

**ENRTF 2020 Request for Proposal (RFP) - FY2021
Final Proposals Received by Category with Summaries**

For the FY 2020 and FY 2021 biennium (July 1, 2019 - June 30, 2021), approximately \$61 million is available each year for funding from the Environment and Natural Resources Trust Fund. As of April 15, 2019, the Legislative-Citizen Commission on Minnesota Resources (LCCMR) received 290 proposals requesting a total of approximately \$203 million. This RFP process is for funding beginning July 1, 2020.

LCCMR reviews and evaluates all proposals against their 10 adopted evaluation criteria. On June 5-6, members will select a subset of high-ranking proposals to invite for presentation before the LCCMR on June 17, 18, 24, 25, 26 and 27 in order to receive further consideration. On July 17-18, LCCMR will make final selection and funding allocation decisions. These selected projects will be presented to the 2020 Minnesota Legislature as the official LCCMR recommendations for spending from the Environment and Natural Resources Trust Fund.

Check the LCCMR schedule for the most up-to-date information and important process dates

ENRTF ID #	Last Name	First Name	Title	Summary	Organization	\$ Requested
A. Foundational Natural Resource Data and Information (46 Proposals / \$34,157,684)						
001-A	Lusardi	Barbara	Geologic Atlases for Water Resource Management	Geologic atlases provide maps/databases essential for improved management of ground and surface water. This proposal will complete current projects and start new projects to equal about 10 complete atlases.	U of MN - Minnesota Geological Survey	\$ 4,121,625
002-A	Texler	Hannah	Expanding the Minnesota Ecological Monitoring Network	This project proposes to expand the Ecological Monitoring Network by adding 500 plots to inform the conservation and management of Minnesota's native forests, wetlands, and grasslands.	MN DNR	\$ 1,587,134
003-A	Grinde	Alexis	Win-Win Forestry: Maximizing Economic and Ecological Benefits	Experimental research sites will be established to study forest management strategies that maximize ecological and economic benefits between forest products, tree growth, water quality, soil health, and wildlife habitat.	U of MN - Duluth NRRI	\$ 532,733
004-A	Nieber	John	Minnesota; How much Water? How is it Changing?	Accurate water storage estimates (groundwater, soil moisture, streams, lakes, wetlands) are essential to sustainable water management. We will integrate satellite monitoring with traditional ground-based measurements to improve water storage estimates.	U of MN	\$ 529,139
005-A	Drewitz	Matt	Optimizing Land Cover Data for Water Resource Analysis	This project will employ new techniques and technologies to improve the accuracy and usability of the crop land data layer in Minnesota for water resource analysis.	MN Board of Water and Soil Resources	\$ 370,000
006-A	Johnson	Lucinda	Expanding the Interactive Natural Resource Atlas for Minnesota	The Natural Resource Atlas provides mapped information to improve decisions that impact the natural resources of NE Minnesota. We will expand the content and geographic scope of the Atlas.	U of MN - Duluth NRRI	\$ 799,991
007-A	Putzier	Paul	County Groundwater Atlas	The groundwater atlas provides essential fundamental information for sustainable management and wise use of Minnesotas groundwater resources. Atlases are used by citizens, industry, agriculture and all levels of government.	MN DNR	\$ 2,250,000
008-A	Norris	Doug	Foundational Hydrology Data for Wetland Protection and Restoration	This project will improve wetland protection, management and restoration in Minnesota by completing a partially established long-term wetland hydrology monitoring network that will provide critical knowledge of wetland hydrology dynamics.	MN DNR	\$ 461,499
009-A	Host	George	Optimizing Management of Minnesota's Forest Landscapes	We will develop a spatially-explicit decision tool that integrates forest productivity, ecosystem service, and economic information to identify benefits and tradeoffs of land management decisions under current and future climates.	U of MN - Duluth NRRI	\$ 495,463

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010-A	Grotten	Joel	Real-Time Measurements of Nitrate Pollution in Surface Water	Rising nitrates are threatening Minnesota streams, but current methods for measuring nitrates are not robust enough. We propose a multi-agency effort to measure, understand, and communicate nitrates in real-time.	U.S. Geological Survey	\$ 631,800
011-A	Petersen	Jessica	Completion of Wild Bee Surveys: Minnesotas Forest Habitats	Complete the statewide bee survey by surveying at up to 75 sites in the Laurentian Mixed Forest Province, thus building the foundation for detecting changes in bee fauna through time.	MN DNR	\$ 664,593
012-A	Monson Geerts	Stephen	Detecting Road Dust Control Chemicals in Air/Water	This project responds to Minnesota road authority requests to detect and assess the transport and fate of chemicals used in dust mitigation on rural unpaved roads near environmentally sensitive areas.	U of MN - Duluth NRRRI	\$ 280,226
013-A	Lord	Chris	Update and Expand 11-County Metro MLCCS Coverage	Provide critical geospatial land cover data and analytical protocols as a foundation for science-based water and ecological resource analysis, project identification, and ranking throughout the 3.2M acre 11-county metro area.	Metro Conservation Districts	\$ 2,934,624
014-A	Bump	Joseph	Voyageurs Wolf Project – Phase II	Wolf predation in summer is almost unknown but critical to deer, moose, wolf, and CWD management. With novel, proven methods, we'll study wolf predation in summer and promote Voyageurs' region wildlife.	U of MN	\$ 608,320
015-A	Hernandez	Daniel	Comparison of Burning and Haying for Prairie Restoration	This project will test how the frequency and timing of haying, used alone or combined with prescribed burning, can promote biodiversity and pollinator habitat in prairie.	Carleton College	\$ 345,599
016-A	Stapleton	Seth	Expanding Restoration and Promoting Awareness of Native Mussels	The Minnesota Zoo will promote mussel conservation by rearing juvenile mussels for reintroduction, researching methods to improve growth and survival in captivity, and encouraging public action to benefit water quality.	Minnesota Zoological Society	\$ 489,270
017-A	Satyshur	Colleen	Improving Pollinator Conservation by Revealing Habitat Needs	Wild pollinators must survive outdoors during our harsh Minnesota winters. We aim to help them persist by discovering habitats they require for shelter through statewide citizen scientists and novel analyses	U of MN	\$ 615,000
018-A	Schroeder	Declan	Bee Minnesota - Protect our Native Bumblebees	By screening and neutralizing bee pathogens we wish to promote best management practices to maintain honey bee health and prevent pathogen spill-over into native bee populations.	U of MN	\$ 693,000
019-A	Joyce	Michael	Bobcat and Fisher Habitat Use and Interactions	We will describe habitat use, diet, and activity patterns of bobcats and fishers to understand why bobcats kill female fishers and identify potential solutions to reverse the fisher population decline.	U of MN	\$ 440,719
020-A	Feng	Xue	Adjusting Crop Water Demand to Protect Minnesota Groundwater	Irrigation increases crop yield but depletes groundwater. We will make computer-generated maps to find places where farmers can use less 'thirsty' crop varieties to save water without sacrificing crop yield.	U of MN	\$ 239,211
021-A	Duncan	Nancy	Complete Sonar Data Mapping on Three Minnesota Rivers	Acoustic data are compiled into an interactive web map that displays distribution and diversity of underwater habitat helping resource managers better understand underwater features critical to effective management and conservation.	National Park Service	\$ 525,945

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022-A	Cuthbert	Francesca	Enhancing Bird and Insect Recovery in Oak Savannas	Our GOALS are to determine the amount, type and intensity of restoration techniques needed to support two unique, imperiled animal communities in Minnesota's oak savannas: birds and insects.	U of MN	\$ 238,000
023-A	Hahn	Jennifer	Networking and Economics of Soil Health-Phase I	Collecting and aggregating soil health data, connecting farmers interested in soil health together, while working with other farmers implementing soil health practices.	Minnesota Soil Health Coalition	\$ 602,310
024-A	Roy	Charlotte	Impacts of Conservation Grazing on Greater Prairie-chickens	Our study will determine whether grazing to meet conservation objectives has trade-offs for ground-nesting birds like Greater Prairie-chickens, a Species of Special Concern, that should be considered and mitigated.	MN DNR	\$ 560,044
025-A	Shaw	Ruth	Healthy Prairies III: Restoring MN prairie plant diversity	We will collect and preserve germplasm of plants throughout Minnesotas prairie region, study microbial effects on them, and discover the scale of local adaptation and the capacity for ongoing adaptation.	U of MN	\$ 1,128,000
026-A	Kiesling	Richard	Estimating Fish Production in Stressed Minnesota Lakes	Using Sentinel Lakes Program data, we will develop a bioenergetics-based method to predict how disruption of primary (algae) and secondary (e.g., zooplankton) production changes fish production in Minnesota Lakes.	U.S. Geological Survey	\$ 416,500
027-A	Kinkel	Linda	Soil and Plant Microbiomes: A Foundational Database for Environmental Health	We will create a statewide database of soil and plant microbiomes to enhance understanding, guide management, and inform policy to preserve Minnesota's environment and natural resources.	U of MN	\$ 758,860
028-A	Mulla	David	Habitat Friendly Solar Impacts: Environmental and Economic Guidance	This project will 1) measure ecosystem and economic benefits of solar installations with pollinator habitat and 2) develop guidance to accelerate the adoption of solar installations that provide these benefits.	U of MN	\$ 751,048
029-A	Fieberg	John	Monitoring Carnivores Statewide: A Citizen-Science Trail-Cam Project	This project will develop and deploy the infrastructure needed to implement a statewide monitoring program for carnivores using remotely triggered cameras and citizen scientists.	U of MN	\$ 789,988
030-A	McCann	Nicholas	Mapping Habitat Use and Disease of Urban Carnivores	We will map habitat and diseases of urban foxes and coyotes to understand what they need to live and risks posed to people and pets, thereby demystifying them for residents.	U of MN	\$ 657,159
031-A	Wettstein	Shannon	Morrison County Performance Drainage and Hydrology Management Phase II	This proposal, when funded, will enable Morrison SWCD to inventory an additional 4,000 culverts to complete the county wide culvert inventory started in 2016.	Morrison SWCD	\$ 213,300
032-A	Peterson	Jeffrey	Critical Insights from Historical Lake Water Quality Data	Derive ~40-year water quality database for >10,000 Minnesota lakes and analyze with in-lake, watershed, and economic factors to evaluate benefits to users and managers of improving or maintaining lake quality.	U of MN - Water Resources Center	\$ 480,000
033-A	Smith	Timothy	An Economy-Wide, Sub-Regional Tool for Economic and Environmental Decision-Making in Minnesota	We propose to create an environmentally extended input-output (EEIO) tool to inform State and local decision-makers on regional sustainable development and sustainable product and procurement policy and legislation.	U of MN	\$ 597,973

