

# NDSU



# 2014

**School of Natural  
Resource Sciences  
Annual Highlights**

## Greetings from the School of Natural Resource Sciences at NDSU



Francis X.M. Casey, Ph.D.  
Director of SNRS

North Dakota stands at a nexus of energy, food, natural resource, and ecosystem issues of national and international importance. As an agricultural, interdisciplinary program at a land grant institute in the North Central Region, the School of Natural Resource Sciences is uniquely placed to address some of the greatest future challenges. North Dakota will play a major role in feeding a growing population, providing clean water and ample energy, and sustaining our natural resources. We rank first in the US for 12 commodities including honey, hard red spring wheat and durum. The prairie pothole region bisecting ND is the primary nesting ecosystem for migrating waterfowl, and produces ~50% of ducks in North America. In less than a decade, oil production in North Dakota has gone from less than 200 thousand barrels per day to approximately 1 million barrels per day, ranking it second in the country only behind Texas.

A major vision for the School is fostering synergies across disciplines and between Extension and research faculty. Interdisciplinary teams are necessary to provide solutions to the important, but complex challenges of the future. Some examples of synergies that have developed throughout the School are:

- **Entomology and Range** – Using growth chambers that control CO<sub>2</sub> levels to study biological impact effects of higher atmospheric CO<sub>2</sub> levels.
- **Range and Soils** – Identifying the impacts of Souris River flooding on rangeland and soil health.
- **NRM and Soils** – Quantifying road dust emissions in oil and gas regions of ND.
- **Entomology and Soils/Integrated with Extension** – Measuring crop responses to salinity and susceptibility to pest infestations.
- **Range and Soils** – Measuring fugitive dust impacts on plants.
- **Entomology and Range/Integrated with Extension** – Identifying land-use influences on Dakota skippers and other prairie butterflies.
- **Entomology and Soils/Integrated with Extension** – Identifying interactions between salinity and pests in corn and soybean
- **Range and Soils/Integrated with Extension** – Reclamation of lands in the Bakken region contaminated by oil and brine spills.

Our School faculty are gaining national, if not international, reputation. Their expertise is being sought for a variety of services, such as grant review panels, editorial boards, promotion and tenure evaluations, and manuscript reviews in the peer-review process. Faculty have also been awarded national awards in 2014, including (among others) Fellow in the Agronomy Society of America, Outstanding Young Professional in Society Range Management, and Excellence in Conservation Award for Soil and Water Conservation Society (see the awards section on page four for a full list).

### Teaching

The first ever SNRS Research Symposium was held in 2014, highlighting the work of our different disciplines. It brought together faculty, staff, and students at the MU, and included a keynote presentation, and student seminars and posters.

### Research

Faculty reported 73 peer-reviewed publications in 2014, an increase of 18% from the previous year. On average, each faculty member published more than three papers per year!

### Extension

In 2014, NDSU marked a centennial celebration of the Smith-Lever Act that established the cooperative extension services. NDSU Extension is a model for the nation, and our Extension faculty play a major role in the School's accountability to the state's agricultural and natural resource stakeholders. The School's Extension faculty planned 36 programs, with approximately 2608 face-to-face contacts. They also provided 129 presentations reaching over 10,000 people in person, which is a tremendous accomplishment.



## Faculty and Staff Updates | Personnel Changes in 2014

### Dr. Jack Norland

was awarded tenure and promoted to Associate Professor in 2014. He has been a faculty member in the NRM program since 2008.



### Dr. Christina Hargiss

received a promotion to a tenure-track faculty position in the School. She transitions into the Assistant Professor position in 2015.



**Larry Swenson**, Soil and Water Testing Lab Manager, retired on July 1, 2014. He had worked for NDSU for 47 years and continues to work part time in the lab.



**Dr. Devan McGranahan**, Assistant Professor of Range Science, started on April 1, 2014. Prior to coming to NDSU, Devan was a Fulbright Scholar in Grassland Science in South Africa.



**Bruce Steele**, Program Assistant for the NRM program, started on January 3, 2014. Bruce advises NRM undergrads and helps with the facilitation of the NRM program.



**Chandra Heglund** was hired on July 1, 2014 as a Research Specialist in Soil Science. She is working with **Dr. Abbey Wick** on Soil Health Research while pursuing her MS degree in Soil Science.



**Dr. Torre Hovick**, Assistant Professor of Range Science, started at NDSU on November 3, 2014. Torre received his PhD from Oklahoma State University in 2014.



**Robert Dregseth**, Research Specialist in Entomology, retired on May 3, 2014 after 41 years of service to NDSU.



**Jacob Rikhus** was hired as a Research Associate in the Entomology Department on November 3, 2014. He will be assisting **Dr. Mark Boetel** with sugarbeet research.



