Director’s Foreword

It has been a busy and productive year since I took on the role of NCRCRD Director in January 2016. By October 2016 I managed to make visits to all 12 states in the North Central region. Valuable discussions with colleagues across the region served as a basis for developing a survey of rural development priority issues and challenges in our region. Based on survey feedback from the NCRCRD constituency and in consultation with partners, the Center now has new set of major themes that will guide activity in the coming years. You can read about these themes on our new website. As I visited the states, questions arose about the NCRCRD small grant program and its future and effectiveness. These questions motivated me to conduct another survey of past small grant recipients to gather more information about the longer-term outcomes of the funded projects. In addition to learning about the numerous publications, ongoing programs and activities, and continued cross-state collaborations, we learned that for every $1 the NCRCRD invested in the region an additional $2 was generated in subsequent grant funding from sources such as the NSF, EDA, and USDA. Survey findings suggest that the NCRCRD small grant program is meeting a key objective of providing seed funds in a way that generates larger grants later on. In addition to the new website and revised priority areas, we also transitioned our communications platform to Constant Contact and expanded our distribution list.

In the meantime, we continue our efforts on other key activities such as the grant funded CAPE and AAPILEPRC programs as highlighted in this report. I also want to bring attention to changes in the NCRCRD Board of Directors and the Research Advisory Panel. Specifically, we offer our sincere thanks to Dr. Neal Merchen (University of Illinois) and Dr. Beverly Durgan (University of Minnesota) for years of service on the Board, and we welcome Dr. Karl Martin (University of Wisconsin), our newest Board member. To better align expertise within the NCRCRD Research Advisory Panel to the revised theme areas, Drs. Sandy Dall’Erba (University of Illinois), Steven Deller (University of Wisconsin), and Carrie Henning-Smith (University of Minnesota) have joined Drs. Lionel “Bo” Beaulieu and Linda Lobao on the Research Advisory Panel.

As with my message last year, I emphasize that the Center, in partnership with the region’s Land Grant institutions, continues to support the excellent work that helps to improve the quality of life in rural communities across the North Central region. And yet it is important to acknowledge the ongoing headwinds we face. The special study “Community Economic Impacts of Reductions in Pension Payments” highlighted later in this report examines the implications of coming consequences of unfunded pension liabilities. Rapidly expanding public and private debt has been a key driver for maintaining the very low interest rate rate environment. However, low interest rates over extended periods have exacerbated the pension liability challenge as pension funds receive lower returns on assets. At the federal level, March 15, 2017 marked the end of a two year debt ceiling holiday—lawmakers must now renegotiate the $20 trillion debt ceiling freeze. Facing the challenges of making good on promises made head on is an important aspect in achieving our goal of helping to create stronger and more resilient communities across the region.

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North Central Land Grant Colleges and Universities:
Original 1862 Land-Grand Institutions
Iowa State University
Kansas State University
Michigan State University
North Dakota State University
The Ohio State University
Purdue University
South Dakota State University
University of Illinois
University of Minnesota
University of Missouri
University of Nebraska
University of Wisconsin

1890 Historically Black Institutions
Central State University
Lincoln University

Hispanic-Serving Institutions
The center is eager to serve federally designated Hispanic-Serving Institutions (HIS) wishing to pursue rural-development activities. The HIS status depends on an enrollment threshold of 25 percent or more Hispanic Students, so qualifying institutions may vary from year to year.

