



Environment and Natural Resources Trust Fund

2027 Request for Proposal

General Information

Proposal ID: 2027-290

Proposal Title: Minnesota Comprehensive Environmental Education: From Immersion to Hands-on

Project Manager Information

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Project Basic Information

Project Summary: A four-component environmental education initiative combining an AI-powered immersive/interactive exhibition, BIPOC youth urban agriculture training, cultural environmental justice education, and a community digital platform for all Minnesotans.

ENRTF Funds Requested: \$6,668,000

Proposed Project Completion: June 30, 2030

LCCMR Funding Category: Education and Outdoor Recreation (C)

Project Location

What is the best scale for describing where your work will take place?

Statewide

What is the best scale to describe the area impacted by your work?

Statewide

When will the work impact occur?

During the Project and In the Future

Narrative

Describe the opportunity or problem your proposal seeks to address. Include any relevant background information.

Minnesota faces urgent and converging environmental challenges. The state's 10,842 lakes and 69,000 miles of rivers are under increasing pressure from zebra mussels now present in 378 lakes, agricultural runoff contributing over 70% of nitrate pollution, and PFAS contamination affecting more than 140,000 residents. Extreme precipitation events have increased two to three times since 2000. Wild rice, known as manoomin and sacred to Anishinaabe communities, is declining due to sulfate pollution. Moose populations have fallen 60% over two decades under climate stress.

Conventional environmental education, including print materials, static exhibits, and standard classroom instruction, has not produced the behavior change or civic engagement that Minnesota's natural resources need. BIPOC communities bear the greatest environmental burdens and carry deep traditional ecological knowledge, yet are systematically underserved by existing environmental education infrastructure. In the Twin Cities' most diverse neighborhoods, food apartheid and environmental disinvestment reinforce each other, leaving residents without access to the lakes, prairies, and forests that most environmental education assumes are familiar.

Indigenous water teachings, including White Earth Band of Ojibwe's 2018 Rights of Manoomin recognizing wild rice as a living being with legal rights, are rarely centered in mainstream environmental education. Our Initiative addresses the gaps.

What is your proposed solution to the problem or opportunity discussed above? Introduce us to the work you are seeking funding to do. You will be asked to expand on this proposed solution in Activities & Milestones.

Minnesota Environmental Education Collaborative" is grounded in a single organizing principle: humans are part of nature, not separate from it. This principle, shared across Anishinaabe/Dakota, Pan African/Asian philosophical traditions, shapes every component of the initiative.

The Collaborative delivers four integrated components, each one a different mode of engagement with the natural world:

Component1FEEL, is an eight-room AI-powered immersive exhibition at 19 Exchange Street East in St. Paul's rundown neighborhood. Built on 3D Wellness Endowment's existing infrastructure, the exhibition places 50,000 or more annual visitors inside Minnesota's waters, native species, soil systems, and Indigenous teachings. Technology serves here not as a barrier to nature but as a bridge into it.

Component2WORK, is Collaborative of urban gardens, with eight-week paid summer training at Frogtown Farm, serving 30 BIPOC youth, 200+ farmers annually in regenerative urban agriculture, soil health, and environmental career pathways.

Component3LEARN, is year-round environmental justice education through Project Sweetie Pie and the University of Minnesota, centering African American, Hmong food traditions, elder-to-youth knowledge transfer, heirloom seed preservation, and community-led climate advocacy.

Component4CONNECT, is SankofaPOWER - community-controlled digital platform connecting 300+ Twin Cities urban farms and gardens while preserving traditional ecological knowledge and building climate-resilient food sovereignty infrastructure.

What are the specific project outcomes as they relate to the public purpose of protection, conservation, preservation, and enhancement of the state's natural resources?

Our initiative protects and enhances Minnesota's natural resources by building the public knowledge, skills, and commitment to steward them. Over three years, outcomes include: 150,000+ residents reached with water and ecological literacy; more than 30+ BIPOC youth, 200+ farmers per year trained in regenerative agriculture with documented soil health gains of 1 to 2% organic matter annually and carbon sequestration of 2 to 3 tons of CO₂ per acre per year; 20+ heirloom seed varieties preserved; 300+ urban farms connected for climate-resilient food security; and Indigenous water knowledge, including Rights of Manoomin, formally recognized as co-equal in environmental education.

Activities and Milestones

Activity 1: Comp1: FEEL - Design, Build, and Open Eight-Room AI-Powered MN Immersive Environmental Education Exhibition in Saint Paul's 3D Wellness Hub

Activity Budget: \$3,953,000

Activity Description:

LCCMR Priorities: WaterB.3/B.4/B.6. EducationC.1/C.3/C.5/C.7. Fish&WildlifeD.1/D.4.

AMA as sub-recipient, it will design and build eight AI-powered immersive rooms at 19 Exchange Street East, replacing the 3D Wellness Endowment's existing 5D immersive projection infrastructure. The exhibition places visitors inside Minnesota's ecological systems using motion-responsive AI, live environmental data from MPCA water quality monitoring, MN DNR wildlife telemetry, and NOAA weather feeds, along with full sensory experience across eight rooms:

- Room1TheSource, immerses visitors in Minnesota's waters across all four seasons with live MPCA data displayed as visible atmospheric particles.
- Room2TheStorm, reconstructs real Minnesota flood events and then transforms into green infrastructure futures.
- Room3TheOrchid, presents Minnesota's 33 native orchid species and mycorrhizal networks.
- Room4TheWild, populates three Minnesota biomes with native wildlife governed by behavioral AI built from real Voyageurs Wolf Project and DNR moose telemetry data.
- Room5TheBeneath, presents 123 native fish species and aquatic habitat.
- Room6TheSoil, is an interactive soil health challenge.
- Room7TheMicroscope, addresses water quality, PFAS contamination, and agricultural runoff.
- Room8TheCircle, presents Dakota and Anishinaabe water teachings, the Rights of Manoomin, and a community stewardship Pledge Wall.