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034-A	Ferrington	Leonard	Winter Dynamics of Vulnerable Trout Streams: Central Minnesota	We will intensively evaluate brook trout streams that are vulnerable to climate warming, will develop quantitative models to predict most vulnerable streams, assess winter food, movement and refugia for fish.	U of MN	\$ 767,060
035-A	Barker	Keith	Malaria in Migrant and Resident Birds of Minnesota	Minnesota birds carry avian malaria, but we do not know how frequently, what kinds, or where they come from. We propose to begin malaria monitoring to fill this knowledge gap.	U of MN	\$ 316,000
036-A	Hong	Jiarong	Realtime Monitoring of Statewide Pollen in Minnesota	This project aims to develop a low-cost phone attachment and mobile app that can be used by the public, enabling real-time monitoring of statewide pollen condition in Minnesota.	U of MN	\$ 319,133
037-A	Blanchette	Robert	Foundational Research on Fungi and Protecting Minnesota Trees	Collecting the medicinal fungus "Chaga" in Minnesota results in damage to trees and is being over harvested. This project develops new methods for sustainable production/harvest and characterizes its medicinal properties.	U of MN	\$ 362,196
038-A	Koch	Richard	Taxonomic Survey of Earthworm Species in Minnesota	This proposed 2-year foundational research involves a statewide field survey of earthworm taxa and their distributions throughout Minnesota. Project outcomes include taxa list and distributional maps.	Bemidji State University	\$ 233,501
039-A	Blair	Robert	Minnesota Nature Trackers: A Citizen Science Project	This project will expand foundational knowledge on the diversity and distribution of trees, dragonflies, bees, and a suite of emerging terrestrial invasive plants by involving the public as citizen scientists.	U of MN	\$ 661,855
040-A	Mukku	Venugopal	Freshwater Sponges and AIS: Engaging Citizen Scientists	The project will study the geographical spread, taxonomic diversity and anti-fouling potential of freshwater sponges against aquatic invasive species by involving faculty, students and citizen scientists.	U of MN	\$ 460,000
041-A	Shen	Lian	Dangerous Current Prediction on Lake Superior Minnesota Coast	Establish a database of rip currents on Lake Superior Minnesota coast, train an artificial intelligence model for prediction, and develop a forecasting App to alert people of dangerous currents.	U of MN	\$ 299,982
042-A	Yoo	Kyungsoo	Building Statewide Daily Soil Temperature Maps	Building statewide daily soil temperature maps has many practical benefits in Minnesota where soil temperature can be different from air temperature because of thick snow cover and organic layer.	U of MN	\$ 847,326
043-A	Zanko	Lawrence	Fugitive Dust in Minnesota's Air: Why It Matters	Guidance manual for sampling and analyzing geological materials throughout Minnesota having potential to generate fugitive dust and produce respirable elongate mineral particles (EMPs); integrated with NRRI's Minnesota Natural Resources Atlas.	U of MN - Duluth NRRI	\$ 381,558
044-A	Lokkesmoe	Kent	MN DNR Water Infrastructure Needs (WIN)	This proposal will fund a water infrastructure needs (WIN) inventory, assessment and evaluation to identify the DNRs future water and waste water investments needed to protect ground and surface waters.	MN DNR	\$ 2,000,000
045-A	Crabtree	Jason	Collaborative Foresight: Addressing Forest-related Workforce and Recreational Challenges	Loggers, truckers, and mill workers are all aging. Hunting, fishing, and other recreation patterns are changing due to demographics. This project brings key stakeholders together to deal with these issues.	U of MN	\$ 300,000
046-A	Singer	Alan	Web-based Natural Resource Information Network Model	This collaborative project will create a web-based application and network that will serve as a model for natural resource information collection, management and sharing across the public and private sectors.	Dakota County	\$ 400,000

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A. Foundational Natural Resource Data and Information						
H. Proposals Seeking \$200,000 or Less (22 Proposals / \$3,875,755)						
047-AH	Windels	Steve	Do Beavers Buffer Against Droughts and Floods?	We propose to use existing data sets to link beaver population data to water storage in beaver ponds, to determine if they buffer against droughts and floods.	Voyageurs National Park	\$ 168,400
048-AH	Quinn	Ed	Enhancing Bat Recovery by Optimizing Artificial Roost Structures	Project will identify characteristics of successful artificial bat roost structures. Data will be used to optimize bat use and reproduction in these structures to improve survival of WNS impacted bats.	MN DNR	\$ 190,271
049-AH	Petersen	Jessica	Tools for Supporting Healthy Ecosystems and Pollinators	This project will create a pollination companion guide to MNDNR's Field Guides to Native Plant Communities for conservation practitioners to better integrate plant-pollinator interactions into natural resource planning and decision-making.	MN DNR	\$ 198,397
050-AH	Grinde	Alexis	Developing Innovative Technology to Track Wildlife Movements	We will build a cost-effective network of automated radio-telemetry stations to assess fine-scale habitat use and track movements of wildlife to inform and improve management decisions for multiple taxa.	U of MN - Duluth NRRRI	\$ 168,265
051-AH	Sadowsky	Michael	Modern eDNA Technology for Better Game Fish Census	We will develop an inexpensive and rapid eDNA measurement tool to determine the abundance and distribution of Walleye in MN lakes, which greatly enhances current counting methods to manage Walleye.	U of MN	\$ 200,000
052-AH	Roepke	Scott	Cannon Valley Trail Natural Resources Inventory/Management Plan	Cannon Valley Trail traverses an ecologically diverse environment and stewards plant and animal species with protected status. This Project will update a 30-year old biological inventory and provide management direction.	Cannon Valley Trail	\$ 50,000
053-AH	Arnold	Todd	Archiving Unreported Band Recoveries of Minnesota Birds	This project will ensure that >30,000 recaptures of banded non-game birds are made permanently available for analysis of population dynamics of Minnesota birds.	U of MN	\$ 141,700
054-AH	Reavie	Euan	Best Management Practices for Minnesota Coldwater Lakes	Remedial measures are needed to conserve fish in Minnesotas coldwater lakes. We will identify the causes of fish habitat loss and compile a set of management recommendations for salvageable lakes.	U of MN - Duluth NRRRI	\$ 199,653
055-AH	Zobel	John	Rapid Assessment of Wildlife Habitat for Environmental Review	Creation of a highly accessible and versatile online application for use by natural resource professionals to rapidly assess the implications of current or proposed forest management on wildlife habitat.	U of MN	\$ 178,000
056-AH	Bracey	Annie	Conserving Black Terns and Forsters Terns in Minnesota	Black Tern and Forster's Tern populations have declined. Comprehensive assessment of distribution and breeding status will identify population limiting factors for best management practices and prioritizing conservation and restoration efforts.	U of MN - Duluth NRRRI	\$ 198,640
057-AH	Havranek	Tony	Studying Solar Panel Impact on Vegetation Quality	This project will assess the potential effects of solar installations on vegetative communities and seek to determine the success of native plantings for pollinators and other wildlife.	WSB & Associates	\$ 160,083
058-AH	Downing	John	How to Save the Cisco-Trout Lakes	We will find the mechanism leading to rapid deoxygenation of deep, cold waters, stressing ciscoes and trout in lakes so that the problem can be fixed. The mechanism is unknown.	U of MN - Duluth - Sea Grant	\$ 185,438

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059-AH	Filstrup	Christopher	Enhanced Online Tool to Track Minnesota Lake Trends	We propose to update and refine an existing online visualization tool and database to explore long-term water quality trends in Minnesota lakes to support natural resources decision-making and environmental education.	U of MN - Duluth NRRRI	\$ 197,836
060-AH	Russell	Matthew	Assessing Vegetation Impacts from Deer	This project will use a citizen science program to determine the economic and ecological impacts of white-tailed deer populations on the health and productivity of Minnesota's forests.	U of MN	\$ 186,460
061-AH	Jones	Jabari	Measuring Mussel Habitat Suitability in the Cannon River	We will measure physical attributes of known mussel sites in the Cannon River watershed and develop hydrodynamic models to determine habitat suitability. Our analysis will identify priority sites for management/restoration.	U of MN	\$ 154,411
062-AH	Petersen	Jessica	Engagement and Monitoring for the Insect Apocalypse	This project will document baseline insect biodiversity across Minnesota by deploying passive interception traps, and engaging with budding insect biologists to sort and identify collected material.	MN DNR	\$ 191,824
063-AH	Olmanson	Leif	Temperature and Ice Phenology Information for Lake Management	Develop cloud based image processing methods to map lake ice/snow phenology (snow, ice cover onset, thickening and disappearance) and lake surface temperature using satellite optical and all weather radar data.	U of MN	\$ 194,704
064-AH	Onello	Emily	Environmental Factors Influencing Nutritional Content of Wild Rice	This project will establish foundational natural resource data on the nutritional variability of Minnesotas wild rice (<i>Zizania palustris</i>) and explore the influence of growth habitat on the nutritional composition.	U of MN	\$ 198,092
065-AH	Downing	John	Role of Submarine Groundwater Altering Lake Superior's Shore	We will determine the deep groundwater input to Lake Superior so that forecasts of lake level can be made. This will help protect important North Shore parks and environments.	U of MN - Duluth - Sea Grant	\$ 198,643
066-AH	Berman	Jesse	Understanding Environmental Factors that Impact Minnesota Tick Populations	Ticks and tick-borne disease are a major problem in Minnesota. Improved understanding of the environment and tick relationship can reduce risk of disease and inform pest control strategies.	U of MN	\$ 199,938
067-AH	Gustin	Andrew	Minnesota Public Trails and Waterways: A Comprehensive Database	Noteworthy features along select trails in Minnesota will be catalogued in a spatial database and displayed on maps to increase public land usage while fostering natural resource awareness and protection.	Outdoor Explorer	\$ 195,000
068-AH	Hartman	Eric	Rock County Aggregate Mapping	Map the aggregate resource potential in Rock County to assist with natural resource decision-making, planning and zoning, land use, and well head protection.	Rock County Land Management Office/SWCD	\$ 120,000
B. Water Resources (47 Proposals / \$23,266,308)						
069-B	Mayer	Terin	Assessing the Value of Green Infrastructure within Minnesota's Water Infrastructure Funding Shortfall	Report on financing water infrastructure through green and grey solutions. Data on where and how natural resource management can address critical infrastructure funding shortfalls while improving habitat and ecosystem services.	U of MN	\$ 384,923
070-B	Edlund	Mark	Unprecedented Change Threatens Minnesotas Pristine Lakes	Why are Minnesota's nicest lakes turning green? We determine what's causing this change and which lakes are most at risk.	Science Museum of Minnesota	\$ 849,392

