The list below provides 50 examples of the impact of publicly-engaged research, teaching, and outreach on Minnesota. For additional impact information, see engagement.umn.edu.

**AGRICULTURE**

The average age of principal farm operators is 56.6 years. The business and personal assets of those who produce the world's food supply must be protected as owners retire and pass the business on to the next generation. Extension held seven workshops on farm transition to assist in business transfer and personal estate programming. A six-month follow up evaluation found that 64% of respondents had begun developing or updating their estate plan and 60% had begun developing or updating their transition plan.

_U of M Leader:_ University of Minnesota Extension Center for Food, Agriculture and Natural Resources

_External Partner:_ Minnesota farmers

The profits and production of soybean farmers are increasingly threatened by weed populations that become resistant to multiple herbicide groups. Current fiscal conditions make it particularly important that farmers are able to increased profitability. In response, Extension educators presented ten programs called "Growing Soybeans that Out-Compete Weeds" across Minnesota. As a result, farmers report using more than one effective herbicide to control key weed species, using more than one crop technology or conventional herbicide to manage weeds, including the planting date as a consideration for weed control, and using mechanical or cultural control tactics for weed control.

_U of M Leader:_ University of Minnesota Extension Center for Food, Agriculture and Natural Resources

_External Partner:_ Minnesota farmers

Nitrogen is absorbed in large amounts by crops. It is the major nutrient supplied in a fertilizer program. There is general agreement that voluntary best management practices are an economically sound choice and that, if used, they can minimize nitrogen loss to the environment and maximize utilization by the crop. Extension’s Nitrogen Smart training programs for producers present the fundamentals of maximizing economic return on nitrogen investments while minimizing nitrogen losses. A follow-up survey found that 756 participants who managed 423,695 acres, saved an average of $5,067 per attendee and that, ultimately, there was a reduction of 551,740 pounds of nitrogen lost to the environment.

_U of M Leader:_ University of Minnesota Extension Center for Food, Agriculture and Natural Resources

_External Partner:_ Minnesota farmers

**ECONOMIC/WORKFORCE DEVELOPMENT**

Partnered with the Itasca Project and Harvard Business School to launch a Minnesota-centric version of Harvard’s Young American Leaders Program, which drew emerging leaders from multiple regions in the state (Twin Cities, Rochester, St. Cloud, and Moorhead) and from
multiple sectors (government, business, non-profits) for an intensive, two-and-a-half day program at the University of Minnesota, Twin Cities. The Program creates a foundation for future collaboration for shared prosperity by providing a better understanding of the state and trajectory of our regional and national economic development, tools for cross-sector collaboration, and expanded networks.

_U of M Leader: Center for Integrative Leadership_

External Partners: Itasca Project; Greater St. Cloud Development Corporation; Destination Medical Center; Emerging Prairie

DirectCourse, an online learning curriculum for professional staff supporting people with intellectual and developmental disabilities, provides evidence-based training that has been proven to increase competency and reduce turnover. In Minnesota, there are currently more than 35,000 active learners using DirectCourse.

_U of M Leader: Institute on Community Integration_

External Partners: Mains'l; Living Well; Opportunity Partners

U of M researchers developed *Building Relationships and Improving Opportunities* (Brio). Available online for free, this training program covers how to network during the job search. A study showed Brio increased the immediate, or proximal, benefits of networking, such as referrals to new sources, helping job seekers define an issue and validation of decisions and led to higher quality positions.

_U of M Leader: Connie Wanberg, professor and industrial relations faculty excellence chair, Department of Work and Organizations_

External Partner: Minnesota Department of Employment and Economic Development

Partnering with public and private sector entities including the Minnesota Governor's Food Safety and Defense Task Force, the Food Protection and Defense Institute conducted ten workforce development trainings that improved the awareness and ability of personnel to better prevent, protect against, mitigate, respond to, and/or recover from food defense and intentional adulteration incidents. Training was provided to over 200 participants representing federal and state agencies, federal law enforcement, and private sector food companies including many with facilities in Minnesota.

