2018 Environment and Natural Resources Trust Fund Proposals Received - by Funding Priority Topic Area for FY19 Funding

For the FY 2018 and FY 2019 biennium (July 1, 2017 - June 30, 2019), approximately $50.8 million is available each year (total = $101,656,000) for funding from the Environment and Natural Resources Trust Fund. As of July 15, 2017, the Legislative-Citizen Commission on Minnesota Resources (LCCMR) received 217 proposals requesting a total of approximately $183 million. This RFP process is for funding beginning July 1, 2018. Approximately $45.7 million is remaining from the Environment and Natural Resources Trust Fund to be available to recommend for project funding from the Environment and Natural Resources Trust Fund (ENRTF). NOTE: $5,089,000 of FY19 ENRTF funds were appropriated by the 2017 Legislature.

The LCCMR will be meeting on September 13-14 to select proposals to call in for a presentation. Proposal presentations are scheduled for September 26, 27, 28 and October 3, 4, and 5 (as needed).

ENRTF ID #	Last Name	First Name	Title	Summary	Organization	$ Requested
A. Foundational Natural Resource Data and Information (RECEIVED: 33 Proposals / Subtotal = $21,011,461)						
001-A	Setterholm	Dale	Minnesota Geological Survey Geologic Atlases for Water Resource Management Part-A	This project continues accelerated production of County Geologic Atlases to support informed management of water and mineral resources. This work is essential to sustainable management of water.	U of MN - MN Geological Survey	$4,121,625
002-A	Putzier	Paul	County Geologic Atlas for Water Resource Sustainability Part-B	County geologic atlases provide information that is essential to sustainable management of Minnesotas groundwater resources by identifying key areas to protect our drinking water and ensure future availability for all.	MN DNR	$2,400,000
003-A	Peterson	Jeffrey	Providing Critical Water Quality Information for Lake Management	Create a semi-automated system to acquire, process, and deliver new satellite derived water quality data (water clarity, algae, turbidity and color) for all Minnesota lakes ~biweekly and in near real-time	U of MN	$477,000
004-A	Weiblen	George	Minnesota Biodiversity Atlas: Phase II Expansion	We propose to double the size of a natural resource management tool, the Minnesota Biodiversity Atlas, by including state agency observations and specimen records from four additional museum collections.	U of MN	$496,000
005-A	Norris	Doug	Building a Long-Term Wetland Hydrology Monitoring Network	This proposal is to fund installation a statewide monitoring network for collecting long-term, foundational data for wetland hydrology. Funds are sought for monitoring equipment acquisition and installation costs.	MN DNR	$573,413
006-A	Windmuller-Campione	Marcella	Maximizing Wildlife, Water, and Productivity in Peatland Forests	There are 3 million acres of peatland forests in Minnesota. This proposal will identify management actions that maximize ecosystem benefits of peatland forests, including wildlife, water, timber, and native plants.	U of MN	$698,000
007-A	Jennelle	Christopher	Deer Movement Related to Potential CWD Prion Transmission	Movement ecology of white-tailed deer in southeastern Minnesota as related to chronic wasting disease prion transmission. DNR will radiocollar deer to evaluate deer movements and disease transmission potential.	MN DNR	$552,456
008-A	Montgomery	Rebecca	Safeguarding Red Pine Forest Health and Productivity	We will produce guidelines to maintain and maximize healthy and diverse pine forests with sustained growth and productivity of our state tree, the red pine, during seasonal and periodic drought.	U of MN	$420,000

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009-A	Andersen	David	Minnesota Trumpeter Swan Migration Ecology and Conservation	Obtain information essential to managing Minnesotas rapidly growing trumpeter swans, using GPS-GSM satellite transmitters to delineate migration patterns and survival, and year-round habitat use and selection.	U of MN	$389,988
010-A	Hines	Nila	Improving Watershed Management by Modernizing Hydrography Data	Improve watershed management decisions with modern, field-scale spatial data of rivers, streams, lakes, wetlands, and watersheds. This foundational data product will serve as the authoritative source for hydrography in Minnesota.	MN DNR	$1,277,727
011-A	Stapleton	Seth	Conserving Minnesota's Turtles through Research and Education	The Minnesota Zoo will improve the long-term viability of Minnesotas imperiled turtle populations by researching threats, implementing mechanisms to reduce mortality, and creating educational materials for use throughout the state.	Minnesota Zoological Garden	$364,000
012-A	Etterson	Julie	Forest Regeneration – Validating Operational Seed Zones	Minnesota forests ecosystems are maintained by continual reforestation efforts. This project will update guidelines for seed sourcing to ensure that the right seed is being planted in the right place.	U of MN - Duluth	$796,395
013-A	Stanton	Daniel	Assessing Ecosystem Services Provided by Lichens and Mosses	The proposed project aims to better understand the impacts that moss and lichens may have on water and pollution.	U of MN	$213,000
014-A	VanderWaal	Kimberly	An Early Warning System for Wildlife Health Threats: Using Wildlife Rehabilitation Data to Monitor Wildlife Health	This project will establish a surveillance system to monitor wildlife health in Minnesota through development of information management and analytical systems utilizing wildlife rehabilitation data.	U of MN	$280,000
015-A	Daniel	Hernández	Restoring Prairie Biodiversity and Pollinator Habitat with Haying	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	$458,362
016-A	Grinde	Alexis	Conservation of Minnesota's Forest Birds of Management Concern	Identify forest management actions and guidelines that maximize breeding season productivity across breeding cycle (nesting through post-fledgling) for three bird species of conservation concern: Golden-winged Warbler, Veery, and American Woodcock.	U of MN - Duluth NRRI	$613,998
017-A	Kinkel	Linda	Minnesota Soil Microbiomes: Foundational Database for Environmental Health	We will develop a systematic, statewide database of Minnesota soil microbiomes. This will provide a critical foundation to enhance understanding and guide management of Minnesota's environments and microbial natural resources.	U of MN	$924,000
018-A	Niemi	Gerald	Mapping Avian Movement in Minnesota	Establish network of automated radiotelemetry stations to monitor bird migration and local movements of a threatened species, and develop strategic plans for long-term use of infrastructure to monitor animal movement.	U of MN - Duluth NRRI	$682,060
019-A	Karwan	Diana	Downstream Effects of Contemporary Forest Practices: Phase 2	Hydrologic data collection and report writing to trace hydrologic and sediment effects of contemporary timber harvest from site to stream and through river network in St.Louis County.	U of MN	$294,000

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020-A	Knight	Joseph	Maintaining Minnesota's Natural Heritage by Monitoring Landscape Dynamics	This project will create necessary knowledge infrastructure for Minnesota's natural resource professionals and policy-makers by providing ongoing information about landscape dynamics throughout the state at frequent intervals.	U of MN	$272,000
021-A	Reschke	Carol	Smart Mapping St. Louis River Estuary Habitats	Produce web-accessible smart maps of St. Louis River Estuary habitats to efficiently display summary information from thousands of biological records for use by resource managers working to restore impaired habitats.	U of MN - Duluth NRRI	$301,000
022-A	Ferrington	Leonard	Variable Winter Thermal Regimes and Managing Trout Streams	Winter sport fishing for trout is a vibrant industry, but can be impacted by changing climate. We seek to understand how to conserve trout habitat, especially focusing on winter management.	U of MN	$499,935
023-A	Kipfmueller	Kurt	Four Centuries of Wildfire in Red Pine Forests	Tree-ring-based fire records will be used to reconstruct four hundred years of fire frequency, severity, seasonality, and climate relationships to inform future management of red pine forests in north-central Minnesota.	U of MN	$257,316
024-A	Sadinski	Walt	Wetland-Biodiversity Vulnerabilities to Changes in Land-Use and Climate	We will model satellite and geospatial data to map relative threats land-use and climate changes pose to habitat quality and connectivity, wetlands, and biodiversity on state-owned lands throughout Minnesota.	U.S. Geological Survey	$481,705
025-A	Garono	Ralph	Safeguarding Our St. Louis River Restoration Investment	Team will collect, analyze, and interpret new data using novel, highly structured method of interaction to better restore and manage fish and wildlife habitat in the St. Louis River.	U of MN - Duluth NRRI	$378,949
026-A	Bump	Joseph	Statewide Wolf Survival Analysis to Build Management Capacity	Developing a statewide wolf-collar database (>250 wolves, ~1995-2018) will deliver urgently needed analysis of survival rates and mortality factors. Results will help support state management, reduce conflict, and inform stakeholders.	U of MN	$333,179
027-A	Jelinski	Nicolas	Foundational Assessment of Soil Health Metrics in Minnesota	This proposed work will produce a foundational dataset which can be used to set data-driven statewide soil health goals and establish a baseline soil health assessment for Minnesota.	U of MN	$695,477
028-A	Bruse	Tanner	Cover Crops for Wildlife Phase I	In this proposed innovative study, we capitalize on the already known environmental and agricultural cover crop benefits and determine benefits current cover crop practices provide for wildlife habitat.	Pheasants Forever Inc	$346,720
029-A	Kramar	David	Monitoring and Mapping of Mercury in Western Minnesota	We will collect/synthesize Hg information from 50 water bodies in order to better understand Hg hotspots within western Minnesota. Results will support long term monitoring and mapping of this toxin.	Minnesota State University - Moorhead	$489,376