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071-B	Ebtehaj	Ardeshir	Microplastics: Occurrence, Toxins, and Detection with Drones	A baseline survey of microplastic occurrence and toxicity in Minnesota waters will be conducted to establish relationships with watershed attributes and develop cost effective remote sensing tools.	U of MN	\$ 450,000
072-B	Bilotta	John	Banking Groundwater	A team led by the Water Resources Center will complete an interdisciplinary analysis of the benefits and barriers to passive and active (injection) aquifer recharge in Minnesota.	U of MN - Water Resources Center	\$ 350,000
073-B	Gulliver	John	Preventing Harmful Algal Blooms through Improved Stormwater Detention	Our project will identify assessment strategies for use in developing tools for pond management to limit nutrient release to be adopted by cities, counties, state agencies and watershed management organizations.	U of MN	\$ 619,031
074-B	Elliott	Sarah	Trace Organic Contaminants in Groundwater from Stormwater Infiltration	Organic contaminants may be transported to groundwater from stormwater infiltration. Contaminants may be carried downstream to drinking water sources or receiving streams with unknown consequences for human and ecological health.	U.S. Geological Survey	\$ 910,000
075-B	Finlay	Jacques	Understanding and Managing Persistent Chloride Pollution in Freshwaters	Stormwater systems can retain road salt, releasing it during summer and maximizing chloride impacts on freshwaters. We will collaboratively collect information needed to design stormwater ponds/wetland systems to minimize impacts.	U of MN	\$ 299,000
076-B	Heger	Sara	Reducing Chloride in Minnesota's Water from Water Softening	This project will promote salt reduction through testing non-salt water softening alternatives; developing a residential web-based water softener tool; and working with two communities to implement softener salt reduction strategies.	U of MN	\$ 362,699
077-B	Hu	Bo	Shedding Lights to Future Septic Systems	We want to add lights in the septic system to promote microalgae growth. It will enable septic systems to better treat domestic wastewater generated in the rural or small community.	U of MN	\$ 361,000
078-B	Novak	Paige	Bacterial Starvation for Improved Toxic Contaminant Treatment	We will understand how starvation changes bacterial function, resulting in their more extensive biodegradation of a greater number of contaminants of emerging concern, leading to development of simple treatment systems.	U of MN	\$ 235,854
079-B	DeBeer	Laura	Novel Field Methods to Evaluate Groundwater Quality Investments	Implement sampling technologies/approaches to measure vertical groundwater nitrate profiles. This alternative method will evaluate groundwater quality improvements from targeted land management changes and provide data for communication with producers.	Pipestone County SWCD	\$ 219,900
080-B	Wright	Natasha	Managing Highly Saline Waste from Municipal Water Treatment	We will develop a cost- and energy-efficient method of managing the concentrated saline waste from a municipal desalination plant, increasing the economic feasibility of centralized water softening and sulfate removal.	U of MN	\$ 255,000
081-B	Baker	Lawrence	Adaptive Management to Reduce Road Salt Pollution	We will develop a practical spreadsheet-based tool to enable cities to evaluate the impact of salting/de-icing practices on water quality and thereby enable adaptive management to improve efficiency.	U of MN	\$ 438,000
082-B	Cotner	James	Is Glyphosate causing harmful Algal Blooms?	This project will determine if the widely used herbicide, glyphosate, is encouraging harmful algal blooms and degrading water quality in our lakes and streams by providing phosphorus to cyanobacteria.	U of MN	\$ 427,000

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083-B	Novak	Paige	Technology for Energy-Generating Onsite Industrial Wastewater Treatment	We will develop "off the shelf" technology to treat industrial wastewater onsite, turning pollutants into hydrogen and methane for energy. This will lead to water quality benefits and cost savings.	U of MN	\$ 474,939
084-B	Wright	Natasha	Chloride-Free Home Water Treatment: Increasing Efficiency, Reducing Cost	We will develop a new low-cost, high-efficiency pump that will enable a chloride-free solution to traditional household water softeners, thus eliminating the future cost of advanced treatment technology for WWTPs.	U of MN	\$ 265,000
085-B	Almendinger	James	Our Future Drinking Water: Nitrate, Tile, and Climate	We will evaluate how to reduce nitrate in rural drinking water and how tile drainage and climate change impact replenishment of drinking water, i.e., groundwater recharge.	Science Museum of Minnesota	\$ 330,000
086-B	Hozalski	Raymond	Groundwater Microbiology Phase 2: Private Wells	The proposed study will generate critically important knowledge on the microbiological quality of private wells throughout Minnesota, identify risk factors, and provide sound guidance for protecting public health.	U of MN	\$ 499,196
087-B	Penn	Lee	Microplastics: Transporters of Contaminants in Minnesota Waters	Microplastics are ubiquitous environmental contaminants, can transport contaminants of concern (COCs), and pose a major environmental threat. We will determine how microplastics affect contaminant fate and transport in Minnesota waters.	U of MN	\$ 448,630
088-B	Cui	Tianhong	Cheap Small Sensor Network for Water Pollutants Monitoring	This project is to develop practical sensor networks based on sensors in Phase I, a very cheap and highly efficient approach for pollutants monitoring of lakes and rivers in Minnesota.	U of MN	\$ 635,000
089-B	Elias	Mikael	Mitigating Insecticide Toxicity for Safer Waters in Minnesota.	We propose to harness the potential of newly discovered proteins from Minnesota ecosystems that turns environmental, toxic pollutants into harmless compounds to protect our state waters quality.	U of MN	\$ 370,000
090-B	Hayes	Nicole	Climate Impacts on Nitrogen Gas Release from Lakes	Nitrogen pollution enters lakes and microbes convert some of it to a nitrogen-based greenhouse gas. We will estimate nitrogen emissions in lakes statewide and guide management to enhance nitrogen removal.	U of MN	\$ 452,000
091-B	Hu	Bo	Phytoremediation for Extracting Deicing Salt from Roadside Soils	We propose to study native plants that can adsorb salts to be planted on the roadside to address the environmental concerns over deicing road salts.	U of MN	\$ 368,000
092-B	Ishii	Satoshi	Assessment of Water Quality for Reuse: Phase II	This project will maximize the potential of water reuse to conserve Minnesota's groundwater and improve surface water quality by providing the pathogen data needed to eliminate barriers to water reuse.	U of MN	\$ 476,000
093-B	Karschnia	Maggie	Innovative Phosphorus Removal Solutions for 10,000 Clean Lakes	Using a venture capitalist approach, the 10,000 Clean Lakes Project will solicit new opportunities for more affordable, more effective, and longer-lasting solutions to treat existing phosphorus problems in Minnesota's lakes.	Prior Lake-Spring Lake Watershed District	\$ 405,000
094-B	Ruan	Roger	Full Utilization of Concentrated Livestock Wastewaters	To develop and demonstrate a system for complete treatment and utilization of concentrated animal wastewater, reducing/preventing pollutants from escaping to air and leaching to groundwater, producing bioenergy, feeds, and foods	U of MN	\$ 545,000

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095-B	Penn	Lee	Storing Sulfide Produced from Sulfate-Containing Wastewater Safely	Sulfate in wastewater is a major concern in Minnesota. We propose to process biproducts of sulfate remediation to produce bricks to safely store sulfur.	U of MN	\$ 280,790
096-B	Hondzo	Miki	Occurrence of Algal Toxicity in Minnesota Waters	We propose to develop real-time and technologies and prediction models to quantify the onset, transport, and mitigation of algal toxicity in Minnesota waters.	U of MN	\$ 351,446
097-B	Pradhananga	Amit	Engaging Private Well Owners in Groundwater Protection	Private well owners' level of engagement in groundwater management is not well understood. We propose to apply a social-science based approach to engage private well owners in groundwater protection.	U of MN	\$ 381,000
098-B	Streets	Summer	Developing Strategies to Manage PFAS in Land-Applied Biosolids	This projects helps municipal wastewater plants, landfills, and compost facilities protect human health and the environment by developing strategies to manage per- and polyfluoroalkyl substances (PFAS) in land-applied biosolids.	Minnesota Pollution Control Agency	\$ 1,403,556
099-B	Bramburger	Andrew	Rapid Detection of Algal Toxins in Minnesota Lakes	We will use satellite data to identify potentially HAB-impacted lakes, then apply genomics based models developed in this project to quantify cyanotoxin exposure risk in target lakes.	U of MN - Duluth NRRI	\$ 830,326
100-B	Capel	Paul	Time-Integrated Sampling of Chemical Contaminants in Minnesota's Streams	Synthetic chemical contaminants in Minnesota streams occur frequently in pulses and mixtures. Time-integrating sampling will complement traditional stream sampling to provide a more complete understanding of the degree of contamination.	U of MN	\$ 349,383
101-B	Karwan	Diana	Maintaining Clean Water Supply from Working Forests	We will identify watersheds at risk of degradation due to forest disturbance (e.g. fire, storms, pests, harvests) develop proactive strategies to maintain clean water focusing in Northeastern Minnesota.	U of MN	\$ 275,785
102-B	LaPara	Timothy	Protozoan Microbes in Groundwater Used for Drinking Water	This project will determine the ability of a treatment system to destroy Cryptosporidium, Giardia, and other dangerous microbes that were recently detected in groundwater used for drinking water	U of MN	\$ 499,699
103-B	Dymond	Salli	Timing is everything: When is Groundwater in MN Recharged?	The goal of this project is to collect robust field data that allow us to determine when groundwater in Minnesota is recharged and quantify the amount of recharge.	U of MN - Duluth	\$ 520,164
104-B	Magner	Joe	Quantifying A New Urban Precipitation/Water Reality	Better understanding of groundwater and surface water interactions will be used to improve future infrastructure planning, reducing damage to home basements and underground infrastructure resulting from recent high water tables.	U of MN	\$ 1,377,893
105-B	LaPara	Timothy	Cold Temperature Ammonia Consuming Bacteria during Wastewater Treatment	This project will investigate ammonia consuming microorganisms during municipal wastewater treatment in the winter. These bacteria protect Minnesota's environment by preventing the release of ammonia and estrogenic hormones.	U of MN	\$ 462,351
106-B	Baker	Lawrence	Maintaining Pollutant Removal in Stormwater Ponds	This study will develop a simple statistical tool to relate the filling rate of stormwater ponds to their watershed characteristics, enabling more efficient pond maintenance.	U of MN	\$ 306,683