### Post-Doctoral Researchers in 2014:

**Xuelian Bai** was a post-doc working with **Drs. Aaron Daigh** and **Ryan Limb** in 2014 working on the impact of flooding on rangelands. **Lakesh Sharma** was hired as a post-doc in June working with **Dr. David Franzen** using optical sensors to develop N recommendations. **Jamin Dreyer** completed his post-doc working on aphid defensive behavior with **Drs. Jason Harmon** and **Deirdre Voldseth** in April.

## Faculty, Staff and Graduate Student Retreat | Albert Ekre Grassland Preserve

The School of Natural Resource Sciences held its first retreat for faculty, staff and graduate students. The retreat took place on August 22<sup>nd</sup> at the Albert Ekre Grassland Preserve near Walcott, ND. **Dr. Ryan Limb**, Assistant Professor in Soil Science roasted a pig for the event and potluck dishes filled out the rest of our plates. Activities at the retreat included an introduction and update on the School by Director **Frank Casey**, SNRS trivia, a tour of the Albert Ekre ranch buildings and a nature walk through one of the preserve's trails. This was the first school-wide event for all faculty, staff and graduate students and was a great success!



## Awards & Honors | Recognition of SNRS personnel in 2014

**Dr. Dave Franzen**, Professor of Soil Science, was presented with the Sugarbeet Distinguished Service Award from the Sugarbeet Research and Extension Board at the American Crystal Sugar Annual Meeting.



**Dr. Mark Boetel**, Professor of Entomology, received a gift for years of service to the North Central branch of the Entomological Society of America. He was the outgoing Secretary/Treasurer.



**Dr. Abbey Wick**, Assistant Professor of Soil Science, was honored with the Scholl Excellence in Conservation Award at the Soil and Water Conservation Society conference in Chicago. The Harold and Kay Scholl Excellence in Conservation Award recognizes individuals who creatively and effectively provide technical assistance in conservation planning and plan application.



**Dr. R.J. Goos**, Associate Professor of Soil Science, was named a Fellow of the American Society of Agronomy.



The Oliver County 4-H Range Judging team placed first at the National Range Judging competition in Oklahoma City, OK. The team was coached by

**Dr. Kevin Sedivec**, Professor and Program Lead of the Range Science Program, and Rick Schmidt, Oliver County Extension Agent.



**Dr. Christina Hargiss**, Assistant Professor of NRM, received the 10 years of service award for River Keepers for her volunteer work with the Red River Water Festival teaching area 4th graders about water.



**Dr. Abbey Wick**, Assistant Professor of Soil Health-Extension, was honored recently by the North Dakota Corn Utilization Council with the "Persistence and Vision Award."



**Jaclyn Eichele**, MS student in Entomology advised by **Dr. Jason Harmon**, won 1st place in her section of the poster competition at the North Central Branch of the Entomological Society of America annual meeting, held in Des Moines, IA.



**Heather Matthees-Dose**, PhD student in Soil Science advised by **Dr. Ann-Marie Fortuna**, was selected to attend the MicroTrop one-month advanced course in Soil Tropical Microbial Ecology, in Senegal West Africa. The course was designed for US and African PhD students and early career scientists, and was co-sponsored by The Ohio State University and NSF.



**Arnab Bhowmik**, PhD student in Soil Science advised by **Dr. Anne-Marie Fortuna**, won 3rd place in the Soil Biology & Biochemistry Division, Graduate Student Poster Competition for his work at the 2014 Annual ASA-CSSA-SSSA International Meeting in Long Beach, CA.





## Additional Award Nominations of SNRS Faculty & Staff in 2014

- **Dr. Marion Harris**, Professor of Entomology, was nominated for the NDSU Odney Teaching award.
- **Dr. Ryan Limb**, Assistant Professor of Range Science, was nominated for the NDSU Excellence in Academic Advising of Undergraduates award.
- **Dr. Christina Hargiss**, Assistant Professor of NRM, was nominated for the NDSU Excellence in Academic Advising of Undergraduates award.
- **Dr. Larry Cihacek**, Associate Professor of Soil Science, was nominated for the NDSU Development Foundation Mentorship award.
- **Dr. Jason Harmon**, Assistant Professor of Entomology, was nominated for the NDSU College of Agriculture Larson/Yaggie Excellence in Research award.
- **Dr. R.J. Goos**, Associate Professor of Soil Science, was nominated for the NDSU College of Agriculture H. Roald and Janet Lund Excellence in Teaching award.
- **Dr. Christina Hargiss**, Assistant Professor of NRM, was nominated for the NDSU College of Agriculture William and Angelyn A. Austin Excellence in Advising award.
- **Danelle Walker**, Account Technician, was nominated for the NDSU College of Agriculture Rich and Jody Burgum Technical Staff award.
- **Joel Bell**, Research Specialist in Soil Science, was nominated for the NDSU College of Agriculture