Low-Income/bus scholarship program removes access/transportation barriers for rural

Activity Milestones:

Description	Approximate Completion Date
Started Planning for ExhibitionRooms; Indigenous partnership agreements signed; Wild Rice room design with tribal authority	December 31, 2027
Exhibition AI/AR/VR design completed; Interactive functionalities/projection mappings installed and operational; Exhibition opens	July 31, 2029
Low-income/Bus-scholarship program launched; BIPOC community outreach; Rural school recruitment and scheduling field trips completed	December 31, 2029
Final mixed-methods evaluation report and research on immersive exhibition impacting behavior changes complete; Findings disseminated	June 30, 2030

Activity 2: Comp2: WORK: Paid hands-on training for farmer/youth in urban agriculture, soil health, green technology, and environmental entrepreneurship.

Activity Budget: \$750,000

Activity Description:

LCCMR Priorities: EducationC.3/C.4. LandF.1/F.2. WaterB.4.

Frogtown Farm will deliver urban agriculture trainings and three annual eight-week paid summer cohorts in summers 2027, 2028, and 2029, each serving 30 BIPOC youth ages 14 to 21. This is the hands-on WORK dimension of the Collaborative, where ecological knowledge from the exhibition meets real land and real practice.

Four learning tracks are offered. The first is Soil Health and Regenerative Agriculture, covering composting, cover cropping, no-till practices, and soil testing, directly extending Room 6 of the exhibition.

The second is Urban Food Production, growing culturally relevant crops for Hmong, East African, and African American communities, providing a practical response to food apartheid in the neighborhoods this Collaborative serves.

The third is Urban Agriculture as Climate Action, addressing carbon sequestration, stormwater management, and urban heat reduction in alignment with RFP priorities F.1 and B.4.

The fourth is Green Technology/Entrepreneurship, covering farm business planning, farmers using AI monitoring and record keeping tools, and career exploration in agriculture and environmental science.

Soil testing tracks organic matter increases of 1 to 2% annually and carbon sequestration of 2 to 3 tons of CO₂ per acre per year.

Activity Milestones:

Description	Approximate Completion Date
Internship Cohort 1 curriculum integrated; 30 youth recruited; training started; soil baseline data established	July 31, 2027
Internship Cohort 1 completes; 10,000 or more pounds of produce grown and distributed	September 30, 2027
At least 4 Farmer Training sessions complete; reached 100 farmers; Year 1 soil data documented	June 30, 2028
Cohorts 2 and 3 complete; Farmer Training offered; cumulative soil improvement and carbon sequestration documented	June 30, 2030
60% of participants continued involving in community gardens, environmental education study; or green technology enterprises	June 30, 2030

Activity 3: Comp3: LEARN - Year-Round Cultural Environmental Justice Education Through Cultural Crops/Heirloom Seeds Preservation, Elder Knowledge Transfer, and Climate Actions

Activity Budget: \$750,000

Activity Description:

LCCMR Priorities: EducationC.5/C.7. WaterB.6. LandF.2.

Project Sweetie Pie, UMN including Extension (4H/Master Gardeners), will deliver year-round environmental justice education across three years. This is the LEARN dimension of the Collaborative, grounding ecological knowledge in community history, cultural traditions, and lived experiences.

Four focus areas structure the program. First is Cultural Crops/Seed Preservation, featuring Black/Hmong heirloom seeds, traditional plant knowledge, and elder storytelling circles. The erasure of traditional food knowledge is itself a form of environmental harm, and this program names and reverses it.

Second is Environmental Justice Education, covering the history of Rondo neighborhood displacement by I-94 construction, community pollution mapping, and community-led environmental health research. Environmental justice here is a lived value, not just scientific category.

Third is Urban Agriculture as Climate Action, connecting land practices to carbon sequestration, stormwater management, agriculture system resilience policy, in conjunction with Immersive Exhibitions & Frogtown Farm.

Fourth is Community Wellness/Healing, offering therapeutic horticulture, intergenerational healing, and “Food is Medicine” rooted in traditional food sovereignty.

UMN provides curriculum development, soil science research, and climate adaptation training. Outputs include 500 participants annually in workshops and mobilization training, 30 elders engaged in knowledge transfer, 20 heirloom varieties

Activity Milestones:

Description	Approximate Completion Date
Elder honored and formed the Wisdom Circle, knowledge transfer program launched; heirloom seed inventory baseline	January 31, 2028
On-going educational opportunities, reached 500 participants; 8 or more heirloom seed varieties preserved	June 30, 2028
Successfully educated target #s; 20+ heirloom seed varieties preserved and documented across three years	June 30, 2030
Outcomes of Cultural Preservation and Environmental Justice Policy documented and publicly disseminated	June 30, 2030

Activity 4: Comp4: CONNECT - Community-Controlled Digital Platform - SankofaPOWER in Connecting Exhibition FEELING, Urban Farms WORKING, and Justice LEARNING for Resilience

Activity Budget: \$750,000

Activity Description:

LCCMR Priorities: WaterB.4. LandF.2. EducationC.7.