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ENRTF ID #	Last Name	First Name	Title	Summary	Organization	\$ Requested
107-B	Johnson	Lucinda	Mobile Water Treatment Demonstration System for Sulfate Reduction	A flexible, mobile treatment system will be developed to demonstrate chemical and biological technologies to remove sulfate from waste streams to below 10 ppm at municipal and industrial sites.	U of MN - Duluth NRRRI	\$ 838,401
108-B	Grover	Valerie	Vermillion River Surface Water and Groundwater Nitrate Impacts	Identify ways to improve surface water and groundwater quality along the Vermillion River by developing better understanding of surface water-groundwater interaction; and identifying significant sources contributing nitrate to the subwatershed	Dakota County	\$ 268,000
109-B	Osweiler	Todd	Protecting Natural Resources & Groundwater Aquifers in Rochester	Significant population growth is expected in Rochester. This project will collect data on deep aquifers necessary ensure no impacts to natural resources and assess sustainability of future water supplies.	Rochester Public Utilities	\$ 537,700
110-B	Johnson	Heather	Increased Sample Capacity for Analysis of Pesticides	Updating the MDA Laboratory pesticide analytical equipment with the latest technology will increase the capacity for analyzing pesticide water samples and increase the number of pesticides measured per water samples.	Minnesota Department of Agriculture	\$ 736,079
111-B	Kang	Peter	Predicting Contaminant Transport in Fractured Aquifers	We will develop a practical tool for accurately quantifying and predicting contaminant transport in fractured aquifers. The tool will help more efficiently and economically manage many active groundwater contamination sites.	U of MN	\$ 350,664
112-B	Missaghi	Shahram	Assessing Human Exposure Risk to Harmful Algae Blooms	Developing needed economic framework and tools for communities so they can assess the associated health risk and costs of chronic exposure to harmful algal blooms poisoning in lakes and ponds	U of MN	\$ 529,632
113-B	Charleux	Laure	Mapping Lake Superior's Changing Biogeochemistry	We will develop an online and updatable atlas of water quality in western Lake Superior, which will provide stakeholders with key information about land-lake interactions to help prioritize conservation efforts.	U of MN	\$ 286,192
114-B	Keegan	Bill	Innovative Solution for Protecting Minnesota from PFAS contamination	Demonstration of an innovative technology to protect the States drinking water and natural resources by eliminating Perfluoroalkyl and Polyfluoroalkyl substances (PFAS) from point source discharges.	Dem-Con	\$ 750,000
115-B	Overholser	Michelle	Assess Water Quality and Flood Retention Structures	The unintended consequences of Minnesota's important agricultural success has been alteration of natural hydrology. This study quantifies water storage needs, solutions, and benefits, and may serve others as a template.	Yellow Medicine River Watershed District	\$ 500,000
B. Water Resources						
H. Proposals Seeking \$200,000 or Less (6 Proposals / \$1,040,497)						
116-BH	Babcock	Laura	Expanding Protection of Minnesota Water through Industrial Conservation	Decrease water demand in communities at risk for inadequate ground water supply or quality by providing technical assistance to identify cost-effective ways to reduce industrial/commercial water use.	U of MN	\$ 178,430
117-BH	Barry	John	Minnesota Sentinel Springs, Understanding Groundwater Recharge and Chemistry	The sentinel springs project builds foundational data necessary to increase understanding of groundwater and surface water interaction, aquifer recharge, and how changes in agricultural land management can protect water quality.	MN DNR	\$ 182,267

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ENRTF ID #	Last Name	First Name	Title	Summary	Organization	\$ Requested
118-BH	Kinney	Mike	Field Testing of a New Phosphorus Removal Technology	The Comfort Lake-Forest Lake Watershed District will pilot new pollutant-removal nanotechnology by installing innovative adsorption pellet containers at multiple sites in order to reduce loading to impaired and/or near-impaired waterbodies.	Comfort Lake-Forest Lake Watershed District	\$ 150,000
119-BH	Cui	Tianhong	Cheap Efficient Filter to Remove Organic Compounds	This project is to develop a new filter to remove toxic organic compounds from drinking water. The technology is very cheap and highly efficient to improve Minnesota water quality.	U of MN	\$ 200,000
120-BH	Knoll	Lesley	Cascading Effects of Ice-Cover on Summer Water Quality	This project will determine the importance of variable ice cover conditions in controlling harmful cyanobacteria, phosphorus cycling, and oxygen distribution in Minnesota lakes.	U of MN	\$ 191,000
121-BH	Arnosti	Don	Temporal Analysis of Sulfate Loading	The study characterizes the introduction, movement, and fate of sulfate from discharge to impact in a way addressing the issues of impact on wild rice and mercury bioaccumulation in fish.	Izaak Walton League of America, Minnesota Division	\$ 138,800
C. Environmental Education (15 Proposals / \$9,815,493)						
122-C	Dorn	Cindy	Statewide Environmental Education via Public Television Outdoor Series	Pioneer Public TV will produce 26 new episodes of a statewide outdoor public television series designed to inspire Minnesotans to connect with the outdoors and restore and protect the environment.	Pioneer Public Television	\$ 300,000
123-C	Edmiston	Julie	Minnesota Freshwater Quest: Environmental Education on State Waterways	30,000 underserved Minnesota youth (6-12 grade) explore and improve their local waterways through the "MN Freshwater Quest"—using freshwater species as the hook for place-based, hands-on environmental education.	Wilderness Inquiry	\$ 1,432,110
124-C	Poppleton	Kristen	TeachScience: Schools as STEM living laboratories	TeachScience will connect new science standards, renewable energy, and STEM opportunities through teacher training and support across the state to prepare students for the challenges and careers of the future.	Climate Generation: A Will Steger Legacy	\$ 368,505
125-C	Loon	Deborah	Mentoring the Next Generation of Conservation Professionals	57 diverse young people will work with and learn from USFWS professionals in paid internships and apprenticeships on the Minnesota Valley National Wildlife Refuge and Wetland Management District.	Minnesota Valley National Wildlife Refuge Trust, Inc.	\$ 755,544
126-C	Souza	Jaime	Rivers Are Alive: Inspiring Life-long Environmental Stewardship	Expanding "Rivers Are Alive" in Minnesota to inspire life-long stewards of rivers and wild places through meaningful, equitable, and inclusive environmental education experiences.	St. Croix River Association	\$ 363,900
127-C	Reese	Luke	Jay C. Hormel Nature Center Supplemental Teaching Staff	The Jay C. Hormel Nature Center would like to offer its environmental education curriculum to more southeast Minnesota students by hiring an additional naturalist and interns for three years.	City of Austin	\$ 252,898
128-C	Halvorson	Joel	UMD Boreal Observatory at Chik-Wauk on the Gunflint	The University of Minnesota Duluth Boreal Observatory is where the public learns first hand about Minnesota's boreal forest, and future scientists and educators hone their skills.	U of MN - Duluth	\$ 514,865
129-C	Becker	Beth	450 Underserved, Diverse Youth Gain Environmental Education	Increase opportunity for 450 underserved, diverse teens, from urban and first-ring suburbs, to experience and connect to environmental sciences in the natural world through YMCA canoeing/learning expeditions with experienced counselors.	YMCA of the Greater Twin Cities	\$ 428,250

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ENRTF ID #	Last Name	First Name	Title	Summary	Organization	\$ Requested
130-C	Yang	Ce	Smart Trash Sorting for Zero Waste in Minnesota	We aim at enhancing recycling in Minnesota by providing a recycling-at-source solution, which is to help Minnesotans make immediate recycling decisions by a smartphone application connected to trash bin networks.	U of MN	\$ 394,709
131-C	Brigham	Jonee	MN GreenStep Schools: Statewide Launch in 12 Schools	MN GreenStep Schools integrates environmental best practices with hands-on environmental education. Funding will launch the program in 12 schools which become regional catalysts, yielding education and environmental outcomes.	U of MN	\$ 554,313
132-C	Hanson	Randel	LSC Living Lab: Operations and Dissemination	We propose to develop, demonstrate and disseminate several new farming methods that have the potential to improve human health and stimulate local economic development while reducing environmental impacts.	Lake Superior College (LSC)	\$ 258,058
133-C	Thompson	Seth	Delivering Student-Centered Environmental Education to Minnesota Students	This project will provide student-centered environmental education to over 15,000 Minnesota students by expanding currently existing in-classroom programs over a three year period.	U of MN	\$ 610,000
134-C	Bloome	Katie	Restoring Land, Reviving Heritage: Conservation Through Indigenous Culture	By linking natural resource management, cultural heritage, and environmental education, we aim to restore an ecologically significant area of land while fostering multi-generational environmental stewardship and restoration of Indigenous culture.	Belwin Conservancy	\$ 606,885
135-C	Daniels	Lisa	Connecting Tribal Communities to Sustainable Energy Pathways	Windustry and partners will build new pathways for Minnesota Tribes to learn how to power their communities with renewable and sustainable energy solutions through trainings and installing demonstration systems.	Windustry	\$ 2,187,669
136-C	Nelson	Theresa	Neighborhoods Sustained: Preserving Ecosystems through Behavior Change	Move Minnesota will decrease the environmental impact of suburban residents by reducing the environmental impact of transportation pollution, which makes up a full quarter of emissions in Minnesota.	St. Paul Transportation Management Organization, d/b/a Move	\$ 787,787
C. Environmental Education						
H. Proposals Seeking \$200,000 or Less (18 Proposals / \$3,017,667)						
137-CH	Foster	Shelli-Kae	YES! Students Take on Water Quality Challenge Phase-II	YES! teams statewide will mobilize local watershed stewardship efforts in 20 communities through student-driven action projects, filling the urgent need for citizen participation to protect and clean-up Minnesota waters.	Prairie Woods Environmental Learning Center	\$ 199,700
138-CH	Montgomery	Maggie	Engaging Minnesotans with Phenology: Radio, Podcasts, Citizen Science	This project builds next generation conservationists using phenology, radio broadcasts, podcasts, and an online, interactive map interface to inspire teachers, students and the public to get outside and experience nature.	Northern Community Radio, Inc.	\$ 198,478
139-CH	Kalnicky	Emily	Driving Conservation Behavior for Mussels and Water Quality	The Minnesota Zoo will develop research-supported strategies to engage the public in specific conservation behaviors they can take in order to improve water quality and mussel health across the state.	Minnesota Zoological Society	\$ 191,580
140-CH	Putzier	Paul	Groundwater: Education to Action	Leverage existing state funding to move water professionals (SWCD) from understanding to action addressing specific local groundwater projects; and repackage existing materials to support revised Grade 9 Earth Science Standards	MN DNR	\$ 180,000