1994 Native American Tribally Controlled Institutions
Bay Mills Community College, Brimley, MI
Cankdeska Cikana Community College, Fort Totten, ND
College of Menominee Nation, Keshena, WI
Fond du Lac Tribal and Community College, Cloquet, MN
Fort Berthold Community College, New Town, ND
Haskell Indian Nations University, Lawrence, KS
Keweenaw Bay Ojibwa Community College, Baraga, MI
Lac Courte Oreilles Ojibwa Community College, Hayward, WI
Leech Lake Tribal College, Cass Lake, MN
Little Priest Tribal College, Winnebago, NE
Nebraska Indian Community College, Macy, NE
Oglala Lakota College, Kyle, SD
Saginaw Chippewa Tribal College, Mt. Pleasant, MI
Sinte Gleska University, Mission, SD
Sisseton Wahpeton Community College, Agency Village, SD
Sitting Bull College, Fort Yates, ND
Turtle Mountain Community College, Belcourt, ND
United Tribes Technical College, Bismarck, ND
White Earth Tribal and Community College, Mahnomen, MN
Small Grant Awards

The NCRCRD is pleased to announce winners of its annual small grants competition. Each proposal goes through an independent review process. Referee comments are reviewed by the NCRCRD Board of Directors, which makes final recommendations for what is to be included in the Center’s annual proposal to the USDA.

Redefining Rural Food Deserts by Transportation Networks
**PI:** Hyung Jin Kim and Gregory Newmark (Kansas State University)
**Collaborators:** David Procter and Nancy Knopp Daniels (Kansas State University); Glen Muske (North Dakota State University) & Lori Capouch (North Dakota Association of Rural Electric Cooperatives)

This research seeks to explore the food access patterns of rural residents to better inform public policy. Specifically, this study aims (a) to reframe rural food access within the context of rural travel behavior that considers the distribution of food outlets using a GIS-based spatial network model; and (b) to understand rural food access barriers and disparities. This study will examine the grocery-related travel of rural residents in the twelve-state NCRCRD region, with additional focus on communities in Kansas and North Dakota, by combining the highly-detailed, geocoded information on trip and activity behavior from the National Household Travel Survey (NHTS) with a full GIS mapping of food outlet location data.

Workforce Issues: Collaborating to Build Extension’s Capacity
**PI:** Kenneth Sherin (South Dakota State University)
**Co-PI:** Cheryl Burkhart-Kriesel (University of Nebraska)

Attracting and retaining talent, both in the foundational STEM (science, technology, engineering and math) areas as well as in vocational skills, is a subject of increasing concern. This project proposes to: 1) initiate a regional Extension dialogue on possible methods to support the development of local workforce skills at the community level; 2) start to identify and inventory key current workforce development resources, primarily within Extension and this region and possibly within other regions; 3) identify gaps, primarily programmatic but possibly in research, that would help communities better address workforce skill issues; 4) modify, if needed, possible resources for multi-state use and consider ways to make resources available in a “one-stop shop”.

Farmer to Non-Farmer: The Role of Farmer Identity on Conservation
**PI:** Eric Toman (Ohio State University)
**Co-PI:** J. Arbuckle (Iowa State University)

The need exists to better understand the full population of landowners, and the factors that influence their behaviors, to balance agriculture production and maintenance of ecosystem quality and services. As calls for increased efficiency and effectiveness from federal and state agencies to address environmental concerns escalate, there is a critical need for a closer examination of the relationship between non-operator landowners, with varying farmer occupational identities, and the tenant farmers in relation to barriers and incentives that exist to adopt Best Management Practices (BMP).
Addressing Mine-Scarred Land in the Upper Mississippi River Mining District
PI: Geoffrey Siemering (University of Wisconsin)
Co-PIs: Kevin McSweeney (University of Illinois) and Troy Maggied (Southwestern Wisconsin Regional Planning Commission)

The Upper Mississippi River Valley zinc-lead mining district comprises an area of approximately 4,000 square miles covering southwestern Wisconsin, the northwest corner of Illinois and a small sliver of Iowa along the west bank of the Mississippi River. While most mining operations ceased by the early 1950s, their environmental legacies remain. These mines and mining materials continue to impact both the small towns and agricultural lands in this area.