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030-A	Duncan	Nancy	Data Acquisition to Develop Native Mussel Habitat Suitability	The acquisition of high-resolution sonar data provides important information essential for mapping mussel habitat while having ecological applications useful to resource managers and policy makers protecting Minnesota threatened/endangered native	National Park Service	$309,778
031-A	Horgan	Brian	Measuring the Impact of Perennial Urban Green Space Management on Soil Ecosystems	Analyzing soil ecosystems impacted by previous land-use management of four urban green spaces (golf course, community park, home lawn, agricultural field) utilizing detailed soil testing, metagenomic analysis, and GPS modeling.	U of MN	$177,346
032-A	Sarnath	Ramnath	Automated Boulevard Tree Inventory and Urban Forest Management	Build an automated boulevard tree inventory and assessment system which rapidly and inexpensively gathers community tree data, helps manage and develop urban forestry resources, enhances community well-being, and supports education.	St. Cloud State University	$154,656
033-A	Magner	Joe	Tracking and Communicating Ice Safety	Minnesota DNR has reported that 193 people have lost their lives in the last three decades. Mid-winter warmth, road salt lead to uncertainty and higher risk to human safety.	U of MN	$282,000
B. Water Resources (RECEIVED: 65 Proposals / Subtotal = $32,197,134)						
034-B	Coletti	Filippo	Removing Plastic Particle Pollution from Minnesota Water Bodies	The objective of the present proposal is to assess and provide remedy to the urgent problem of microscopic plastic particles polluting water bodies in Minnesota.	U of MN	$388,557
035-B	Peck	Joel	Wastewater Treatment Plant Optimization Pilot Program	A pilot program of wastewater treatment optimization without costly facility upgrades. This will lead to cleaner lakes and rivers without needless costs, and achieve significantly better treatment results.	Minnesota Pollution Control Agency	$236,360
036-B	Bushley	Kathryn	Phosphorus Accumulating Fungi to Control Agricultural Runoff Pollution	This project will utilize non-mycorrhizal fungi that can access insoluble soil phosphorus to significantly decrease needs for phosphorus fertilizers and reduce phosphorus pollution to our water and lakes.	U of MN	$361,000
037-B	Gulliver	John	Investigation of Road Salt Alternatives and Pavement Innovations	We will investigate road salt alternatives and pavement innovations that will reduce or eliminate the flux of chloride from road salt into our lakes, streams and groundwater.	U of MN	$521,999
038-B	Behrens	Sebastian	Biological Sulfate Removal for Wastewater Treatment in Minnesota	Goal of the project is to improve Minnesota's water quality by removing sulfate from wastewater. The project will provide best management practices to integrate sulfate removal into wastewater treatment operations.	U of MN	$494,000
039-B	Singer	Randall	Defining Minnesota's Environmental Antibiotic and Antibiotic Resistance Footprint	We will quantify and map antibiotic and antibiotic resistance gene contamination in Minnesota waters and soils and identify locations in need of mitigation to protect environmental, human, and animal health.	U of MN	$921,584

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040-B	Hondzo	Miki	Promoting Nitrogen Removal in Channels, Floodplains, and Riparian Areas	The goal is to develop a tool to quantify nitrogen removal in floodplains and riparian areas to inform best management practices and promote clean water conditions across the landscapes of Minnesota.	U of MN	$390,641
041-B	Schoenfuss	Heiko	Contaminant Removal Efficiency of Urban Stormwater Treatment Ponds	Urban stormwaters contain biologically harmful contaminants of emerging concern whose abatement through best management practice ponds requires evaluation to safeguard habitats for aquatic species from mussels to birds.	St. Cloud State University	$377,588
042-B	Bramburger	Andrew	Rapid Detection of Algal Toxins in Minnesota Lakes	We will use novel genetic and toxin characterization techniques to develop DNA based indicators of toxin risk. Citizen scientist sampling will be used to evaluate risk model application statewide.	U of MN - Duluth NRRI	$686,013
043-B	Groten	Joel	Hydroacoustic Monitoring to Understand Sediment Impacts - Phase 2	Installation of streamgage web cameras and development of an online real-time sediment network maximizes sediment monitoring efforts of several agencies and better disseminates collected information to the general public.	U.S. Geological Survey	$328,640
044-B	Janke	Benjamin	Wetland Contribution to Methylmercury Pollution of Surface Waters	Create design guidelines for agricultural wetlands to optimize nitrate removal while reducing potential toxic methylmercury production, and develop a tool to assess methylmercury pollution risk in Minnesota lakes and streams.	U of MN	$567,604
045-B	Ng	G.-H. Crystal	Developing a Map of Arsenic Risk in Groundwater	Over 20% of private wells in west- and south-central Minnesota exceed the arsenic standard. Proposed arsenic risk map will transform 20 years of arsenic research into access to cleaner groundwater.	U of MN	$550,000
046-B	Rosen	Carl	Improving Agricultural Sustainability on Irrigated Sandy Soils	This project will explore the use of innovative planting configurations and new nitrogen fertilizer technology to sustain potato productivity and reduce nitrate leaching to groundwater under irrigated conditions.	U of MN	$470,000
047-B	Trost	Jared	Natural Denitrification: Helping and Hiding Drinking Water Problems	Natural denitrification is beneficial for protecting drinking water from nitrate contamination, but it may hide aquifer vulnerability to other contaminants (pesticides or chloride). Project will measure and map natural denitrification.	U. S. Geological Survey	$664,000
048-B	Cui	Tianhong	Small Cheap Purification System for Cleaner Drinking Water	This project is to develop a small cheap purification system for community drinking water facilities to remove toxic contaminants. The technology is highly efficient to improve current drinking water quality.	U of MN	$496,788
049-B	Gilkeson	John	Bounty and Outreach Program for Enhanced Recovery of Unwanted Mercury	MPCA proposes a mercury bounty and outreach program for enhanced recovery of unwanted mercury, to protect human health and reduce mercury emissions to meet statewide water quality protection goals.	Minnesota Pollution Control Agency	$467,000

