

**SECTION 319  
NONPOINT SOURCE POLLUTION  
CONTROL PROGRAM**

**INFORMATION/EDUCATION/TRAINING/DEMONSTRATION PROJECT**

**FINAL REPORT**

**319 Information and Education Project Segment 4**

By

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This project was conducted in cooperation with the State of South Dakota and the United States Environmental Protection Agency, Region 8.

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## Executive Summary

Project Title: 319 Information and Education Project Segment 4

Project Start Date: May 27, 2014

Project Completion Date: July 31, 2017

### FUNDING

#### Total Budget

Total EPA Grant	\$336,700.00
Total Expenditure of EPA Funds	\$302,761.00
Total Section 319 Match Accrued	\$307,818.56
Budget Revisions	\$0.00

Total Expenditures \$610,579.56

### SUMMARY ACCOMPLISHMENTS

The 319 Information and Education Project successfully promoted and facilitated public understanding of watersheds and related issues through the continued implementation of a comprehensive, coordinated statewide effort. The Project achieved 105% of its milestones. In doing so, the project approved 11 projects through mini-grants, continued support of the volunteer monitoring program, supported 18 water festivals, and reached over 325 educators.

The 319 Information and Education Project continues to be a valuable part of the strategy to protect watersheds. The partnership of federal, state, and non-profit organizations leverages the strength of each to deliver a project that is effective and useful for the citizens of South Dakota.

## 1.0 Introduction

The South Dakota 319 Information and Education Project (I&E Project) began in 2004. Prior to the project, watershed protection outreach and education were coordinated by the South Dakota Department of Environment and Natural Resources Water Resources Assistance Program. However, staff changes within the department in 2003 required a new method of delivering outreach and education. The South Dakota Department of Environment and Natural Resources partnered with the South Dakota Discovery Center, outsourcing much of the day to day delivery and oversight of outreach and education save for some watershed project coordinator training and web activities. This partnership is described more in depth in the *South Dakota Nonpoint Source Management Plan, 2014*. (<http://denr.sd.gov/dfta/wp/documents/NPSMgmtPlan14.pdf>)

The information and education project that resulted from this partnership has had three previous segments, 2004-2007, 2007-2010, and 2010-2014 reaching South Dakotans statewide with the message about watershed protection and preventing nonpoint source pollution. These topics are particularly important in South Dakota as nonpoint source pollution is a primary contributor to water pollution with sedimentation, algae and bacteria being the pollutants of concern. (South Dakota Department of Environment and Natural Resources, *2016 South Dakota Integrated Report*).

The first three segments of the I&E Project met or exceeded almost all their milestones and objectives. The fourth segment does the same. As with previous projects, the fourth segment was statewide in scope. The broad geographic focus was to ensure that all South Dakotans were being reached with the important message of watershed protection. Under the current structuring of 319 projects, South Dakotans who live in impaired watersheds where there is an active improvement project are reached with watershed specific information and education. That leaves a vast number of unreached and formerly reached citizens who are not receiving any information about watershed protection. Since watershed protection requires continual and repeated practices by a wide array of stakeholders, a statewide project was deemed necessary to support current, past and future watershed improvement projects.

The I&E Project used a variety of practices to reach different audiences. The adult audience was reached through a volunteer monitoring program, workshops, and outreach conducted at the local or regional level by groups availing themselves of mini-grant funds provided by the I&E Project. The youth audience was reached by training educators in various watershed education curricula, water festivals, and youth and student outreach events.

## 2.0 Project Goals, Objectives and Activities

The goal of the South Dakota 319 Information and Education Project is to **use information and education to foster citizen support for and participation in activities which maintain and restore water quality and watersheds.**

Information is used to refer to outreach that is fact based and is targeted towards adults and the broader community. The delivery methods can be broad-- media, publications--or focused, as in a workshop. Education projects are also fact based but include the development of critical thinking skills. Education project are targeted towards students (pre-kindergarten through college) and youth. The delivery methods can be direct to students (Water Festivals), or indirect as through the agency of a trained teacher or youth program leader.

This is a big, audacious goal. Like all big goals, it needs smaller steps in order be realized. The Project staff identified intermediary outcomes, objectives, tasks and products that, if attained, would lead to goal achievement. For the purposes of this project, we define the above terms thusly:

Outcomes - the desired result that occurred because of the work of the project.

Objectives - the means to achieve the outcomes.

Tasks - a description of work to be done.

Products - the outputs from the work done in the tasks.

The I&E Project identified four outcomes or results that would lead to goal achievement. All work conducted under the auspices of the I&E Project was to result in one of the following.

Outcome 1. Increased awareness and/or knowledge of watershed ecology.

Outcome 2. Increased awareness of nonpoint source pollution causes, effects and remedies.

Outcome 3. Increased awareness of and participation in nonpoint source best management practices.

Outcome 4. Increased capacity to deliver nonpoint source information and education.

The two main objectives each with related tasks and products are:

Objective 1: Facilitate understanding and action to protect watersheds.

Objective 2: Educate students and educators about watershed and nonpoint source issues.