Using Agent Based Modelling to Understand and Enhance Rural Tourism Industry Collaboration
PI: Sarah Nicholls (Michigan State University)
Co-PI: Jonathon Day (Purdue University) and Bonnie Zoia (Michigan State University)

Unlike traditional primary and secondary sectors such as forestry, fishing and manufacturing, tourism is diverse and fragmented, made up of a diverse assortment of public, private and non-profit agencies and entities that operate under a range of missions and mandates, and at a variety of geographic scales. The tourism industry is also plagued by a general lack of collaboration, cooperation, and partnerships, especially in rural areas. The use of ABM will allow industry actors’ behaviors, and the interactions between them, to be visualized and assessed. Resulting outcomes will enable researchers and practitioners to identify, understand, and replicate the drivers of collaboration, as well as the settings in which collaboration is most likely to flourish.

Food Council Development in Rural Communities: A Toolkit for Extension Educators
PI: Kendra Wills (Michigan State University)
Co-PI: Jodee Ellett (Purdue University)

The rural Midwest is scattered with small towns affected by poverty, hunger, and a lack of community services and events. Local food efforts have begun to address some of these issues in rural communities. New farmers markets create greater access to healthier foods. Young food and farming entrepreneurs build the economic base and enhance quality of life. Agricultural and food issues can be complex and controversial in some communities and the need for Extension to have a facilitative leadership role is increasing. We seek to enhance this new role for Extension by creating and piloting a food council development curriculum that will guide our new and seasoned educators in a six-month process with an engaged group of community members and leaders.

Community Entrepreneurial Development Project
PI: Francis Gublo (Michigan State University)
Co-PIs: Charlotte Narjes and Connie Hancock (University of Nebraska) and Andrew Hayes (Michigan State University)

Creating entrepreneurial communities encompasses many elements from community knowledge and mindset to tools and resources to help entrepreneurs grow their endeavors. It has been well documented that helping entrepreneurs is a cost effective way for rural communities to grow and sustain their economies. Although there is no “template” to implement a successful program, we feel that Extension faculty can learn and improve educational offerings by sharing best practices. This proposal describes a process for such idea sharing and will serve as a starting point for future collaboration and cooperation between those land grant universities engaged in assisting entrepreneurs in local communities.
Impacts of Small Grants
“...prepare a solid report examining how a relatively new local economic development technique has been used to start and retain essential local businesses, especially in small rural communities facing economic declines. Furthermore, it provides a significant resource for rural developers to work with local leaders to revive their downtowns. The research also has raised the issue of whether a Vermont Country Store approach that relies heavily on social capital can be used in declining rural areas in the Midwest. The research offers a new perspective on ways in which residents can invest in local businesses and enhance the local economy. “
Normal Walzer, Northern Illinois University

“...partner with colleagues from other university Extension systems while exploring best practices in small town redevelopment.”
Zach Kennedy, University of Illinois

“...develop a network of regional cider producers, enhance my understanding of their priorities, and develop appropriate follow-on projects that better meet their needs.”
Michelle Miller, University of Wisconsin

“...develop leadership capacity among 34 participants to promote Latino family engagement in youths’ academic success by illuminating the pathways to college."
Rueben Martinez, Michigan State University

“...train additional Extension staff in Iowa and their community partners in the curriculum, and then plan as local teams for program implementation.”
Kim Breder, Iowa State University

“...understand the depth of Extension programs and resources related to downtown development in the U.S., and how I can improve and enhance my work by learning from those in other states.”
Bill Ryan, University of Wisconsin

“...develop a more comprehensive knowledge and understanding of the research literature on community leadership and how community leadership education can be conceptualized, organized, delivered and implemented.”
Deborah Tootle & Jerry Braatz, Iowa State University and University of Wisconsin

