Environment and Natural Resources Trust Fund
2019 Request for Proposals (RFP)

Project Title: **ENRTF ID: 026-A**

RRB Seamless Foundational Geospatial Data Initiative

Category: A. Foundational Natural Resource Data and Information

Sub-Category:

Total Project Budget: $ 559,860

Proposed Project Time Period for the Funding Requested: June 30, 2022 (3 yrs)

Summary:

Complete a seamless hydro-conditioned digital elevation model (h3DEM) to develop foundational geospatial data for the MN Red River Basin.

Name: Charles Fritz

Sponsoring Organization: International Water Institute

Title: Executive Director

Department:

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Location

Region: Northwest

County Name: Beltrami, Clearwater, Kittson, Marshall, Norman, Pennington, Polk, Red Lake

City / Township:

Alternate Text for Visual:

Sandhill River, Red Lake River, Middle River, Tamarac River, Snake River, and Two Rivers watersheds

_____ Funding Priorities	_____ Multiple Benefits	_____ Outcomes	_____ Knowledge Base
_____ Extent of Impact	_____ Innovation	_____ Scientific/Tech Basis	_____ Urgency
_____ Capacity Readiness	_____ Leverage	_____ TOTAL	_____%
____ If under $200,000, waive presentation?			

PROJECT TITLE: RRB Seamless Foundational Geospatial Data Initiative

I. PROJECT STATEMENT

The International Water Institute (IWI) will develop a seamless hydro-conditioned (h3DEM) digital elevation model (DEM) for the Red River Basin. LiDAR-derived DEMs require modification to accurately depict water movement across the earth's surface. h3DEMs are required to derive accurate foundational geospatial data that will serve numerous MN state agencies and greatly enhance natural resource decision-support applications for local resource managers/practitioners and private landowners to protect and manage MN resources.

The IWI is working to systematically develop a seamless h3DEM for the entire Red River of the North Basin (US and Canada), with an eye toward addressing natural resources and water quality issues. h3DEMs have been created for many MN watersheds and the IWI recently received $1.3 million to complete h3DEM hydro-conditioning and create data products for the North Dakota portion of the Red River Basin. The IWI is seeking funding to complete h3DEMs in the remaining MN Red River Basin watersheds (Sandhill River, Red Lake River, Middle River, Tamarac River, Snake River, and Two Rivers).

The h3DEM is critical to generate the highest quality geospatial data including hydro-enforcement burn lines and wall lines (including lakes >100 acres routing), flow paths (NXT-hydrography), flow direction, non-contributing areas, time of concentration grid, and flow accumulation grid. These geospatial data are used in variety of analytical GIS applications to explore and better understand landscape interactions at any scale. Applications include fine scale catchment delineation and decision support models such as Prioritize, Target, and Measure Application (PTMApp) and Hydrologic Simulation Program – FORTRAN (HSPF-SAMS) and the Agriculture Conservation Planning Framework (ACPF).

All geospatial data products developed from this effort will undergo a rigorous third party quality assurance process and be provided to the appropriate MN state agencies for public dissemination.

II. PROJECT ACTIVITIES AND OUTCOMES

Activity 1: Hydrologic conditioning – Several iterations are generally needed to achieve the h3DEM (https://ptmapp.bwsr.state.mn.us/files/DEM-Hydrologic-conditioning-Steps-FINAL.pdf)

ENRTF BUDGET: $559,838

Outcome	Completion Date
1. Attributed Burn Line – Hydro-enforcement data	*July, 2020*
2. h3DEM in remaining Red River Basin watersheds	*October, 2020*
3. 3rd Party Quality Assurance Review	*December, 2020*

Activity 2: Develop seamless foundational natural resources data for the MN portion of the Red River Basin cluding flow paths to develop NXG-Hydro, 2 and 10 year event non-contributing areas, time of concentration and flow accumulation raster data.

ENRTF BUDGET: $59,098

Outcome	Completion Date
1. Derive foundational datasets (e.g. NXT-hydrography, non-contributing areas, time of concentration, flow accumulation, etc.)	*March, 2021*

2.third Party Quality Assurance review	*June, 2021*

Activity 3: Data dissemination. Data will be provided to the MN Geospatial Information Office and the MN Boar of Soil and Water's PTMApp website.

ENRTF BUDGET: $10,000

Outcome	Completion Date
1. create foundational dataset/geodatabase to partners/state agencies	*July, 2021*
2.Distribute to partners/state agencies	*July, 2021*

III. PROJECT PARTNERS:

A. Partners receiving ENRTF funding

Name	Title	Affiliation	Role
Mark Deutschman	Engineer	Houston Engineering Inc.	3rd Party QA

B. Partners NOT receiving ENRTF funding

Name	Title	Affiliation	Role
Rob Sipp	Executive Director	RRWMB	Local funder
Matt Drewitz	Measures/Outcomes Coor	MN BWSR	Advisor/Data Recipient
SeanVaugn	GIS Hydrologist	MN IT	Adisor/Data Recipient
Peter Mead	Manager	TSA 1	Advisor/Data Recipient

IV. LONG-TERM- IMPLEMENTATION AND FUNDING: These geospatial data will result in a seamless foundational natural resource dataset for the entire Minnesota portion of the Red River of the North Basin. Upon completion of this project, there should be no additional funding needs with the exception of annual costs necessary to maintain and disseminate this information as part of MN GEO and MN BWSR's normal work flow.

