Agricultural Carbon Capture in Western North Dakota

Submitted by:

ND Natural Resources Trust (NDNRT)

Principal Investigator: Dr. Rebecca Phillips

- **Total Funding Request - $500,000**

  Total Project Costs - $1,051,000

  Project Duration: 2 years

Project Description

The overall objective of this proposed project is to quantify how agricultural (biological carbon) C capture in managed grazing lands could serve to reduce the footprint of oil and gas exploration in western North Dakota. Three subobjectives for meeting this goal are: 1) scientifically collect, process and analyze high frequency atmospheric C data and environmental covariates (precipitation, soil and air temperature, soil moisture, net radiation) using state-of-the-art micrometeorological instruments and associated sensors at grazed and ungrazed pastures; 2) report how rotational, managed grazing influences rates of biological C utilization (using net C uptake data) and C sequestration (using net C uptake and export data); 3) frame results as a prototype to illustrate how North Dakota grazing lands can be managed to improve C utilization and sequestration for the benefit of agricultural and energy industries and rural economies. These goals require measurement of net C uptake and exports as forage in grazing animals. The final report will provide guidance materials for land managers and investors interested in optimizing biological utilization and sequestration of C. Guidance will show how asynchronous grazing influences plant production, diversity, and rates of C sequestration in grazed and ungrazed grasslands. This proposal represents an initial set up and data collection phase, covering two years of work. We anticipate additional years of data and economic impacts over subsequent years, in Phases II and III.

TECHNICAL REVIEWERS' RATING SUMMARY

		Technical Reviewer			
Statement	**Weighting Factor**	**G-56-01A**	**G-56-01B**	**G-56-01C**	**Average Weighted Score**
Objectives	**9**	4	3	4	33
Achievability	**7**	4	1	4	21
Methodology	**8**	5	3	4	32
Contribution	**8**	4	2	4	26
Awareness / Background	**5**	4	3	5	20
Project Management	**3**	4	3	4	11
Equipment / Facilities	**2**	4	3	5	8
Value / Industry-Budget	**4**	4	2	5	14
Financial Match – Budget	**4**	4	2	4	13
Average Weighted Score		208	120	211	179
Maximum Weighted Score				**250 possible points**	

Technical Reviewer Totals

- G-56-01A

Average Weighted Score: **208 out of 250**

FUND

- G-56-01B

Average Weighted Score: **120 out of 250**

DO NOT FUND

- G-56-01C

Average Weighted Score: **211 out of 250**

FUND

Technical Reviewer Comments

Reviewer G-56-01A

This project will provide critical North Dakota ecosystem-specific data that ultimately could be used to store significant amounts of carbon and may provide an additional source of income to our agricultural community. The goals are very supportive of the Governor's Carbon objectives. The teamwork and support of the OGRC to the agricultural community is a superb example of the NDIC's commitment to our two most important industries, energy and agriculture. The energy-agriculture nexus is fertile ground for research and will provide a strong foundation for a prosperous and sustainable future.

Although similar studies have been achieved in other ecosystems, the ability to develop ecosystem-specific data for North Dakota's grassland habitats will be a significant contribution to our understanding of carbon flux in this every significant part of North Dakota's agricultural industry.

Recommendation: FUND

Technical Reviewer Comments

Reviewer G-56-01B

There is on-going research with Eddy Flux systems in ND already i.e. Mandan ARS. It seems it would be better to piggyback with them. There has been other research done on different grazing practices in western ND related to C sequestration by Doctor Manske, Dickinson Research Center. I believe the Oil and Gas Research Council should be very cautious on picking a project that they would like to support in this field, if any, as there are multiple projects and studies going on both on the academia side and private sector. AI technology and satellite imagery are moving fast in this space. Industry participation seems lacking. I know the oil and gas industry is partnering with many projects in this space already. Other than Petroleum Council in kind for education purposes in this project industry participation seems inadequate. While I agree the upper Great Plains has the potential to be the biggest carbon sink in North America or the world for that matter and could be a great benefit to the AG and Oil and Gas industry, I would vet many different projects before I would really decide “who what where” to provide financial support.

Recommendation: Do Not Fund

Reviewer G-56-01C

Good project with potential for widespread impacts. Recommend some expansion of scope, including "do nothing" alternative and verification of dissolved C assumption. Also, additional model verification /comparison.

Recommendation: Fund

Director's Recommendation:

The applicant will provide responses to the technical reviewers' comments and give a presentation at the Council meeting –
Funding to be Considered.