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An Economic Analysis and Assessment of Impacts of Conservation Practices on Agro-Environmental Conditions in the Lower Bad River Basin of South Dakota

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Abstract

In this poster, we report selected socio-economic findings from analysis of the Bad River Water Quality project (BRWQ) implemented in western South Dakota from 1990 through 2004. The BRWQ project involved nearly \$13 million of funding for environmental assessment and implementation of conservation practices on farms and ranches. This research work is a component of a CEAP (Conservation Effects Assessment Project) grant funded by USDA / CSREES, which involves a multi-disciplinary research team and multi-agency efforts to estimate environmental and economic benefits of conservation practices adopted by private landowners. An overview of various BRWQ project phases are presented, along with analysis of the cost of conservation practices applied and local landowners current assessment of the practices implemented from 1990 – 2004.

Problem Statement

The Bad River (BR) watershed is located in west central South Dakota (SD) and drains into the Missouri River at Ft. Pierre. The lower 1/3 of the BR watershed discharges 2.17 million tons out of 3.25 million tons annual discharge sediment to Lake Sharpe (Thelen, 2004).

A reduction of flow rates affect power generation and cause more negative economic impacts. The turbidity caused by sediment has a negative impact on sport fishing, recreation, and tourism. The sport fishery in this reach of the Missouri River contributes about \$2.5 million annually to Pierre's economy, but only when it is not impaired by turbidity from the Bad River. When the Bad River is flowing, the value essentially goes to zero (USDA-NRCS-USFS, 1998).

Objectives

1. To present an overview on various phases of bad river water quality project (BRWQ)
2. To estimate the private landowner costs and governmental (public) costs of adopting a broad set of conservation practices
3. To assess those factors that most influence the landowner decision to implement conservation practices on their farm and ranch.

Overview of Bad River Project

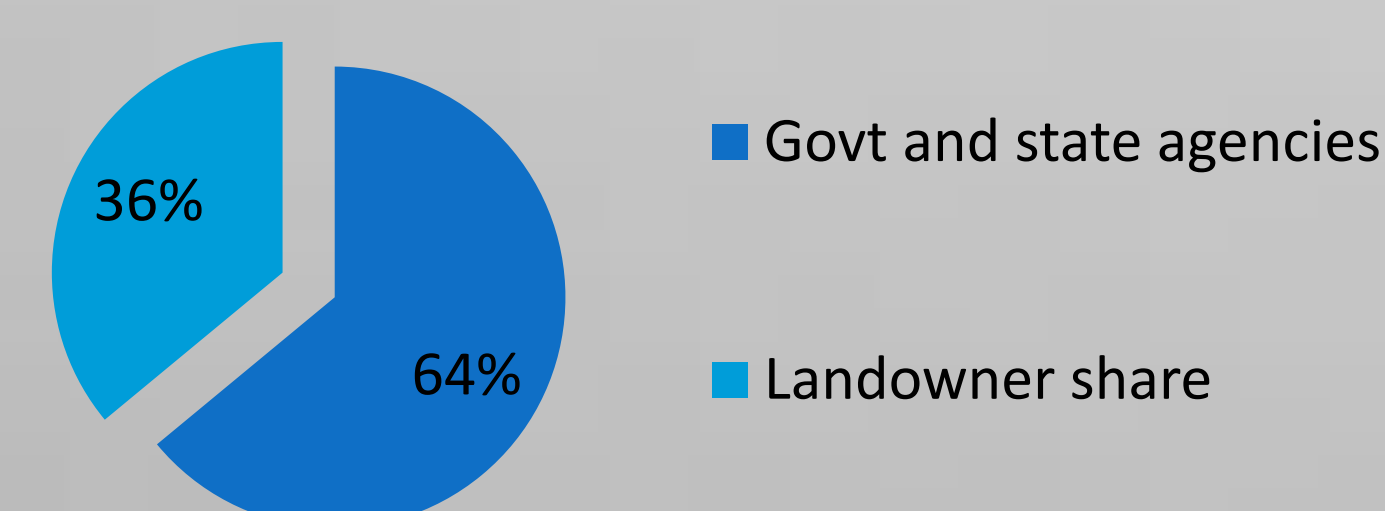
Table 1.1 Various Phases of Bad River Project