_U of M Leaders: Jennifer van de Ligt, director, Food Protection and Defense Institution; Amy Kircher, senior advisor, Food Protection and Defense Institute; and Deb Freedman, education manager, Food Protection and Defense Institute_

External Partners: Minnesota Governor's Food Safety and Defense Task Force; other public and private sector entities

In support of the Minnesota Department of Human Services' effort to provide evidence-based integrated mental health and substance abuse care, the Center for Practice Transformation provided training, coaching and consultation to Minnesota’s six behavioral health hospitals, four Intensive Residential Treatment Service programs and 32 Assertive Community Treatment teams. Pre-post fidelity review demonstrates a significant
improvement in providing integrated care and the agencies report a reduction in rehospitalization rates.

U of M Leaders: Center for Practice Transformation; School of Social Work

External Partners: Minnesota Department of Human Services Direct Care and Treatment Services and Behavioral Health Divisions

More than 200 Minnesota second language instructors gained the latest research-based skills and knowledge to improve their teaching through professional development offered by the University's Center for Advanced Research on Language Acquisition. People's lives are enriched by global connections and understanding, and language learning is a key component of preparing Minnesota's future leaders for global success.

U of M Leaders: Center for Advanced Research on Language Acquisition

External Partner: Minnesota K-12 schools

ENERGY

Partnering with the Minnesota Department of Commerce, U-Spatial, and Clean Energy Resource Teams (CERTS), a group of Geography students built a web application showing homeowners, planners, and solar installers where to place solar panels to maximize energy production. Thousands of Minnesotans have used the app to decide if solar panels would be cost effective on their home, or if community solar projects would be more advantageous.

U of M Leaders: University of Minnesota Extension; Clean Energy Resource Teams (CERTS)

External Partner: Minnesota Department of Commerce

In the United States, roughly 40% of all food goes to waste, including food donated to non-profit food banks like Minnesota’s Second Harvest Heartland. UMN researchers designed an anaerobic bioreactor that turns food waste into energy to help Second Harvest evaluate the feasibility of a commercial-scale installation that could one day offset up to 70% of the electricity and 40-60% of natural gas used by the facility.

U of M Leaders: Bo Hu, associate professor, Department of Bioproducts and Biosystems Engineering; Timothy Lapara, professor, Department of Civil, Environmental, and Geo-Engineering

External Partner: Second Harvest Heartland

ENVIRONMENT

Metals mined in northern Minnesota are used in the electronics and energy industries, but high concentrations of metals in surrounding soils and waters create both environmental and health concerns. Researchers are studying microbial systems capable of removing manganese, cobalt, and other heavy metals from mining wastewater in order to develop sustainable bioremediation strategies to treat waters impaired by heavy metals.

U of M Leaders: Cara Santelli, associate professor, Department of Earth and Environmental Sciences; Tingying Xu, postdoctoral research scholar, College of Science and Engineering

External Partner: ClearWater BioLogic
Partnering with a multitude of diverse stakeholders, the Minnesota Center for Prion Research and Outreach developed and delivered innovative educational opportunities for over 1,500 Minnesotans in the past six months. Chronic wasting disease education and outreach efforts integrate specialized and translated science communications structured to reach many diverse communities across Minnesota using a web-based interface and in-person events featuring augmented reality displays, 3D models, and unique animations.

_U of M Leaders:_ Ann Bateman, operations manager, Center for Animal Health and Food Safety; Peter Larsen, assistant professor, Department of Veterinary and Biomedical Sciences; Marc Schwabenlander, research project specialist, Veterinary and Biomedical Sciences; Tiffany Wolf, assistant professor, Department of Veterinary Population Medicine; University Relations

_External Partners:_ Central Lakes College; Minnesota Board of Animal Health; Minnesota Department of Natural Resources; Minnesota Hmong community leaders; Minnesota state legislators; Red Wing, Rochester, and Faribault Rotary Clubs; Science Museum of Minnesota; Southeast Minnesota Amish community leaders; Winona State University

In 2019, the Bell Museum, the U.S. Army Corps of Engineers and State environmental agencies released more than 1.2 million observations of biological species in the Minnesota Biodiversity Atlas. Records from all 87 counties were for the first time integrated across management agencies to create the largest publicly accessible data set ever assembled for Minnesota's biological heritage.