## SNRS Graduates | Degrees Awarded in 2014

### MS Degrees

Ashton Hansen, Entomology  
Austin Link, Range Science  
Skye Gable, Soil Science  
Honggang Bu, Soil Science  
Brandon Montgomery, Soil Science  
James Walker, Entomology  
Aaron Field, Range Science  
Dustin Ford, NRM  
Peter O'Brien, NRM  
Kathryn Kral, Range Science  
Amanda Lipinski, NRM

### PhD Degrees

Kirk Anderson, Entomology  
Yangbo He, Soil Science  
Lakesh Sharma, Soil Science

### MNRM Degrees

Zahra Hashim, MNRM  
Adam Kleinschmidt, MNRM  
Zach Sager, MNRM  
Ryan King, MNRM  
Jessica Nymark Aasand, MNRM  
Mohan Pai, MNRM  
Courtney Duchene, MNRM  
Joshua King, MNRM  
Jordan Smith, MNRM  
Andrew Lillejord, MNRM  
Benjamin Carlson, MNRM  
Benjamin Anderson, MNRM  
Emma Lintelman, MNRM  
Berdakh Utemuratov, MNRM  
Sarah Wilson, MNRM

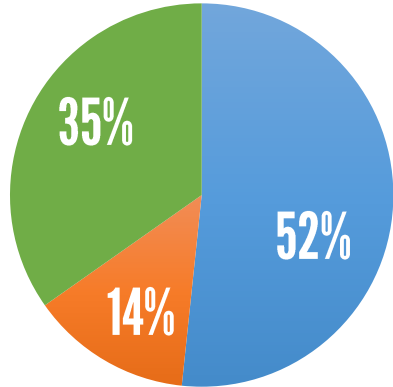
### Undergraduates

Jared Floodman, NRM  
Jessica Christianson, Soil Science  
Joseph Budke, Soil Science  
Joseph Rude, NRM  
Brandon Dahl, NRM  
Lindsey Forward, NRM  
Danielle Steinhoff, NRM  
Kayla Graber, NRM  
Benjamin Munson, NRM  
Mitch Neitge, NRM  
Christopher Anderson, NRM  
Shelby Hanson, NRM  
Raymond Heinz, NRM  
Daniel Peterson, NRM  
Benjamin Uecker, NRM  
Jordaan Thompson, Soil Science  
Jared Lamartine, NRM  
Keaton Laymon, NRM  
Sofia Costa-Terryll, NRM  
Aaron Klaustermeier, NRM  
Adam Johnson, NRM  
Matthew Mecklenburg, NRM  
Dustin Spaeth, NRM



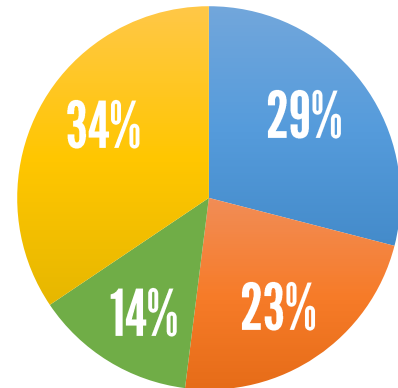
## Highlights of 2014 | A Year in Infographics

### FUNDING ACTIVITIES



■ Agriculture ■ Natural Resources ■ Oil & Gas

### SOURCE OF FUNDING



■ Commodity ■ State ■ Industry ■ Federal

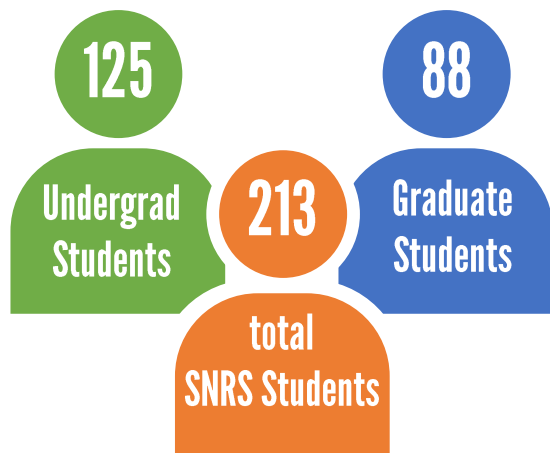
Faculty reported almost \$2.6 million in new funding in 2014, an increase of almost 60% from 2013! As a whole, the total active grants in 2014 were up 9% for a total of \$6,957,397. One reason for the increase in funding is the need for research and education on oil and gas impacts on agriculture and natural resources in the Bakken area (see SNRS Hot Topics section on page 7 for more details on this area of research).

