

The logo for North Dakota State University (NDSU) is located in the top left corner. It features the letters "NDSU" in a white, serif font, set against a background of a colorful, abstract design with green, yellow, and red elements.

# Growing High-Tech On The Great Plains

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# NDSU



NDSU

# It's About the Land



600

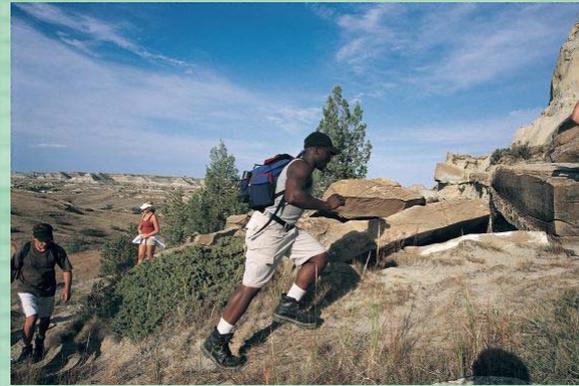
NDSU

# ...what it produces



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# ...its people



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# ...identifying market niches

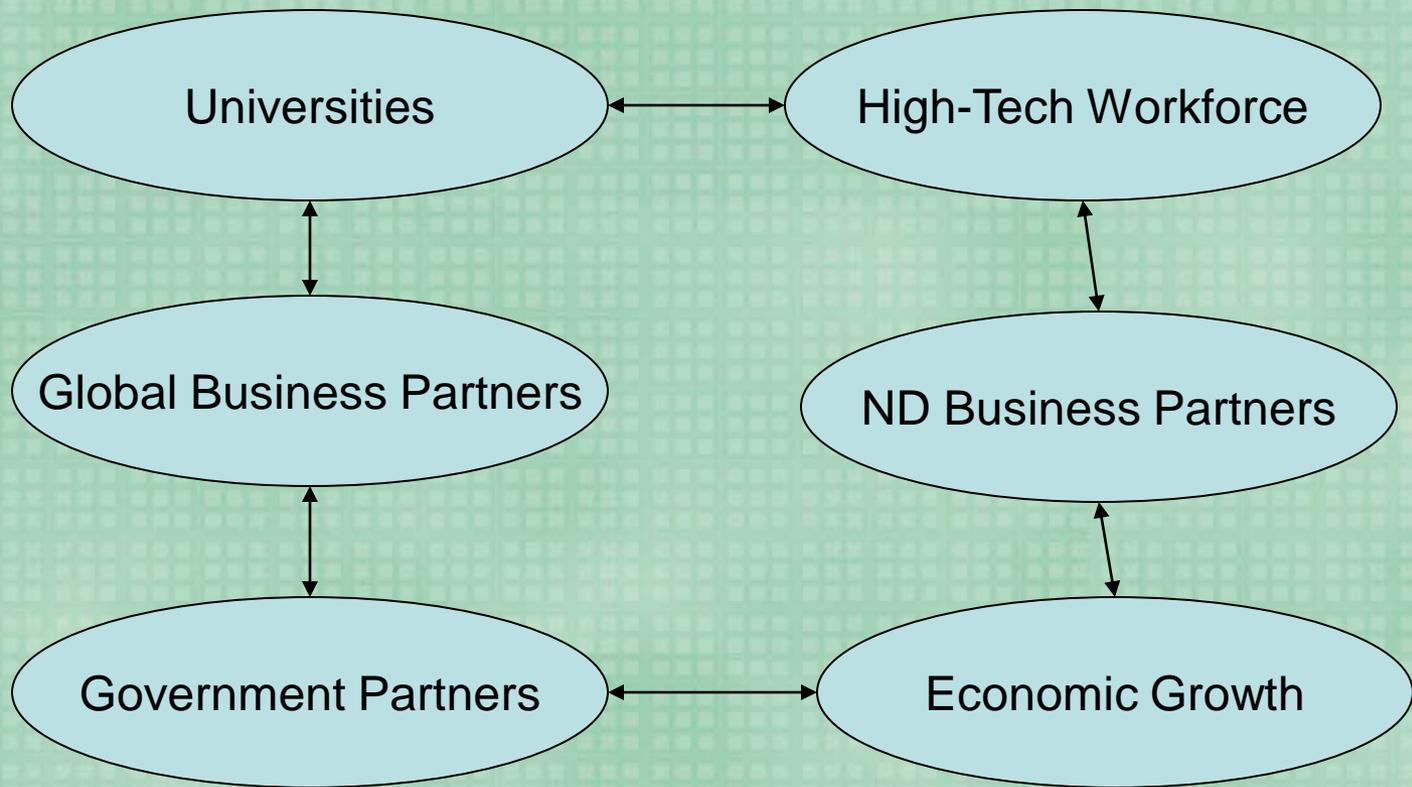


NDSU RTP Technology Incubator



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# and...connecting the dots



# North Dakota

- Population: 640,000 U.S. Census Bureau estimate
- Economic playing field for ND: agriculture, energy, light manufacturing, and tourism
- 44 crops; # 1 nationally for 11-14 crops
  - Production Ag now very efficient → big losses in workforce
  - Extraction industries: same story
- High productivity and profitability are not enough to keep our young people



# Losing Young Workers

- This is the picture for rural America, and rural everywhere. Why?
  - Efficiency of Ag and Extraction Industries
  - Lack of High Paying Jobs & Career Prospects
  - Loss of Services in Small Towns
  - Loss of Small Towns!
- And then there is ... Globalization