_U of M Leaders:_ George Weiblen, professor, Department of Plant and Microbial Biology and science director, Bell Museum; faculty curators in the Department of Fisheries, Wildlife & Conservation

_Biology, Department of Plant & Microbial Biology, and the Department of Ecology, Evolution & Behavior

_External Partners:_ U.S. Army Corps of Engineers; Minnesota Department of Pollution Control; Minnesota Department of Natural Resources

Planning for floods, wildfires, tornados, and other natural hazards saves lives and money in Minnesota. With funding from the Minnesota Department of Public Safety, U-Spatial@UMD works with county, tribal, and local governments to develop hazard mitigation plans that integrate the best research and tools to inform strategies for reducing impacts of future disasters. Over 40 Minnesota counties and tribes have used the assessments to develop risk reducing mitigation actions in their jurisdictions.

_U of M Leaders:_ U-Spatial, University of Minnesota, Duluth

_External Partners:_ Minnesota Department of Public Safety

_In the U.S., as many as 10 million children have experienced parental incarceration and 2.7 million children have one or both parents currently incarcerated. To support incarcerated fathers in their efforts to be the best dads they can be, five Extension educators enrolled 121 fathers from three correctional facilities through a parent education contract operated by the Minnesota Department of Corrections. From before to after, fathers significantly improved their knowledge and skills regarding a host of critical parenting_
behaviors, including childhood routines, discipline, and building a trusted relationship.

*U of M Leader:* University of Minnesota Extension Center for Family Development

*External Partner:* Minnesota Department of Corrections

By educating human service professionals, collaborating across systems and disciplines, informing policy makers and the public, and expanding the child welfare knowledge base, the Center for Advanced Studies in Child Welfare (CASCW) works to improve the well-being of children and families that are involved in the child welfare system. In 2019, CASCW partnered with community stakeholders and passed legislation to fund a statewide child welfare training academy operated through a state-University partnership.

*U of M Leaders:* Traci LaLiberte, executive director, Center for Advanced Studies in Child Welfare

*External Partners:* Minnesota Department of Human Services; Minnesota Association of County Social Service Administrators; Ethan Vogel (AFSCME); Kirsten Anderson (AspireMN); Rich Gehrman (Safe Passage for Children of Minnesota)

African American parents previously involved in the child welfare system conceptualized and spearheaded a peer mentoring program for parents currently involved in the system in order to reduce the disproportionate involvement of families of color in child welfare. University researchers partnered with parent mentors to evaluate the program, and set up a system for parent mentors to collect ongoing data on client outcomes important for monitoring program quality, and securing grant funding.

*U of M Leaders:* Wendy Haight, professor and Gamble-Skogmo chair in child welfare and youth policy, School of Social Work; Gamble-Skogmo PhD student research group

*External Partner:* The Minnesota One-Stop for Communities Parent Mentor Program

### FOOD SECURITY

A partnership between the University of Minnesota Rochester (UMR) and the Village Community Garden in Rochester has increased access to fresh, healthy, and culturally relevant foods for minority community members that currently have limited access to such foods. Since its inception, the Village Community Garden has served as a community partner/learning site for Community Collaborative, an upper-division course at UMR. In addition to supporting twenty-three intersectionally-diverse growers, the Village Community Garden currently provides UMR’s Student Food Pantry with thirty to fifty pounds of fruits and vegetables per week.

### HEALTH

In partnership with the White Earth Nation Harm Reduction Integration Program, Medical School, Duluth Campus Professor Brenna Greenfield conducted and evaluated the first tribally-centered opioid overdose fatality reviews in the country, and with White Earth community members, identified a set of actionable risk and protective factors for opioid overdose deaths.

*U of M Leader:* Brenna Greenfield, assistant professor, Department of Family Medicine and BioBehavioral Health

*External Partner:* Clinton Alexander, White Earth Nation Behavioral Health
The Rural Health Research Center has led research on rural obstetric closures and the impacts on families and communities, including a site visit to Sawtooth Mountain Clinic in Grand Marais, Minnesota. These research efforts have led to feature media coverage locally by Minnesota Public Radio and the Star Tribune. Professors Kozhimannil and Henning-Smith have informed the passage of the Improving Access to Maternity Care Act and collaborated closely with Minnesota’s Congressional delegation on federal legislation to increase resources to improve rural maternity care outcomes through the Rural Maternal and Obstetric Modernization of Services Act or the Rural MOMS Act, sponsored by U.S. Senator Tina Smith.