Led by the Center for Wellness Technology, SankofaPOWER is the Collaborative's community-owned mapping and knowledge platform — the connective layer uniting FEEL, LEARN, and WORK into a coordinated environmental education ecosystem across North Minneapolis and Frogtown/Rondo. Through a public map and knowledge interface, residents, youth, educators, growers, and partners can locate gardens, food sites, and neighborhood resources; contribute stories and local observations; and connect stewardship, training, and cultural knowledge to real-world action.

The platform's four modules include: (1) NorthStar Urban Digest — a real-time GIS map of gardens, food shelves, markets, and urban farms with community storytelling; (2) NorthStar Registry — a directory of community activists supporting food growing, distribution, and climate action with a resource-matching tool to circulate the surplus food; (3) NorthStar Trading — an enterprise hub for food businesses, co-owned market spaces, and community bartering; and (4) Community BEAM — an AI-powered archive preserving oral histories, cultural food practices, and traditional ecological knowledge.

SankofaPOWER directly supports LCCMR priorities by making environmental information visible and locally actionable in neighborhoods facing flooding risk, contaminated soils, and unequal green space conservation effort — advancing urban agriculture, soil health, climate resilience, and protection of native plants and pollinators.

Activity Milestones:

Description	Approximate Completion Date
Platform architecture finalized; community governance structure established; all four modules scoped	June 30, 2028
NorthStar Food Digest and Registry live with 5,000 residents onboarded	June 30, 2029
NorthStar Trading Post and Community BEAM archive operational; 300 farms connected	June 30, 2030
15,000 platform users; cultural knowledge archive publicly accessible, community-controlled SankofaPOWER digital platform is popular	June 30, 2030

Activity 5: Initiative Operational Support - Administration, Financial Management and Evaluation

Activity Budget: \$465,000

Activity Description:

The Minnesota Environmental Education Collaborative operates across four interconnected components — FEEL, WORK, LEARN, and CONNECT — requiring dedicated operational infrastructure to ensure coordinated, accountable, and equitable program delivery. This activity will be supported by MN350, as the administrative backbone that makes cross-component coordination possible: fiscal management, grant compliance, partner contracting, and shared reporting systems across all four lead organizations (Asian Media Access, Frogtown Farm, Project Sweetie Pie, and Center for Wellness Technology).

Financial management includes grant disbursement tracking, quarterly budget reconciliation, ENRTF compliance reporting, and audit preparation. Administrative support covers partner MOU management, subcontractor oversight, meeting coordination, and document management. Program evaluation spans all four components: shared outcome measurement framework, participant data collection, annual impact reports, and final ENRTF evaluation submission. Equity-centered evaluation practices — including community-defined success metrics and BIPOC researcher involvement — ensure findings reflect community priorities, not funder assumptions.

Activity Milestones:

Description	Approximate Completion Date
Operational Launch: contracts executed, shared financial management system live, baseline evaluation data collected across components.	October 31, 2027
Year1 Report: First annual ENRTF progress report submitted; financial audit complete; Year2 Workplan done.	September 30, 2028
Supporting Accessibility Grants: Cross-component outcome data synthesized; community report collected; program benefits documented	June 30, 2030
Final Report/Sustainability Plan: Complete ENRTF final evaluation submitted; peer-reviewed CBPR findings published; sustainability plans	June 30, 2030

Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Stephen Lu	3D Wellness Endowment	In-kind Facility & Tech. ~ \$8M in-kind: physical space, existing 5D immersive projection infrastructure and technical equipment at 19 Exchange St E., St. Paul Building	No
Ange Hwang	Asian Media Access (AMA)	Program Director and AMA serves as the Sub-Recipient / FEEL Lead - Immersive Exhibition design, AI tech, projection mapping, multilingual programming; 30+ yr track record; 5D Immersive Lab precedent at same site.	Yes
Vivekananda raman eeday	Center for Wellness Technology	Technology Partner CONNECT Lead - Technology integration support for the immersive Exhibition and SankofaPOWER Digital Platform with Wellness concepts	Yes
LANE BROWN	Central Area Neighborhood and Development Organization (CANDO)	Community Development agency - Neighborhood planning to support Urban Agricultural Development and SankofaPOWER digital platform integration	Yes
Minneapolis Healthy Living Initiative	City of Minneapolis — CPED & Public Health	Municipal Partner - fruit and veggie growing and consumption for Healthy Living, food ecosystem development, F&V voucher and produce prescription pilots	No
Climate Policy and Climate Action	City of St. Paul	Municipal Partner - Climate Actions, food ecosystem development	No
Dr. Douglas DJ Belton	Community BEAM and Abode R+D	Applied Researcher Strategy Advisor, designing and mobilizing evidence-based interventions that drive social, economic and environmental transformation through SankofaPOWER, as CONNECT Partner	Yes
Dr. Narayan P Dhakal	Diversity Intelligence in Climate Action, LLC.	Technical Assistance and Environmental Education Trainer - Ecological scholar investigating the relationship between human consciousness, biodiversity, and sustainable agriculture through urban farming, diversity knowledge systems, and environmental education	Yes
Lachelle Cunningham, Executive Director	Frogtown Farm	Sub-Recipient / WORK Lead - Urban agriculture site, youth training curriculum and hiring, soil health data, SankofaPOWER food registry contribution	Yes
Donnell Bratton	Frogtown/Rondo Black Church Alliance	Faith-based Partner - Community recruitment, supporting Pan African Environmental Education and community engagement, field trip coordination for MN Immersive Exhibition	Yes
Dr. Rodolfo Gutierrez	HACER (Hispanic Advocacy and Community Empowerment through Research)	Research and Evaluation Partner - Evaluation and Environmental Research Lead, culturally appropriate outreach supporting Latinx community field trips for MN Immersive Exhibition,	Yes
Climate and Resiliency	Hennepin County Public Health	Municipal Partner and TA Workshop Partner - Population-level climate actions, health equity coordination, environmental monitoring	No
Theresa “Tee” McClenty	MN350	Initiative Lead and Fiscal Manager - Administrative oversight, grant compliance, financial management, cross-Collaborative coordination; and community accountability	Yes
Nature Resource Data	MN Dept. of Nature Resource	Offering State Data Manager & Technical Assistance Partner - Species telemetry data, ecological content validation for the Immersive Exhibition, TA workshop partnership, ex. MN Orchid and Wild Rice Conservation	No
Elizabeth Pittman,	MN Prep Academy	School Partner at Urban Area - School field trip coordination and curriculum connection	Yes