Study	Completion Date	Activities/Conclusion
Phase I and IB	1990	Badlands soils are not a major sediment source. Cropland is not a major sediment source.
Lower Bad River-Basin Study	March 1994	72 percent of sediment is from the lower third of the drainage area.
Phase II	September 1995	Identified cost-effective land treatment practices.
Phase III	September 1999	Initiated best management practices (BMP) implementation in the lower basin.
Demonstration Project 319	February 2000	Developed project and local ownership in the upper basin.
Monitoring	2008	Sediment monitored for paired watersheds.

Table 1.2 Average Cost Share Contribution of Different Conservation Practices (In US \$)

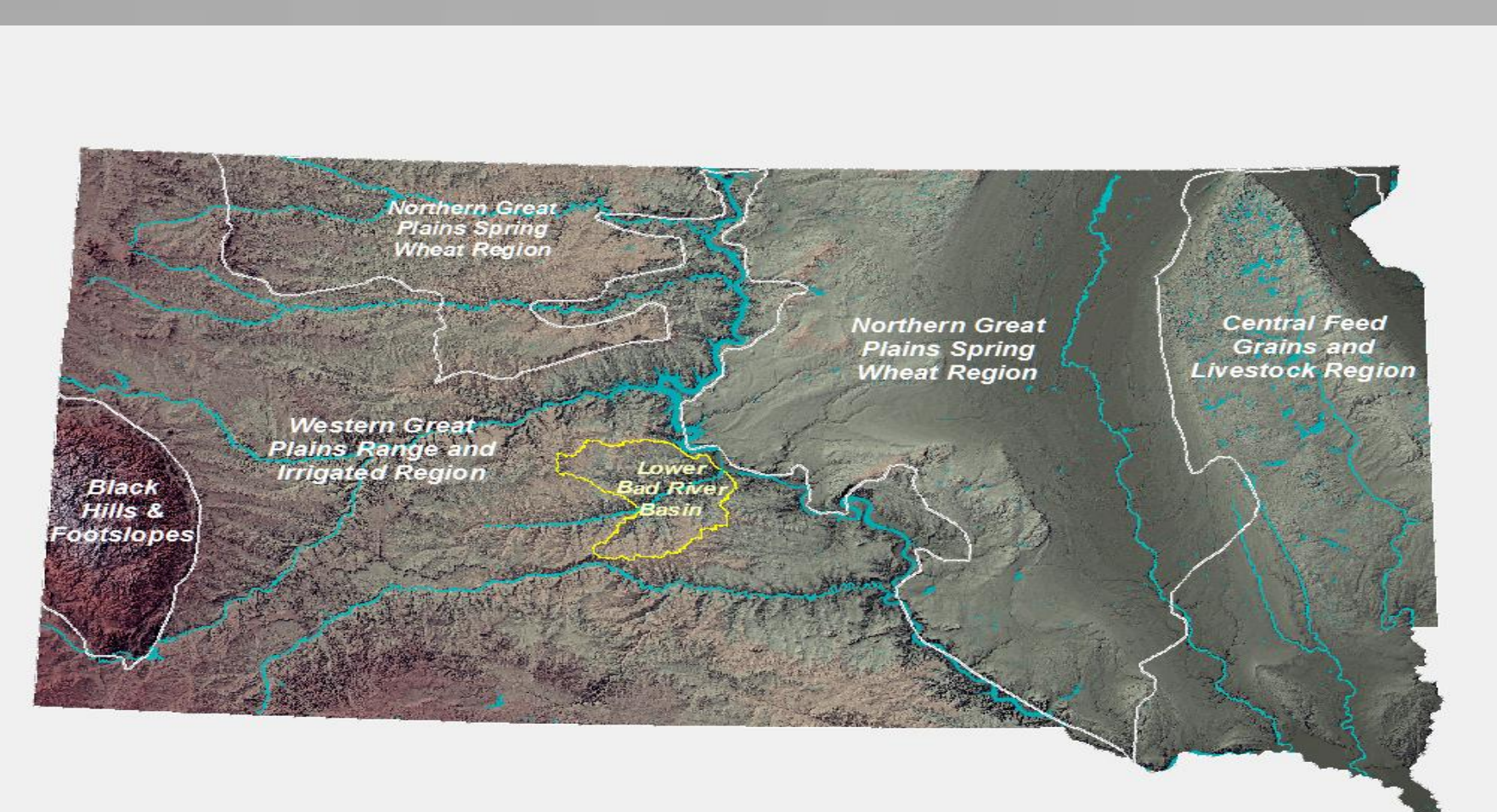
Name of Practices adopted	No. of Operators	Landowner Cost-Share	Govt Cash Cost	Landowner Other Cost	Total All Cost (1995-98)	Total All Cost 1999
Deferred grazing	19	0	120,795	105,538	226,333	102,000
Wells	12	72,832	136,007	2215	211,054	23,000
Dams & Dam repair	-	70,859	282,289	38,890	392,038	120,000
Pipelines	22	156,081	197,833	3981	357,895	30,000
Ponds	-	15,216	61,100	2100	78,426	0
Livestock wind structures	15	16,502	49,844	4387	70,668	28,000
Riparian fencing	9	10,693	42,708	4570	57,971	55,000
Tanks	21	1,242	5,965	708	7,915	0
Other practices	-	29,000	110,000	20000	147,000	9000
Total	67	383542	1051532	190912	1625986	367,000