**U of M Leaders:** Katy Backes Kozhimannil, associate professor, Division of Health Policy and Management and director, Rural Health Research Center; Carrie Henning-Smith, assistant professor, Division of Health Policy and Management and deputy director, Rural Health Research Center

**External Partners:** U.S. Senator Tina Smith; U.S. Representative Angie Craig; Sawtooth Mountain Clinic

As the project director of the PAD PRAIRIE Initiative: Promoting Healthy Aging and Mobility in Rural Minnesota, Professor Treat-Jacobson partners with communities in west central Minnesota to diagnose, treat, and educate healthcare providers, patients, and the public about Peripheral Artery Disease (PAD). Her work has led to policy changes in Minnesota for those affected by PAD.

**U of M Leader:** Diane Treat-Jacobson, professor, Adult and Gerontological Health Cooperative

**External Partners:** Lakes Region Healthcare (Fergus Falls); Otter Tail County Public Health; Stevens Community Medical Center (Morris); Prairie Ridge Hospital and Health Services (Elbow Lake); Glacial Ridge Health System (Glenwood)

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**HOUSING**

Partnering with the Resilient Communities Project and the Scott County Community Development Agency, Fabbri and his students produced “At Home, in Scott County,” a 3-episode documentary series featuring housing assistance programs in Scott County. The series was able to: accurately portray the stories of community members who participate in the Community Development Agency Housing Assistance and Section 8 Programs; create awareness of the value and benefits of affordable housing programs; dispel common prejudices about who lives in affordable housing.

**U of M Leaders:** Lorenzo Fabbri, assistant professor, Department of French and Italian; Sarah Tschida, program coordinator, Resilient Communities Project

**External Partner:** Scott County Community Development Agency

Minnesota is losing 2,000 affordable rental options annually. People in poverty with bad rental records lose the opportunity for home ownership, which is a path for families to increase wealth. The RentWise program helps local social service providers easily deliver quality education about renting with lesson plans, participant resources and more. Culture and language-adapted workshops are delivered to Latino families directly by Extension. A total of 37 local agencies were trained to conduct RentWise programs in 2018, affecting renters in neighborhoods and communities across Minnesota.

**U of M Leader:** University of Minnesota Extension Center for Family Development
INVASIVE SPECIES

The Minnesota Aquatic Invasive Species Research Center (MAISRC) has worked closely with many individuals, local stakeholder groups, policymakers, and state and local managers to prioritize knowledge gaps, conduct research and implement management outcomes. By integrating rigorous research with community engagement and outreach, MAISRC has changed the way that Minnesota responds to aquatic invasive species and become a national leader in the field.

*U of M Leader:* Nick Phelps, assistant professor, Department of Fisheries, Wildlife and Conservation Biology and director, Minnesota Aquatic Invasive Species Research Center

*External Partners:* Many lake associations; local governments; Minnesota Department of Natural Resources

Invasive forest pests in Minnesota include the emerald ash borer, gypsy moth, Asian longhorned beetle, Japanese barberry and Oriental bittersweet. Landowners and other concerned citizens can act as monitors and detectors to identify and eradicate forest pests. The Minnesota Forest Pest First Detector program was designed to train Minnesotans to identify forest pests early. Between 2015 and 2018, 13 workshops mobilized 263 citizen scientists who are now actively engaged in finding and addressing forest pests.

*U of M Leader:* University of Minnesota Extension

K-12 EDUCATION

After participating in Ramp-Up to Readiness™, a college and career readiness curriculum developed at UMN, the students in five Minnesota middle and high schools reported considerably higher levels of college and career readiness including increased college knowledge. For example, 87% reported that they had a “better understanding of the benefits of earning a college degree or certificate,” and 83% said they knew “more about what I must do to be admitted to college.”