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050-B	Novak	Paige	Linking Food, Energy, and Water for Resource Recovery	Technological innovations will integrate the treatment of water from the food- and beverage-processing industry, energy generation, and greenhouse-based crop production for resource recovery, water conservation, and better water quality	U of MN	$941,600
051-B	Valentas	Kenneth	Hydrochars to Remove Nitrates from Agricultural Drainage	A modified hydrochar that will reduce the amount of unwanted nitrates in agricultural waters and also improve agricultural sustainability through recycling the nitrate nutrients will be developed from agricultural residues.	U of MN	$359,000
052-B	Guzina	Bojan	Characterizing Fractured Bedrock to Assess Pollution Risk to Groundwater	The project involves developing tools to quantitatively assess the site-specific environmental impact of a given contaminant source as controlled by the regional permeability of fractured bedrock.	U of MN	$330,000
053-B	Downing	John	Rise and Fall of Superior: Water and Security	Lake Superiors water level is critical to Minnesotas economy. We will provide science to make level predictions, determine critical knowledge gaps, and prepare communities and industries for water level change.	U of MN	$406,000
054-B	LaPara	Timothy	Emerging Pathogens in Lakes, Rivers, and Tap Water	This research project will provide critical information regarding how to treat surface water (used by 25% of Minnesota's population) to prevent outbreaks of Legionnaires' disease and infections by Mycobacterium avium.	U of MN	$355,244
055-B	Jordan	Nicholas	Working Farmlands: Targeting Alfalfa Production for Water Protection	We will develop a farmer-led, market-based working lands approach for protecting water by targeted expansion of alfalfa production, and enable farmers to take this approach by expanding markets for alfalfa.	U of MN	$752,913
056-B	Lewandowski	Ann	Water Quality through Capture/Use of Agricultural Runoff	More water storage in agricultural landscapes is essential for protecting water, but expensive. We will develop a cost-effective approach benefiting water and wildlife by capturing runoff for use in irrigation.	U of MN	$600,000
057-B	Peterson	Heidi	Preventing Nitrate Contamination of Groundwater Using Perennial Grains	Establish and monitor 120 acres of intermediate wheatgrass (Kernza), a new perennial grain crop, in vulnerable wellhead protection regions of Minnesota to profitability reduce nitrate leaching to drinking water.	Minnesota Department of Agriculture	$759,312
058-B	Gulliver	John	Preventing Lake and Stream Pollution from Stormwater Ponds	We will develop tools to cost-effectively identify stormwater ponds requiring rehabilitation, and to investigate and evaluate techniques to mitigate the lake and stream pollution that results from these ponds.	U of MN	$535,740
059-B	Lin	Hongjian	Developing Nutrient Separation Systems for Livestock Environmental Sustainability	This project will develop an economical manure nutrient separation system. The separation system will produce environmentally sustainable fertilizers and ameliorate the water environmental impact of Minnesota livestock operations.	U of MN	$304,000

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060-B	Santelli	Cara	Improving Water Quality by Capturing Sulfate in Wetlands	The overall goal of this project is to provide effective strategies for removing excess sulfate, a priority pollutant, from mining discharge waters in northeastern Minnesota and improving water quality.	U of MN	$578,000
061-B	Barney	Brett	Natural Nitrogen Fertilizer Production with Low-Runoff Potential	The goal of this project is to leverage success optimizing a nitrogen-fixing bacterium to construct a sustainable route to inexpensive biologically derived fertilizers with low-runoff potential.	U of MN	$727,000
062-B	Kozarek	Jessica	Re-Connecting Fish Habitat at Road-Stream Crossings	We will quantify the impact of culverts on fish movement to enable designers and resource managers to preserve fish populations by prioritizing passage at road-stream crossings with the biggest impact.	U of MN	$474,689
063-B	Larkin	Daniel	Benefits of Lake Plant Diversity for Water Quality	We predict that aquatic plant diversity will benefit water quality in lakes. We will test this in shallow lakes throughout Minnesota, leveraging the Sentinel Lakes program for this research.	U of MN	$463,113
064-B	Robertson	Stephen	Unregulated Contaminants: Addressing Gaps in Drinking Water Protection	This project will characterize unregulated drinking water contaminants at wells and intakes (which pump from groundwater, lakes, rivers), and to examine if they persist after standard public water system treatment.	Minnesota Department of Health	$2,107,920
065-B	Hansen	Amy	Lake Restoration: Benefits and Duration in Agricultural Landscapes	We will quantify nutrient reduction benefits and anticipated duration from lake restoration in agricultural regions of Minnesota. Priority lakes for restoration will be identified using nutrient, social and economic data.	U of MN	$459,356
066-B	Lee	Sungyon	Predicting Impact of Oil Spill in Minnesota Lakes	We will develop urgently-needed monitoring, measurement, and prediction tools for trajectory estimation and remediation strategy of spilled oil in Minnesota lakes, to assist decision makers in coping with oil spills.	U of MN	$394,948
067-B	Sivaprakasam	Kannan	Innovative Technology to Remove Nitrate from Surface Water	To develop an innovative technology to remove nitrate from surface water that is flexible enough to be used in household, large scale public utility system and in farm/livestock industry.	St. Cloud State University	$173,847
068-B	Zamalloa	Carlos	Rural Wastewater Treatment: Water Reuse and Energy Production	This project aims to develop a rural wastewater treatment system that could replace septic tanks, decreasing pollution entering rivers and lakes and increasing potential water reuse and energy generation.	U of MN	$297,000
069-B	Barney	Brett	Microbial Transformation of Plastics in Minnesota Waters	This project will study the ability of indigenous bacteria to biodegrade plastics found in contaminated waters across the state of Minnesota and determine their fates and potentially toxic by-products.	U of MN	$506,000

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070-B	Ishii	Satoshi	Nutrient Removal and Recovery Technology for Agricultural Drainage	The goal of this project is to improve water quality by removing nitrogen and phosphorus from agricultural runoff water, and to reclaim these nutrients for use as animal feed.	U of MN	$880,000
071-B	Jones	Daniel	Sulfide Mineral-Eating Microbes to Improve Water Quality	Naturally occurring microorganisms break down sulfide minerals from Minnesota's copper-nickel deposits. If we can understand this process, we can use microorganisms to improve management of mine waste and water.	U of MN	$339,667
072-B	Kohno	Satomi	Increasing Contaminants and Temperature Eliminate Minnesota Turtles	Quantifying factors, including estrogenic contaminates and rising temperature, responsible for turtle decline in Minnesota Lakes to provide natural resource managers opportunities to remediate sensitive habitats and stabilize populations.	St. Cloud State University	$248,632
073-B	Nieber	John	How Rapidly can Groundwater Quality be Improved?	Aquifers in southeastern Minnesota have continually received excessive doses of anthropomorphic chemicals such as nitrates since WWII. We will estimate how long it will take to make them clean again.	U of MN	$716,000
074-B	Reavie	Euan	Minnesota's Coldwater Fish Decline: Causes and Solutions	Determine long-term causes of fish loss and develop management recommendations for rehabilitation of coldwater fisheries in hundreds of lakes. A collaboration with the MNDNR to enhance the sentinel lakes program.	U of MN - Duluth NRRI	$789,021
075-B	Strack	Otto	Water Saving Subsurface Irrigation to Reduce Contamination	We investigate below-ground irrigation to 1) reduce water use, 2) reduce operational cost, and 3) reduce pollution of both groundwater and surface water. A construction manual will be created.	U of MN	$93,391
076-B	Strack	Otto	Protecting Fish Habitat in Streams From Groundwater Withdrawal	We propose a method to withdraw groundwater near streams without damaging fish habitat. A construction manual will be delivered. This project will allow pumping, e.g., for irrigation, without damaging fish.	U of MN	$93,391
077-B	Edlund	Mark	Establishing Priorities for Restoring Minnesota's Nutrient-Impaired Lakes	Over 350 Minnesota lakes are impaired with excess nutrients and noxious algae. This project will target restoration efforts toward the most imperiled and recoverable lakes to maximize resources and success.	Science Museum of Minnesota	$375,000
078-B	Johnson	Nathan	How does Iron Protect Wild Rice from Sulfate?	Iron in sediments is protective of wild rice, but only partially. Our study will determine the balance of beneficial and harmful effects of iron on the sustainability of wild rice.	U of MN - Duluth	$401,142
079-B	Heger	Sara	Determining the Impact of Microfibers on Septic System Performance	Project will determine the impact of microfibers on septic systems and evaluate options to reduce the microfibers in graywater from laundering clothing currently passing through various septic system and WWTPs	U of MN	$367,000