V. TIME LINE REQUIREMENTS: The h3DEM is expected to take 18 months. Processing of derived foundational geospatial data will require approximately 6 months, followed by 3 months for third party data review and additional processing to address issues (if any) and reprocess data. Delivering data and disseminating online through MNGEO and MNBWSR is expected to take 2 months

VI. SEE ADDITIONAL PROPOSAL COMPONENTS:

A. Proposal Budget Spreadsheet
B. Visual Component or Map
C. Parcel List Spreadsheet
D. Acquisition, Easements, and Restoration Requirements
E. Research Addendum (not required at proposal stage)
F. Project Manager Qualifications and Organization Description
G. Letter or Resolution
H. Certified Audit or 990 Tax Information

2019 Proposal Budget Spreadsheet

Project Title: Red River of the North Seamless Foundational Geospatial Data Initiative

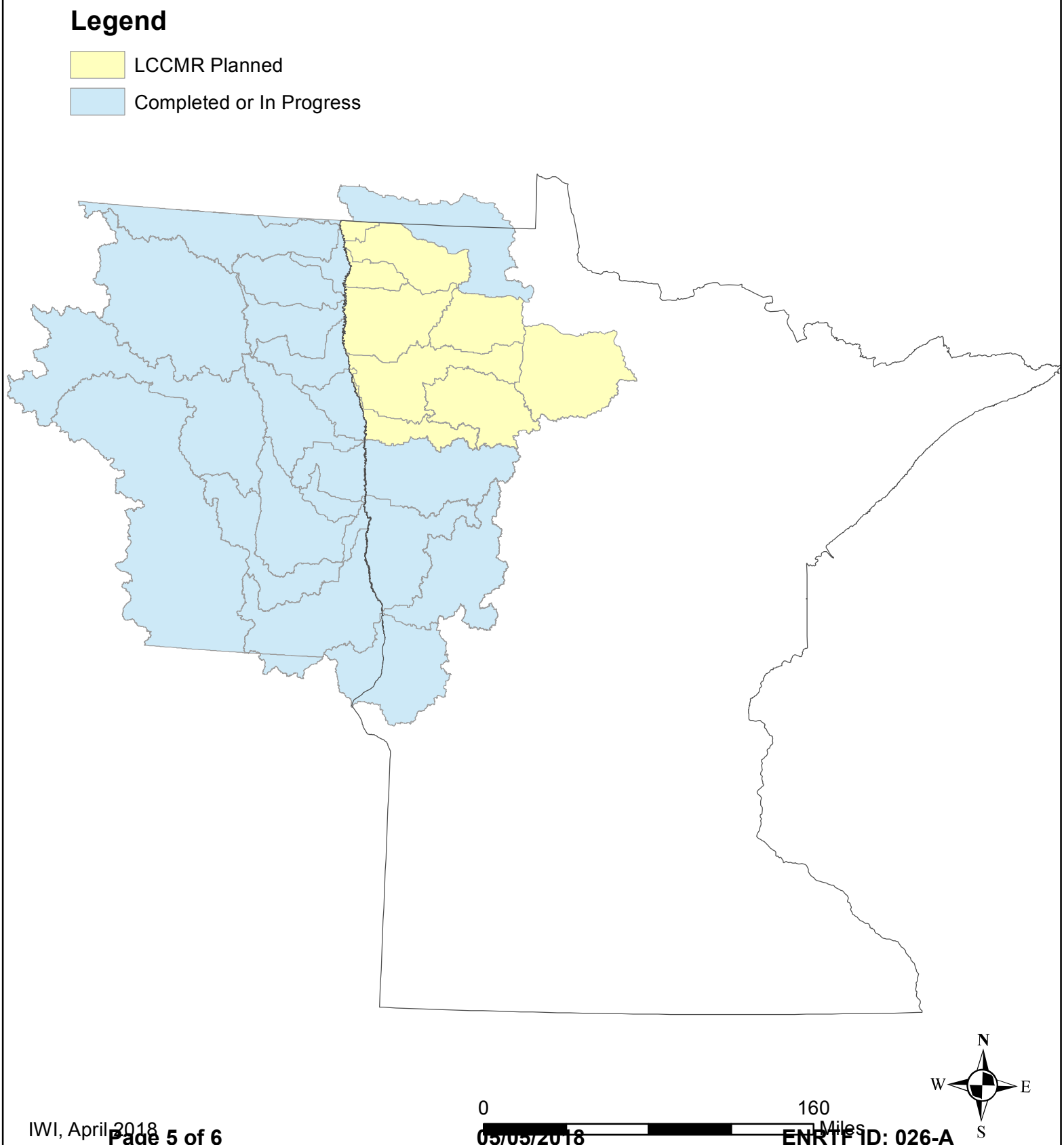
IV. TOTAL ENRTF REQUEST BUDGET: 2

BUDGET ITEM (See "Guidance on Allowable Expenses")	**AMOUNT**
Personnel: Executive Director (1FTE @ 10% 26% fringe). Activity 1 and 3	$ 20,000
Personnel: GIS Project Manager (1FTE @ 100%, 26% fringe). Activity 1, 2, and 3	$ 150,000
Personnel: GIS Technician (3FTE @ 100%, 26% fringe) Activity, 1 and 2.	$ 210,000
Personnel: GIS and Monitoring Specialist (1FTE @ 50%, 26% fringe). Activity 1 and 3	$ 57,000
Personnel: GIS Interns (hourly). 16% Fringe. 3120 hours @ 15/hour (16% fringe)	$ 93,600
Professional/Technical/Service Contracts: Houston Engineeering Inc. (Maple Grove, MN) 3rd Party Qauality Assurance of h3DEM burnlines, and derived foundational datasets	$ 45,460
Equipment/Tools/Supplies: laptop (1 @ $2,500), external hard drives (2 @ $200), Arg GIS lisences (5 @ $100/annual)	$ 3,800
Acquisition (Fee Title or Permanent Easements):	$ -
Travel:	$ -
Additional Budget Items:	$ -
TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND $ REQUEST =	$ 559,860

V. OTHER FUNDS *(This entire section must be filled out. Do not delete rows. Indicate "N/A" if row is not applicable.)*

SOURCE OF FUNDS	**AMOUNT**	**Status**
Other Non-State $ To Be Applied To Project During Project Period: Red River Watershed Management Board cost share	$ 69,076	To be Determined - In Progress
Other State $ To Be Applied To Project During Project Period:		
In-kind Services To Be Applied To Project During Project Period:	$ -	
Past and Current ENRTF Appropriation: Roseau River Lake Bed PTMApp (Swift: 0114999)	$65,000	Ongoing - Est. Compl. June 2018
Other Funding History: PTMApp: Water Quality Decision Support Application/Prioritize, Target, and Measure Application - PTMApp: BWSR/CWF P15-1138, C14-8916, C14-7617	$ 457,940	*Completed*