The tasks and products for Objective 1 are:

- Task 1: Develop and coordinate outreach.
  - Product 1: One (1) media campaign
  - Product 2: Volunteer Monitoring Program with 45 sites monitored
  - Product 3: Five (5) conferences supported
  - Product 4: One (1) climate outreach project

- Task 2: Provide support for local, regional and statewide projects through a competitive mini-grant program.
  - Product 5: Twelve (12) projects sponsored by local or regional groups which inform or educate South Dakotans or that provide I & E opportunities to a high-priority segment of the population (example: communities with identified water quality concerns).

The task and products for Objective 2 are:

- Task 3: Support water education and water educator professional development activities that align with state educational initiatives and standards.
  - Product 6: Eighteen (18) water festivals which are hands-on learning events for 4<sup>th</sup>-6<sup>th</sup> graders conducted in a field day format with multiple stations, events and activities.
  - Product 7: Envirothon. Two (2) competitions for high school youth.
  - Product 8: Eighteen (18) Professional development opportunities for educators.
  - Product 9: Seventeen (17) events for youth and students outside of the water festival format.

Table 1 and Appendix A summarize the objectives, tasks and products completed during the Information and Education Project.

### 2.1 Planned and Actual Milestones, Products, and Completion Dates.

The I&E Project had a target of 126 products or milestones to achieve. The total number of milestones achieved was 134. A summary of planned and completed milestones for each objective, task and product can be found in Table 1 and Appendix A.

#### Explanation for Milestones Not Achieved

While the total number of milestones exceeded the target, not all tasks achieved their targeted milestones.

The milestone target for conferences was five and only four were achieved. When the targets were being developed, several conferences were approached as to their interest in funding. One of these conferences, Plain Green, originally indicated an interest but ceased operation after the I&E Project was funded. Another conference also indicated an interest in funding but did not request the funds

The target for mini-grants was 12 and only 11 were achieved. The I&E subcommittee of the South Dakota Nonpoint Source Task Force decided to robustly fund some projects with merit such as the Soil Health Coalition which meant that the total number funded was less.

The other tasks either met or exceeded their milestone targets.

**TABLE 1: SUMMARY OF ACTIVITIES, MILESTONES, DOLLARS AND OUTCOMES**

<b>Goal/Objective/Task/Product</b>	<b>Milestones</b>	<b>EPA Dollars</b>	<b>Match</b>	<b>Total Dollars</b>	<b>Outcome</b>
<b>Objective 1: Facilitate understanding and action to protect watersheds.</b>					
Task 1: Develop and coordinate outreach.					
Product 1: Media campaign	1 planned 1 completed	\$5,990.67	\$4,001.46	\$9,992.13	Increased awareness of and participation in NPS best management practices.
Product 2: Volunteer Monitoring	45 planned 45 completed	\$11,423.61	\$31,475.11	\$42,898.72	Increased awareness and/or knowledge of watersheds.
Product 3: Conference support	5 planned 4 completed	\$8,506.17	\$14,214.09	\$22,720.26	Increased awareness of NPS pollution prevention, causes, effects and remedies.
Product 4: Climate outreach	1 planned 2 completed	\$5,659.57	\$30,019.01	\$35,678.58	Increased awareness of and participation in NPS best management practices. Increased awareness and/or knowledge of watersheds.
Task 2: Competitive Mini-grants					
Product 5: 7 mini-grants	12 planned 11 completed	\$58,918.07	\$121,477.61	\$180,395.68	Increased awareness of and participation in NPS best management practices.
<b>Objective 2: Educate youth and students about watersheds and non-point source pollution</b>					
Task 3: Coordinate and support water education					
Product 6: Water Festivals	18 planned 18 completed	\$23,875.44	\$12,612.87	\$36,488.31	Increased awareness and/or knowledge of watersheds.
Product 7: Envirothon	2 planned 3 completed	\$34,356.29	\$114.65	\$34,470.94	Increased awareness and/or knowledge of watersheds.
Product 8: Professional Development	27 planned 30 completed	\$36,087.57	\$30,655.96	\$66,743.53	Increased capacity to deliver NPS I&E.
Product 9: Family, Youth and Student	15 planned 18 completed	\$6,475.92	\$4,935.72	\$11,411.64	Increased awareness and/or knowledge of watersheds.

## 2.2 Evaluation of Goal Achievement and Relationship to the State NPS Management Plan

### Goal achievement

Goal achievement can be measured both quantitatively and qualitatively. Quantitatively, the goal achievement is measured in the number of products successfully completed. Out of 126 anticipated products, 134 were achieved for a 105% success rate. See Section 2.1 above for more discussion.

The qualitative measurement is determined by evaluation of outcomes achieved (see discussion at the beginning of this section and Table 1) and will be discussed more in depth in Sections 3 and 5. A complete summary of qualitative evaluation is provided in Appendices B and C.