This year the NCRCRD conducted a survey of past small grant recipients between 2009-10 and 2015-16 to learn about the outcomes of investments made in the region. Below, we provide a few highlights:
- 75% of grant recipients are still working across state lines with grant partners.
- More than 50% of grant projects included the development of a curriculum, two-thirds of which are still in use today.
- Grant recipients produced 13 publications with several in refereed journal outlets.
- A total of $1.27 million in grant funding was obtained in subsequent years from sources such as the EDA, NSF, and USDA. For every $1 invested in the small grant program, $2 in subsequent grant funding was received.
Farewell, but still in the Family, for Craig Carpenter

When Craig Carpenter arrived at NCRCRD, he rapidly carved out a niche looking at how Hispanics use business development to make their way in the United States. With help from then Director Scott Loveridge, the Atlanta Federal Reserve, board member Dick Todd, and the University of Michigan, he gained access to federal microdata to help track how Hispanics thrive and how they contribute to the local economy. Craig’s work was a perfect fit for a new position at Texas A&M working as an Assistant Professor and Extension Specialist with Texas AgriLife Extension, where he contributed to knowledge of rural economies via access to A&M’s Federal Statistical Data Access Center. Craig contributed a policy brief to NARDEP (a joint project of the four RRDCs) and presented results of his dissertation work at the North American Regional Science Council annual meetings and the Minneapolis Federal Reserve. Additional 2017 presentations are scheduled with the Upjohn Institute for Employment Research and a joint webinar with SRDC and NCRCRD. An article out of Craig’s dissertation is scheduled for publication in 2017 with the Journal of Regional Analysis and Policy. Arriving at A&M in June, Craig immediately engaged with the joint RRDC/USDA Rural Development Stronger Economies Together program as well as other community development Extension work.

Publications


NC1100
Virtual Fast-Pitch Hits it Out of the Park—A New Way to Connect Faculty

In September, NC1100 members John Mann, C. Y. Wang, and Scott Loveridge experimented with a new way to connect research faculty working on innovations in agriculture. Using webinar technology, the team assembled a group of bench scientists from South Dakota State University (SDSU) to give brief overviews of their “ready to commercialize” work. Prof. Christopher Chase shared his work on microbiome-immune interactions; Prof. Om Perumal talked about food protein-based delivery systems; Prof. Padu Krishnan discussed his efforts to advance human nutrition opportunities with distillers’ grain; and Prof. Bill Gibbons shared his progress using plant based meal for aquaculture diets. The session helped establish new collaborative efforts between SDSU faculty-entrepreneurs, Profs. Chase, Perumal, and Krishnan, and identified new potential paths for innovations developed by Profs. Chase and Perumal. Feedback from the group included (1) expanding sessions so faculty can interact with peers at other institutions; and (2) incorporating industry participation into future sessions.

Other NC1100 highlights include the Innovations in Agriculture and Rural Development series which featured faculty and innovations from University of Wisconsin-Madison, Kansas State University, University of Minnesota, Ohio State University, Michigan State University, and the University of Illinois. For example, Karen Mancl (Ohio State University) presented cost and job saving technology for rural meat processing plants, and was able to connect to stakeholders in several states where the regulatory environments are different than in Ohio. As another example, Lauri Baker and Cheryl Boyer (Kansas State University) and Hikaru Peterson (University of Minnesota) provided relevant discoveries in new-marketing media of horticulture to a broader range of agricultural industries nationally.

Additionally, NC1100 member Mann was part of the Extension and outreach effort to increase participation in the USDA Small Business Innovation Research (SBIR) program, especially by women- and minority-owned firms. The collaboration was led by the Western Rural Development Center and included representatives from all four rural development centers and the USDA SBIR program. Mann’s contribution was complemented by serving on the USDA SBIR Rural and Community Development and American Farm Bureau Federation’s Innovation Challenge review panels.