Academic Director			
Joshua Lewis	Northside Green Zone Task Force	Environmental Education Network - 30+ community members and organizations supporting urban agriculture and food ecosystem data collection for SankofaPOWER	Yes
Dr. Cong Li	PathwaySMART	Subawardee - Agricultural and Wellness Technology (AI/AR/VR) Career pathways and workforce development integration	Yes
Michael Chaney	Project Sweetie Pie	Sub-Recipient/LEARN Lead - Cultural food preservation, environmental justice education, elder-youth knowledge transfer, heirloom seed preservation	Yes
Soil and Water Conservation District	Ramsey County	Municipal Partner and Technical Assistance (TA) Partner - TA support for the Immersive Exhibitions, and Rain garden and stormwater TA workshop partnership	No
Soil and Water Conservation District	Ramsey County SWCD	Municipal Partner and Technical Assistance (TA) Partner - TA support for the Immersive Exhibitions, and Rain garden and stormwater TA workshop partnership (June 2028)	No
Rob Hendrickson	Southside Green Zone Task Force	GIS Mapping partner with SankofaPOWER - supporting GIS mapping, urban agriculture and food ecosystem data collection for SankofaPOWER	Yes
Ms. Bailey Tangen	University of Minnesota Extension and 4H	Sub-Recipient / Research / LEARN Partner with soil/water conservations - Curriculum integration, soil science research, climate adaptation training, college student engagement	Yes
Dr. Randel Hanson	University of MN Master Gardeners	Research/Technical Assistance on Urban Agriculture and Climate Actions - Agricultural expertise and climate actions, sustainable agriculture training for Frogtown Farm curriculum	Yes
Dr. Sizie Brooks	Veritas Academy	School Partner at the Rural Area - School field trip coordination and curriculum connection	Yes
Anita Gates	Zintkala Luta (Dakota Tribe)	Indigenous Lead Partner/ Sub-Recipient - Immersive Room 8 tribal content co-development; Dakota nation cultural oversight; right of revision; coordinating the field trips and education of tribal wild rice technology	Yes
Dr. Jing Li	Ziran – https://ziran.ngo	Environmental Conservation and Education agency - Supporting community education and environmental engagement in heritage languages	Yes

Dissemination

Describe your plans for dissemination, presentation, documentation, or sharing of data, results, samples, physical collections, and other products and how they will follow ENRTF Acknowledgement Requirements and Guidelines.

I. Research Effort #1: Environmental Data Through Immersive Exhibition → Behavior Change

What you're actually studying: Whether translating live environmental data (MPCA water quality, DNR wildlife telemetry, NOAA precipitation) into fully embodied, sensory, AI-responsive experience produces measurable shifts in conservation knowledge, attitudes, and stated behavioral intent — especially in communities who have had little access to Minnesota's natural landscapes.

A. Participation and awareness of potential beneficiaries: The communities most likely to benefit from these findings are science museums, nature centers, tribal cultural centers, and school districts serving high concentrations of students of color — institutions that have struggled to reach underserved communities with conventional environmental education. Your dissemination should actively loop them in during the research, not just at the end. That means sharing interim findings with sub-awardee partners annually, and inviting NAAEE member organizations to observe the exhibition model before the final manuscript is complete.

B. Sharing results with resource managers: The most direct connection is to MPCA and MN DNR, whose live data already feeds the exhibition. When you show them that their water quality monitoring data — when made viscerally experiential rather than graphical — produces a measurable increase in visitor stewardship intent, that becomes an

argument for investing in public-facing data visualization infrastructure statewide. Annual briefings to MPCA environmental education staff and MN DNR's Division of Fish and Wildlife are the right vehicle.

C. Peer-reviewed dissemination: A manuscript targeting *Journal of Environmental Education* or *Environmental Education Research* documenting the mixed-methods evaluation: visitor pre/post surveys, Pledge Wall commitment data broken out by language and demographic group, educator follow-up at 3 months post-workshop. The novel contribution is the comparison across visitor subgroups — whether immersive technology closes the experiential gap for communities without easy access to Minnesota's bogs, northern lakes, and prairies.