Figure 1.1 Average cost share contribution of conservation practices



Key Findings

- I. Based on Table 1.2 data, federal and state agencies provide an average of 64% cost share for practices adopted while 67 land owners/operators provided 36% of all direct costs, during the 1995 – 1998 period.
- II. Funding for conservation practices adopted over the entire project life was \$5.4 million with government cost sharing payments of \$3.5 million to landowners.
- III. The remaining portion of the \$13 million total includes project administration costs, initial research to estimate baseline conditions in the Bad River basin, and other costs.



Landowner / Producer Survey Results , March 2011

A survey of landowners and producers located in the Bad River basin, including BRWQ project participants, was conducted in March, 2011 to obtain current assessment data. Initial key findings from 102 respondents, including 64 current producers, are:

Three fourths of the respondents agreed with the fact that soil erosion is a problem in the Bad River basin and 57% indicated that soil erosion can be controlled in this basin.

Nearly three-fifths of respondents are "somewhat concerned" or "very concerned" about sediment both in the Bad River and upper Lake Sharpe.

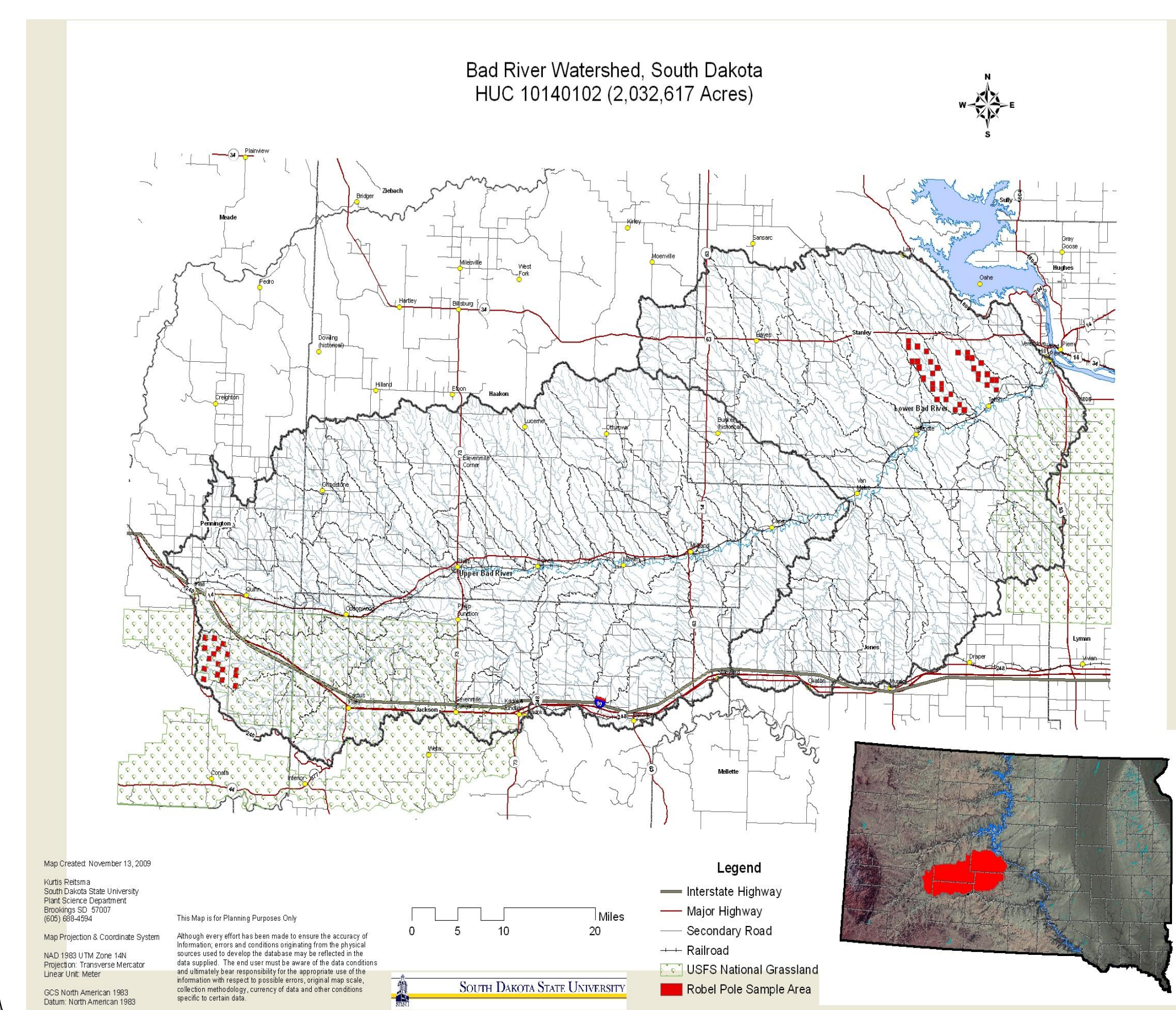
Respondent perception of best way to address the sediment issue in upper Lake Sharpe: implement soil erosion control practices on uplands (45%), reduce sediment delivery by installing catch basins (27%), or remove sediment by dredging (20%).

Nearly 90% of producers implemented land management practices to reduce soil erosion or improve in water quality at their farm or ranch over the last 15 years.