### EXTENSION ACTIVITIES IN 2014

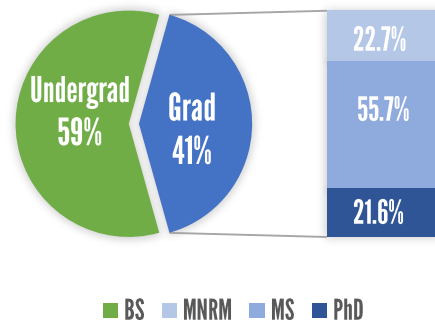


Peer-reviewed publications increased by 18% over the last year.

18%



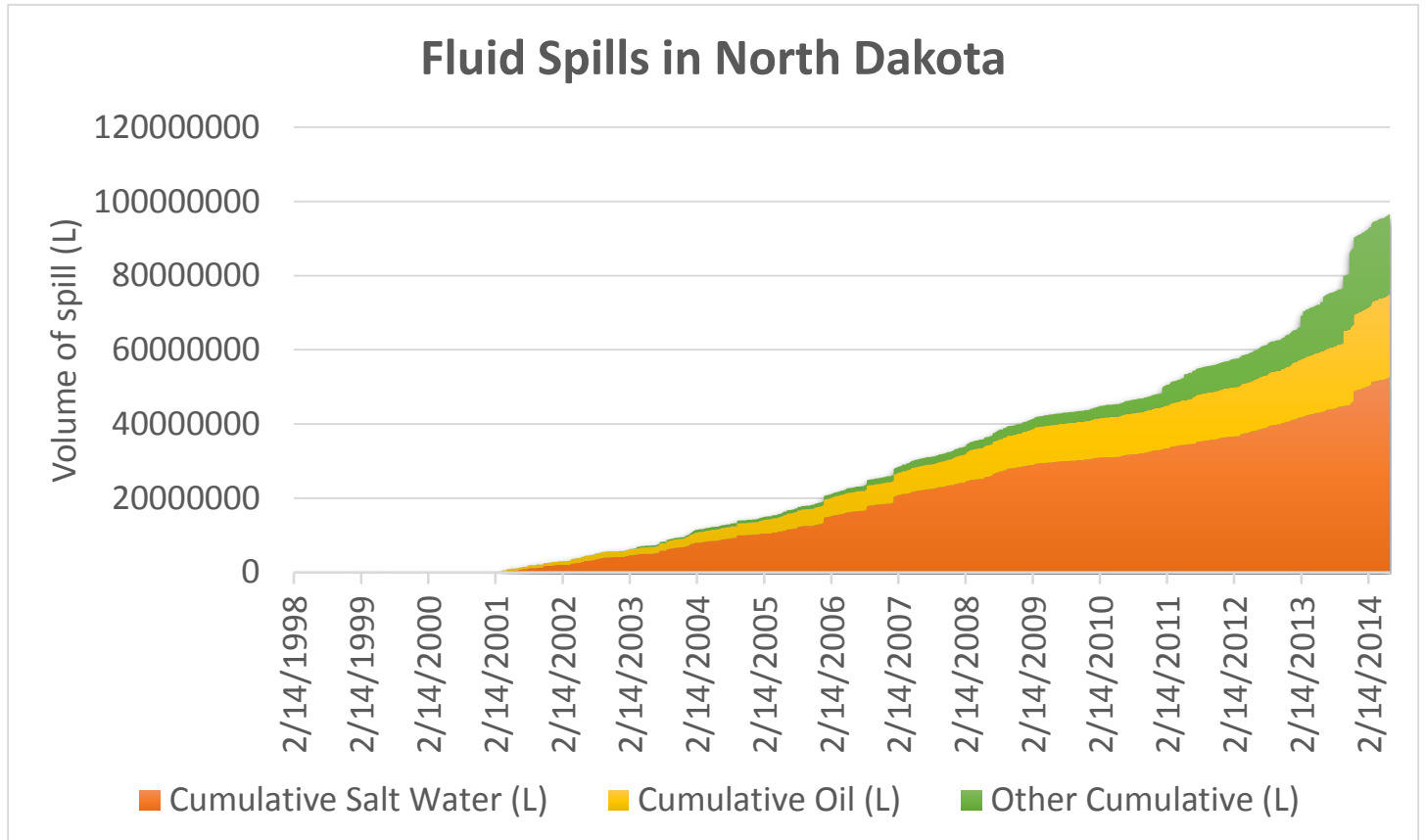
### 2014 ENROLLMENT



In 2014, there were a total of 213 undergraduate and graduate majors in the School's majors. Our highly successful professional degree, the Masters of Natural Resource Management, helped increase our graduate enrollment to 88.

