

Environment and Natural Resources Trust Fund (ENRTF)
 Research Projects completed between January 1, 2019 and December 31, 2020
 Full abstracts are included in Section III. Completed Research Projects

Year	Subd.	Title	Organization	First Name	Last Name	Funding Amount
2013	06a	An Aquatic Invasive Species Research Center	U of MN - MAISRC	Nicholas	Phelps	\$ 8,700,000
2013	06a-02	AIS Research Center Sub-Project 02: Delaying the Spread of AIS: Monitoring the Abundance and Distribution of AIS Using New Molecular Tools so Techniques to Delay Their Spread can be Implemented	U of MN - MAISRC	Michael	Sadowsky	
2013	06a-03	AIS Research Center Sub-Project 03: Reducig and Controlling AIS: Developing Effective Tools to Attract and Locate Aggregations of	U of MN - MAISRC	Peter	Sorensen	
2013	06a-04	AIS Research Center Sub-Project 04: Reducing and Controlling AIS: Developing Effective Bio-Control Techniques to Control Common and/or Asian Carp	U of MN - MAISRC	Przemyslaw	Bajer	
2013	06a-07	AIS Research Center Sub-Project 07: Developing Eradication Tools: Exploring whether Native Pathogens can be used to Control AIS	U of MN - MAISRC	Nicholas	Phelps	
2013	06a-08	AIS Research Center Sub-Project 08: Implementing Findings: An Applied Ecologist - Extension Specialist Position and Program	U of MN - MAISRC	Daniel	Larkin	
2013	06a--09	AIS Research Center Sub-Project 09: Implementing Findings: ImplementinNew Tools for Zebra Mussel Control	U of MN - MAISRC	Michael	McCartney	
2013	06a-10	AIS Research Center Sub-Project 10: Implementing Findings: An Extension Educator or Outreach Position	U of MN - MAISRC	Daniel	Larkin	
2013	06a-12	AIS Research Center Sub-Project 12: Characterizing long-term spiny water flea ecosystem impacts using paleolimnology	U of MN - MAISRC	Donn	Branstrator	
2013	06a-14	AIS Research Center Sub-Project 14: Cost-effective Monitoring of Lakes Newly Infested with Zebra mussels	U of MN - MAISRC	John	Fieberg	
2013	06a-16	AIS Research Center Sub-Project 16: Sustaining Walleye Populations: Assessing Impacts of AIS	U of MN - MAISRC	Gretchen	Hansen	
2013	06a-17	AIS Research Center Sub-Project 17: Building Scientific and Management Capacity to Respond to Invasive Phragmites	U of MN - MAISRC	Daniel	Larkin	
2013	06a-18	AIS Research Center Sub-Project 18: Eurasian and Hybrid Watermilfoil Genotype Distribution in Minnesota	U of MN - MAISRC	Raymond	Newman	

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2013	06a-19	AIS Research Center Sub-Project 19: Decision-Making Tool for Optimal Management of AIS	U of MN - MAISRC	Nicholas	Phelps	
2013	06a-21	AIS Research Center Sub-Project 21: Early Detection of Zebra Mussels Using Multibeam Sonar	U of MN - MAISRC	Jessica	Kozarek	
2013	06a-26	AIS Research Center Sub-Project 26: Updating an invasive and native fish passage model for locks and dams	U of MN - MAISRC	Anvar	Gilmanov	
2014	06a	Enhancing Pollinator Landscapes	U of MN	Marla	Spivak	\$ 864,000
2014	Sec 8 - 01	MITPPC #1: Novel Diagnostic Tools for Rapid and Early Detection of Oak Wilt	U of MN - MITTPC	Abdenmour	Abbas	\$ 271,911
2014	Sec 8 - 02	MITPPC #2: Early Detection, Forecasting and Management of Brown Marmorated Stinkbug (Halyomorpha halys)	U of MN - MITTPC	William	Hutchison	\$ 616,081
2014	Sec 8 - 03	MITPPC #3: Climate Change and Range Expansion of Invasive Plants	U of MN - MITTPC	David	Moeller	\$ 206,335
2014	Sec 8 - 04	MITPPC #4: Cover It Up! Using Plants to Control Buckthorn	U of MN - MITTPC	Peter	Reich	\$ 327,000
2015	03h	Reintroduction and Interpretation of Bison in Minnesota State Parks	MN DNR	Edward	Quinn	\$ 600,000
2015	03m	Turtle Population Dynamics in an Urban Lake	St. Thomas University	Jennifer	McGuire	\$ 250,000
2015	04a	Understanding Water Scarcity, Threats, and Values to Improve Management	U of MN - Humphrey School of Public Affairs	Bonnie	Keeler	\$ 234,000
2015	04g	Using Hydroacoustics to Monitor Sediment in Minnesota Rivers	US Geological Survey	Jeffrey	Ziegeweid	\$ 455,000
2015	04h	Assessment of Irrigation Efficiencies in Benton County	Benton Soil and Water Conservation District	Gerry	Maciej	\$ 431,000
2015	06b	Emerald Ash Borer Ecological and Hydrological Impacts – Phase II	U of MN	Anthony	D'Amato	\$ 400,000
2015	06c	Biological Control of Canada Thistle	U of MN	Roger	Becker	\$ 300,000