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ENRTF ID #	Last Name	First Name	Title	Summary	Organization	\$ Requested
141-CH	Wood	Bryan	Providing Residential Environmental Learning Experiences to Underserved Students	Through program and busing scholarships, and a multi-language informational orientation video, we wish to connect Minnesota's increasingly diverse and changing K-12 student demographics to nature through residential environmental learning experiences.	Audubon Center of the North Woods	\$ 150,000
142-CH	Knopf	Chris	Connecting 350 Northeastern Minnesota Students to Boundary Waters	This project will connect over 350 Northeastern Minnesota Students and young adults to the Boundary Waters through wilderness canoe experiences and conservation stewardship programs.	Friends of the Boundary Waters Wilderness	\$ 184,050
143-CH	Simonson	Erik	Lake Superior Zoo; Water Protection Intuitive Exhibit	Create an environmental water protection intuitive exhibit that uses Kingsbury Creek within the Lake Superior Zoo to demonstrate the importance and value of buffer areas adjacent to our watersheds.	Lake Superior Zoological Society	\$ 197,500
144-CH	Rao	Sujaya	Environmental Education: Cricket Farming for Reducing Carbon Emissions	The project seeks to engage K-12 students in environmental education and cricket farming, an alternative to livestock for reduction of carbon emissions, for long-term preservation of Minnesota's natural resources.	U of MN	\$ 198,879
145-CH	Suss	Ted	River Watch on the Minnesota River	This project continues and expands the high school team-based water quality monitoring project in the Minnesota River basin through which data is collected by students and submitted to MPCA.	Friends of the Minnesota Valley	\$ 100,000
146-CH	Wegwerth	Matt	Creating Awareness About Runoff to Protect Water Quality	We will create demonstration sites in Itasca County to study how phosphorous and chloride enters lakes. Outreach will educate the public about runoff impacts and strategies to reduce them.	City of Grand Rapids	\$ 200,000
147-CH	Heskel	Mary	Carbon on Campus: Connecting Students to Minnesota Ecosystems	We aim to create a statewide, openly-accessible database and website of Minnesota's ecosystems, integrating student-driven environmental fieldwork, data analysis, web-based educational tools, and engagement with middle- and high-school science classes.	Macalester College	\$ 134,577
148-CH	Zanko	Lawrence	Enriching Natural Resource Knowledge for Informed Decision Making	A pilot educational outreach program designed to engage and encourage Minnesotans to participate in well-informed discussions about the complex interrelationships between Minnesota's water and mineral resources and clean energy future.	U of MN - Duluth NRRI	\$ 196,627
149-CH	Wood	Bryan	Environmental Education through Regenerative Agriculture	The Audubon Center of the North Woods seeks to create a regenerative farm that models and teaches environmental education through sustainable agricultural practices to thousands of children and adults annually.	Audubon Center of the North Woods	\$ 80,000
150-CH	Pine	Adam	UMD Land Lab Sustainable Food System Project	The UMD Land Lab is a mold-breaking interdisciplinary outreach center that provides active-learning environmental and food systems education for school groups and community members.	U of MN - Duluth	\$ 199,860
151-CH	Aro	Matthew	Promoting Forest Health and Reducing Forest Fire Hazards	The goal is to improve forest health, reduce wildfires, and grow Minnesota's forest products industry by demonstrating the benefits of a thermally modified tamarack and white pine boardwalk and boathouse.	U of MN - Duluth NRRI	\$ 152,373
152-CH	Matemba-Mutasa	Gertrude	Camp Katharine Parsons Conservation and Environmental Education Initiative	PWCC's Camp Katharine Parsons day camp and ecotourism program for youth served from North Minneapolis and the surrounding area, including environmental education, outdoor recreation, conservation efforts, and STEM projects.	Phyllis Wheatley Community Center	\$ 200,000

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153-CH	Schultz	Peter	The Longspur Prairie Fund Urban Prairie Learning Lab	The Longspur Prairie Fund, an organization dedicated to conservation in the Red River Valley, will establish an urban micro-prairie and stormwater bioretention "learning lab" at the Rourke Art Museum.	The Longspur Prairie Fund	\$ 62,943
154-CH	Mohan	Ned	Living Laboratory for Community Education of Solar Energy	To create a showcase of solar power and battery technologies which will serve to educate students, homeowners and the general public about societal and economic aspects of clean energy.	U of MN	\$ 191,100
D. Aquatic and Terrestrial Invasive Species (11 Proposals / \$18,329,636)						
155-D	Venette	Robert	Minnesota Invasive Terrestrial Plants and Pests Center (MITPPC) Phase 5	The Minnesota Invasive Terrestrial Plants and Pests Center (MITPPC) requests \$7 million to accelerate up to 15 new, high-priority research projects that will lead to better management of invasive species on the land.	U of MN - MITPPC	\$ 7,000,000
156-D	McClannahan	Valerie	Protect Community Forests by Managing Ash for EAB	Project will reduce EAB through community developed management (inventory, canopy assessment, management plan, removal, non-neonicotinoid treatment) and improve their community forest by involving citizens and planting a diversity of trees.	MN DNR	\$ 5,929,174
157-D	Salomon	Christine	White Nose Bat Syndrome Biological Control: Phase 3	Testing of best biocontrol microbes for controlling white nose syndrome (WNS) in bats: Mapping of fungal pathogen, field testing, and assessment of a WNS-free cave with healthy bats	U of MN	\$ 444,636
158-D	Nerbonne	Brian	Applying New Tools and Techniques against Invasive Carp	Invasive carp pose a major threat to Minnesota's rivers and lakes. The Minnesota DNR will apply cutting edge techniques to keep these aquatic pests at bay.	MN DNR	\$ 578,000
159-D	Slesak	Robert	EAB and Black Ash: Maintaining Forests and Benefits	Utilize ongoing experiments to determine longterm EAB impacts on water, vegetation, and wildlife; optimal replacement species and practices for forest diversification; develop indicators and criteria for prioritization of mitigation activities.	U of MN	\$ 774,000
160-D	Chandler	Monika	Tactical Invasive Plant Management Plan Development and Implementation	We will systematically identify, prioritize, coordinate control and eliminate high priority invasive plant infestations.	Minnesota Department of Agriculture	\$ 658,137
161-D	Schrank	Amy	Enhancing Habitat and Diversity in Cattail-Dominated Shorelines	Determine if hybrid cattail removal at the landowner scale benefits nearshore ecological function by experimentally removing cattails from sites in 36 lakes and measuring environmental, vegetation, and fish responses.	U of MN	\$ 582,994
162-D	Oliver	Jonathan	Ticks! A Rising Threat in Minnesota	The Asian longhorned tick will bring disease and economic costs impacting wildlife, livestock, pets, and people. We will build a collaborative surveillance network to detect and limit its spread.	U of MN	\$ 300,000
163-D	Hatch	Jay	Mississippi River Dams: Blocking Invasive Fish, Helping Natives	Deter Bigheaded Carp establishment in Minnesota by adjusting gates at six Mississippi River navigation dams. Downstream dams block carp, while upstream dams open pathways for native fishes to resist invasion.	U of MN	\$ 324,282
164-D	Forester	Jeff	Stop Starry Invasion - Community Invasive Species Containment	The destructive invasive algae starry stonewort, discovered in 2015, has now spread to 14 lakes. We hope to contain it in those lakes with boat cleaning stations at all accesses.	Minnesota Lakes and Rivers Advocates	\$ 1,264,955
165-D	Jensen	Douglas	Does AIS Outreach Lead to Behavior Change?	This project will augment AIS prevention efforts to increase boater compliance with regulations based on new community engagement outreach, social media and use of waterless boat cleaning stations.	U of MN - Duluth - Sea Grant	\$ 473,458

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D. Aquatic and Terrestrial Invasive Species						
H. Proposals Seeking \$200,000 or Less (4 Proposals / \$700,035)						
166-DH	Sickmann	Katie	St. Croix Terrestrial Invasive Species Awareness, Prevention, and Control	St. Croix Terrestrial Invasive Species Awareness, Prevention, and Control will engage, educate, and empower key stakeholders to protect biodiversity and native ecosystems against the adverse impacts of terrestrial invasive species.	St. Croix River Association	\$ 191,940
167-DH	Brady	Valerie	How Effective and Protective are AIS Removal Methods?	The best way to prevent AIS spread in Minnesota is to stop the transfer of water and living material between lakes. We will test how well boat cleaning methods work	U of MN - Duluth NRRI	\$ 110,699
168-DH	Edlund	Mark	Invasive Rock Snot Threatens North Shore Streams	We examine the recent spread, origin, cause, and economic and ecological threat of nuisance rock snot formation in North Shore streams and Lake Superior to inform management and outreach.	Science Museum of Minnesota	\$ 197,896
169-DH	Olson	Eric	Rainy Lake Non-native Hybridized Cattail Removal	Eliminate non-native hybridized floating cattail mats, focusing on a 19-acre bog located in Jackfish Bay, that have displaced native vegetation outside of the Voyageurs National Park area on Rainy Lake.	Koochiching SWCD	\$ 199,500
E. Air Quality, Climate Change, and Renewable Energy (26 Proposals / \$20,048,620)						
170-E	Hansen	Gretchen	Increasing Resilience of Lakes to Extreme Precipitation Events	We will identify and communicate watershed best management practices for increasing resilience of coldwater fish habitat in lakes to warming and increased frequency of extreme storm events.	U of MN	\$ 323,780
171-E	Rhees	Suzanne	Tracking Climate Benefits of Natural and Working Lands	Assess the climate change mitigation benefits provided by Minnesotas natural and working lands through an inventory and an interactive tool designed to measure and maximize these benefits going forward.	MN Board of Water and Soil Resources	\$ 390,500
172-E	Chan	Gabriel	Partnerships with Municipal and Cooperative Utilities	We propose to develop a three-year research engagement platform for university and non-profit experts to partner with diverse cohorts of municipal and cooperative utilities to develop targeted clean energy solutions.	U of MN	\$ 448,991
173-E	Herrmann	Bryan	Storing Renewable Energy in Flow-Battery for Grid Use	The University of Minnesota Morris, Otter Tail Power Company, business and project partners will install a large flow-battery for storing renewable energy and grid optimization, and research the batterys performance.	U of MN - Morris	\$ 3,271,229
174-E	Montgomery	Rebecca	Making Red Pine Forest Resilient to Climate Change	To increase resilience of red pine forests to climate change, we will conduct a statewide vulnerability assessment, develop approaches to adapt forest management, and create a Forest Adaptation Learning Network.	U of MN	\$ 628,737
175-E	Reich	Peter	"Climate-Smart" Trees and Forests for Minnesota	We will fill a key knowledge gap by identifying tree species likely to be 'winners' under future climate, helping establish a strategy to make our trees and forests "Climate-Smart"	U of MN	\$ 494,000
176-E	Chen	Paul	Produce Marketable Liquid Fuels from Plastic Wastes	Evaluate and develop conversion technology for production of high quality and marketable liquid fuels from plastic wastes and hence reduce solid pollutants and protect the environment.	U of MN	\$ 383,000
177-E	Ramaswamy	Shri	Converting Forest Products Industry Waste to Value-Added Bioproducts	We propose to reduce solid waste and greenhouse gas emissions from landfills by converting biomass in solid waste from forest products industry to value-added products and improve Minnesota's forest bioeconomy.	U of MN	\$ 309,000

