

Research and Economic Development at the University of North Dakota

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Vice President for Research and Economic
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UND is a Major National Research University

- Our focus is on research and scholarship that:
 - Involves our students as central partners in the discovery process.
 - Prepares our students to be leaders in their chosen career paths by providing real world, hands-on experiences.
 - Seeks to address the major challenges of our society and our world, such as energy and human health.
 - Benefits North Dakota and the nation through technology and workforce development that drives economic prosperity.

UND is a Major National Research University

- We achieve our status as a major research university by:
 - Aggressively developing industrial/corporate/private sector partnerships and relationships.
 - Actively informing the public about what we do and why it is important to North Dakota, and responding to public needs.
 - Providing resources to, and mentoring our faculty and students to help drive more research and more success in garnering financial support for our research.
 - Providing appropriate administrative infrastructure.

UND is a Major National Research University

- We measure our status as a research university by:
 - External funding
 - FY15: \$91M total funding.
 - **FY16: \$115M total funding (~25% increase)**
 - Research-based graduate degrees (e.g., Ph.D.)
 - FY16: 137 Ph.D. degrees awarded
 - Technology development and corporate partnerships
 - Our **Impact** on North Dakotans

Notes About Our Funding

- Our major areas of federal/private sector funding are in energy and biomedical.
 - In FY16, energy funding awards totaled approximately \$40M, with most funds coming from Department of Energy, National Science Foundation, and the private sector.
 - In FY16, biomedical funding awards totaled approximately \$33M, with most funds coming from the National Institutes of Health.
 - The majority of these funds were received through competitive programs.

Notes About Our Funding

- Research expenditures are self-reported by the university to the NSF for the annual HERD survey.
- Research expenditures lag award data by one or more years.
- Each university across the country reports expenditures differently, and for this reason, making direct comparisons of research volume and impact between universities using the HERD data is very difficult.

Notes About Research Expenditures

- For example, UND reports to NSF relatively small expenditures funded by the state because we do not have an agriculture-extension mission and do not receive funds to pursue such a mission.
- Most land grant universities report such state support **plus** the un-recovered indirect costs that were expended in carrying out the work (states do not typically provide indirect costs for extension services).
- UND also does not currently report to NSF many institutional contributions to research because we have not yet implemented procedures to accurately determine some of these contributions (e.g., university compensation to faculty for conducting research).

UND Total Grant and Contract Funding

- For FY16, total external grant funding was \$115M, up from \$91M in FY15.
- In addition, external contracts for non-research related services (i.e., other sponsored programs, primarily in Aerospace funded by the UND Aerospace Foundation) totaled ~\$45M.
- Total institutional commitments to research and scholarship are estimated at ~\$20M.
- Total of external and institutional grants, contracts and support is ~\$180M.

Major Research and Development Focus Areas

Energy/Power

- Research on production of conventional energy sources as well as alternatives and renewables
- Research on physical and societal impacts of energy production and use
- Research on power distribution
- Carbon capture and sequestration – **Major opportunity**
- EERC, Institute for Energy Studies, Petroleum Engineering, Chemical Engineering, Electrical Engineering, Computer Science, Physical and Life Sciences, Medicine, Law, UAS

UND is One of the Nation's Premier Energy Research Universities

Opportunity: Carbon Capture and Sequestration

- How can UND help drive the state economy through energy?
- North Dakota is rich in fossil fuels. However, national and global regulations are making it harder to extract and benefit from these resources.
- UND has initiated programs to investigate carbon capture and sequestration.
- With the proper state and private investments, UND can help develop new technologies that will allow us to unlock the value of our carbon resources.
- This is potentially a major economic opportunity for North Dakota that UND can lead.

Remarks from EERC and Minnkota

<Presentation by Tom Erickson, CEO, Energy and Environmental Research Center>

<Remarks by Michael Hennes, Vice President – Transmission, Minnkota Power Cooperative on partnering with UND>

Major Research and Development Focus Areas

UAS

- Research on Data Supply Chain
 - Collecting, Storing, Communicating, Protecting, Analyzing, Exploiting data acquired by UAS for power distribution, energy exploration, agriculture, transportation infrastructure and other applications.
- Research on Sensor/Imaging development
 - Proof of concept research that demonstrates UAS sensors can deliver desired information.
- Research on Integration of UAS into national airspace
 - NPUASTS and UND are pioneers in integration. Enabling complete integration is key to capitalizing on the economic potential of UAS.

UND is a National Leader in UAS Research

Remarks from Northrup Grumman and Skyskopes

- <Remarks by Dave Hambleton, Northrup Grumman Corporation, on partnering with UND>
- <Remarks by Matt Dunlevy, CEO, Skyskopes, on partnering with UND>

Major Research and Development Focus Areas

Biomedical

– School of Medicine & Health Sciences

- Research focus on Neurosciences, Infectious Disease, Epigenetics, Rural Health
- Growing research enterprise balances nicely and is synergistic with the training mission as the state's medical school

– Colleges of Nursing & Professional Disciplines, Education & Human Development, Arts & Sciences, Engineering & Mines

- Research in social work, public health, psychology, counseling, kinesiology, addiction, obesity and fitness, biomedical sensors