### Relationship to the State NPS Management Plan

The mission of the South Dakota Nonpoint Source Program is:

*Protect or restore the chemical, physical, and biological integrity of the waters of the state by promoting locally sponsored projects where waters are threatened or impaired due to nonpoint sources of pollution.*

To achieve this mission, the South Dakota Nonpoint Source Program has its goal:

*Maintain a balanced program focused on the restoration and maintenance of the beneficial uses of the State's water resources impaired by nonpoint source pollution by developing and implementing workplans to attain the TMDLs for listed waterbodies.*

To achieve this goal and fulfill the mission, objectives were identified for six program areas, one of which was information and education (I&E). Objective Three (3) in the Nonpoint Source Management Plan is

*Provide for an outreach program that conveys information and participation opportunities to targeted segments of the state's urban and rural populations.*

The South Dakota Department of Environment and Natural Resources (DENR) selected the South Dakota Discovery Center to facilitate aspects of that outreach. The Department of Environment and Natural Resources retained some elements of outreach such as training watershed coordinators and web outreach as well as requiring that each project to develop Total Maximum Daily Loads (TMDLs) have an information and education component.

The 319 Information and Education Project coordinates with the State Nonpoint Source Management Plan by conducting outreach to targeted audiences that are not reached by DENR or TMDL project outreach.

## 2.3 Supplemental Information

Below is a summary of activity conducted as part of the 319 Information and Education Project Segment 4.

## Information

A total of \$291,685.37 in Federal and local funds were spent on information projects which included a media campaign, conferences, climate outreach, and mini-grants to local and regional groups. The US EPA Region 8 funds totaled \$90,498.09 with a match of \$201,187.28

### PRODUCT 1: MEDIA CAMPAIGN

The City of Sioux Falls conducted a media campaign to address pet waste. A 30 second commercial was produced and aired 114 times during July and August on Bravo, Discovery, HGTV and A&E among other channels. A series of Facebook posts were launched with a reach of over 36,000 viewers.

Outcome: Increased awareness of and participation in NPS best management practices.

### PRODUCT 2: VOLUNTEER MONITORING

The numbers below reflect the 2016 activity of the volunteer monitoring program.

35 sites on 15 lakes

10 sites on 8 streams

1 site on 1 pond

Total= 45 sites on 23 waterbodies

Approximately 24 volunteers directly collect data. Several Lake associations participated and have designated certain members to conduct the sampling for the group (because of ability and to reduce errors resulting from different people collecting the measurements). Because of this, there are more people interacting the program, even if they aren't collecting data directly. Those lake associations include: Clear Lake, Lake Poinsett, Oakwood Lakes, Lake Byron, Lake Campbell, and Brant Lake. Additionally, 2 teachers from the Alcester-Hudson School District were collecting samples on streams near their school with their class, but the students themselves were not included in the participation numbers.

Volunteers collected weather conditions, water clarity, water levels, temperature, physical conditions (color, odor, algae presence), invasive species (presence/absence), and rated perception of water conditions on a scale from 1-5.

Most waterbodies had at least 2 samples sent to a health lab for E. coli bacteria.

Streams collected pH and nitrates/nitrites using test strips.

Lakes had samples sent to the health lab for total Phosphorus, Nitrogen (Nitrate + Nitrite), Total Kjeldahl Nitrogen, Ammonia, and Chlorophyll-a.

Outcome: Increased awareness and/or knowledge of watersheds.

### PRODUCT 3: I&E CONFERENCE

Four conferences were supported by the I&E Project.

- The Upper Big Sioux Backyard Native Vegetation event (originally entitled 50 Shades of Wetlands)

- The Sioux Falls Earth Day Event
- The Mayor's Summit on the Big Sioux, 2015,
- The Mayor's Summit on the Big Sioux, 2016

Outcome: Increased awareness of NPS pollution prevention, causes, effects and remedies.

#### PRODUCT 4: CLIMATE AND WATERSHED OUTREACH

Climate outreach was originally designed to support the outreach of the assistant state climatologist around climate change and hydrology. However, a change of staffing required the focus to be reoriented.

This task funded a project that supported the planting of native vegetation along urban waterways as part of an effort to use green infrastructure to mitigate climate impacts on rain events. The task also funded rain gauges as part of the CoCoRaHS program run out of the state climatologist's office to increase understanding about the changes in precipitation and associated hydrological regimes.

Outcomes: Increased awareness of and participation in NPS best management practices. Increased awareness and/or knowledge of watersheds.

#### PRODUCT 5: MINI-GRANTS

Mini-grants are a mechanism to support local or regional outreach efforts to communities or producers (as opposed to students or youth). All mini-grants were required to support one of the priority topics:

- Wetlands, Watershed, and Ground Water ecology
- TMDLs
- Nutrient and manure management (no demonstration projects)
- "Smart Growth" and low impact development
- Healthy watershed protection
- Climate and watersheds
- Nonpoint source prevention and mitigation

Mini-grants also had to support one of the outcomes of the Information and Education Project.

- Outcome 1. Increased awareness and/or knowledge of watersheds.
- Outcome 2. Increased awareness of NPS pollution prevention, causes, effects and remedies.
- Outcome 3. Increased awareness of and participation in NPS best management practices.
- Outcome 4. Increased capacity to deliver NPS I&E.