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178-E	Schweser	Greg	Deep Winter Greenhouses: Passive Solar Winter Food Production	The University of Minnesota will improve and advance a highly energy and water efficient passive solar Deep Winter Greenhouse (DWG) to reduce the carbon footprint of winter food production.	U of MN	\$ 1,559,706
179-E	Koester	Steven	Power Electronics Circuits for Minnesota's Renewable Energy Future	Our project involves engineering techno-economic solutions that will propel pertinent stakeholders in Minnesota to the forefront of advances in next-generation ultra-wide-bandgap power-electronics circuits for renewable (solar) energy applications.	U of MN	\$ 472,647
180-E	Kortshagen	Uwe	Clean Hydrogen Fuel from Sunlight, Wind, and Water	Hydrogen is an attractive option for renewable energy storage. This project will develop inexpensive catalysts for hydrogen production via water splitting using electricity from intermittent renewable sources.	U of MN	\$ 240,000
181-E	Mitchell	William	Pilot Scale Crematorium Mercury Filter	This project will develop a pilot-scale system to capture mercury from crematorium exhaust. Cremation in Minnesota emits 95 pounds of mercury from dental amalgam annually (~5% of state total).	Mertron, LLC	\$ 597,500
182-E	Ruan	Roger	Nitrogen Fixation for Fertilizers and Hydrogen Fuels Production	To demonstrate a new process to fix nitrogen from water and air to produce ammonia and nitrogen-rich water using renewable electricity from wind or solar energy, eliminating the need for fossil resources and pollutant emissions.	U of MN	\$ 487,000
183-E	McDonald	Kevin	Leveraging Carbon & Stormwater to Preserve Ash Trees	Community trees sequester enormous amounts of carbon and provide other valuable services. This project pioneers securing carbon credits and quantifying alternatives to costly stormwater infrastructure by preserving mature ash trees	Minnesota Pollution Control Agency	\$ 1,013,840
184-E	Barney	Brett	Carbon Capture through Biological Mineralization	We will utilize emerging technologies to capture and transform carbon dioxide into mineralized insoluble carbonates for use in secondary markets such as cement production.	U of MN	\$ 292,500
185-E	Draeger	Kathryn	Filling Empty Trucks: Energy Efficient Regional Food Distribution	This project fills empty wholesale trucks on existing routes to maximize energy efficiency, mitigate climate change and air quality impacts of food distribution, while opening markets for local food producers.	U of MN	\$ 1,058,772
186-E	Schmitt	Jennifer	A Community Table: Food Waste and Climate Change	Food waste contributes to climate change. This project will examine the experiences Minnesotans have with food and food waste to uncover more targeted, just, and effective waste prevention strategies.	U of MN	\$ 859,216
187-E	St. Lawrence	Mark	St. Louis County Building Deconstruction/Materials Reuse Pilot	St. Louis County, together with its public and private partners, will sponsor a building deconstruction and materials reuse pilot to reduce pollution and create jobs.	St. Louis County	\$ 1,463,000
188-E	Marr	Jeffrey	Coping with Cold Weather in Minnesota Wind Energy	This project will use laboratory, field, and modeling studies to investigate and mitigate impacts of ice accumulation on wind turbine blades, a common issue in Minnesota and other cold regions.	U of MN	\$ 399,562
189-E	Ruan	Roger	Remove Airborne Contaminants from Animal Production Facilities	Develop and evaluate innovative non-thermal plasma-based technologies for removing airborne biological and chemical contaminants from animal production facilities; protect human and animal health and environment.	U of MN	\$ 585,000

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190-E	Srinivasan	Vinod	Clean Combustion of Renewable Biofuels from Waste Biomass	This proposal develops technology that enables clean combustion of waste biomass derived from agricultural or forest residue, and also performs a life-cycle assessment of the environmental impact of this technology.	U of MN	\$ 583,000
191-E	Addy	Min	Pilot Scale Anaerobic Digester for Mixed Wastes	To develop a pilot-scale anaerobic digester and generate information for designing and building a commercial anaerobic digester in eastern Minnesota to produce renewable natural gas from organic wastes	U of MN	\$ 250,000
192-E	McCormick	Alon	Phase 2: Integrated Small-Scale Ammonia Synthesis	Make ammonia sustainably for the farm, using renewable energy and with no greenhouse gas emission; phase 2 focuses on a new efficient integrated module made possible with previous advances.	U of MN	\$ 2,108,520
193-E	Wang	Xiaojia	Multifunctional Materials for Building Energy and Power Generation	Our collaborative team proposes to design and engineer novel two dimensional (2D)-material aerogels with multifunctionalities for renewable energy applications including both building superinsulation and power generation.	U of MN	\$ 395,136
194-E	Gardner	Robert	Minnesota Shrimp Production Using Clean Energy	We propose to develop a modularized shrimp production system that can utilize solar thermal, solar PV, and energy storage to power the energy-intensive process; providing fresh seafood to Minnesota.	U of MN	\$ 1,129,000
195-E	Shen	Lian	Prediction of Inversions for Air-quality in Cold Weather	Use experiments and models to reveal the relationships between inversions and air pollution in cold weather, and provide tools to help reduce air pollution.	U of MN	\$ 304,984
E. Air Quality, Climate Change, and Renewable Energy						
H. Proposals Seeking \$200,000 or Less (11 Proposals / \$1,718,506)						
196-EH	Anastasio	Joel	The Beltrami County Climate Vulnerability Assessment	HRDCs project is centered around completing a Climate Vulnerability Assessment for Beltrami County, which encompasses the Red Lake Tribal region, and looks to foster environmental stewardship in our community.	Headwaters Regional Development Commission	\$ 180,000
197-EH	Blumenfeld	Kenneth	Visualizing projected climate information for Minnesota	Provide access to climate projections for the 21st century through a simple web tool, so that Minnesotans can use the best available science to plan for future conditions.	MN DNR	\$ 125,000
198-EH	Sarkanen	Simo	Eco-Friendly Plastics from Cloquet Pulp-Mill Lignin	We will reduce environmental pollution from plastics by creating eco-friendly replacements using lignin from the pulp mill in Cloquet. The lignin plastics will be similar in strength to polystyrene.	U of MN	\$ 193,967
199-EH	Rog	April	Diverting Unsold Food from Landfills, Reducing Greenhouse Gases	This project will help us expand a Prepared Foods Donation Program, which will source food donations from restaurants and prevent food from going to landfills; thereby reducing greenhouse gas emission.	Second Harvest Heartland	\$ 130,000
200-EH	Rao	Shashi	Resource Recovery from E-waste to Conserve Natural Resources	The project will analyze the challenges and opportunities to recover hazardous and valuable materials from electronic waste to conserve natural resources, reduce greenhouse gases, and to create local jobs.	U of MN - Duluth NRRI	\$ 199,010
201-EH	Tallaksen	Joel	Identifying Agricultural Energy Consumption and Impacts in Minnesota	This project uses data from multiple sources to analyze current and future agricultural energy use at the county and enterprise levels, filling a key knowledge gap for making system-wide improvements.	U of MN	\$ 146,791

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202-EH	Swanson	Jacob	Modelling PAH Emissions from Aircraft Surrounding MSP Neighborhoods	Use commercially available software (AEDT) to model emissions of polycyclic aromatic hydrocarbons and other air toxic gases from aircraft in areas surrounding MSP. Disseminate to public. Put results into context.	Minnesota State University Mankato	\$ 96,400
203-EH	Wright	Christopher	Monetizing Carbon Capture by Minnesota Forests	Minnesota forests have tremendous potential to absorb excess CO2 from the atmosphere, mitigating climate change. This project is intended to jump-start a market for forest carbon offsets in Northern Minnesota.	U of MN - Duluth NRRI	\$ 161,838
204-EH	OKeefe	Pete	Recycling Construction and Building Materials via Habitat ReStores	Keep usable building materials out of landfills via Habitat for Humanity ReStores. Purchase two box trucks to increase donation pickup capacity and make opening a third metro ReStore possible.	Twin Cities Habitat for Humanity, Inc.	\$ 98,000
205-EH	Thibert	Jill	Rural Distributed Renewable Energy and Back-Up Power	This project will deploy ten Minnesota designed and manufactured SolarBank (solar/storage) systems, to provide rural energy consumers carbon free energy savings and back-up power during grid outages.	Northwest Renewable Energy LLC	\$ 198,500
206-EH	Wang	Ping	Cellulosic Carbon Fiber-Intensified Capture and Biodegradation of Airborne VOCs	The overall goal of the project is to explore a nano carbon-assisted VOC capture and biodegradation strategy, taking advantages of our recently discovered electrically-switchable adsorption/desorption behaviors of VOCs.	U of MN	\$ 189,000
F. Methods to Protect, Restore, and Enhance Land, Water, and Habitat (37 Proposals / \$20,591,425)						
207-F	Buck	Wiley	Pollinator Central: Habitat improvement with citizen monitoring	Restore / enhance 500 acres of pollinator habitat on 20 traditional and nontraditional sites, from Hastings to St. Cloud, to benefit pollinators and build knowledge of impact through citizen monitoring.	Great River Greening	\$ 981,000
208-F	Huinker	Dane	Prairie to the People: Habitat Restoration and Education	Prairie to the People is a community-based restoration initiative that will permanently restore 60 acres of public green spaces into native prairie and pollinator habitat within Fergus Falls, Minnesota.	Wildlife Forever	\$ 441,128
209-F	Shaw	Dan	Pollinator & Beneficial Insect Strategic Habitat Program	This project address dramatic declines of beneficial insects by building a new BWSR initiative to strategically restore and enhance approximately 1000 acres of diverse native habitat over 100 projects.	MN Board of Water and Soil Resources	\$ 780,500
210-F	Pease	Lindsay	Adapting 4R Management for the Red River Basin	This multi-institutional collaboration proposes adapting 4R Nutrient Stewardship for Northwest Minnesotas Red River Basin to improve fertilizer use efficiency while maintaining profitability and limiting potential impairment to Minnesotas freshwater ecosystems.	U of MN	\$ 459,218
211-F	Remucal	David	Preserving and Learning from Minnesota's Native Orchids	The Minnesota Landscape Arboretum will continue vital conservation of Minnesota's sensitive native orchid species and implement a science-based curriculum for Minnesota grade schools leveraging this program's research and infrastructure.	U of MN	\$ 556,100
212-F	Runquist	Erik	Saving Endangered Pollinators through Data-driven Prairie Restoration	Minnesota Zoo, Parks, and TNC will use prairie restorations and Endangered Dakota skipper reintroductions to study factors supporting butterflies and develop foundational habitat management recommendations for Minnesotas imperiled prairie butterflies.	Minnesota Zoological Society	\$ 1,024,915
213-F	Kloiber	Steve	Maximizing Ecosystem Benefits through Integrated Wetland-Watershed Planning	To improve ecological outcomes for wetland and watershed planning, the DNR and SCWRS propose to develop a web-based tool that delivers the latest wetland information within a watershed planning framework.	MN DNR	\$ 506,517

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Final Proposals Received by Category with Summaries**