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080-B	Bezada	Maximiliano	Non-Invasive, Cost-Effective Investigation of Groundwater Resources	Management of groundwater resources is hampered by our limited knowledge of the structure of aquifers. This proposal will use a new method to reveal the subsurface distribution of this resource.	U of MN	$93,783
081-B	Ebtehaj	Ardeshir	Web-GIS for Satellite Monitoring of all Minnesota Lakes	This proposal aims to develop a modern publically accessible Web-based Geographic Information System (Web-GIS) for low-cost and super-resolution water quality monitoring of almost all Minnesota lakes from space.	U of MN	$393,506
082-B	Ostlund	Aaron	Water Quality Benefits of Red River Basin Impoundments	Surface water management and biomass harvesting within impoundments can capture non-point source nutrients and sediment. This project will evaluate and enhance management of retention projects to maximize water quality improvements.	Red River Basin Commission	$495,042
083-B	Wells	M. Scott	Incentivizing Oilseed Cash Covercrops for Water Quality Improvement	Through a market-based approach, this project will protect water resources by increasing the marketability and adoption of oilseed cash cover crops into annual row crop agricultural production systems across Minnesota.	U of MN	$1,320,000
084-B	Zimmer	Kyle	Reducing Water Nitrogen to Restore Minnesota Lakes	This project will improve water quality in shallow lakes by developing management strategies that reduce nutrient levels and reduce blooms of noxious and toxic cyanobacteria.	University of St. Thomas	$362,000
085-B	Knoll	Lesley	Assessing Water Quality in Mississippi Headwaters Region Lakes	The goals of this project are to preserve, analyze, interpret, and augment historical water quality data for lakes with minimal, but increasing, external stressors to inform statewide lake management strategies.	U of MN	$406,200
086-B	Ebtehaj	Ardeshir	Optimal Configuration of Windbreaks for Agricultural Water Conservation	This proposal aims to develop a predictive tool that enables optimal configuration of windbreaks, canopy, and wind turbines for reduction of farm-scale water loss due to soil evaporation.	U of MN	$368,614
087-B	Karwan	Diana	Sediment Impairments in Northern Minnesota Non-Agricultural Streams	In-stream particle/sediment formation is common in wetland streams. This project quantifies terrestrial and in-stream source contributions to sediment-impaired streams, emphasizing seasonal and hydrologic influences on in-stream sediment formation	U of MN	$335,000
088-B	Khodursky	Arkady	Maximizing Water Safety against Antibiotic Resistance	The proposed research will establish comprehensive experimental and informational framework for surveillance and monitoring of the effects of antibiotic use on the spread of antibiotic resistance.	U of MN	$350,000
089-B	Ruan	Roger	Polycyclic Aromatic Hydrocarbons Abatement using Non-Thermal Plasma Technology	The proposed project is aimed to develop an innovative non-thermal plasma based technology for the cost effective and sustainable removal of polycyclic aromatic hydrocarbons from Minnesota air and waters.	U of MN	$820,000

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090-B	Feinberg	Joshua	Determining which Iron Minerals Remove Phosphorous from Stormwater	Iron-enhanced sand filters installed throughout Minnesota are exhibiting mixed effectiveness. We hypothesize that only certain iron minerals will remove phosphorous from water; we propose to determine which minerals work.	U of MN	$384,591
091-B	Yang	Ce	Better Fertilizer Management to Prevent Further Water Contamination	To prevent more nitrate pollution from agricultural operations, we will develop an online fertilizing recommendation tool that integrates airborne remote sensing with advanced crop models.	U of MN	$392,000
092-B	Bergee	Anton	Geospatial Airborne Sensor Survey to Manage Water Resources	This project seizes immediate opportunities to employ aerial sensors and other GIS technology through the use of drones to capture high resolution…real time…3-dimentional data for active management of watershed challenges.	Northland Community and Technical College	$999,768
093-B	Peterson	Daryl	A Landscape Conservation Design for the Lower St. Louis River	This project develops a watershed-scale conservation plan to guide continued recovery of fish and wildlife habitat and populations of the lower St. Louis River, western Lake Superior's most important river	Minnesota Land Trust	$397,000
094-B	Christensen	Courtney	ShellRock River Watershed Stormwater Quality Trading Pilot Program	This project will develop and implement a model stormwater water quality credit trading framework. The purpose is to provide voluntary, cost effective, pollutant reductions on a watershed scale.	Shell Rock River Watershed District	$350,000
095-B	Current	Dean	Guidelines for Sustainable Biomass Production for Multiple Benefits	This project will develop widely accepted guidelines for sustainable biomass production ensuring that the state environment benefits from implementing biomass plantings for production and conservation purposes.	U of MN	$192,000
096-B	Julius	Matthew	Creating a Algal Toxin Alert Network for Central and Upper Minnesota	The goal of this project is to create a rapid algal toxin detection network for portions of northern and central Minnesota, with the potential for low cost statewide expansion.	St. Cloud State University	$154,630
097-B	Trappe	Jon	A Multi-Faceted Approach Towards Reducing Nitrogen Inputs and Loss in Urban Landscapes	Using in-person assessments to determine actual amount of fertilizer applied to lawns in conjunction with biological nitrification inhibition techniques to reduce amount of fertilizer applied to lawns.	U of MN	$284,300
098-B	Current	Dean	Farmer Generated Water Quality Solutions	We are proposing an innovative farmer centered approach to define, plan and implement a watershed level strategy to address water quality issues in the Elm Creek Watershed in southern Minnesota	U of MN	$348,000
C. Environmental Education (RECEIVED: 33 Proposals / Subtotal = $12,581,000)						
099-C	Legato	Denise	Increasing Diversity in Environmental Careers: Fellowships, Internships, Mentorships	This collaborative project creates a college to workforce pathway for under-represented students who are interested in pursuing Natural Resources careers by reducing barriers that inhibit successful educational attainment.	MN DNR	$1,000,000

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100-C	Potter	Caitlin	Providing Enduring Ecology Experiences for all Minnesota Middle-Schoolers	Cedar Creek will use local scientific data in a freely-available, interactive web-based learning application and virtual field trip to teach ecology and environmental awareness to Minnesotas 200,000 middle school students.	U of MN - Cedar Creek Ecosystem Science Reserve	$308,000
101-C	Lenczewski	John	Connecting Students with Watersheds through Hands-on Learning	Students will get outdoors for hands-on learning focused on water quality, groundwater, aquatic life, watershed health and their role as watershed stewards. Introductions to fishing and conservation will be offered.	Minnesota Trout Unlimited	$581,270
102-C	Evans	Elaine	Pollinator Ambassadors for Urban Gardens	The Pollinator Ambassadors for Urban Gardens project will enhance outreach capacity for pollinator education by creating an outreach toolkit and training educators and youth for engagement in native pollinator education.	U of MN	$421,431
103-C	Raber	Carrie	Online Modules Build Local Capacity to Protect Groundwater	This series of 8-10 online modules will increase knowledge and skills in local government staff and leaders so that Minnesotas groundwater is protected from overuse and pollution.	Minnesota Department of Health	$335,000
104-C	Heitkamp	Barbara	The SAFL Summer Experience	This project provides an annual interactive STEM experience for students and teachers at the St. Anthony Falls Laboratory, a world-renowned research facility in downtown Minneapolis along the Mississippi River.	U of MN	$158,069
105-C	Buck	Wiley	Engaging a Diverse Public in Ecological Restoration	Great River Greening will make 5,300 restoration volunteer high-quality contacts through a myriad of offerings and levels of engagement, targeting a younger, more diverse audience.	Great River Greening	$383,600
106-C	Foster	Shelli-Kae	YES! Students Take on Minnesota Water Quality Challenge	Youth Energy Summit (YES!) expands its successful model to improve local waterways by mobilizing over 20 youth-led teams in Minnesota communities to complete water quality related projects, moni-toring and reporting.	Prairie Woods Environmental Learning Center	$213,700
107-C	Scholl	Laura	Blue Thumb Pollinator Plantings Connecting Regional Population Centers	Deploying Blue Thumb - Planting for Clean Water® resources to regional population centers to connect pollinator corridors, improve water quality, and to inventory and map matrix of privately managed native plantings.	Metro Blooms	$321,034
108-C	Thomas	Steve	Preserve Resources by Expanding the State's Reuse Sectors	This project will focus on creating a much more robust reuse economy throughout the State resulting in reduced solid waste, less pollution, more jobs, and small business development.	ReUSE Minnesota	$363,910
109-C	Bakken	Timothy	Phase 2 Prairie Sportsman Statewide Environmental Education Project	Produce, broadcast and share 26 science-based environmental programs, 26 "call to action" and 27 "outdoor lifestyle" videos that inspire and demonstrate how to protect and engage with Minnesota's natural resources.	Pioneer Public Televison	$300,000