The NDSU logo is positioned in the upper left corner of the slide. It consists of the letters "NDSU" in a bold, black, serif font. The background of the slide features a colorful, abstract graphic with a grid pattern and a wavy, rainbow-like border at the top.

# North Dakota Response

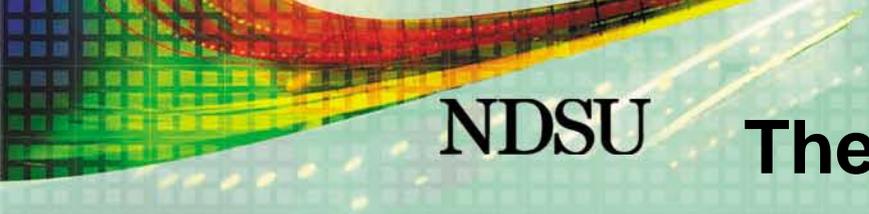
- NDSU President Joseph Chapman – Vision & Challenge
- Entrepreneurial University System: flexibility with accountability (*The Roundtable*, ND Legislature's Initiative)
- Economic Development Centers of Excellence  
Governor John Hoeven's Initiative
- Red River Valley Research Corridor  
Senator Byron Dorgan's Initiative: Energy, Defense, Agriculture
- Universities commit to meet Private Sector needs through partnerships



# Is High Tech a Solution?

- A good bet for rural America because
  - National Security Issue: avoid over concentration of critical technologies
  - Excellent educational infrastructure in place
  - Excellent communications systems
  - Many rural states are net energy producers
  - Many High Tech industries require a small but well-trained and highly-educated workforce – important for low population areas



The logo for North Dakota State University (NDSU) is located in the top left corner. It features a stylized, colorful graphic of a field or landscape in shades of green, yellow, and red, with a white swoosh element. The text "NDSU" is written in a bold, black, sans-serif font to the right of the graphic.

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# The Land Grant University ...every state has at least one