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2015	06d	Preventing a New Disease of Pines in Minnesota	U of MN	Robert	Blanchette	\$ 371,000
2015	07a	Renewable and Sustainable Fertilizers Produced Locally	U of MN	Alon	McCormick	\$ 1,000,000
2016	03a	Data-Driven Pollinator Conservation Strategies	U of MN	Daniel	Cariveau	\$ 520,000
2016	03c1	Prairie Butterfly Conservation, Research, and Breeding - Phase II	Minnesota Zoo	Erik	Runquist	\$ 421,000
2016	03c2	Prairie Butterfly Conservation, Research, and Breeding - Phase II	MN DNR	Jessica	Petersen	\$ 329,000
2016	03f	Assessment Tool for Understanding Vegetation Growth Impacts on Groundwater Recharge	U of MN	Gene-Hua (Crystal)	Ng	\$ 212,000
2016	03j	Improving Brook Trout Stream Habitat through Beaver Management	Minnesota State University - Bemidji	Andrew	Hafs	\$ 225,000
2016	03l	Restoration of Elk to Northeastern Minnesota	U of MN	James	Forester	\$ 300,000
2016	03m	Game and Nongame Bird Pesticide Exposure	U of MN - Raptor Center	Julia	Ponder	\$ 349,000
2016	03n	Evaluating Insecticide Exposure Risk for Grassland Wildlife on Public Lands	MN DNR	Nicole	Davros	\$ 250,000
2016	03p	Evaluation of Tree Retention Guidelines Pertaining to Wildlife	U of MN - Duluth NRRI	Gerald	Niemi	\$ 232,000
2016	03q	Determine Impacts on Wildlife From Emerald Ash Borer Infection of Black Ash Forests	U of MN - Duluth NRRI	Gerald	Niemi	\$ 334,000
2016	04a	Tracking and Preventing Harmful Algal Blooms	Science Museum of Minnesota	Daniel	Engstrom	\$ 500,000
2016	04b	Assessing the Increasing Harmful Algal Blooms in Minnesota Lakes	U of MN - St. Anthony Falls Laboratory	Miki	Hondzo	\$ 270,000
2016	04d	Assessing Techniques for Eliminating Contaminants to Protect Native Fish and Mussels	St. Thomas University	Kristine	Wammer	\$ 287,000

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2016	04e	Assessing Neonicotinoid Insecticide Effects on Aquatic and Soil Communities	U of MN	William	Arnold	\$ 400,000
2016	04f	Bacterial Assessment of Groundwater Supplies Used for Drinking Water	U of MN	Raymond	Hozalski	\$ 299,000
2016	04h	Protection of State's Confined Drinking Water Aquifers - Phase II	US Geological Survey	Jared	Trost	\$ 433,000
2016	04i	Assessment of Surface Water Quality With Satellite Sensors	U of MN	Jacques	Finlay	\$ 345,000
2016	04j	Development of Innovative Sensor Technologies for Water Monitoring	U of MN	Tianhong	Cui	\$ 509,000
2016	04k	Wastewater Treatment Process Improvements	U of MN	Timothy	LaPara	\$ 398,000
2016	04l	Membrane-Based Process for Decentralized Drinking Water Production	U of MN	Santiago	Romero-Vargas Castrillón	\$ 199,000
2016	04n	Understanding Impacts of Salt Usage on Minnesota Lakes, Rivers, and Groundwater	U of MN	John	Gulliver	\$ 497,000
2016	04o	Microbes for Salt and Metal Removal	U of MN	Daniel	Bond	\$ 596,000
2016	04p	Engineered Biofilter for Sulfate and Metal Removal from Mine Waters	U of MN	Sebastian	Behrens	\$ 440,000
2016	04q	Developing Biosponge Technology for Removal of Nitrates from Minnesota Waters	U of MN	Lawrence	Wackett	\$ 198,000
2016	04u	Assessing Effectiveness of Wetland Restorations for Improved Water Quality	U of MN	Jacques	Finlay	\$ 420,000
2016	06b	Developing Membrane Filtration System to Treat Lake Superior Ballast Water	U of MN	Santiago	Romero-Vargas Castrillón	\$ 151,000
2016	06d	Biological Control of White Nose Syndrome in Bats - Phase II	U of MN	Christine	Salomon	\$ 452,000
2016	06f	Dutch Elm Disease Resistance - Phase II	U of MN	Robert	Blanchette	\$ 200,000

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2016	07b	Waste Heat Recovery with Efficient Thermoelectric Energy Generators	U of MN	Uwe	Kortshagen	\$ 400,000
2016	07c	Hydrogen Fuel from Wind-Produced Renewable Ammonia	U of MN - WCROC	William	Northrop	\$ 250,000
2016	07d	Utilization of Dairy Farm Wastewater for Sustainable Production	U of MN - WCROC	Bradley	Heins	\$ 475,000
2016	08b	Measuring Pollen and Seed Dispersal for Prairie Fragment Connectivity	U of MN	Lauren	Sullivan	\$ 556,000
2016	08c	Establishment of Permanent Habitat Strips Within Row Crops	Science Museum of Minnesota	Shawn	Schottler	\$ 179,000
2016	08e	Controlling Reed Canary Grass to Regenerate Floodplain Forest	Minnesota State Office of National Audubon Society	Luis	Ramirez	\$ 218,000
2017	04a	Assessment of Household Chemicals and Herbicides in Rivers and Lakes	U of MN	William	Arnold	\$ 236,000
2017	04g	Identification of Chemicals of Emerging Concern in Minnesota Fish	Grand Portage Band of Lake Superior Chippewa	Seth	Moore	\$ 400,000
2017	06d	Adapting Stream Barriers to Remove Common Carp	U of MN - MAISRC	Przemyslaw	Bajer	\$ 301,000
2017	08b	Promoting Conservation Biocontrol of Beneficial Insects	U of MN	Vera	Krischik	\$ 400,000
2018	03f	Develop a System to Assess Wildlife Health Threats in Minnesota	U of MN	Kimberly	VanderWaal	\$ 280,000