ENRTF ID #	Last Name	First Name	Title	Summary	Organization	\$ Requested
214-F	Miller	Nathaniel	Marsh Bird Conservation Planning in St. Louis River Estuary	Audubon and partners will develop a landscape scale conservation action plan for the most critical marshes of the St. Louis River Estuary in Northeast Minnesota.	National Audubon Society	\$ 284,068
215-F	Singsaas	Eric	Lignin-coated Fertilizers for Phosphate Control	This project will test a new natural slow-release fertilizer coating made from processed wood, which will decrease phosphorus runoff from farmland while also storing carbon in soils.	U of MN - Duluth NRRI	\$ 279,382
216-F	Olander	Keith	Implementing Hemp Crop Rotation to Improve Water Quality	We will evaluate how hemp crops may reduce nitrogen contamination of surface and groundwater in conventional crop rotations while demonstrating the environmental and economic benefits of hemp grain production.	Central Lakes College	\$ 740,000
217-F	Taylor	Carrie	Developing a Rare Plant Salvage Program for Minnesota	Develops critically needed and scalable protocols for salvaging rare plant species permitted to be destroyed. Accomplished through development of a mobilized network, species specific protocols, field testing, and monitoring.	Anoka Conservation District	\$ 344,628
218-F	Cates	Anna	Developing Cover Crop Systems for Sugarbeet Production	Cover crops in sugarbeet production can reduce erosion and nutrient loss from agroecosystems in West-Central and Northwest Minnesota. Developing agronomic guidelines will support growers adopting sustainable practices.	U of MN	\$ 300,546
219-F	Aukema	Brian	Native Eastern Larch Beetle is Decimating Minnesotas Tamarack Forests	Eastern larch beetle, native to Minnesota, is suddenly decimating Minnesota's tamarack forests. This proposal develops insect management techniques and determines how bad this problem may remain in the future.	U of MN	\$ 398,180
220-F	Barney	Brett	Transformation of Plastic Waste into a Valued Resource	We will develop technologies that utilize indigenous microbes to convert waste plastics into useful chemical compounds and fuels.	U of MN	\$ 308,000
221-F	Hillard	Scott	Enhanced Forest Inventory Implementation for Multiple Values Management	Forest Inventory is the foundational data set for all stakeholders. This project will implement a new remote sensing forest inventory methodology across the state, allowing management for multiple values.	MN DNR	\$ 1,470,000
222-F	Kloiber	Steve	Wetland and Forest Change Monitoring	We propose to develop an automated remote sensing system to monitor wetland and forest cover change on an ongoing basis, greatly enhancing our ability to respond to natural resource challenges.	MN DNR	\$ 450,000
223-F	Griffin	Daniel	Mississippi Gorge Veteran Oaks: Mapping and Preservation	We will identify and map veteran bur oaks above the Mississippi Gorge, and develop conservation arboriculture techniques to preserve and retain legacy trees while minimizing urban park public safety risk.	U of MN	\$ 239,907
224-F	Ramirez	Luis	Habitat Associations of Mississippi Bottomland Forest Marsh Birds	This project will determine habitat associations of breeding bottomland forest birds in response to restoration actions along the Mississippi River at the Reno Bottoms outside Reno, MN.	National Audubon Society	\$ 295,336
225-F	Behrens	Sebastian	New Organic Fertilizer to Protect Minnesota's Water Quality	This study will protect Minnesota's water quality by developing a slow-nutrient-release, organic fertilizer based on co-composting biochar with manure. Fertilizer production and application provide economic incentives for Minnesota's livestock farmers.	U of MN	\$ 499,000
226-F	Guala	Michele	New Solution for Streambank Erosion and Energy Conversion	The project aims at scaling up a new technology, designed to protect river banks from erosion while producing energy, and deploy it in a river.	U of MN	\$ 278,344

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ENRTF ID #	Last Name	First Name	Title	Summary	Organization	\$ Requested
227-F	Sorensen	Peter	Protected Areas: A New Way to Save Fisheries	This project determines whether protecting a few key pieces of lakes in a holistic fashion could save our fisheries and waters, just as similar efforts have saved our wildlife.	U of MN	\$ 499,950
228-F	Barney	Brett	Lowering Nitrogen Requirements for Agricultural Crops	We will bestow upon plants the ability to obtain nitrogen through sustainable biological processes by improving associations between plants and nitrogen-fixing microbes that live with the above-ground plant tissues.	U of MN	\$ 271,000
229-F	Coletti	Filippo	Predicting Pollen Dispersal: Impact on Habitat and Population	We will conduct laboratory and field measurement of pollen dispersal by wind, and obtain a predictive model useful for both prairie conservation/restoration and for the evaluation of air quality.	U of MN	\$ 325,918
230-F	Hall	Kristin	Documenting Species Response to Prairie Habitat Management	Conservation Focus Area project prioritizing effectiveness monitoring of bird and pollinator species to four defined prairie management actions. Results will help inform and guide future prairie habitat management efforts.	MN DNR	\$ 599,522
231-F	Hill	Kimberly	Improving the Success of Shoreline Restoration Projects	We propose to use field surveys of lakeshore restoration projects and experiments to develop tools for resilient and economic shoreline habitat restoration in Minnesota lakes and estuaries.	U of MN	\$ 335,618
232-F	Zirbel	Chad	Bison as Keystone Species in Minnesota Savannas	Recently, bison have been reintroduced to Minnesota. Their reintroduction will likely have cascading effects on these ecosystem. We propose to study how bison reintroduction affects deer, pollinators, and other animals.	U of MN	\$ 344,000
233-F	Jordan	Nicholas	Supporting Pollinators and Prairie with Beneficial Soil Fungi	Develop methods to restore native prairies in agricultural areas with beneficial soil fungi, improving conservation of pollinators, soil, water, and other wildlife, and increasing resistance to invasive non-native plants	U of MN	\$ 331,079
234-F	Herb	William	Reducing Sediment Loading and Temperatures in Northshore Streams	This project will determine riparian vegetation best management practices to enhance habitat in the Northshore trout streams and reduce contaminant loading to Lake Superior.	U of MN	\$ 383,744
235-F	Strock	Jeffrey	Integrated Conservation to Achieve Water Quality Goals	Implementation of soil and water management and conservation practices to restore and protect soil and water resources while making measurable changes toward water quality improvements in southwest and northwest Minnesota	U of MN	\$ 1,963,155
236-F	Bruse	Tanner	Phase II: Economic Assessment of Precision Conservation and Agriculture	Utilizing technology through precision agriculture, precision conservation and drones/remote sensing to improve farmers bottom line, provide additive conservation acres and monitor habitat using drones/sensors to support monarchs, pollinators and wildlife.	Pheasants Forever	\$ 789,648
237-F	Kaproth	Matthew	Shifting Savannas: Assessing Management of At-Risk Sites	We propose to survey Central and Southern Minnesota savannas and prairies to develop assessments measuring the success of restorations and train practitioners on management practices that promote robust sites.	Minnesota State University Mankato	\$ 351,754
238-F	Johnson	Margaret	Local Agriculture Steward Partnership: Science to Sustainable Action	To enhance water quality through implementation and evaluation of regenerative farming practices on 5,000 acres of land, education through four outreach events within the Middle Fork Crow River Watershed.	Middle Fork Crow River Watershed District	\$ 620,420

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Final Proposals Received by Category with Summaries**

ENRTF ID #	Last Name	First Name	Title	Summary	Organization	\$ Requested
239-F	Elias	Mikael	An Engineered Solution to Toxic Copper Coatings for Boats	We propose to replace toxic antifouling coatings, and prevent the damage they cause, by developing a new and biologically advanced generation of coatings.	U of MN	\$ 408,000
240-F	Labuz	Joseph	Precursors of Failure in Mine Tailings Dams	We aim to obtain data for design of an early warning system for predicting conditions that result in failure of mine tailings dams.	U of MN	\$ 298,000
241-F	Dalzell	Brent	Improving the Cost Effectiveness of Minnesota's Conservation Programs	By developing management guidance sensitive to the landscape (soils & topography) and weather (temperature & precipitation), we can increase the cost effectiveness of water conservation efforts in Minnesota.	U of MN	\$ 277,577
242-F	Hanson	Jeffrey	Biological Sulfate-Reduction System	Field demonstrate a low-cost sulfate-reducing system to remove sulfate from contaminated water that facilitates meeting state and federal sulfate standards while protecting wild rice and improving water quality.	Clearwater BioLogic LLC	\$ 1,268,266
243-F	Pardey	Philip	Predicting Agriculture's Outcomes with Sensors and Machine Learning	We will use low-cost sensors on long-term cropping system experiments to develop advanced machine learning algorithms that will predict yield and water quality outcomes across the southern half of Minnesota	U of MN	\$ 887,005
F. Methods to Protect, Restore, and Enhance Land, Water, and Habitat						
H. Proposals Seeking \$200,000 or Less (17 Proposals / \$3,172,199)						
244-FH	McCormack	Torin	Peatland Restoration in the Lost River State Forest	The project will collect physical attributes from the drained peatlands, incorporate the data into a decision matrix, and generate a report detailing restoration potential throughout the Lost River State Forest.	Roseau River Watershed District	\$ 135,646
245-FH	Montgomery	Rebecca	Prescribed Burning for Brushland-Dependent Species-Phase II	Brushlands provide critical habitat for >250 wildlife species. We compare effects of spring, summer and fall burns on birds and vegetation, providing much needed management guidelines for this key habitat.	U of MN	\$ 147,428
246-FH	Lynch	Michael	Management Strategies to Benefit Minnesota's Forests and Birds	Engage landowners in forest stewardship and encourage sustainably harvested forest products through the development and promotion of a guide and interactive web application on forestry methods that enhance bird habitat.	Forest Stewards Guild	\$ 196,518
247-FH	Daub	Betsy	Pollinator Habitat Creation Along the Urban Mississippi River	To improve habitat for pollinators and other wildlife, we will remove invasive plants and replace them with high-value native species at three urban sites along the Mississippi River.	Friends of the Mississippi River	\$ 129,297
248-FH	Addy	Min	Concentrating Animal Waste for Solid Fertilizer Production	The proposal aims to develop an efficient and low-cost animal waste treatment process to concentrate the waste into solid fertilizers and separate the liquid for vegetables and microalgae production	U of MN	\$ 200,000
249-FH	Windmuller-Campione	Marcella	Restoration of Floodplain Forests along the Mississippi River	We want to assess and develop techniques for restoration and adaptive management at Crosby Farm Regional Park (70 acres) by monitoring seedlings, quantifying the environment, and developing restoration guidelines.	U of MN	\$ 199,000
250-FH	Reinikainen	Mike	Impacts from Larch Beetle to Forests and Wildlife	Larch beetle has damaged nearly half of Minnesota's tamarack forest. The ecological impacts are unknown. We propose surveying tree and bird populations to assess their response to widespread tree mortality.	MN DNR	\$ 195,107