**TABLE 2: MINI-GRANTS**

<b>Mini-grant Name</b>	<b>Sponsor</b>	<b>Description</b>	<b>Topic</b>	<b>Outcome</b>
Forestry BMPs	Black Hills Forestry Resource Association	Forestry BMPs supported a field audit of forestry BMPS	Nonpoint source prevention and mitigation	Increased awareness of and participation in NPS best management practices.
Leopold Conservation Award, 2015	Sand County Foundation	The Leopold Conservation Award supports the administration of an annual award to a cattle operation that exemplified extraordinary achievement in voluntary conservation, land management, and best management practices.	Healthy watershed protection	Increased awareness of and participation in NPS best management practices.
Farm Beginnings Farm Tours	Dakota Rural Action	This award supported four farm tours to participants in the SD Beginning Farmer and Rancher Sustainable and Holistic Management Training. This training provides small acreage farmers support and mentoring in sustainable small scale farming.	Nonpoint source prevention and mitigation	Increased awareness of and participation in NPS best management practices.
Shaping Watershed Land Stewardship through High-Impact Education and Outreach	South Dakota State University	This project provided workshops to producers about environmental risks and potential consequences of grassland conversion to row cropping.	Healthy watershed protection	Increased awareness of and participation in NPS best management practices.

<b>Mini-grant Name</b>	<b>Sponsor</b>	<b>Description</b>	<b>Topic</b>	<b>Outcome</b>
Identifying Ways to Reduce Sedimentation Impacts in and around Lewis and Clark Lake	Missouri Sedimentation and Action Committee	This project will provide a more detailed look at the dynamics of sediment deposition in the Lewis and Clark Lake delta in the Missouri River located upstream and downstream of Springfield, South Dakota.	Wetlands, watershed, and groundwater ecology	Increased awareness and/or knowledge of watersheds
City of Pierre Walkability Assessment	City of Pierre	This project helped introduce smart growth to the Pierre community and city staff through a walkability assessment. The engineering, planning and parks departments cooperated on this project.	“Smart Growth” and low impact development	Increased awareness of and participation in NPS best management practices.
Big Sioux Litter Clean Up	Ecomaniacs	Supported the development of educational materials and resources to help with event specific litter clean up along the Big Sioux.	Nonpoint source prevention and mitigation	Increased awareness of and participation in NPS best management practices.
City of Sioux Falls Pet Waste, 2016	East Dakota Water Development District	Signage about pet waste impacts on water quality was installed in two dog parks in Sioux Falls as a result of this project.	Nonpoint source prevention and mitigation	Increased awareness of and participation in NPS best management practices.
Adopt A Drain	Greening Vermillion	This project provided stipends to artists to paint high visibility storm drains and funds for a rain barrel and flow through planter box building workshop.	Nonpoint source prevention and mitigation	Increased awareness of and participation in NPS best management practices.

<b>Mini-grant Name</b>	<b>Sponsor</b>	<b>Description</b>	<b>Topic</b>	<b>Outcome</b>
Communities Learning Environmentally Appropriate Nitrogen management, Working and Training for Environmental Responsibility (CLEAN WATER)	Soil Health Coalition	This project provided funding for workshops and field demonstration tours to inform producers of ways to manage land to reduce water runoff and improve nutrient cycling.	Nonpoint source prevention and mitigation	Increased awareness of and participation in NPS best management practices.
Leopold Conservation Award, 2016	Sand County Foundation	The Leopold Conservation Award supports the administration of an annual award to a cattle operation that exemplified extraordinary achievement.	Increased awareness of and participation in NPS best management practices.	

## Education

A total of \$149,114.42 of Federal and local dollars were spent on education activities including educator trainings, Envirothon, Water Festivals and youth and student outreach activities. The US EPA Region 8 funds totaled \$100,795.22 with a local match of \$48,319.20. This section discusses achievements in these areas.

### PRODUCT 6: WATER FESTIVALS

Water Festivals, usually for 4<sup>th</sup> and 5<sup>th</sup> graders, feature a half or full day of hands-on presentations or stations about water. The following locations have established Water Festivals: Sioux Falls, Brookings, Yankton (Gr 7-12), Vermillion, Pierre and Aberdeen. These events pull in students from that locale as well as surrounding counties. Approximately 4500 students and 240 teachers are served each year through these Water Festivals.

The I&E Project supports Water Festivals by providing funding for student or teacher resources and a presenter, either the I&E project coordinator or a contractor. Sufficient presenters are an on-going challenge for Water Festivals so having a reliable, quality presenter is an important means of support. Agency and organization outreach staff enjoy working at Water Festivals. An estimated 140 state, local and organizational volunteers support the local water festivals by staffing a station.

Outcome: Increased awareness and/or knowledge of watersheds.

### PRODUCT 7: ENVIROTHON

Envirothon is a hands-on competition for teams of five high school students who compete in knowledge and skills pertaining to aquatic ecology, soils, wildlife, forestry and a current issue. The Envirothon is active in the US and Canada. Three Envirothons were held during the project, October 2014 (2014-2015 academic year), March 2016, April 2017.

Outcome: Increased awareness and/or knowledge of watersheds.

