attended, everyone takes a turn or two at karaoke! Professor Wang and I share a particular interest in biodiesel and other non-food products from vegetable oil. China is investing heavily in research in many areas, and providing travel grants to enable faculty and students to conduct research internships abroad. One of Professor Wang’s students, Sun Guo, will spend 6 months with us beginning in August, as she continues her development of a biolubricant from waste cooking oil.

My city (Guangzhou) lies in a part of southeast China known as the Pearl River Delta. This is truly a megalopolis! Guangzhou is a city of 14 million inhabitants, and sits elbow-to-elbow with a string of cities (extending even to Hong Kong) with a combined population of 57 million. So most of the inhabitants live in high-rise apartments and rely on mass transit. Certainly, this population density poses huge challenges. But Guangzhou is a livable city with many, large parks; a vast, efficient subway system; and an endlessly fascinating blend of traditional and ultramodern architecture. People function well with such patience, fortitude and good will, it gives me hope for the world and its growing population.

Dr. Wiesenborn with his family on a side trip to Qingdao Harbor (NE China)
Bison Pullers Rank #1 in Maneuverability, 2013

Bison Pullers participated in the 2013 Quarter Scale Tractor Pull Competition in Peoria, IL. They were ranked number one in tractor maneuverability test, and took 16th position in overall ranking. Twenty-nine teams from universities across North America vied for prizes and global recognition for their design innovations in the 16th Annual International Student Design Competition, sponsored by the American Society of Agricultural and Biological Engineers (ASABE). The event was held May 30-June 2, at the Expo Gardens in Peoria, Ill. Corporate sponsors are AGCO, Briggs & Stratton, Case IH, Caterpillar, Deere & Company, New Holland, Solidworks and Titan.

Each team gets one 31-hp Briggs and Stratton Vanguard Big Block Engine and a set of Titan tires; they acquire all other components. Tractors run on a 10% ethanol fuel blend.

ASM Club Activities

The ASM Club started the year, as in the past, with an outing to Thunder Road for go-karting. ASM members worked on tractors to drive in the Homecoming Parade. New tractors were added and everything was organized, but then the parade was canceled due to weather issues. So they created their own parade around Campus.

Work progressed on the two JD H tractors. Several speakers presented at meeting and students arranged tour of local companies. The club was involved with the Ag Tech Expo, the spring and fall picnics and the lawn mower/snowblower clinic. To help finance the tractor project they work at the Rodeo at the Fargo Dome.

Pumpkin Carving a “Ghoul” Time for the Student Clubs

The students of the ASM Club, ASABE, Alpha Epsilon and Bison Pullers enjoyed an evening of creativity and dirty hands! The students, using their own designs, worked diligently on carving, cleaning and lighting the large pumpkins.

The ABEN building was very festive for Halloween!
2013 North Dakota Water Resources Research Institute Graduate Fellowships Awarded

Kyle Hornsveldt is an M.S. student in ABEN at NDSU. Dr. Xinhua Jia, advisor. He graduated with his B.S. degree in Civil Engineering NDSU, with a focus in water resources. Kyle is working on a research project funded by the USDA-Sustainable Agriculture and Research Education (SARE) grant, titled “Effect of optimal water management for sustainable and profitable crop production and improvement of water quality in the Red River Valley”, focusing on subsurface drainage and subirrigation at the field scale.

Kelsey Kolars is an M.S. graduate student in ABEN at NDSU. Dr. Xinhua Jia, advisor. Kelsey holds a BS degree in Mathematics from NDSU. She is researching the relationship of water tables to crop water consumption by measuring water table levels, soil moisture, irrigation and drainage variables, and weather data. She will incorporate her findings into a new application for subsurface drainage and subirrigation water management.

Mengqi (Hy) Xiong, an M.S. student who Dr. Zhulu Lin co-advises with Dr. G. Padmanaban from the Civil Engineering Department.

NDSU Development Foundation grants endowment

Saravanan Sivarajan, Research Associate, Agricultural and Biosystems Engineering, received the Board of Trustee Endowment. Congratulations Saravanan!

Harjot Sidhu featured in 3D Printing Showcase

Harjot Sidhu was featured in the 3D Printing Showcase on October 20 2014. 3D Printing and practical uses with agriculture. Harjot discussed her grooved feeding extension she created for a sunflower seed huller.

Graduate Student Juan Vargas-Ramirez award the Graduate Student Teaching Award of Merit, 2014

Juan Vargas-Ramirez, graduate student under the supervision of Dr. Dennis Wiesenborn was presented by Dr. Sreekala Bajwa at the Spring picnic with the 2014 “Graduate Student Teaching Award of Merit” sponsored by the North American Colleges and Teachers of Agriculture (NACTA) and the College of Agriculture, Food Systems & Natural Resources.

Kelsey Kolars receives 2014 ND WRRI Fellowship—Development of a Model for Subsurface Drainage and Subirrigation Water Management Decisions

The research project will focus on subsurface drainage and subirrigation water management by modifying the Checkbook irrigation method. The specific objectives of the study are to: 1. Determine the relationships between shallow water tables and crop water consumption. 2. Develop net irrigation amount using field measured water table, soil moisture, irrigation/drainage, and weather data. 3. Incorporate SI and SSD into the modified Checkbook method for a best water management practice for SSD and SI systems.

Anthony Wamono receives 2014 ND WRRI Fellowship—Effects of calcium based surface amendments on the hydraulic conductivity and selected physical properties of subsurface drained sodic-saline soils

Anthony W. Wamono is a Ph.D. student advised by Drs. Dean Steele and Zhulu Lin at Agricultural and Biosystems Engineering Department. He is working on the “Effects of calcium based surface amendments on the hydraulic conductivity and selected physical properties of subsurface drained sodic-saline soils” for his thesis topic. He has a MS in Environmental and Conservation Science from NDSU, where he evaluated the influence pore size and surface charge on filtration process of nitrate ions in bentonite clay, and modeled nitrate breakthrough effluent concentrations through the membranes. Anthony got his bachelor’s degree in Agricultural Engineering at Makerere University Kampala, Uganda in his home country. Prior to joining NDSU, he worked with ministry of water and environment, Uganda, as the technical officer for Eastern Umbrella of water and sanitation.

Jingyi Sun received 2014 ND WRRI Fellowship - Evaluation of Bioavailable Dissolved Organic Nitrogen Using Various Algal Species

Jingyi Sun obtained B.S degree in Water and Wastewater Engineering from Beijing University of Civil Engineering and Architecture, Beijing, China in June 2013. During B.S. education, she was an exchange student in Civil Engineering Department at NDSU from August 2012 to May 2013. From August 2013, she became an M.S. student in Agricultural & Biosystems Engineering at NDSU. Her research focus is to evaluate bioavailability of dissolved organic nitrogen using various types of algae for samples obtained from two different wastewater treatment plants (WWTPs) and animal feedlots.