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ENRTF ID #	Last Name	First Name	Title	Summary	Organization	\$ Requested
251-FH	Evenson	Eric	Lake Minnetonka Comprehensive Plan and Civic Governance Model	Our project will create a one-of-a-kind, large-lake, unified management plan linking together water quality, fisheries, vegetation, land-use, recreation, AIS, climate change, and economic development using the "Civic Governance" planning model	Lake Minnetonka Association	\$ 195,000
252-FH	Addy	Min	Convert Solid Wastes to Protein Feed and Fertilizer	This project aims to use black soldier fly larvae to convert animal and food waste produced in Minnesota to \$7 billion worth protein-rich animal feed and organic fertilizer	U of MN	\$ 200,000
253-FH	Gutknecht	Jessica	Identifying Prairie Mixes to Reduce Pollution	We will identify which mixtures of prairie plant species best remove nitrates in vulnerable sandy soils, using existing long-term plantings under multiple environmental conditions.	U of MN	\$ 199,917
254-FH	Bushley	Kathryn	Safe Biopesticides for Protection of Minnesota Groundwater Resources	In order to protect Minnesota groundwater and human health, this project will identify bio-based chemical controls from fungi to replace highly toxic nematicides against the soybean cyst nematode.	U of MN	\$ 199,000
255-FH	Downing	John	Increase Golden Shiner Production to Protect Aquatic Communities	We propose four strategies to increase Golden Shiner (bait) production in-state because angler demand exceeds production. Suggested importation from out-state creates high risk of introducing aquatic invasive species and disease.	U of MN - Duluth - Sea Grant	\$ 188,161
256-FH	Musser	Kimberly	Integrating Water Storage, Conservation Targeting and Civic Involvement	This project focuses on improving water quality and mitigating the impacts from hydrological modifications by engaging community members, supporting partnerships and promoting water storage and targeted conservation practices.	Minnesota State University, Mankato - Water Resources Center	\$ 195,232
257-FH	Fleischman	Forrest	Communicating about Science: Knowledge Exchange in Forest Management	Field foresters need access to the best information. We will study what information foresters need, what information is already available, and create training opportunities to facilitate knowledge exchange.	U of MN	\$ 199,922
258-FH	Smith	Patrick	Comprehensive Environmental Building Site Design Using GIS Mapping	This web-based tool would quickly provide in-depth site information, streamlining compliance with existing environmental regulations and allowing designers and owners to develop and operate sites which better support ecological networks.	U of MN	\$ 195,000
259-FH	Jenkins	Holly	Restoring Turf to Native Pollinator Gardens Across Metro	Turf to Pollinator Gardens will transition ecologically-degrading turf to native gardens throughout the Regional Park System to provide critical pollinator habitat, long-term stewardship, and help connect diverse populations with nature.	Wilderness in the City	\$ 197,000
260-FH	Shen	Lian	Control Snowdrift Using Living Fences to Protect Wildlife	We propose to develop, study, and demonstrate living snow fences made of natural plants that balance ecological benefits and economical cost for protecting wildlife against snowdrift caused by winter storms.	U of MN	\$ 199,971
G. Land Acquisition for Habitat and Recreation (24 Proposals / \$62,810,117)						
261-G	Schulte	Judy	DNR Scientific and Natural Areas	Scientific and Natural Area (SNA) habitat restoration and improvements (1000+ acres), increased public involvement and strategic acquisition (500+ acres) will conserve Minnesota's most unique and rare resources for everyone's benefit.	MN DNR	\$ 5,875,000

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ENRTF ID #	Last Name	First Name	Title	Summary	Organization	\$ Requested
262-G	Schulte	Judy	Private Native Prairie Conservation through Native Prairie Bank	Native Prairie Bank will help landowners conserve native prairie through multiple outreach methods, restoration and enhancement of 770 acres, and protection of 150 acres through conservation easements.	MN DNR	\$ 2,280,000
263-G	Christie	Jennifer	Minnesota State Parks and State Trails In-Holdings	Acquire high priority State Park, State Recreation Area and State Trail in-holding parcels from willing sellers to protect Minnesotas natural and cultural heritage, enhance outdoor recreation and promote tourism.	MN DNR	\$ 5,000,000
264-G	Mularie	Audrey	Grants for Local Parks, Trails, and Natural Areas	Provide approximately 25 matching grants for local parks, acquisition of locally significant natural areas and trails to connect people safely to desirable community locations and regional or state facilities.	MN DNR	\$ 3,000,000
265-G	Arvidson	Adam	Mississippi River Aquatic Habitat Restoration and Mussel Reintroduction	MPRB and its scientific partners will undertake a large-scale project to restore lost habitat in the Mississippi River and reintroduce mussels above St. Anthony Falls.	Minneapolis Park and Recreation Board	\$ 2,538,000
266-G	Drotts	Gary	Minnesota Hunter Walking Trails, Public Land Recreational Access	Within Minnesotas ~1,000 hunter walking trail system; restore/upgrade ~200 trailheads and ~80 miles of trail; develop ~20 miles of new trail; and compile enhanced maps for management and public users.	Ruffed Grouse Society	\$ 545,000
267-G	Forbes	DJ	Turning Back to Rivers: Environmental and Recreational Protection	This project will help communities acquire priority land along the Mississippi, St. Croix, and Minnesota Rivers, and their tributaries, protecting the environment and water quality while creating much-needed recreational opportunities.	The Trust for Public Land	\$ 3,803,600
268-G	Mullin	Emmett	Metropolitan Regional Parks System Land Acquisition Phase 6	This project will acquire approximately five properties with high-quality natural resources or strong natural resource restoration potential for the metropolitan Regional Parks System.	Metropolitan Council	\$ 2,500,000
269-G	Skaar	Kent	Minnesota State Trails Development	This project proposes to expand recreational opportunities on Minnesota State Trails through the development of new trail segments and the rehabilitation and enhancement of existing State Trails.	MN DNR	\$ 10,000,000
270-G	Tuominen	Todd	Elm Creek Restoration Phase IV	Elm Creek Habitat Restoration Improvements includes 0.7 miles of habitat and stream restoration up-gradient of the Mill Pond Lakes and flows through the Elm Creek Protection Areas.	City of Champlin	\$ 650,200
271-G	Caneff	Denny	Superior Hiking Trail As Environmental Showcase	Renew the Superior Hiking Trail (SHT) to minimize environmental damage, make it safer for users, and make it more resistant to increased traffic and climate change.	Superior Hiking Trail Association	\$ 450,000
272-G	Hopper	Rachel	Creating Welcoming Environments at Minnesota State Parks	This project provides Minnesota State Park and Trail (PAT) visitors with an integrated, next-generation information system that creates a positive, safe, and welcoming experience for all users.	MN DNR	\$ 2,565,167
273-G	Rosenthal	Ron	Red Wing Riverfront Trail Connection Project	Red Wing's project is the construction of a pedestrian-bicycle bridge and local recreational trail connector over railroad tracks providing a needed accessible route to a recreational and natural area.	City of Red Wing	\$ 682,000
274-G	Monson	Kjersti	Acquire Riverfront Land at Upper St. Anthony Falls	The City of Minneapolis and Friends of the Lock & Dam seek fee title acquisition of land abutting the Upper Lock for recreational and educational purposes.	Friends of the Lock & Dam	\$ 3,000,000

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ENRTF ID #	Last Name	First Name	Title	Summary	Organization	\$ Requested
275-G	Terrill	Tim	Whiskey Creek & Mississippi River Water Quality/Habitat/Recreation Project	Project will purchase 13.8 acres and construct water quality, habitat, and recreational improvements to protect the Mississippi River from contaminants in the 400-acre, highly impervious watershed in Baxter Minnesota.	Mississippi Headwaters Board	\$ 1,470,500
276-G	Grotte	Charles	Perham to Pelican Rapids Regional Trail (West Segment)	Requesting funding for the West Segment (6.83 miles) of the 32-mile Perham to Pelican Rapids Regional Trail that will connect the city of Pelican Rapids to Maplewood State Park.	Otter Tail County	\$ 2,836,000
277-G	Simonson	Ryan	Crow Wing County Community Natural Area Acquisition	Crow Wing County acquisition of three private parcels adjacent to the historic fire tower property will allow for diverse recreational opportunities while protecting wildlife habitat and preventing forest fragmentation.	Crow Wing County	\$ 405,000
278-G	Stenson	Amber	Purchasing 316 acres for Conservation and Agriculture Education	The Food Group seeks to purchase 316 acres of farmland in Washington County to preserve it from development and sustain and expand our organic farmer education program.	The Food Group	\$ 1,500,000
279-G	Weber	Pete	Rocori Trail Phase 3	This project consists of the design and construction of Phase 3 of the Rocori Trail along the old BNSF rail corridor and will connect Cold Spring, Richmond and Rockville.	ROCORI Trail Construction Board	\$ 1,260,000
280-G	Bissonette	Cathy	Birch Lake Recreation Area Campground	This project consists of expanding the existing Birch Lake Recreation Area to add a new 22 acre campground that will include 49 campsites for recreational vehicles and tent campers.	City of Babbitt	\$ 350,000
281-G	Manzoline	Robert	Mesabi Trail; New Trail and Additional Funding	Constructing two new Mesabi Trail segments and one new trail head; and additional funding for trail segments currently in development.	St. Louis and Lake Counties Regional Railroad Authority	\$ 6,337,000
282-G	Fralich	Lana	Silver Bay Multi-Modal Trailhead Center	Development of a Multi-Modal Trailhead Center that provides ample lighted parking, safe access to non-motorized and motorized trails, a multi-use building with lavatories/showers, picnic/playgrounds, and conveniently located to city/business amenities.	City of Silver Bay	\$ 1,400,000
283-G	Gautreux	Sherril	Ranier Safe Harbor/Transient Dock on Rainy Lake	To construct a dock in Ranier which would accommodate boats 26 feet or longer with the goal of increasing public access for boat recreation on Rainy Lake.	City of Ranier	\$ 762,650
284-G	Janssen	Jim	Crane Lake Voyageurs National Park Campground & Visitors Center	This project consists of the design and construction of a new campground and site preparation/permitting/engineering/design for a new Visitors Center in Crane Lake; the gateway to the Voyageurs National Park.	Town of Crane Lake	\$ 3,600,000
G. Land Acquisition for Habitat and Recreation						
H. Proposals Seeking \$200,000 or Less (5 Proposals / \$699,000)						
285-GH	Williams	Scott	Chippewa Acquisition, Recreation and Education	Chippewa County will acquire 51 acres of riverine wetland/floodplain forest complex, floodplain and abandoned gravel pits along the MN River to provide water filtration, education and recreational opportunities.	Chippewa County	\$ 160,000
286-GH	Hasbargen	Bruce	Construction of Pedestrian/Bicycle Bridge on LSSB/GRR	Construction of pedestrian/bicycle bridge over the Mississippi River on Lady Slipper Scenic Byway (LSSB)/Great River Road (Beltrami County HWY39) in Chippewa National Forest, to increase safety and enhance recreation.	Lady Slipper Scenic Byway, Inc.	\$ 133,000

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ENRTF ID #	Last Name	First Name	Title	Summary	Organization	\$ Requested
287-GH	Stahl	Timothy	West Fork Singletrack Trail in SW Minnesota	The repurposing of an underutilized county park for the creation of the first multi-mobility competitive singletrack bicycle and hiking trail in SW Minnesota	Jackson County	\$ 194,500
288-GH	Greedy	Ross	Enhancing Winona's Prairie Island	The City of Winona aims to increase community access to the Mississippi River through updates to its riverfront campground, day use area, and boat launch.	City of Winona	\$ 126,500
289-GH	Sogard	Ray	Sportsmens Training and Developmental Learning Center	The Minnesota Forest Zone Trappers Association is requesting LCCMR funds to complete a site evaluation and for the development of a master plan for their outdoor educational learning center.	Minnesota Forest Zone Trappers Association	\$ 85,000
I. Other (1 Proposal / \$135,000)						
290-I	Sherman-Hoehn	Katherine	Contract Agreement Reimbursement	Provide continued contract management and customer service to ENRTF pass-through appropriation recipients. Ensure funds are expended in compliance with appropriation law, state statute, grants policies, and approved work plans.	MN DNR	\$ 135,000