Journal articles, conference papers, and policy briefs:


The **AAPILEPRC** has been working with Mr. Brent Elrod, National Program Leader – Community and Rural Development USDA NIFA, and Janet Nuzum, USDA Senior Advisor and Director of Asian American and Pacific Islander Affairs, to expand its reach to different AAPI farmer and rancher communities across the United States. This year the Center has focused on four key programs to provide translated resources to AAPI farmers and ranchers. These resources provide information to improve and expand their agricultural business operations. These four key program areas are:

1. Translation of Priority Resources
2. Collection of Translated Resources
3. Website Resource Library
4. Summer Internship Program

This year the Center translated 33 priority resources: Three documents into Burmese, 27 documents into Hmong, and three documents into Tagalog. The Center also collected 103 resources that had already been translated into the following languages: Burmese, Hmong, Khmer, Lao, Tagalog, Ilocano, and Vietnamese. These resources are made available to anyone with an internet connection via the Centers’ newly developed website ([http://www.aapileprc.org/](http://www.aapileprc.org/)). The website is continually updated with documents that the Center has translated and collected.

With the introduction of its first summer internship program, two interns, Win Oo and Wynona Bautista, assisted the Center in gathering and translating materials specific to their respective ethnic communities of Burmese and Filipino.

During the four week internship, Win and Wynona contacted organizations working with farmers in their respective communities to identify needs for translated resources. This process revealed a need for translated resources for those who do not read and speak the national language of their respective countries. For example, Tagalog is the national language of the Philippines, yet there were farmers from the Philippines who read and spoke Ilocano, not Tagalog. With this discovery, the interns collected translated resources that are not the traditional national language, but the minority languages spoken by AAPI farmers and ranchers here in the United States.


**USDA Reaches Out to Growing Asian American and Pacific Islander Population**

Posted by Janet Nuzum, USDA Senior Advisor and Director of Asian American and Pacific Islander Affairs, Office of the Assistant Secretary for Administration in Trade (Dec 22, 2016)

Over the last several years, the NCRCRD has led the national project Community Assessment and Education to Promote Behavioral Health Planning and Evaluation. The $6.2 million grant, which is funded by the Substance Abuse and Mental Health Services Administration (SAMHSA) and the National Institute for Food and Agriculture (USDA-NIFA) comes to a close in August 2017 with all the major deliverables nearing completion.

Highlighted this year is the development of a behavioral health training curriculum for Extension Specialists/Educators, local community groups, and other interested parties. The intent of the training is to build capacity in two ways: 1) enhance the behavioral health literacy of those who are in a position of developing and supporting organizational initiatives; and 2) build local coalitions that include mental health service providers to respond to ongoing community behavioral health challenges. The trainings have or will soon be delivered in all four regions of the United States with participants from 12 states.

The CAPE team also administered a nationally representative survey to evaluate behavioral health literacy, focusing on depression, anxiety, prescription drug misuse, and alcohol abuse. Summary findings are illustrated in the infographics accessible in the links below:

- Depression
- Anxiety
- Prescription Drug Misuse
- Alcohol Abuse

In addition, a series of research articles based on the survey data are being prepared. Also, an article was recently published that uses real time Google trends search data to predict changes in suicide and drug and alcohol related deaths. This innovative research is expected to be influential in identifying changing trends so that resources can be more effectively used to address emerging challenges.
Paula K. Miller is a Postdoctoral Fellow at the North Central Regional Center for Rural Development. Her primary role is to conduct work within the Community Assessment and Education to Promote Behavioral Health Planning and Evaluation (CAPE) program. In this position, she facilitates a series of webinars targeted towards Extension agents and other local and state employees to increase community development in the areas of mental health literacy. These trainings also include an eight hour Mental Health First Aid training, which teaches participants how to engage with those who are experiencing a mental health crisis. One of these trainings was completed in the fall of 2016. Four additional trainings are scheduled for the spring and summer of 2017. In addition, Paula is working to analyze and disseminate information related to CAPE’s National Survey, a survey of almost 5,000 respondents that surveyed their mental health literacy around depression, anxiety, prescription drug misuse, and alcohol abuse. This work has resulted in numerous outputs, including submissions to key disciplinary conferences, policy documents, and working drafts of research papers. In the fall of 2017, Paula will be transitioning to a new role, as an Assistant Professor in the Department of Sociology and Anthropology at Ohio University, where she will continue to analyze social determinants of health and mental health literacy.