Conditiong Status RRB and James River



PROJECT MANAGER QUALIFICATIONS / ORGANIZATION DESCRIPTION

www.internationalwaterinstitute.org

Charles Fritz has been Executive Director of the International Water Institute since 2000 he holds a Master's of Science Degree in Natural Resources Management and a Bachelor's Degree in Science and Mathematics from North Dakota State University. Fritz has been principal investigator or project lead for a variety of large (>$5 million) and small scale projects and program as the IWI Executive Director. Project management experience includes National Science Foundation, Understanding the Science Connected to Technology, River Watch, Red River Basin Mapping Initiative, Watershed Pollutant Load Monitoring, and Basin Science and Technical Advisory Committee,

The international Water Institute (IWI) was formed after the 1997 Red River of the North flood as a public 501(c)(3) organization that facilitates research, public education, training, and information dissemination relating to flood damage and water resource protection and enhancement. The IWI is managed by board of directors that includes members from Manitoba, Minnesota and North Dakota.

The IWI has been working to develop decision support tools for Minnesota watershed districts, and soil and water conservation districts since completion of the Red River Basin Mapping Initiative in 2009. The IWI has a long history and applied experience with terrain analysis to better understand spatial relationships and landscape interactions. The IWI has been hydro-conditioning LiDAR derived DEMs since 2005 and has pioneered terrain analysis of geospatial dataset to facilitate natural resource management and protection. Most recently, the IWI worked with the MN Board of Water and Soil Resources, and Houston Engineering Inc. to develop the Prioritize, Target, and Measure Application. (PTMApp). PTMApp builds on general strategy types in local water plans by identifying implementable on-the-ground Best Management and Conservation Practices. PTMApp can be used in real-time by Soil and Water Conservation Districts (SWCDs), Watershed Districts, county local water planning, agency staff and decision-makers to:

- **Prioritize** resources and issues impacting them.
- **Target** specific fields to place CPs and BMPs.
- **Measure** water quality improvement by tracking expected nutrient and sediment load reduction to priority resources.
- Create reports documenting the prioritization, targeting, and measuring process.
- Establish tailored CPs and BMPs implementation scenarios for funding by the Board of Water and Soil Resources and other agencies.