### PRODUCT 8: EDUCATOR PROFESSIONAL DEVELOPMENT

Equipping educators with the skills, knowledge and resources necessary to implement high quality instruction about watersheds is a critical part of the information and education project. Educators include classroom teachers but also include agency staff and non-formal educators that work in settings other than a school, such as 4H or camp. More than 375 educators were reached through 30 opportunities.

This segment of the project used GLOBE (Global Learning and Observations to Benefit the Environment) in most of the educator trainings. GLOBE is an international, school based, citizen science project sponsored by NASA and the National Science Foundation with support from NOAA and the US Department of State. Other resources included National Geographic, Project WET, the Annenberg Project, and the Leopold Education Project. This segment of the project also included the Limnology workshop, a popular hands-on workshop held in a residential camp. Previously, the Limnology workshop was funded through a mini-grant.

Outcome: Increased capacity to deliver NPS I&E.

#### PRODUCT 9: YOUTH AND STUDENT

Youth and Student outreach targets youth and students outside of the water festival format. Classroom visits, special events such as a macroinvertebrate focused Bio-blitz, Earth Day events, field days and even resource library upgrades are supported by the youth and student product. Over 2,100 students were reached.

Outcome: Increased awareness and/or knowledge of watersheds.

### 3.0 Long Term Results in Terms of Behavior Modification, Stream/Lake Groundwater, and/or Watershed Protection Changes

The 319 Information and Education project contributed to water quality by developing the knowledge, skills and abilities of targeted groups of citizens to understand watershed protection and act upon that understanding. Development of these knowledge, skills and abilities is a multi-faceted process with various methods and intensity levels of outreach required.

True long term results are difficult to determine as the 319 Information and Education Project does not have the time nor the finances to support a longitudinal follow up of those reached by the project. The project has identified immediate outcomes which are expected to yield eventual intermediate and long term results. Immediate and intermediate outcomes are more easily measured than long term outcomes which need to be tracked over a period of years.

Outcome 1. Increased awareness and/or knowledge of watershed ecology.

Outcome 2. Increased awareness of NPS pollution causes, effects and remedies.

Outcome 3. Increased awareness of and participation in NPS best management practices.

Outcome 4. Increased capacity to deliver NPS I&E.

Measuring the immediate outcomes are discussed more in depth in Section 5.0.

A logic model is useful for seeing how immediate outcomes relate to long term results. Table 1 is the logic model for the 319 Information and Education project. The model below shows the relationship of output/product to long term outcomes.

**TABLE 3: LOGIC MODEL CONNECTING OUTCOMES**

Output/ Product	Audience	Outcomes		
		Immediate	Intermediate	Long term
Projects conducted by local/regional stakeholder groups (mini-grants, media campaigns, volunteer monitoring, conferences, climate outreach)	Adult, community	<p>Increased awareness and/or knowledge of watershed ecology.</p> <p>Increased awareness of NPS pollution causes, effects and remedies.</p> <p>Increased awareness of and participation in NPS best management practices.</p>	As opportunities present themselves, those adults and community members participate in watershed protection practices. This strengthens the social norming and diffusion of these practices.	Many informed and active citizens positively impact water quality through good watershed management.
Educator workshops	K-16 students	Increased awareness and/or knowledge of watershed ecology.	Educators utilize assets (knowledge, skills, abilities, resources) acquired during the workshop in their classrooms.	Youth and Students are educated and positively impact water quality by engaging in lifelong watershed protection.
Water Festivals	Grade 4-6 students	Increased awareness and/or knowledge of watershed ecology.	Students build upon the knowledge acquired at Water Festivals	Youth and Students positively impact water quality by engaging in long term watershed protection.
Youth and Student outreach	K-16.	Increased awareness and/or knowledge of watershed ecology.	Students participate in watershed protection activities such as monitoring as part of the curriculum and youth programs.	Youth and Students positively impact water quality by engaging in long watershed protection.

Even if no long term behavior changes can be measured, evaluation of outreach is a necessary task for the 319 I&E Project. All aspects of the 319 I&E Project have an evaluation component.

The evaluation is shaped by the four outcomes discussed above. Each product has a primary outcome it is expected to achieve.

In evaluating the products, there are a few underlying assumptions that exist.

1. Numbers are indicator of outcome. This underpins using numbers served as an evaluation tool. If a product is not being used and has no or low numbers served, then the value and effectiveness of the product should be called into question.
2. Using appropriate methods and executing those methods will yield desired results, though it is difficult to assess the quality of those results. Some methods are so evident and essential (such as signage or media campaigns) that you can assume that the outcome was achieved, if only to a small degree. Completion of project is an indirect indicator that the outcome was achieved.
3. Self-reporting is an indicator of whether an outcome was achieved. It does not tell you to what degree the outcome was achieved.

The tools and resources available to the I&E Project allow for a coarse grained evaluation. In short, the evaluation shows whether the outcomes are being achieved to some degree but it is not feasible to determine to what degree. A summary of products and their evaluation is provided in Appendices B and C. All products were found to have achieved the minimum desired outcome.