D. Practitioner replication: A free practitioner toolkit for institutions wanting to replicate the model — room design principles, AI integration guidance, tribal partnership protocols from Room 5's collaboration with Dakota and Anishinaabe nations, multilingual programming approaches, and evaluation instruments. Distributed through NAAEE and MN DNR's environmental education network.

E. Longevity: Anonymized visitor datasets and evaluation instruments deposited in the UMN Digital Conservancy within 90 days of project close. This allows future researchers to run longitudinal follow-up studies on whether Pledge Wall commitments translated into actual behavior change — the question your project cannot answer within three years but future work can.

II. Research Effort 2: Urban Agriculture as Environmental Conservation Strategy

This effort generates three years of measured environmental outcomes data from regenerative urban agriculture practice at Frogtown Farm and Project Sweetie Pie: soil carbon sequestration, stormwater infiltration improvement, native biodiversity enhancement, and documentation of heirloom seed varieties representing crop genetic diversity from African American, Hmong, and East African food traditions. The research sits at an unoccupied intersection in the literature - cultural food sovereignty practice as a mechanism for producing quantifiable conservation outcomes - and has the potential to produce the evidence base that moves urban agriculture out of its current gray zone in ENRTF eligibility determinations. Findings will also directly inform the MN Climate Action Framework's urban resilience and carbon sequestration targets, which set policy goals that currently lack site-level empirical grounding of the kind this project will produce.

Pre-intervention baseline measurements will be collected at both sites before any Year 1 activity begins. All sampling points will be GPS-marked and held constant across all three project years. Where applicable, measurements will also be taken at matched control sites (conventional urban lots or park lawn in proximity to each farm), to document the difference that urban agriculture makes relative to baseline urban soil and biodiversity conditions. The full measurement methodology for in-ground urban agriculture sites and controls includes:

A. Soil Health: Total soil organic carbon will be measured using the combustion method at 0–6" and 6–12" depths annually. Samples will be fractionated into particulate organic matter (POM) and mineral-associated organic matter (MAOM) to distinguish recent organic inputs from longer-term stabilized carbon storage, a fractionation increasingly standard in soil health research that strengthens the sequestration argument beyond what total SOC alone can support. All soil samples will be analyzed by the UMN Soil Testing Lab using methods consistent with NRCS Soil Health Assessment protocols, in coordination with faculty from UMN.

Bulk density will be collected via intact cores at baseline and annually at fixed sampling points, providing the data needed to convert SOC percentage to tons of CO₂ equivalent per acre per year. Soil water retention curves will be generated from core samples using pressure plates at UMN, providing full characterization of how soil holds and

releases water and directly supporting both carbon storage and stormwater infiltration findings.

Potassium permanganate oxidizable carbon (POXC) will be measured in-season and at the end of each growing season as a rapid-response indicator of organic matter change, given that statistically significant shifts in total SOC may not be detectable within a three-year study window. Aggregate stability will be measured annually as an indicator of soil structure improvement attributable to no-till and cover cropping practices. Soil compaction will be assessed in two ways: bulk density cores and via penetrometer readings taken simultaneously with soil moisture measurements using a TDR sensor, which can be obtained from the UMN soil health lab. Compaction readings are only interpretable alongside moisture data and will be reported as paired measurements.

Soil respiration rate will be measured as a proxy for biological activity using CO₂ flux chambers, connecting the biological outcomes of composting, cover cropping, and reduced tillage to the carbon sequestration argument.

Carbon sequestration estimates in tons CO₂e per acre per year will be derived from SOC percentage and bulk density data. A scaling analysis in Year 3 will apply these site-level figures to the Minneapolis and St. Paul metro green space inventory to project what the carbon and stormwater contributions of regenerative urban agriculture would be at scale relative to MN Climate Action Framework targets. COMET-Planner cover crop and no-till practice coefficients will be used as a comparison benchmark for this scaling analysis, with transparent notation that rural practice coefficients are being applied to urban conditions as a conservative estimate.

B. Stormwater and hydrology: Infiltration rates will be measured using a Saturo tension infiltrometer, at both farm sites and control sites at year 1 and 3. Results will be reported in inches per hour and compared directly against local precipitation intensity data from NOAA and MSP airport weather station records, specifically against the 1-inch and 2-inch per hour storm events that drive urban flooding in Minneapolis and St. Paul. Where farm site infiltration rates exceed the intensity of these storm events, findings will be reported as direct evidence of stormwater management benefit in the language of MS4 permit obligations that both cities already operate under. Prior land use and impervious surface cover at each site will be documented at baseline to support a theoretical runoff reduction calculation.

C. Biodiversity: Native plant cover will be assessed annually at mid-season along fixed permanent transects using the Braun-Blanquet cover-class method, with the same observer used across years where possible. Pollinator abundance and diversity will be documented via timed 15-minute Pollard walk transects conducted three times per season (early, peak, and late) by trained community scientists using a standardized observation form. Soil macroinvertebrate diversity will be assessed annually in spring via earthworm counts and morphogroup sorts from standardized soil blocks (25cm x 25cm x 20cm) at both farm and control sites.