ENRTF ID #	Last Name	First Name	Title	Summary	Organization	$ Requested
110-C	Mattson	Nicole	Unlocking the Science of Minnesotas Moose Decline	The Minnesota Zoo will develop educational displays and engaging, hands-on components to summarize scientific findings about moose decline in Minnesota. Information will be integrated online to increase accessibility for all.	Minnesota Zoological Garden	$300,000
111-C	Poppleton	Kristen	Youth Convening Minnesota	Educating and engaging youth is critical to maintain and improve our heritage in natural resources. We will mentor youth and youth leaders to work with communities to address environmental issues.	Climate Generation: A Will Steger Legacy	$300,000
112-C	Holger	Sara	Get Outdoors After School!	This project will equip out-of-school youth organizations across Minnesota with knowledge, skills and resources to incorporate outdoor nature activities into after-school programs and engage under-privileged children with the outdoors.	Project Get Outdoors Inc	$30,000
113-C	Musser	Kimberly	Minnesota River Education Model: Connecting Students to Watersheds	An educational model that delivers watershed stewardship education to 2,000 high school students in St. Peter, Mankato, and New Ulm, using science to promote an action-based conservation ethic.	Minnesota State University - Mankato, Water Resources Ctr	$248,582
114-C	Yakub	Mohamed	Integrating Environmental Science Research in High School Education	Working with researchers, 40 teachers statewide will integrate environmental research in their classrooms engaging students in scientific processes. Students will participate in ongoing scientific research and present at UofM	U of MN	$445,000
115-C	Carlson	Stephan	Students Using Local Phenology Contributes to Citizen Science	Students lack real data to make STEM learning relevant. Partnering with nature centers and schools, this project trains a network of 1000 students to collect and analyze citizen science data.	U of MN	$224,000
116-C	Knight	Joseph	Strengthening Natural Resources Management with Drone Training	The goal of this project is to provide training to enable natural resource professionals to effectively use drones in restoring, protecting, and managing natural resources.	U of MN	$132,000
117-C	Liu	Zengqiang	Digital Watershed Simulator for K-12 Education and Outreach	We will use a cutting-edge visualization platform to turn water resource education into intuitive, hands-on, informal, and play-based learning experience for K-12 students and communities in Minnesota.	St. Cloud State University	$314,489
118-C	Poppe	Steven	Morris Prairie Pollinator Demonstration and Education	Project will restore and demonstrate a native prairie habitat in order to enhance the local ecosystem for beneficial pollinators as well as to offer educational opportunities.	U of MN	$681,000
119-C	Ceurvorst	Robyn	Minnesota River Water Quality Education	This project targets Environmental Education and will provide a water quality education, field trips, monitoring and assessment to a total of 3,000 students in Southwestern Minnesota.	Minnesota State University - Mankato	$65,000

ENRTF ID #	Last Name	First Name	Title	Summary	Organization	$ Requested
120-C	Pulscher	MaryLynn	Expanding Nature Knowledge and Experience in North Minneapolis	Compelling, new, interactive exhibits at North Mississippi Regional Park will spark curiosity, increase knowledge, change behavior, and inspire a diverse audience of 326,000 annual visitors to explore the outdoors.	Minneapolis Parks and Recreation Board	$865,000
121-C	Suss	Ted	River Watch on the Minnesota River	Continue and expand a River Watch program on the Minnesota River engaging teams of high school students in water quality monitoring and reporting the data to the MNPCA	Friends of the Minnesota Valley	$103,000
122-C	Arlt	Timothy	Online Training for Front Line Water Quality Protectors	This project will construct an online training course for county and state staff enabling them to prevent the incidence of manure and or nutrients from entering surface and ground water.	U of MN	$322,175
123-C	Tonko	Jennifer	Customized Water Education Combining Stories, Histories, and Science	The Humanities Center will work with 160 locally-based organizations in 8 Minnesota communities to develop community-specific activities, events, and exhibits that educate 8,000 Minnesotans about water in Minnesota.	Minnesota Humanities Center	$427,215
124-C	Tiffin	Peter	Market Science: Connecting Minnesotans with Environmental Research	Market Science is a scientific education and outreach program that promotes dialogue between Minnesota's scientist and citizens through attractive visual displays and interactive demonstrations at Farmer's markets and county fairs.	U of MN	$236,165
125-C	Wackett	Lawrence	RAPID: Google for the Environment	We will develop RAPID, the Environmental Google, to help maintain the lowest levels of chemicals in the environment, and to be used by government agencies, science teachers, researchers, and citizens.	U of MN	$228,000
126-C	Justen	Emilie	Dangerous Plant Guides: How to Recognize and React	There is a growing need to provide outreach materials on dangerous plants to residents who enjoy the outdoors. This project will develop videos, brochures, and posters for statewide distribution.	Minnesota Department of Agriculture	$138,380
127-C	Kline	David	Preparing Minnesotans for Changes in Wolf Management	Minnesotans need to understand the complexities of successful state-controlled management, conflict resolution, and co-existence with our 2,400 wolves. A new educational exhibit at the International Wolf Center will help.	International Wolf Center	$1,200,000
128-C	Kraus	Alan	Farm Based Environmental Education: Studies Measuring Altered Hydrology	Create educational opportunities for emerging environmental scientists by providing living laboratories with numerous practices/structures/systems at one site demonstrating how to manage and measure altered hydrology on a working farm.	Cannon River Watershed Partnership	$206,199
129-C	Meschke	Linda	Managing Soil Quality for Ecosystem Services & Productivity	Developing an innovative approach to reduce water quality impacts from agricultural landscapes by focusing on soil health management, rather than yield, resulting in increased ecosystem services and crop quality.	Rural Advantage	$1,451,404

ENRTF ID #	Last Name	First Name	Title	Summary	Organization	$ Requested
130-C	Waters	Amy	Aquatic Education & Outreach Programs: Engaging 6,000 Students	The Aquatic Research & Conservation Society requests funding to expand youth learning experiences enhancing their environmental science education through hands-on field and in-class workshops and free classroom kits to educators.	Aquatic Research & Conservation Society, Inc	$52,477
131-C	WhiteEagle	Ann	Native Plant Education/Implementation Benefitting Pollinators and Water	RCD will educate diverse kindergarten-adult audiences about how native plants are essential for protecting pollinators and water. RCD will assist residents with native plantings and provide matching grant incentives.	Ramsey Conservation District	$224,900
D. Aquatic and Terrestrial Invasive Species (RECEIVED: 25 Proposals / Subtotal = $31,581,850)						
132-D	Venette	Robert	Minnesota Invasive Terrestrial Plants and Pests Center 4	Funding is requested to accelerate high priority research that will protect Minnesotas wetlands, forests, prairies, and agricultural resources from terrestrial invasive plants, pests, and pathogens.	U of MN	$7,000,000
133-D	Merkes	Christopher	Developing RNA Interference Genetic Controls for Zebra Mussels	We will develop a microparticle using genetics (RNA interference) to specifically control zebra mussels.	U.S. Geological Survey	$769,528
134-D	Sorensen	Peter	An Effective and Practical Invasive Carp Deterrent	Promising new carp deterrent system is tested in the Mississippi River along with an existing deterrent and predators; 99% blockage is suggested and Fish and Wildlife Service is a partner.	U of MN	$998,000
135-D	Abrahamson	Mark	Slow the Spread of the Emerald Ash Borer	Reducing the yearly rate of spread of the emerald ash borer through outreach and strategic management grants could delay spread throughout Minnesota for decades and save billions of dollars.	Minnesota Department of Agriculture	$14,689,500
136-D	Mensinger	Allen	Sound Gradient for Acoustic Deterrence of Bigheaded Carp	Develop a sound gradient acoustic barrier for deployment in locks. As invasive carp swim upstream, they will encounter ever increasing, louder sound and be forced to turn back downstream	U of MN - Duluth	$396,310
137-D	Sadowsky	Michael	Fish on a Chip: An AIS Detection Platform	In this study we will develop and validate an new method for simultaneously determining the presence and relative quantity of 21 invasive fish species in any Minnesota waterway.	U of MN	$399,000
138-D	Ambourn	Angie	Monitoring and Biocontrol of Brown Marmorated Stink Bug	Brown marmorated stink bug is increasing in Minnesota. This project will expand monitoring to identify areas of spread, and gather data on native parasitoids and predators and implement biological control.	Minnesota Department of Agriculture	$199,224
139-D	Heathcote	Adam	Determining Minnesota's Risk of a Toxic Algal Invader	This project will determine the historical distribution, abundance, and toxicity of the invasive blue-green alga, Cylindrospermopsis raciborskii, in Minnesota lakes using a combination of paleolimnological and contemporary monitoring techniques	Science Museum of Minnesota - St. Croix Research Station	$243,000