### 3.1 Water Quality Data

The 319 Information and Education project supported Dakota Water Watch, a statewide volunteer monitoring project.

## 4.0 Best Management Practices Developed and/or Revised (For Demonstration Projects)

No Best Management Practices were developed as a result of this project.

## 5.0 Monitoring Results for Demonstration Projects

This was not a demonstration project. The results of the project are discussed above in Section 3 and Appendix B and C

## 6.0 Public Involvement and Coordination

Section 6.0 discusses how the public was involved in this project and how the various partners contributed to the project. With a project of this scope and breadth, it is difficult to identify every source of involvement and coordination. Only the entities that made significant financial, technical or administrative contributions will be listed.

### 6.1 State Agencies

The lead state agency that coordinated the project was the South Dakota Department of Environment and Natural Resources (DENR) by providing administrative and grant management assistance. The 319 Information and Education funds were awarded by the DENR to the South Dakota Discovery Center.

South Dakota State University received mini-grant funding. The state climatologist's office which runs the CoCoRaHS program received 72 rain gauges to distribute. Staff from the SD Department of Agriculture and South Dakota State University served on the Nonpoint Source Task Force Information and Education Subcommittee which helps select mini-grants. State agencies have been strong supporters of the Water Festival throughout the state. The Departments of Environment and Natural Resources, Game Fish and Park, Agriculture and the South Dakota State University provide presenters for the festivals.

## 6.2 Federal Agencies

Federal agencies are involved directly and indirectly in the educational outreach of the 319 Information and Education Project. NASA and the University Corporation for Atmospheric Research provides support for GLOBE at the national level. They supported the GLOBE student research symposium in January - June 2017. Staff from the Natural Resource Conservation Service served on the Envirothon steering committee. The Natural Resource Conservation Service also provided funding for Envirothon. Federal agencies provide support for Water Festivals through staff volunteering for Water Festivals. Agencies such as the Natural Resource Conservation Service, US Fish and Wildlife, Bureau of Reclamation have provided volunteers over the years. These volunteers are not counted as part of the match provided by water festivals towards the 319 Information and Education Project.

## 6.3 Local Governments, Industry, Environmental, and Other Groups; Public at Large

The bulk of support for the 319 Information and Education Project comes from local agencies and groups in local cash and local in-kind. Most of these contributions were small and cumulative, a few hundred or at the most one thousand dollars a year over the course of 3 years. These small contributions add up, however.

The East Dakota Water Development District is the largest supporter of information and education, supporting the volunteer monitoring project by providing a staff member whose wages and benefits count as match. They also support youth and student work by loaning out water education kits to teachers year round.

All mini-grant sponsors (See Section 2.3 Supplemental Information) provided a minimum of 40% match of total project costs. These include the cities of Sioux Falls and Pierre,

The Day County Conservation District supports water education by sponsoring the Limnology training for educators, agency staff, and the general public.

Educators provided match in the form of time at and travel to trainings. They also provided cash by paying a deposit for the workshops. Educators are the front line resource for reaching youth and students. Time is valued only during the training itself at the rate set by Independent Sector, a research organization dedicated to the study of the non-profits and volunteers. The valuations set by Independent Sector are accepted by the Federal Government for determining match.

Water Festivals also generate a lot of cash and in-kind match. Providers of matching funds are municipalities, conservation districts, private businesses, and organizations. Volunteer time is a substantial component of water festival time to streamline accounting, the 319 Information and Education Project values all time, including those who coordinate festivals as part of their paid staff

duties, as volunteer time. The valuation of volunteer time is set by Independent Sector for the state of South Dakota. As of this writing that rate is \$20.81 per hour. Only the hours spent at the Water Festival are counted as pre and post hourly contributions are not easily tracked.

## 6.4 Other Sources of Funds

**TABLE 4: OTHER SOURCES OF FUNDS BY PRODUCT**

<b>Best Management Practices</b>		
Product 1: Media Campaign		
	City of Sioux Falls	\$4,001.46
Product 2: Volunteer Monitoring		
	East Dakota Water Development District	\$31,475.11
Product 3: Conference		
	City of Sioux Falls	\$6,941.64
	SDSU	\$7,272.45
Product 4: Climate Outreach		
	SD Discovery Center	\$28,760.60
	SDSU	\$1,258.41
Product 5: Mini-grants		
	Mini-grant Recipients	\$121,477.61
Product 6: Envirothon		
	SD Discovery Center	\$114.65
Product 8: Educator Trainings Information & Education		
	Volunteer Match	\$30,655.96
Product 9: Water Festivals Information & Education		
	Local Water Festivals	\$12,612.87
Product 10: Youth and Student		
	Youth and Student Organizations	\$4,662.80
	Discovery Center	\$272.92
<b>Admin</b>		
	SD Discovery Center	\$58,368.94

## 7.0 Aspects of the Project That Did Not Work Well

Most projects have at least one aspect that presents challenges. The 319 Information and Education Project was no exception. The need for outreach around climate and watersheds is essential as there is very little happening in this regard in the state. The National Climate Assessment calls for “renewed emphasis on restoration of ecological systems and processes”. Building the capacity of state and local entities to address climate and watersheds should have been a priority of this grant but it was not. This is particularly true when it comes to the topic of using green infrastructure in urban areas to mitigate water quality impacts from runoff, specifically from storm events that are predicted to become more numerous and more intense as well as snow that will melt more quickly.