*U of M Leaders:* Julie Sweitzer, director, College Readiness Consortium; Jennifer Kunze, director, Ramp-Up to Readiness

By bringing a dozen Native American high-school students from around the state to a American Indian Summer Institute, the American Indian Studies Department exposed young people to educational opportunities at the University. More than half of students reported that this experience made them change their plans for post-high school by showing...
that the University was a place they could find support, community, be challenged, and succeed.

U of M Leaders: Brendan Fairbanks, professor, Department of American Indian Studies; Fawn Sampson, community engagement coordinator, Department of American Indian Studies

External Partners: Native American students and educators from throughout the state

Partnering with the Minnesota Department of Education, Professors Ernest Davenport and Mark Davison helped develop the state's educational testing and accountability system. Their research also showed that course content matters more than number of courses, resulting in changes in the state's high school graduation requirements whereby the state gives more specification to coursework areas rather than number of courses and credit.

U of M Leader: Mark Davison, professor, Department of Educational Psychology; Ernest Davenport, professor, Department of Educational Psychology

External Partner: American Guidance Service, Inc.

Partnering with Minneapolis and St. Paul metropolitan area high schools, New Moves, an all-girls physical education class, supplemented with nutrition and self-empowerment components, provided a model for addressing the broad spectrum of weight-related problems among adolescent girls. As a result, improvements were seen for sedentary activity, eating patterns, unhealthy weight control behaviors, and body/self-image leading to the continuation of the program in the majority of the schools.

U of M Leader: Dianne Neumark-Sztainer, professor and division head, Division of Epidemiology and Community Health

External Partner: Minneapolis Public Schools; St. Paul Public Schools

The Math Center for Educational Programs in the School of Mathematics provides academic year and summer enrichment programs to hundreds of K12 students each year. Programs range from Saturday morning enrichment events, where students explore mathematical ideas outside of their regular curriculum, to summer camps such as the Math Modeling Camp for High School Students, in which students learn how to build and use mathematical models to solve real-world problems.

UMN Leaders: Math Center for Educational Programs (MathCEP) faculty and staff

External Partners: School districts (and independent schools) in the Twin Cities; sponsoring companies and individuals who have supported the camps both financially and through mentorship and presentations

College in the Schools (CIS) is a concurrent enrollment partnership program that provides nearly 10,000 high school students the opportunity to enroll in rigorous introductory U of M courses without leaving their high school. Partnering with 440 high school instructors from 141 Minnesota high schools across 36 counties, the program provides CIS instructors with U of M faculty-led discipline-specific connections to the field through ongoing professional development workshops.

U of M Leader: Emily Hanson, program director, College in the Schools

External Partners: 141 Minnesota high schools across 36 counties
Prepare2Nspire provides underrepresented high school students with weekly mathematics tutoring and mentoring. The program is intended to support students in advanced algebra through calculus, building confidence and preparing students for a post-secondary education. North Minneapolis 8th and 11th graders that participate have seen their scores on the math section of the ACT improve by 3 points, which represents a significant growth on the 36 total point assessment.

*U of M Leader:* Lesa Clarkson, professor, Department of Curriculum and Instruction

*External Partners:* North Minneapolis residents

### Leadership

About 90,000 land owners and dairy farmers produce food in Minnesota. These producers make difficult management decisions that respond to market forces, public policy shifts and personal life circumstances. Extension organizes southern Minnesota marketing groups of farmers who work together over an extended period of time to market agricultural products. Averaging all of the benefits, we can estimate that 72 people who participated in the marketing groups benefited from the program with $336,168 in enhanced income.

*U of M Leader:* University of Minnesota Extension Center for Food, Agriculture and Natural Resources

*External Partner:* Minnesota farmers

By moving their Dakota language courses on-line, American Indian Studies language instructors enabled community members to study this critically endangered language which is essential to the resurgence of the Dakota People. Enrollments in Introductory Dakota more than quadrupled in two years as tribal members and other individuals in Minnesota, North Dakota, and Saskatchewan enrolled to study the Minnesota indigenous language online while remaining in their own communities.