Dr. Ipsen grew up on a cattle ranch in a small rural farming community in southeastern Idaho. She came to appreciate agriculture through living for extended periods abroad, and began studying the effect of agriculture on local development and labor, particularly on women workers in Chile who brought attention to the issue of pesticides and lobbied for regulatory changes to protect their health. Later with a Fulbright fellowship and an Oxfam grant she studied labor relations in large citrus firms in Argentina and Uruguay. She also worked on an Interamerican Development Bank project that brought together small fruit farmers with large firms to discuss how to make their supply chains more sustainable and fair.

Dr. Ipsen returned to graduate school where she started her PhD in Sociology at the University of Wisconsin-Madison with training in the political economy of agriculture, community development, and environmental and food justice. Dr. Ipsen’s work focuses on the interactions between corporations, communities, and social movements and the implications those relationships have for local environmental regulation and community development. She is analyzing how firms use power differentials to their advantage and the ways that communities can make their voices heard at the negotiating table with firms in place-based industries. She is also working as part of a multidisciplinary team (see the NC1100 project) to conduct case studies and interviews across the Midwest for a project designed to improve the adoption of and access to new agricultural technologies. This project will culminate in peer-reviewed publications that identify best practices in technology transfer in agricultural projects from Land Grant Universities to local farmers.
Community Economic Impacts of Reductions in Pension Payments

The Baby Boomer generation is entering retirement at an increasing rate. For many of these retirees, private and/or public pension funds will provide the majority of their income. In 2015, the median annual private pension and annuity benefit for persons 65 and older was $9,376. For those with a state or local government pension the median was $14,158 while the median federal government pension was $22,669. Pension funds, both private and public, are under pressure. Many pension plans have been underfunded, with both private employers and state and local governments deferring payments. At the same time, the lingering effects of the financial crisis that resulted in the Great Recession and record low interest rates have contributed to pension funds being unable to meet their obligations (GAO 2013). According to the PBGS, U.S. multiemployer pension funds had $1.8 billion in total assets against $44.2 billion in total discounted liabilities as of September 30, 2014 (Pension Benefit Guaranty Corporation, 2016).

The Central States Pension Fund, with the main body of pensioners in Michigan, Wisconsin, Minnesota Missouri, Texas and New York, was on the brink of declaring insolvency in 2016. Several companies that paid into this multiemployer fund on behalf of their teamster employees cut back on payments or went bankrupt, forcing the fund to pay out $2 billion more annually in benefits than it receives in contributions. This multi-employer pension applied to reduce benefits on average 23 percent for the 407,000 recipients covered by the plan under 2014 legislation that allows multiemployer plans to reduce benefits to improve solvency. This legislation is a major change from 40 years of shielding workers’ pensions (Fletcher, 2014). This is not a lone case, as other pension programs are vulnerable, including those in Appalachia, as utilities shift to other fuels and coal companies close. The public pension difficulties of Illinois are well known, and pensions were a major issue in the Detroit bankruptcy.

This project uses the Central States Pension as a case study to address two questions:
- Beyond national averages, to what extent is rural America exposed to the “pension crisis”?
- What are the economic impacts on the jurisdictions most affected by the reduction in benefits from the Central States Pension?

Initial outcomes suggest that for every dollar of lost pension incomes, communities may lose an additional $0.50 to $0.75 in economic activities. The sizes of the total impacts relative to lost pensions, exhibit no relationship with either population or per-capita personal income, but rather reflect the share of residential expenditures captured by local businesses. Because larger counties likely capture more of pensioners’ expenditures, the size of community impacts will likely be larger for more insular regional economies. These findings are preliminary and omit consideration of some counties in this analysis.