An annual community BioBlitz will be held at each farm site using iNaturalist, capturing plants, animals, fungi, and insects in a single georeferenced community science event. BioBlitz observations will be submitted to the iNaturalist Minnesota network and shared with MN DNR's Natural Heritage Information System, contributing to Minnesota's statewide biodiversity database. The BioBlitz model (developed and documented by the National Geographic BioBlitz program) will be recruited through farm community networks to maximize participation from African American, Hmong, and East African community members, engaging urban residents as active contributors to conservation science and building naturalist capacity in communities with limited prior access to that practice.

D. Research Dissemination.

1) Sharing with resource managers: Annual briefings to MN DNR urban land management staff and MDA sustainable agriculture staff, translating field data into policy-relevant language. Briefings will specifically connect project findings to existing state benchmarks and obligations, including MS4 stormwater permit requirements that Minneapolis and St. Paul already operate under, to demonstrate that regenerative urban agriculture at this scale produces outcomes measurable in the same terms that resource managers already use. The specific argument to make: urban agriculture at the

Frogtown Farm scale, if replicated across Minnesota's metro green space inventory, could contribute meaningfully to state carbon sequestration and stormwater management goals.

A co-authored manuscript targeting Urban Ecosystems or Journal of Sustainable Agriculture will document three years of measured outcomes across soil health, hydrology, biodiversity, and seed diversity domains. UMN faculty co-authors from the Department of Soil, Water, and Climate and the MN Agricultural Experiment Station will ensure findings enter Minnesota's long-term soil health and urban ecology research infrastructure. Manuscript submission is targeted for Year 3.

2) Longevity of collections: The heirloom seed archive is your most irreplaceable conservation product. You need a formal commitment from UMN or the Minnesota Historical Society to house the formal documentation, and Project Sweetie Pie maintains the living community collection. Without that institutional home committed in writing before the grant ends, this collection is at risk.

3) Peer-reviewed dissemination: A manuscript targeting Urban Ecosystems or Journal of Sustainable Agriculture documenting three years of measured environmental outcomes. The novel contribution is the intersection of cultural food practice and conservation ecology — this combination has almost no precedent in the literature, which makes it publishable and significant.

4) Land access and land tenure: Durable land access for urban growers is a prerequisite for achieving the MN Climate Action Framework's urban green infrastructure goals at scale, and it is a frequently under-documented outcome of urban agriculture projects serving communities of color. This project will track and report changes in land tenure, lease terms, and ownership status at both sites across the grant period, and will document any replication or expansion of regenerative practice at partner sites. Where project outcomes (demonstrated soil health improvement, stormwater management benefit, and biodiversity enhancement) contribute to securing longer-term or permanent land access for urban growers in Minneapolis and St. Paul's most environmentally underserved neighborhoods, those outcomes will be reported as conservation-relevant findings. Connecting land tenure equity to long-term stewardship capacity is central to the project's theory of change and to the policy argument that ENRTF investment in urban agriculture produces durable natural resource benefits.

5) Policy brief: A plain-language policy brief produced in Year 3 will make the explicit, evidence-based argument that urban agriculture qualifies as an eligible ENRTF investment category. The brief will map project findings across three domains (carbon sequestration, stormwater management, and biodiversity enhancement) directly onto Minnesota's constitutional mandate language and MN Climate Action Framework targets, and will address the MDA urban agriculture grant program as a vehicle for scaling the model beyond the ENRTF grant period. It will be directed to the Senate and House Environment and Natural Resources Finance and Policy committees in coordination with project partners with existing legislative relationships.

6) Data longevity: Anonymized environmental datasets, field sampling protocols, seed collection documentation, evaluation instruments, and iNaturalist BioBlitz observation records will be deposited in the UMN Digital Conservancy within 90 days of project close, enabling future longitudinal research and replication at additional urban agriculture sites statewide.

Long-Term Implementation and Funding

Describe how the results will be implemented and how any ongoing effort will be funded. If not already addressed as part of the project, how will findings, results, and products developed be implemented after project completion? If additional work is needed, how will this work be funded?

The 3D Wellness Endowment owns and permanently operates the immersive exhibition site at 19 Exchange Street East,

ensuring the immersive exhibition continues as a public resource after grant completion. Admission revenue, educator workshop fees, and school district partnerships sustain exhibition operations. Frogtown Farm's established infrastructure sustains youth training through produce sales, city contracts, and environmental foundation grants. Project Sweetie Pie and the University of Minnesota maintain programming through institutional budgets and environmental justice funding streams. SankofaPOWER sustains platform operations through municipal data partnerships and community membership revenue. Together, these funding streams extend the Collaborative's impact well beyond the grant period.

Project Manager and Organization Qualifications

Project Manager Name: Ange Hwang

Job Title: Project Director for "Minnesota Comprehensive Environmental Education" Collaborative

Provide description of the project manager's qualifications to manage the proposed project.

The Project Director, Ange Hwang (ED of Asian Media Access), brings three decades of direct, community-rooted experience at the intersection of environmental education, multicultural programming, and community-inspired technology — making her uniquely qualified to lead the "Minnesota Comprehensive Environmental Education" Collaborative.

Since 2013, Ange has worked in urban agriculture, developing hands-on, culturally grounded programming that connects BIPOC communities to soil, food sovereignty, and ecological stewardship. This long-term commitment directly informs both the Frogtown Farm Youth Training (WORK) and the SankofaPOWER digital platform (CONNECT). As lead designer of SankofaPOWER, Ange brings firsthand systems-design experience in community-owned digital infrastructure, participatory research, and environmental data governance — ensuring the platform remains accountable to BIPOC communities rather than extractive institutional models.