*U of M Leaders:* Šišōka Dúta Joseph Bendickson, teaching specialist, Department of American Indian Studies; Çanté Máza Neil McKay, teaching specialist, Department of American Indian Studies; Amarin Chanthorn, curriculum coordinator, Department of American Indian Studies

*External Partners:* Whitecap Dakota First Nation; members of the Prairie Island Sioux Community, Shakopee Mdwakanton Sioux Community, and Upper Sioux Community

Extension has examined the demand for community leadership and found that one in every 34 rural Minnesotans must serve in a leadership position to provide needed local leadership positions. In comparison, one in every 143 urban residents must serve. In 2018, Extension designed and delivered over 30 leadership education cohorts to grow and strengthen rural community leadership. Of participants in these programs 150 of 227 participants (66.1%) increased their level of involvement in at least one of their organizational roles -- either a new role or an increase from inactive to active leadership.

*U of M Leaders:* Ben Winchester, Extension educator, Community Economics
**LEGAL**

Addressing access to justice needs, law students provided $3,038,000 worth of free legal services through law school legal services clinics and volunteering. In greater Minnesota specifically, students served veterans, immigrant, and rural communities in counties including Beltrami, Chisago, Le Sueur, Mower, Nobles, St Louis in legal issues involving family law, unemployment benefits, wills, bankruptcy, tax, and claims for immigration relief.

*U of M Leader: Law School*

*External Partners: Minnesota Assistance Council for Veterans; Minnesota Justice Foundation; Dakota County Legal Assistance; Indian Child Welfare Act Center; Volunteer Lawyers Network*

**REDUCING DISPARITIES**

The 2017 Minnesota Department of Health state health assessment makes clear that health equity in Minnesota depends on changing policies, systems and environments that shape health behaviors. In 2018, Extension supported 120 coalitions, wellness committees and food networks as they implemented food charter strategies. As a result, 328 local policy, systems and environment changes were made.

*U of M Leader: University of Minnesota Food Safety team*

Partnering with Rebecca Polston at Roots Community Birth Center, Minnesota's first and only African-American-owned birth center, Professors Katy Kozhimannil and Rachel Hardeman documented the process and outcomes of their culturally-centered model of care, and worked with Polston to ensure that Roots was able to contract with all Minnesota’s Medicaid Managed Care providers. Their work supported the passage of HF 909, a bill on prenatal care service programs and funding, in the Minnesota legislature.

*U of M Leaders: Katy Backes Kozhimannil, associate professor, Division of Health Policy and Management; Rachel Hardeman, assistant professor, Division of Health Policy and Management*

*External Partners: Roots Community Birth Center*

Partnering with the Urban Land Institute Minnesota and the Metropolitan Council, College of Design professor Tasoulla Hadjiyanni helped make Culturally Enriched Communities one of the state's priorities for a healthy, connected, and vibrant future. Best practices for how to implement the eight principles of Culturally Enriched Communities allow MN municipalities to plan in ways that eliminate disparities and support growth, diversity, and inclusion.

*U of M Leader: Tasoulla Hadjiyanni, professor and director, Interior Design Program*

*External Partners: Urban Land Institute of Minnesota; Metropolitan Council*
Partnering with the Minnesota Department of Health, The Center for Victims of Torture, and local public health clinics, School of Social Work Associate Professor Patricia Shannon developed a culturally grounded mental health screening tool for use in statewide public health screening of all newly arriving refugee populations. In 2019, the pilot screener identified and referred up to 30% of refugees for mental health services.

*U of M Leader: Patricia Shannon, associate professor, School of Social Work*

*External Partners: Minnesota Department of Health; Center for Victims of Torture; local public health clinics.*

**WATER**

With funding from the Minnesota Local Road Research Board, researchers developed the iron-enhanced sand filter, which removes phosphate from stormwater runoff. With over 170 installations throughout the state, the iron-enhanced sand filter is a primary means of cleaning stormwater before it reaches Minnesota's lakes and rivers.