Bibliography


2015 NCRCRD Funding

Core Budget Allocations

Core Funding: $442,311

External Funding: $6,348,238
The NCRCRD periodically sponsors or facilitates webinars to help connect rural development researchers and Extension professionals with each other and with stakeholder groups. For webinar archives or upcoming webinars go to: http://ncrcrd.msu.edu/ncrcrd/webinars

Building Strong Economies and Healthy Food Systems from the Bottom Up
A. Flaccavento

Leading Communities: Development of a Place-Based Leadership Program
D. Tootle (Iowa State University) & J. Braatz (University of Wisconsin)

Assessment of Tribal Natural Resources Needs and Services: Transforming Governance, Management, and Sovereignty in the Upper Great Lakes
J. Cheruvelil (Michigan State University)

The Impact of Latino-Owned Business on Local Economic Performance
C. Carpenter (Michigan State University)

Tribal Community Development Projects in the Great Lakes Region
E. Proctor (Michigan State University), D. Newman (University of Minnesota) & B. Gauthier (Lac du Flambeau Tribal University of Wisconsin)

Building Community Capacity through Strategic Planning
A. Silvis (University of Illinois) & B. Nesbitt (Ohio State University)

Economic, Social and Environmental Policy Challenges in the Bakken Oil Field
D. Ripplinger & A. De Laporte (North Dakota State University)

Assessing Strategies for Water Supply in the Bakken Region
R. Hearne & F. Fernando (North Dakota State University)

Facilitating Rural Development in the Greater Great Lakes Region: Development of a Regional Collaborative to Support Sustainable Hops Production
J. Robert Sirrine (Michigan State University)

Fostering Cross-Disciplinary Research on Energy Development
J. Jacquet & A. Junod (South Dakota State University) & J. Haggerty (Montana State University)

Extension Programming Approaches for Farmers Under the Affordable Care Act
S. Innwood (University of Vermont), A. Kantrovich & S. Loveridge (Michigan State University), B. O’Neill (Rutgers University), & R. Riportella (Kansas State University)

Affordable Housing Policies for Essential Service Workers in the Bakken Region
L. Flage & F. Fernando (North Dakota State University) & J. Jacquet & A. Junod (South Dakota State University)
Innovations in Agriculture and Rural Development

A free webinar series designed for business owners and entrepreneurs to learn more about university developed technology that may be relevant to your current or future business operations.

Soil Diagnostics, Helping Growers Protect Their Most Valuable Asset: Soil
K. D. Bhalerao (Soil Diagnostics)

Peer-to-Peer Solutions: Fast Pitch Innovation Collaboration
Chris Chase, Om Perumal, Padu Krishnan, Bill Gibbons, & Will Aylor (South Dakota State University)

Intermediary Perceptions of Rural Firm Tech Adoption
R. Poole (Michigan State University)

Wastewater Treatment Systems for Rural Meat Processing Plants
K. Manci (The Ohio State University)

The State of New-Marketing in the Green Industry and Implications for Small, Rural Businesses
L. Baker & C. Boyer (Kansas State University) & H. Peterson (University of Minnesota)

UW-Madison’s Animal Sciences Byproducts Initiative: Discovering Value in Animal Slaughter By-Products
M. Cook (University of Wisconsin-Madison)

Cosabody-10 Technology Update for Antibiotic Free Animal Agriculture
J. Sand (University of Wisconsin-Madison)
The North Central Regional Center for Rural Development (NCRCRD) is one of four regional centers in the United States that work to improve the quality of life in rural communities. With funding from the USDA National Institute of Food and Agriculture and the land-grant universities in our 12-state region, the NCRCRD helps Extension professionals, researchers and other partners address issues that affect rural areas across the region. The center provides leadership in rural development by linking research with education and community outreach to facilitate, integrate, link and coordinate research and action for rural America.

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