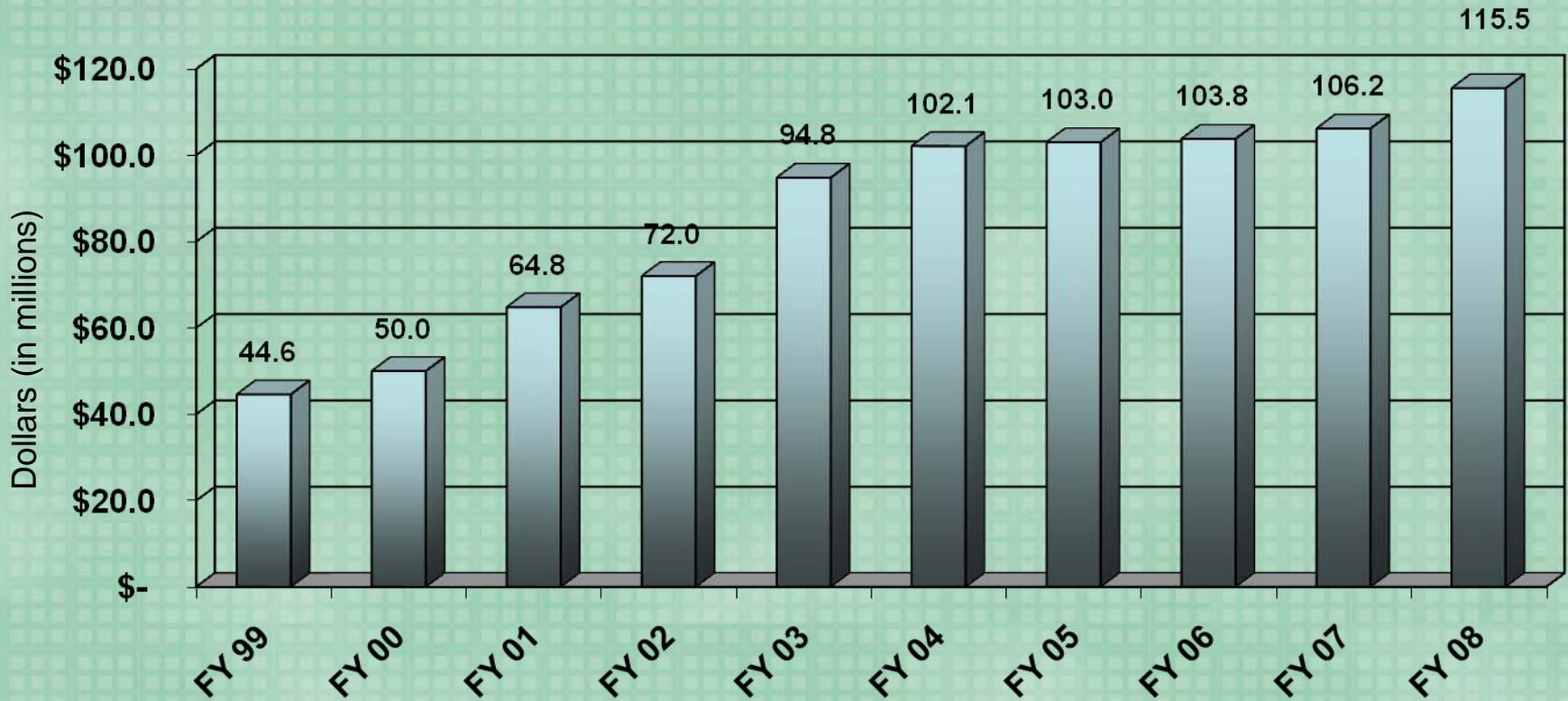
## The Land Grant Mission (1862)

- Incorporate liberal arts and sciences with those of the practical: agricultural, mechanical and industrial
- Emphasis: economic benefit of the average citizen
- The Roles of the Modern Land Grant University
  - Teaching, Research, Service, and...
  - Economic Development



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# Research Growth



# Economic Impacts

- \$100 million annual research activity translates into:
  - Direct economic impact of \$78.4 M in North Dakota
  - Indirect economic impact of \$234.9 M
  - Significant influx of intellectual capital

\*Study by Dr. L. Leistritz, NDSU Dept. of Agribusiness & Applied Economics



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# NDSU Research at a Glance

- Ranked in Top 100 research universities in physical sciences, chemistry, ag sciences, social sciences: Source: National Science Foundation – FY08.
- Overall ranked 41st out of 537 research universities w/o Medical Schools; 128<sup>th</sup> of 662 overall. Source: National Science Foundation – FY07exp.
- Royalties = \$1.5M/yr. Consistently in top 60

Source: Association of University Technology Managers



# Research Capabilities

- Photovoltaics
- Catalysis (crop oils → specialty chemicals)
- Biomass (agriculture)
- Coal Sequestration (pipeline corrosion studies)
- Nanotechnology
- Microelectronics
- Magnetoelectronics



The logo for North Dakota State University (NDSU) is displayed in a serif font. The background of the slide features a colorful, abstract graphic in the top left corner with a grid pattern and a curved, multi-colored band. The main background is a light green grid.

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# Research Capabilities

- High performance computing
- Conformal Computing
- Plant genomics
- Engineering and food safety
- Coatings and polymeric materials
- Bioengineering
- Animal nutrition & physiology
- Archaeology



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# High Technology in N.D.