ENRTF ID #	Last Name	First Name	Title	Summary	Organization	$ Requested
140-D	Tiffin	Peter	Stopping Invasive Species by Attacking from Below	Invasive plants strongly impact soil microbes, fungi, and fertility; we will evaluate innovative and potentially effective methods to manipulate these soil properties to control invasive plants in prairies and forests.	U of MN	$491,515
141-D	Chandler	Monika	Palmer Amaranth Detection and Eradication Continuation	Find and control Palmer amaranth in conservation plantings to prevent severe economic damage and protect prairies.	Minnesota Department of Agriculture	$431,200
142-D	Cotner	James	Using CO2 to Kill Undesirable Fish including Carp	We will develop techniques to for controlling nuisance and invasive fish species. Adding CO2 under ice is effective and inexpensive with great potential to improve water quality and aquatic habitat.	U of MN	$470,000
143-D	Elias	Mikael	Innovative and Ecological Coatings to Mitigate Invasive Species	We propose to develop innovative coatings containing a revolutionary antifouling biological molecule: these coatings will contribute to coastal economy competitiveness and to mitigate the spread of invasive species.	U of MN	$321,500
144-D	Karschnia	Maggie	Accelerated Watershed Approach to Invasive Carp Management	This project will take an accelerated watershed approach to invasive carp management that tests new, innovative techniques and ultimately restores and protects multiple, connected waterbodies within an important chain-of-lakes system.	Prior Lake-Spring Lake Watershed District	$342,796
145-D	Dieterman	Doug	River Food Webs with and without Invasive Carp	This project will determine how Invasive Carp disrupt river food webs, effects of disruptions on important fishes and recommend best management practices to limit harm to over 500 river miles	MN DNR	$495,000
146-D	Amberg	Jon	New Tools for Fight Against Zebra Mussels	We will validate, develop manuals and train people on the use of both a portable DNA detector and commercially available mapping technology for integration into their Zebra Mussel monitoring program.	U. S. Geological Survey	$539,323
147-D	Burks	Susan	Terrestrial Invasive Plant Detection Methods for Forest Lands	Develop and test aerial buckthorn detection methods in northern Minnesota; upgrade invasive plant risk model to prioritize forest surveys; design/test ground survey methods and integrate into annual work planning.	MN DNR	$300,000
148-D	Waller	Diane	Integrating Control of Zebra Mussels and Aquatic Vegetation	The project investigates the use of aquatic pesticides for combined control of zebra mussels and nuisance aquatic vegetation by identifying efficacious pesticides to mussels and sites of nuisance species co-occurrence.	U. S. Geological Survey	$251,310
149-D	Russell	Matthew	Testing a New Method for Eradicating Dwarf Mistletoe	This projects seeks to use new technology that gives natural resource managers another tool to maintain healthy and productive black spruce forests across Minnesota.	U of MN	$352,000
150-D	Marko	Michelle	Development of Predictive Tools for AIS Management	We will develop predictive modeling on which lakes are most susceptible to zebra mussel spread, which invasive species are most likely to arrive in Minnesota lakes and through which pathways.	Concordia College	$331,644

ENRTF ID #	Last Name	First Name	Title	Summary	Organization	$ Requested
151-D	Burks	Susan	Boot Brush Use to Prevent Spreading Invasive Species	A better understanding of Minnesota hikers and the tools they use to clean their gear will prevent the spread of terrestrial invasive species and protect natural and scenic resources.	MN DNR	$267,208
152-D	Windels	Steve	Evaluate Control Methods for Invasive Hybrid Cattails	This project will evaluate the effectiveness of two methods to remove exotic hybrid cattail to restore fish and wildlife habitat in Minnesota wetlands.	Voyageurs National Park	$131,920
153-D	Pahs	Steven	Circle Lake Wild Rice Restoration and Carp Management	The Circle Lake Wild Rice Restoration and Carp Management Project will provide a mechanism to restore wild rice to Circle Lake to increase waterfowl abundance and diversity and, mitigate the negative effects of carp on water quality and fishery habitat and Serve as a model for other lakes within.	Rice SWCD	$594,985
154-D	Peterson	Jason	Invasive Species Wash Site Innovation, Improvements, and Standards	Design and construction of innovative site improvements at five DNR offices for staff to clean equipment and contain invasive species so that they will not spread.	MN DNR	$908,023
155-D	McEwen	Daniel	Controlling Densities of Zebra Mussels in Infested Lakes	We will determine the metapopulation structure of zebra mussels within lakes, figure out source populations, and chemically treat those to reduce densities and overall impacts in whole lakes.	Limnopro Aquatic Science, Inc	$428,864
156-D	Terrill	Tim	Minnesota Traditions Newspaper AIS Awareness Campaign	This project seeks to educate the outdoor enthusiast about the Clean, Drain, Dry prevention techniques by delivering positive legacy messaging through a Twin Cities/North Central newspaper insert.	Mississippi Headwaters Board	$230,000
E. Air Quality, Climate Change, and Renewable Energy (RECEIVED: 20 Proposals / Subtotal = $13,974,044)						
157-E	Reese	Michael	Agricultural Weed Control Using Robots	A robot, powered by solar energy, will be developed to control weeds on agricultural lands. We envision significant reductions in fossil-fuel and herbicide use while increasing local energy production.	U of MN - Morris	$600,000
158-E	Kortshagen	Uwe	Clean Electricity from Solar Windows	Solar windows are a disruptive photovoltaic technology that virtually invisibly integrates with buildings. This renewable energy technology will increase photovoltaics adoption, reduce air pollution, and ameliorate climate change.	U of MN	$458,494
159-E	Anderson	Ellen	Community-Scale Energy Storage Guide for Renewable Energy	Create user-friendly, research-based energy storage guide and decision tools (print and web-based) for community-scale sites with renewable energy and do three geographically dispersed battery storage demonstration projects, through broad stakeholder-expert	U of MN	$625,478
160-E	Cui	Tianhong	Cheap Solar Energy from Simple Roll-to-Roll Manufacturing	This project is to develop cheap clean solar energy by simple roll-to-roll manufacturing. Perovskite is a new photovoltaic material, very economical while maintaining high power conversion efficiency.	The University of Minnesota	$388,852