Most critically for the FEEL component, Ange has led multiple immersive exhibition projects — including Journey to the West and the Digital Forest initiative — that pioneered the blending of AI-responsive technology, cultural storytelling, and community wellness into transformative, embodied learning environments. These exhibitions demonstrated that immersive spaces can move visitors from passive observation into felt ecological relationship — precisely the animating principle behind the eight AI-powered rooms of the Minnesota Immersive Exhibition.

For the LEARN component, Ange led AMA's award-winning "Between the Water and Clouds" environmental justice dance drama, using place-based environmental education to guide audiences from water conservation awareness toward a healthy, sustainable way of living. Through culturally grounded performance and storytelling, she has effectively delivered environmental justice education across Pan Asian and Pan African senior communities. Five community listening sessions generated field-tested insights into linguistic and cultural barriers across Hmong, Laotian, Somali, Mandarin, and Cantonese-speaking communities. By bridging Confucian and Western frameworks of human-nature relationship and reframing environmental stewardship as community self-care, Ange brings the precise cross-cultural educational fluency that the LEARN component's elder-youth knowledge transfer and traditional ecological curriculum require.

Organization: MN350

Organization Description:

MN350 unites Minnesotans with the global movement to end pollution damaging our climate, speed the transition to clean energy, and create a just and healthy future for all — securing a safe climate through a just transition from an economy based on extraction to one that is sustainable and life-affirming, with benefits flowing first to marginalized communities bearing the worst effects of climate change. Our flagship program — Climate Justice and Food Systems Team work to accelerate the transition to a resilient, regenerative, and inclusive ecosystem, building capacity at the

intersection of climate, food access, air quality, and community health.

As the lead for the Minnesota Comprehensive Environmental Education Collaborative, MN350 brings this deep environmental justice infrastructure to support a coalition of transformative partners — including: 3D Wellness Endowment, Asian Media Access, Center for Wellness Technology, Diversity Intelligence in Climate Action LLC, Frogtown/Rondo Black Church Alliance, Frogtown Farm, Hispanic Advocacy and Community Engagement through Research (HACER), MN350, Project Sweetie Pie, Zintkala Luta, and the University of Minnesota (Extension, 4-H, and Master Gardeners) — united to deliver immersive environmental education, hands-on urban agriculture, and community-owned digital infrastructure to BIPOC communities across the State of MN

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	\$ Amount
Personnel								
MN350 Administration Director		1/2 Staff time to oversee the 4 components for 3 years' salary + 20% Fringe			20%	1.5		\$150,000
MN350 Financial Manager		1/2 Staff time to oversee the 4 components for 3 years' salary + 20% Fringe			20%	1.5		\$90,000
							Sub Total	\$240,000
Contracts and Services								
Asian Media Access	Subaward	Supporting Component 1 FEEL for developing/installing Interactive/Immersive ExhibitionRooms: 1) Staffing at \$320,000 for 3 years; 2) RM1: \$495,000; 3) RM2: \$514,000; 4) RM3: \$415,000; 5) RM4: 440,000; 6) RM5: \$446,000; 7) RM6: \$430,000; 8) RM7: \$345,000; 9) RM8: \$548,000				45		\$3,953,000
Frogtown Farm	Subaward	Supporting Component 2 WORK for 3 years on Urban Agriculture Hands-on Training				9		\$750,000
Project Sweetie Pie	Subaward	Supporting Component 3 LEARN for 3 years of cultural environmental justice education				9		\$750,000
Center for Wellness Technology	Subaward	Supporting Component 4 CONNECT for 3 years of a community digital platform for all Minnesotans, piloting at North Minneapolis and Frogtown neighborhoods				9		\$750,000
							Sub Total	\$6,203,000
Equipment, Tools, and Supplies								
							Sub Total	-
Capital Equipment								
							Sub Total	-

Acquisitions and Stewardship								
							Sub Total	-
Travel In Minnesota								
							Sub Total	-
Travel Outside Minnesota								
							Sub Total	-
Printing and Publication								
	Publication	Supporting the on-going Educational Materials and Multilingual Platform Guides & Community Outreach Materials in Hmong, Somali, Spanish, Ojibwe, English	Supporting Environmental Education efforts from July, 2027 - June 2030					\$30,000
							Sub Total	\$30,000
Other Expenses								
		Accessibility Grant	3 Years' Funding for school bus transportation, multilingual interpretation, and accessibility accommodations ensures BIPOC youth, elders, and rural students can fully participate in immersive environmental education, paid farm training, and community knowledge-sharing programs regardless of income or language.					\$150,000
		Liability Insurance	Supporting 3 years' overall initiative liability insurances					\$45,000
							Sub Total	\$195,000
							Grand Total	\$6,668,000

Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request
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Non ENRTF Funds

Category	Specific Source	Use	Status	Amount
State				
			State Sub Total	-
Non-State				
In-Kind	3D Wellness Endowment	Supporting in-kind facility donation for the Immersion Exhibitions around 30,000SF, at \$30/Per SF/per year	Secured	\$2,700,000
In-Kind	Frogtown Farm In-kind donation of Community Gardens for training purposes	Supporting 3 years of training usage	Secured	\$90,000
In-Kind	MN Comprehensive Environmental Education Collaborative	In-kind donation of their time and efforts to plan, design and support community outreach for the Initiative	Secured	\$60,000
In-Kind	Asian Media Access	LED Screens, Exhibition Projectors, Sensors, and Audio Equipment	Secured	\$3,000,000
			Non State Sub Total	\$5,850,000
			Funds Total	\$5,850,000

Total Project Cost: \$12,518,000

This amount accurately reflects total project cost?