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# Some Core Competencies

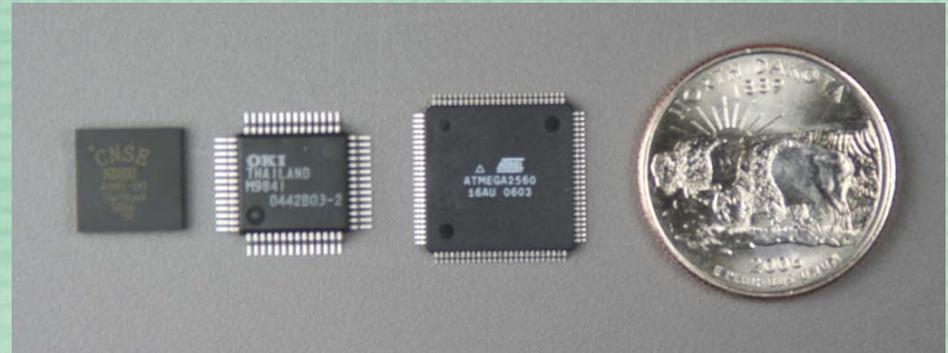
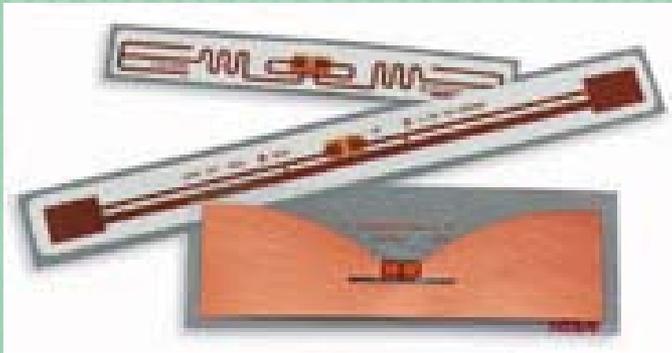
- Robotics - From one ..... to many



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# Electronics miniaturization

- RFID and chip scale packaging



# Examples of Industry Research Partners

- Akzo Nobel
- Alien Technology
- Bobcat
- Crane
- DuPont
- Gremada Industries
- Honeywell
- PPG
- Microsoft
- Monsanto
- Pfizer
- Phoenix International
- Symyx
- Tessera
- 3M
- Appareo



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# Fields to Tech Park



**US Dept of Commerce Award  
of Excellence for Technology  
Led Economic Development -  
2006**



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# Research 1



- NDSU Research Administration
- ND EPSCoR
- NDSU Coatings & Polymeric Materials
- Center for Surface Protection
- Center for High Performance Computing



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# Research 2



- NDSU Center for Nanoscale Science & Engineering
- Microelectronics
- Combinatorial Materials Research
- RFID, CSP
- Magnetoelectronics
- Conformal Computing
- Center for Advanced Electronics Design and Manufacturing
- Center for Integrated Electronics and Software



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# Research Park



Alien Technology

Phoenix International  
A John Deere Co.



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# Research & Technology Park Goals

- Turn visionary ideas into high-tech businesses
- Create one-stop center with entrepreneurial tools
- Nurture new technologies into commercial enterprises
- Diversify region's economy
- Create high-quality, long-term jobs
- Apply technology from NDSU researchers to global economy – Product Design and Development



# Measurable Results

- Research growth \$44M to \$115M
- Enrollment growth from 9,700 to more than 13,500 students
- 7 buildings in 9 years
- NDSU research activities in NY Times, Financial Times, National Geographic, Wall Street Journal, CNN, Washington Post
- More than 475 people come to work in NDSU's Research & Technology Park each day
- Plus 100 undergrad researchers every summer



# Moving Forward

- Number of ND workers under age 35 grown by more than 2,000/yr from 2004 to 2006 (ND Census Committee – Job Service ND – statistics released Oct. 2007)
- Reverses decline in young work force from 1999 to 2006
- Research Corridor created 2,810 jobs since 2002
- Legislature created R&D tax credit – 25% of first \$100,000 in qualified research expenditures and 20% of qualified expenditures until 2017
- Connecting the dots – University partnerships lead to manufacturing opportunities, for ex. Killdeer Mountain Mfg.
- ND Industrial R&D Performance: #1 in % increase for 2000-2004 (SSTI)



- Federal, State and Metro participation is critical
- Bipartisan leadership
- Commitment to North Dakota's future
- Collaboration with local, regional and state economic development groups
- Providing opportunities for professionals to return to North Dakota





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**Thank You**