ENRTF ID #	Last Name	First Name	Title	Summary	Organization	$ Requested
161-E	Cui	Tianhong	Cheap Efficient Air Filter to Remove Organic Compounds	This project is to develop a new air filter to remove airborne organic compounds, polycyclic aromatic hydrocarbons. The technology is very low-cost and highly efficient to improve Minnesota air quality.	U of MN	$386,187
162-E	Marr	Jeffrey	Lowering Costs of Solar Energy in Minnesota	This project will reduce the cost of PV solar projects in Minnesota by creating structural design methodologies to improve the accuracy of load estimation for both wind and snow loading.	U of MN	$410,692
163-E	Hu	Bo	A Solar-Powered Electrochemical System for Sulfide Removal	This project will develop a solar-powered electrochemical system to be applied to remove major odorous sulfide compounds in sewage and to remove sulfur from acid mine drainage.	U of MN	$435,000
164-E	Swaggert	Nick	Phase II- Reduce Solid Waste and Greenhouse Gas Emissions	This project will: expand strategies of the 2015 LCCMR grant; establish deconstruction and building material reuse as a practice statewide; document the environmental, health, and economic benefits of material reuse.	The NetWork for Better Futures (D/B/A) Better Futures Minnesota	$1,151,931
165-E	Randolph	Jimmy	Field Testing/Demonstration of Novel Groundsource Heat Pump	Project will field-test novel groundsource heat pump technology developed at the UMN. Promising research must now be followed by pre-commercial testing, paving the way for a MN heat pump renaissance.	U of MN	$174,757
166-E	Walsh	Kayla	Life Cycle Analysis of Anaerobic Digestion and Organics	A life-cycle analysis (LCA) of anaerobic digestion (AD) will evaluate the use of organic materials to create clean energy, conserve resources and reduce the amount of organics going to landfills.	Minnesota Pollution Control Agency	$250,000
167-E	Wang	Ping	Electrically Switchable Adsorption of PAHs on Renewable Cellulosic Nano Carbon Materials for Mitigation of Airborne Pollutants	A unique nano carbon materials from cellulosic fibers will be examined for adsorption of PAHs, providing an efficient means for mitigation of airborne contaminants at sites of emission.	U of MN	$202,000
168-E	Baker	Lawrence	Optimizing Food Waste Reduction throughout Minnesota	This project will develop tools to optimize food waste reduction in specific contexts (size of cities, location, etc.) throughout Minnesota, reducing environmental impacts while gaining economic benefits.	U of MN	$999,000
169-E	Randolph	Jimmy	Bringing Geothermal Power to MN: CO2 Power-System Test	Project will design, fabricate and test an innovative, closed-cycle CO2 power system, the first steps for geothermal power and grid-scale geologic energy storage to become renewable energy opportunities for MN.	TerraCOH Inc.	$315,250
170-E	Sinko	John	Color-Change Solar Coating for Residential Energy Savings	In this study, lab and field tests assess residential building heating and cooling cost savings by using color-changing exterior coatings, possibly yielding millions of dollars in savings for Minnesota consumers.	St. Cloud State University	$151,306

ENRTF ID #	Last Name	First Name	Title	Summary	Organization	$ Requested
171-E	Claussen	Anna	Capacity Building for Rural Resource Management Implementation	We will implement a community engagement strategy that will enable state agencies to better implement natural resource management strategies in rural areas with authentic rural support for those strategies.	Institute for Agriculture and Trade Policy	$655,424
172-E	Myers	Sandra	Developing Innovative Mercury Capture Technology for Crematoria Emissions	The proposal project develops affordable and easy to use technology to capture mercury in crematoria emissions. This prevents contamination of our water resources, impacting the food chain and human health.	U of MN	$435,984
173-E	Chatmas	Bob	Diverting Prepared Food from Landfills, Reducing Greenhouse Gases	This project will help us introduce a Prepared Foods Donation Program, which will source food donations from restaurants and prevent food from going to landfills; thereby reducing greenhouse gas emissions.	Second Harvest Heartland	$478,000
174-E	Weber	Mark	Production and Utilization of Biomass: St. Louis County	This project will facilitate the production and utilization of biomass as a source of energy while providing economic and environmental benefits to the citizens and industry of St. Louis County.	St. Louis County Land & Minerals Dept	$3,999,300
175-E	Droessler	William	Stove Swap: Improving Air and Health; Avoiding Violations	Stove Swap incentivizes replacement of inefficient wood burning devices, provides cleaner burning options, helps meet air quality standards by reducing 43 tons/yr of emissions, and improves our health and economy.	Environmental Initiative	$1,008,389
176-E	Chatmas	Bob	Keeping Groceries from Landfills to Reduce Greenhouse Gases	This project will help our food bank expand efforts to gain donations of food from grocery retailers, preventing this food from going to landfills, and thereby reducing greenhouse gas emissions.	Second Harvest Heartland	$848,000
F. Methods to Protect, Restore, and Enhance Land, Water, and Habitat (RECEIVED: 22 Proposals / Subtotal = $30,965,697)						
177-F	Lonsdorf	Eric	Identifying Pollinator Conservation Areas in Minnesota Prairie Parklands	This research will produce an on-line, interactive map illustrating current or potential future quality of pollinator conservation areas in Minnesota by considering habitat quality, surrounding land cover, and pesticide risk.	U of MN	$552,100
178-F	Henderson	Carrol	Nongame Wildlife Program Acceleration	This acceleration package will fulfill ENTRF goals including rare wildlife data collection and management, conservation education, collaborative land protection management, & new emphasis on nature tourism to benefit rural communities.	MN DNR	$2,000,000
179-F	Remucal	David	Preserving and Restoring Minnesota's Native Orchids – Phase 2	Minnesota's 48 native orchids are at risk. The Minnesota Landscape Arboretum will expand conservation of species through propagation and banking and begin restoration planting research in the program's second phase.	U of MN	$468,000
180-F	Schottler	Shawn	Show Me the Money: 10 Markets for Perennials	Design and evaluate 10 market-based scenarios for perennial cropping systems and their potential to improve water quality and provide wildlife habitat. Create awareness through thought-provoking videos, fact sheets, and presentations.	Science Museum of Minnesota - St. Croix Research Station	$347,500

ENRTF ID #	Last Name	First Name	Title	Summary	Organization	$ Requested
181-F	Walker	Michele	Restoration Strategies for Ditched Peatland SNA - Phase II	This project will conduct a feasibility study, and design and implement a pilot habitat restoration project resulting in the increased health and resiliency of a pattern peatland ecosystem.	MN DNR	$460,294
182-F	Quinn	Edward	Restoring Minnesota's Forests in State Parks	Restores 420 acres of high-quality forests at Itasca, Jay Cooke, Scenic, Forestville Mystery Cave and Wild River State Parks and Greenleaf Lake State Recreation Area.	MN DNR	$432,240
183-F	Wickert	Andrew	Sediment Hazards to Trout in Southeast Minnesota Streams	Excess sediment in southeast Minnesota streams can smother trout eggs. Large floods can crush them with gravel. We build knowledge to restore and improve trout populations, fishing, and habitat.	U of MN	$337,000
184-F	Ulrich	Jason	Repurposing Unprofitable Cropland: Water and Wildlife's Silver Bullet?	Conduct the first statewide quantitative analysis estimating the extent of unprofitable croplands, and quantify the water-quality and habitat benefits of converting these lands to perennial vegetation.	Science Museum of Minnesota - St. Croix Research Station	$319,063
185-F	Guala	Michele	Advancing Streambank Protection Systems	We request funding to build and test a prototype of a new bank protection system designed to protect stream banks, limit erosion and provide electricity in pristine ecosystems.	U of MN	$286,426
186-F	Larson	Danelle	Restoring Wetland Invertebrates to Revive Wildlife Habitat	Amphipods are wetland invertebrates that are critical wildlife food and indicators of water quality. We will assess reasons they are missing from Prairie Potholes and unique methods to restore amphipods.	MN DNR	$417,895
187-F	Huckett	Steven	Implementing Novel Market-based Methods for Urban Habitat Restoration	The Implementing Novel Market-based Methods for Urban Habitat Restoration is intended to restore native habitat and evaluate methods which incentivize habitat restoration and sustainable conservation in an urban setting.	Great River Greening	$499,900
188-F	Pagliari	Paulo	Converting Agricultural Wastes into Energy, Polymers, and Fertilizers	Swine manure, sugar processing waste, and ethanol fermentation waste contain significant amounts of unused energy and nutrients. This project will revolutionize waste management by converting these waste into primary resources.	U of MN	$949,000
189-F	Slesak	Robert	Increasing Timber Availability and Habitat with Soil Management	Develop strategies and practical tools to identify conditions that minimize impacts to soil across a wide range of conditions to promote regeneration of diverse forests, wildlife habitat, and timber availability.	U of MN	$396,000
190-F	Rhees	Suzanne	Working Conservation Lands for Grazing, Harvest, and Habitat	The project will improve water quality, pollinator habitat, and other ecosystem services by establishing perennially-rooted crops on conservation lands for managed grazing, biomass, livestock feed, and emerging food products.	Board of Water and Soil Resources	$315,000