*U of M Leaders: John Gulliver, professor, Department of Civil, Environmental and Geo- Engineering; faculty from the College of Science and Engineering; Center for Transportation Studies*

*External Partner: Minnesota Local Road Research Board; Minnesota Pollution Control Agency*

Partnering with Metro Blooms, Blue Thumb, the Lake Pepin Legacy Alliance, and several Minnesota watershed districts, a group of researchers, media producers, artists and musicians formed the Ecosong.Net project, mobilizing communities to install native landscaping and raingardens throughout the Twin Cities, supporting efforts to keep siltation from degrading Lake Pepin, and informing residents about chloride pollution caused by the overuse of road salts, in addition to ongoing projects. Ecosong.Net productions are featured in partner’s websites, outreach campaigns, and live performances in the community, and their music videos have earned 27 selections and 8 awards at national and international film festivals.

*U of M Leaders: Faculty from College of Liberal Arts, College of Education and Human Development; Institute on the Environment; Extension*

*External Partners: Metro Blooms; Blue Thumb; Lake Pepin Legacy Alliance; Minnehaha Creek Watershed District; Friends of Diamond Lake; Browns Creek Watershed District; Mississippi River Management Organization; Mellon Foundation; Humanities in a Changing Climate*

Trichlor, the chemical used globally to disinfect pools, spas, and fountains, is effective in killing dangerous pathogens like *Giardia*—but over time, the build-up of the chemical cyanuric acid can reduce its ability to disinfect. University of Minnesota researchers have developed a patented technology to remove cyanuric acid from water and are working with DuPont to explore opportunities for commercialization, reducing the need to drain approximately 100 million residential pools in the U.S. alone.

*U of M Leaders: Alptekin Aksan, professor, Department of Mechanical Engineering; Larry Wackett, professor, Department of Biochemistry, Molecular Biology, And Biophysics*

*External Partners: Dupont; Minnepura*
YOUTH

Experiences that create "21st century skills" are ones that cause youth to enjoy learning, make decisions for themselves, and try new things. Extension's youth development programs create 21st century skills. Evaluations demonstrate that 92% of 4-H youth said they learned more about a project in 4-H; 90% helped to solve a problem; 94% used communication skills; 89% solved problems in a group; 79% designed something new; and 78% took part in a community service project.

U of M Leader: University of Minnesota Extension Center for Youth Development

Findings from the Project EAT (Eating and Activity in Adolescents and Young Adults) study have identified environmental, personal, and behavioral factors influencing nutritional intake, physical activity, and weight status among ethnically and socioeconomically diverse young people in the Twin Cities area of Minnesota. As a result of this long-standing comprehensive study, many public health interventions have been developed to address the broad spectrum of weight-related problems in young people in Minnesota and throughout the world.

U of M Leader: Dianne Neumark-Sztainer, professor and division head, Division of Epidemiology and Community Health

Partnering with Pathways to Success, an educational re-engagement program for county-involved youth, we conducted a Youth Participatory Action Research (YPAR) project to identify successful program practices. Hennepin County Juvenile Probation utilized the findings to develop a new vision, purpose and value statement that will guide the practice of their youth probation officers.

U of MN Leader: Katie Johnston-Goodstar, associate professor, School of Social Work

External Partners: Pathways to Success; Hennepin County Juvenile Probation

MN Youth Story Squad addresses educational opportunity gaps through digital storytelling and offers internship opportunities to U of M undergraduates in Minneapolis and St. Paul public middle schools. After participating in our programming, 81% of Twin Cities public school students imagine college in their future, 78% believe they will succeed in school, and 68% have gained a pathway to college.

U of M Leaders: Jigna Desai, professor, Department of Gender, Women and Sexuality Studies; Kari Smalkoski, post-doctoral associate, Department of Gender, Women and Sexuality Studies; Institute for Advanced Study

External Partners: Minneapolis Public Schools; St. Paul Public Schools; TPT (Twin Cities PBS)

The Ladder is a cascading mentorship organization for youth in Minneapolis who are interested in health careers, "ages nine years old through ninety-nine". Sponsored through the Department of Family Medicine and Community Health, the Ladder started in 2012 and now has youth members who started as high school and undergraduates that are currently in U of M Medical School both pre-clinical and clinical years. This includes the U of M Rochester students who were accepted to other medical schools and have chosen the U of M as their medical school to continue their participation in The Ladder program.

U of M Leader: Renee Crichlow, assistant professor, Department of Family Medicine and Community Health

External Partners: North Minneapolis residents; Broadway Family Medicine Clinic North Minneapolis