Most influential factor to implement added management or conservation practice is an improvement of environmental sustainability, followed by added profits. Cost share and costs to implement practice are ranked as 3rd and 4th respectively, while tax credits are considered as least influential compared to these other factors.

Fifty-five percent of respondent producers preferred cost share ahead of tax credits (only 27% supported) and loans (only 12% support) as an incentive to implement financially advantageous practices on their farm.

Stanley and Jones county conservation announcement played a pivotal role to inform the landowners regarding the BRWQ project.



Conclusion

This evaluation of conservation practices in the Lower Bad River watershed is fairly unique in its focus on using historical project data, current producer / landowner assessment data, and environmental indicator data for project assessment purposes. The finding from survey response should provide material for good discussion on local landowners' assessment on that project. Our research findings should provide useful information to ranchers, farmers, landowners and other local / regional stakeholders on appropriate conservation practices to help meet agro-economic and environmental goals in South Dakota and the Northern Great Plains.

References

- I. Thelen, Jerry. 1995-2004. Bad River Phase III Water Quality Project Final Report.
- II. United States Department of Agriculture, Soil Conservation Service, 1994. Lower Bad River-River Basin Study Final Report
- III. Survey questionnaire (Bad River producers / landowners), February 2011, South Dakota State University.

Acknowledgement

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