Yes

Attachments

Required Attachments

Visual Component

File: [abf03389-c04.pdf](#)

Alternate Text for Visual Component

Visual Concepts for both: 1) Component 1: FEEL: For different Immersion/Interactive Room Designs, and 2) Component 4: CONNECT: Data Visualization how people can use the SankofaPOWER Digital Platform....

Financial Capacity

Title	File
MN350 In Good Standing Proof	2749db7c-319.pdf
MN350 FY24 990	ceb417eb-adb.pdf
MN350 FY24 Audited Report	9642f8b5-8ad.pdf

Board Resolution or Letter

Title	File
Authorization Letter	1724afe2-a93.pdf

Supplemental Attachments

Capital Project Questionnaire, Budget Supplements, Support Letter, Photos, Media, Other

Title	File
Support Letters from Partners	dc164ca8-0f0.pdf
Comp 4 CONNECT Partner - Center for Wellness Technology Media Coverage and Tech Staff Resume	5c421f8c-65f.pdf
Comp 3 LEARN Partner - Project Sweetie Pie Media Coverage and Education Staff Resume	8be802ed-799.pdf
Comp 2 WORK Partner - Frogtown Farm's Media Coverage and Training/Research Staff Resume	4f62d375-fe8.pdf
Comp1 FEELING Partner - -Asian Media Access' Media Coverage and Tech Staff Resume	82b9625f-77e.pdf
Past ENRTF Funding Analysis and How Our Initiative Expand Equity Lens	d5391cb4-3ff.pdf
Concepts Design for the 8 Immersion Exhibition Rooms	bb8024d2-b3d.pdf
Budget Supplement	3aeedab1-8d5.pdf

Administrative Use

Does your project include restoration or acquisition of land rights?

No

Do you understand that travel expenses are only approved if they follow the "Commissioner's Plan" promulgated by the Commissioner of Management of Budget or, for University of Minnesota projects, the University of Minnesota plan?

N/A

Does your project have potential for royalties, copyrights, patents, sale of products and assets, or revenue generation?

Yes

Do you understand and acknowledge IP and revenue-return and sharing requirements in 116P.10?

Yes

Do you wish to request reinvestment of any revenues into your project instead of returning revenue to the ENRTF? If so, describe here (1) the source and estimated amounts of any revenue and (2) how you propose to use those revenues:

Yes, 1. Revenue Sources and Estimated Annual Amounts:

Exhibition admission on a sliding-scale donation basis, with 10,000 or more annual visitors projected, is expected to generate approximately \$200,000 at the 3rd year. Educator and technical assistance workshop registration fees are estimated at approximately \$10,000 at the 3rd year. Frogtown Farm produce sales, farmers market participation, and a community-supported agriculture program are expected to generate approximately \$15,000 incomes per year. Total estimated revenue across the three-year project period is approximately \$255,000 for the 3 years.

2. Proposed Use of Reinvested Revenues:

All revenues will be reinvested directly into program delivery, community access, and long-term sustainability. Specific uses include: a bus scholarship program providing free or subsidized transportation for Title I schools, Greater Minnesota rural schools in the Iron Range, Red River Valley, and southeastern Minnesota, and tribal community groups; ongoing AI system maintenance and live data integration updates for MPCA water quality monitoring, DNR wildlife telemetry, and NOAA weather feeds powering all eight exhibition rooms; multilingual programming, translation, and interpretation services for Hmong, KaRen, Oromo, Spanish, Dakota, and Ojibwe-speaking visitors and participants; Indigenous partnership honoraria and tribal cultural review stipends supporting ongoing Dakota and Anishinaabe relationships, including tribal authority over Room 8 content; and youth stipends to expand capacity for Frogtown Farm's paid summer training cohorts. Reinvesting these revenues ensures that the Collaborative's environmental education mission continues serving Minnesota communities well beyond the ENRTF grant period.

Does your project include original, hypothesis-driven research?

Yes

Does the organization have a fiscal agent for this project?

No

Does your project include the pre-design, design, construction, or renovation of a building, trail, campground, or other fixed capital asset costing \$10,000 or more or large-scale stream or wetland restoration?

No

Do you propose using an appropriation from the Environment and Natural Resources Trust Fund to conduct a project that provides children's services (as defined in Minnesota Statutes section 299C.61 Subd.7 as "the provision of care, treatment, education, training, instruction, or recreation to children")?

Yes

Do you certify that background checks are performed for background check crimes, as defined in Minnesota Statutes, section 299C.61, Subd. 2, on all employees, contractors, and volunteers who have or may have access to a child to whom children's services are provided by your organization?

Yes

Provide the name(s) and organization(s) of additional individuals assisting in the completion of this proposal:

Tee McClenty, Executive of Director, MN350

Do you understand that a named service contract does not constitute a funder-designated subrecipient or approval of a sole-source contract? In other words, a service contract entity is only approved if it has been selected according to the contracting rules identified in state law and policy for organizations that receive ENRTF funds through direct

appropriations, or in the DNR's reimbursement manual for non-state organizations. These rules may include competitive bidding and prevailing wage requirements

N/A