## 8.0 Future Activity Recommendations

The 319 Information and Education Project has been funded for an additional two years per the recommendation of the 319 Nonpoint Source Task Force.

The essential objectives, tasks and products remain sound. The following activities are recommended.

1. Engage the community based volunteer monitoring project with GLOBE to find ways to collaborate, especially around training and data.
2. Refine the climate outreach task to focus on building resilience.
3. Support existing hands-on education events in the state that include a water education component as a new model to expand Water Festivals.
4. Support educators in reporting GLOBE data.
5. Identify and support agencies and organizations to do youth and student water education.

## Appendix A – Milestones Achieved

Goal/Objective/Task/Product	Quantity	Year 1				Year 2				Year 3			
		Months 1-3	Months 4-6	Months 7-9	Months 10-12	Months 1-3	Months 4-6	Months 7-9	Months 10-12	Months 1-3	Months 4-6	Months 7-9	Months 10-12
<b>Objective 1: Facilitate understanding and action to protect watersheds.</b>													
Task 1: Develop and coordinate outreach.													
Product 1: Media campaign	1 planned 1 completed				1								
Product 2: Volunteer Monitoring	45 planned 45 completed								45				
Product 3: Conference support	5 planned 4 completed			1	1	1				1			
Product 4: Climate outreach	1 planned 2 completed									1			1
Task 2: Competitive Mini-grants													
Product 5: 7 mini-grants	12 planned 11 completed			1	1	1	1				2	2	1
<b>Objective: Educate youth and students about watersheds and nonpoint source pollution</b>													
Task 3: Coordinate and support water education													
Product 6: Water Festivals	18 planned 18 achieved	3	3			3	3			3	3		
Product 7: <u>Envirothon</u>	2 planned 3 achieved		1				1				1		
Product 8: Professional Development	27 planned 30 completed			6	8	4	4	3	1	2		1	1
Product 9: Family, Youth and Student	15 planned 18 completed		2		3	5	2		2	1	0	1	2

## Appendix B- Summary of Evaluation

Product	Outcome: Increased awareness and/or knowledge of watershed ecology.	Outcome: Increased awareness of NPS pollution causes, effects and remedies.	Outcome: Increased awareness of and participation in NPS best management practices.	Outcome: Increased capacity to deliver NPS I&E.	Evaluation Strategy	Outcomes Summary
1.0 Media Campaign			<b>X</b>		Numbers reached.	TV ad was shown 114 times and Facebook posts reached over 36,000
2.0 Volunteer Monitoring					Numbers served.	Participation has remained consistent.
3.0 Conference						
- 3.01 Fifty Shades of Wetlands			<b>X</b>		Numbers reached, Self report	30 people participated. 100% of the evaluations were positive.
- 3.02 Sioux Falls Earth Day	<b>X</b>				Numbers served.	About 100 people participated.
- 3.03 Mayors Summit on the Big Sioux 2015			<b>X</b>		Numbers served. Completion of project.	About 150 participated.
- 3.04 Mayors Summit on the Big Sioux 2016			<b>X</b>		Numbers served.	137 people, with a wide geographic range

## Appendix B- Summary of Evaluation

Product	Outcome: Increased awareness and/or knowledge of watershed ecology.	Outcome: Increased awareness of NPS pollution causes, effects and remedies.	Outcome: Increased awareness of and participation in NPS best management practices.	Outcome: Increased capacity to deliver NPS I&E.	Evaluation Strategy	Outcomes Summary
4.0 Climate Outreach						
- 4.01 Urban Native Vegetation Signage			<b>X</b>		Completion of project.	The city of Sioux Falls sited the signs which explained the purpose of using native vegetation along urban buffer strips.
- 4.02 CoCoRaHS support	<b>X</b>				Numbers served.	Through a partnership with the state climatologist's office, 72 rain gauges will be distributed.
5.0 Mini-grants						
- 5.01 Forestry BMPs			<b>X</b>		Completion of project. Pre/post survey.	Black Hills Forestry Resource Association completed the project as described. They also conducted a pre/post survey of audit participants which showed the auditing process did increase participants understanding of the BMPs and their purposes.