ENRTF ID #	Last Name	First Name	Title	Summary	Organization	$ Requested
191-F	Haines	Dustin	Are We Turning Wild Prairie Plants into Crops?	Prairie restorations use native plant seeds produced in agricultural conditions. Is this reducing plant diversity and establishment, thereby undermining restoration success? Our experimental and genetic studies will answer this question.	U of MN - Duluth	$555,441
192-F	Shen	Lian	Floating Mini-Gardens for Shoreline Protection and Wetland Restoration	Floating mini-gardens are proposed to decrease waves crashing onto shoreline to reduce erosion, to provide habitats, and to facilitate soil accumulation to help vegetation growth for wetland restoration.	U of MN	$310,753
193-F	Warren	Natalie	Preserving Natural Shoreline on the St. Croix River	Preserving Natural Shoreline on the St. Croix River will provide landowners, local governments, and realtors/developers with necessary tools to protect our nationally-designated river's clean water and Wild and Scenic character.	St.Croix River Association	$128,520
194-F	Rickert	Dave	MN CREP for Water Quality and Habitat	MN CREP is a federal and state partnership designed to improve water quality and provide habitat in the 54 County area through establishing buffers, restoring wetlands, and protecting groundwater resources.	Board of Water and Soil Resources	$20,000,000
195-F	Pagliari	Paulo	Replacing Plastic Cover in Vegetable Production with BioMulch	A biodegradable product will be developed to replace non-degradable petroleum based plastic used in vegetable and fruit production. This project, if funded, will revolutionize horticulture in Minnesota, and potentially worldwide.	U of MN	$310,000
196-F	Voit	Jan	Okabena Creek Water Quality and Flood Protection Demonstration	HLWD is partnering with agricultural landowners to create a pond and two-stage ditch, both of which would include the establishment of native prairie, pollinator habitat, and protection in perpetuity.	Heron Lake Watershed District	$720,565
197-F	Marchetto	Peter	Hearing the Cry of the Loon	Loons might be displaced by too much noise in their mating and nesting season. Monitoring their nesting grounds will allow us to fix this.	U of MN	$580,000
198-F	Marchetto	Peter	Saving Our Mosquito-Eaters: Management of White-nose Syndrome	White-nose syndrome is drastically affecting bats throughout Minnesota, and the best means of censusing them is by using acoustics. Well use this to evaluate ways to help them.	U of MN	$580,000
G. Land Acquistion for Habitat and Recreation (RECEIVED: 18 Proposals / Subtotal = $40,157,964)						
199-G	Booth	Peggy	SNA Habitat Restoration, Public Engagement, and Strategic Acquisition	Scientific and Natural Area (SNA) habitat restoration and improvements (1000+ acres), increased public involvement, and strategic acquisition (700+ acres) will conserve Minnesota's most unique and rare resources for everyone's benefit.	MN DNR	$6,760,265
200-G	Christie	Jennifer	Minnesota State Parks and State Trails Land Acquisition	Minnesota State Parks and Trails land acquisition proposal is to acquire high priority parcels within legislatively authorized boundaries from willing sellers to protect Minnesota's environmental stewardship and enhance outdoor recreation.	MN DNR	$5,000,000

ENRTF ID #	Last Name	First Name	Title	Summary	Organization	$ Requested
201-G	Mularie	Audrey	Local Parks, Trails and Natural Area Grants	Provide approximately 25 matching grants for local parks, acquisition of locally significant natural areas and trails to connect people safety to desirable community locations and regional or state facilities.	MN DNR	$3,000,000
202-G	Skaar	Kent	Minnesota State Trails - Development and Enhancement	This project is to focus on expanding recreational opportunities on Minnesotas State Trails through the development of new trail segments and/or the rehabilitation, improvement and enhancement of existing State Trails.	MN DNR	$5,000,000
203-G	Schulte	Judy	Private Native Prairie Conservation through Native Prairie Bank	Native Prairie Bank will help landowners conserve native prairie though outreach to 10,000 landowners and practitioners, restoration and enhancement of 870 acres, and protection of 600 acres through conservation easements.	MN DNR	$4,535,000
204-G	Kill	Karen	Browns Creek 40 Acre Acquisition	Fee title acquisition for open space project protecting up to 34 acres of high-quality natural area including 1,400 feet of Brown's Creek, a designated trout stream, in Grant, Washington County.	Browns Creek Watershed District	$350,000
205-G	Manzoline	Robert	Mesabi Trail, County Road 88 to Ely Segment	3.5 mile long bituminous surface trail beginning at the intersection of Hwy 169 and County Road 88 to Ely. In Ely, connection will be made to existing Mesabi Trail.	St. Louis & Lake Counties Regional Railroad Authority	$600,000
206-G	Smith	Stacy	State Park and Trail Integrated Public Information System	This project provides Minnesota State Park and Trail visitors with an integrated, next-generation information system that creates a positive, safe, and welcoming experience for all users.	MN DNR	$3,984,142
207-G	Illg	Jerome	Harmony State Trail Extension Land Acquisition	To acquire fee title to 16 parcels to allow for the extension of the state trail from Harmony south to the Iowa state boarder with a spur to Niagara Cave.	City of Harmony	$235,000
208-G	Owens	Jay	Mississippi Blufflands State Trail - Red Wing Riverfront	Construction of an engineered and designed three-quarter mile segment of the Mississippi Blufflands State Trail along Red Wing's Mississippi River riverfront, from Barn Bluff Regional Park to Colvill Park.	City of Red Wing	$920,000
209-G	Caneff	Denny	Superior Hiking Trail Enhancement Plan	Evaluate routing, safety, water management and other environmental and design issues of the Superior Hiking Trail and establish SHTA best practices methods for carrying out the resulting redesign plans.	Superior Hiking Trail Association	$100,200
210-G	Taylor	Sara	Bayport St. Croix Conservation Initiative	Fee title acquisition for parkland to protect, reconnect, restore and make publicly accessible 11 acres of St. Croix Riverfront, including 665 feet of shoreline and natural area in Bayport, MN.	City of Bayport	$550,000

ENRTF ID #	Last Name	First Name	Title	Summary	Organization	$ Requested
211-G	West	Lisa	Improving Hydrologic Resilience in Rural Dakota County	Improving hydrologic resilience and wildlife habitat in rural Dakota County through priority site selection, design, easement acquisition, water retention, and wetland and upland natural resource restoration.	Dakota County	$1,960,000
212-G	Mork	Laird	Swedish Immigrant Trail Segment within Interstate State Park	Swedish Immigrant Regional Trail connection through Interstate Park to Taylors Falls City Hall. Build 180 bridge and trail segment A&B as illustrated. Segment C reviews and engineering only.	Chisago County Environmental Services	$2,254,665
213-G	Doty	Josh	A Local-State-Federal Partnership Protects multiple public benefits on the Mississippi River	A partnership among the City of Baxter, Brainerd Public Schools, Camp Ripley Sentinel Landscape program and The Conservation Fund will acquire 200 acres of riparian forest on the upper Mississippi River Headwaters.	City of Baxter	$700,000
214-G	Thoreen	Jim	Mississippi Riverfront Redevelopment Project	The City of Brainerd is requesting a $1,000,000 grant for the preliminary and final design of the Three Bridges Trail, Phase 1 of the Mississippi Redevelopment Project.	City of Brainerd	$1,000,000
215-G	Barrick	Melissa	Prioritize and Target North-Central Minnesota Lakes for Protection	This project will complete 18 permanent conservation easements, 30 forest management plans, and 20 best management practices (BMP) around Aitkin and Crow Wing Counties highest quality lakes.	Crow Wing SWCD	$1,492,500
216-G	Forstner	Michael	East Fork Des Moines River Wetland Restoration	The project includes the restoration and permanent protection of a 160-acre wetland, native buffer, and pollinator habitat along Martin County JD 50 within the East Fork Des Moines River watershed.	Martin County Drainage Authority	$1,716,192
H. Other (RECEIVED: 1 Proposals / Subtotal = $135,000)						
217-H	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