## SNRS Hot Topic | Oil and Gas Production in North Dakota

Currently, there are 10,000 wells in production in ND with another 40,000 wells are anticipated to be developed. Pipelines and/or tanker trucks are used to transport this oil and associated natural gas. Currently, there are 17,000 miles of pipeline installed in Western ND used to transport oil, brine water, and natural gas. From present to 2020, it is forecasted that 2,200 miles of pipeline will be installed per year for a total of 35,700 miles of pipeline. This is enough pipeline to wrap the earth at the equator nine times. The total land area to be reclaimed from pipeline installation alone will be 270 square miles. Dust loading resulting from the oil traffic is significant, and concerns are growing about the effects of dust on human, livestock, and crop health.



**Fluid spills:** The frequency and quantity of brine, oil, and "other" fluids spilled in North Dakota has dramatically increased over the past decade. From 2001 to present, the number of spills (11,393) more than tripled.



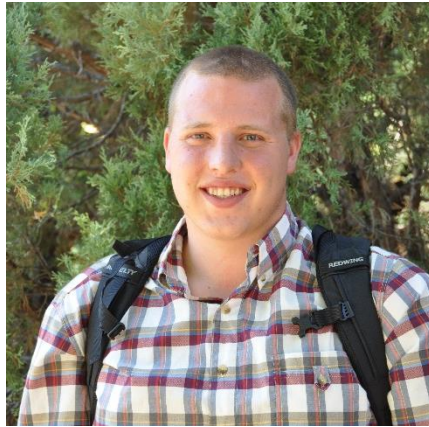
School faculty are involved in reclaiming the soil from the largest land oil spill in the United States. This spill occurred in September 2013, when a farmer harvesting wheat near Tioga discovered an oil spill from a broken pipeline managed by the Tesoro Logistics GP, LLC (Tesoro). A lightning strike is assumed to have weakened the pipe after which a ¼ inch hole was formed causing over 20,000 barrels of crude oil to discharge across 7 acres to depths of 30 or 40 feet.

## SNRS Alumni Updates | News from SNRS Graduates

**Samantha Brunner** is working as the State Apiary inspector with the North Dakota Department of Agriculture. She graduated with an MS degree in NRM in 2012 and was advised by **Deirdre Prischmann-Voldseth**, Associate Professor of Entomology. In her work with the Department of Agriculture, Samantha oversees the Apiary program which licenses all beekeepers, registers their colonies and locations where they will be putting bees. She is also the State Survey Coordinator (SSC). As the SSC, she is responsible for organizing supplies, locations and helping to conduct several statewide surveys to monitor and detect major pests of concern. She also issues Phytosanitary Certificates which are required to export plant and plant products such as wheat and beans to some countries.



**Brandon Montgomery** was recently hired by the Minnesota Pollution Control Agency in St. Paul, MN. Brandon completed his MS degree in Soil Science in 2014 under the guidance of **David Hopkins**, Associate Professor of Soil Science. In his role at the Minnesota Pollution Control Agency, Brandon will be providing soil and technical assistance for the Subsurface Sewage Treatment Systems (SSTS) program. The goal of the SSTS program is to protect the public health and the environment through adequate dispersal and treatment of domestic sewage from dwellings or other establishments generating volumes less than 10,000 gallons per day.



**Austin Link** was recently hired as an Agronomy Research Specialist at the NDSU -Williston Research Extension Center. Austin completed his MS Degree in Range Science in 2014 and was advised by **Shawn DeKeyser**, Program Leader of NRM. In his work at the WREC he is responsible for designing, conducting, analyzing and summarizing scientific experiments and assisting in the dissemination of dryland cropping systems, alternative crop, soil nutrient and pest management research results. Austin is also tasked with presenting results of cropping systems research to other research and/ or stakeholder groups. One experiment Austin is particularly excited to be coordinating is a pipeline reclamation study that will evaluate the success of different cropping rotations, annual and perennial cover crops, and manure application in rehabilitating soil health and restoring crop yields.



Want to appear in the SNRS Annual Highlights? Submit your Alumni news by email to [diane.pennington@ndsu.edu](mailto:diane.pennington@ndsu.edu).

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