## Appendix B- Summary of Evaluation

Product	Outcome: Increased awareness and/or knowledge of watershed ecology.	Outcome: Increased awareness of NPS pollution causes, effects and remedies.	Outcome: Increased awareness of and participation in NPS best management practices.	Outcome: Increased capacity to deliver NPS I&E.	Evaluation Strategy	Outcomes Summary
- 5.02 Leopold Conservation Award			<b>X</b>		Numbers served.	Numbers served include those who applied for the prize. Six producers were served which indicated to the project sponsors they needed to adjust their outreach.
- 5.03 Shaping Watershed Land Stewardship			<b>X</b>		Pre/post quiz. Self-report. Participants reported a positive response to the workshop	A quiz administered by the project sponsors showed gains in technical knowledge
- 5.04 Sediment Impact Reduction	<b>X</b>				Completion of project. Numbers served	Missouri Sedimentation Action Coalition undertook a robust outreach and information project with multiple outreach and media events.
- 5.05 City of Pierre Walkability Assessment			<b>X</b>		Completion of project	A report was produced that will inform future smart growth development in Pierre.
- 5.06 Big Sioux Litter Clean Up			<b>X</b>		Numbers served. Completion of project	252 volunteers were engaged to pick up litter. Recycling rates were at 27%

## Appendix B- Summary of Evaluation

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- 5.07 Pet Waste Campaign, 2016			<b>X</b>		Numbers served. Completion of project	This second segment built upon by the first by continuing the media outreach, adding a public booth where contact with 500 citizens was made, and installing signage.
- 5.08 Adopt A Drain			<b>X</b>		Numbers served. Completion of project	200 drains painted. 15 by artists. 50 participants at rain barrel and planter box workshops. 500 participants in Earth Day event.
- 5.09 Farm Beginnings			<b>X</b>		Numbers served. Completion of project	The skill share and farm tour had 80 participants. Participants reported a positive response.
- 5.10 Soil Health CLEAN WATER			<b>X</b>		Completion of project	3 Farm Tours focusing on cover crops, native plantings and grassland restoration were conducted. A publication (farm planner) focusing on water was distributed.

## Appendix B- Summary of Evaluation

Product	Outcome: Increased awareness and/or knowledge of watershed ecology.	Outcome: Increased awareness of NPS pollution causes, effects and remedies.	Outcome: Increased awareness of and participation in NPS best management practices.	Outcome: Increased capacity to deliver NPS I&E.	Evaluation Strategy	Outcomes Summary
- 5.11 Leopold Conservation Award			<b>X</b>		Completion of project	Over 2 million media hits. The Governor's office was involved. The number of applicants increased.
6.0 Water Festivals	<b>X</b>				Numbers served Completion of project	18 water festivals were served. Please see Appendix C.
7.0 Envirothons	<b>X</b>				Numbers served Completion of project	Three events, 16 teams total.
8.0 Professional Development	<b>X</b>				Numbers served Self report	379 educators served in 31 professional development opportunities. See the Appendix C for more specifics.
9.0 Youth and Student	<b>X</b>				Numbers served	17 events, 3000 students, 2 sub-recipients. See Appendix C for more specifics.

## Appendix C: Additional Education Evaluation

The South Dakota Discovery Center not only administers the education objective of the 319 Information and Education Project but implements most of it as well, with the support of key partners. This is a summary of the evaluation conducted as part of the education outreach. The education outreach lends itself to a cohesive evaluation treatment since the methods are consistent and the audience similar across tasks and products.

### 6.0 Water Festival

Water Festivals are field trips that engage students in hands-on learning about water. They have been conducted in the state for over twenty (20) years. Water Festivals have been one of the bedrock field trips offered to 4th-5th graders and have now been extended to the middle and high school level as well. The literature shows that field trips have an important educational impact, (*A Short Review of Field Trips*. DeWitt and Storksdieck. 2008) The research also suggests field trips have an important impact on the development of pro-environmental views. (*An Elementary School Environmental Education Field Trip: Long-Term Effects on Ecological and Environmental Knowledge and Attitude Development*. Farmer, Knapp and Benton. 2010).

The Water Festivals are evaluated by the numbers served both students and teacher AND volunteers. The students and teacher numbers are indicator that the Festivals are perceived to be valued educationally. The volunteer numbers are indicator that the groups, organizations, and agencies involved perceive that volunteering is a good use of their time.

There are six recurring water festivals in South Dakota: Sioux Falls, Brookings, Vermillion, Yankton, Aberdeen, and Pierre. They serve approximately 4,750 students annually and an additional 230 educators. These festivals depend on the participation of agency staff from the federal, state, and local sectors; business, academia, and community members at large, with over 200 presenters involved statewide annually. These numbers have remained consistent.

#### **Summary**

Participation in Water Festival remains consistent, an indicator of its value. A future goal is to identify additional sponsors to coordinate Festivals in the central and western portions of the state.

## 7.0 Envirothon

Envirothon is a hands-on natural resources competition for teams of five (5) high school students. It is part of a North American network of competing teams. Envirothon is evaluated by numbers served. There were 16 teams and 90 students served. There were three Envirothons

- October 2, 2014 (3 teams)
- March 11, 2016 (6 teams)
- April 2, 2017 (7 teams)

### Summary

Envirothon continues to advance slowly. It seems to be well utilized by 4H and FFA programs. Increasing the involvement of the agriculture sector is a future goal.

## 8.0 Professional Development

The main outcome of this product is to build capacity to deliver watershed education. Offering professional development for formal (K-12) and informal (4H staff, museums, etc) educators is an important strategy to deliver education. The 319 Information and Education Project has focused most of its professional development opportunities on GLOBE (Global Learning and Observations to Benefit the Environment) which is sponsored by NASA and NOAA. GLOBE is an international school-based citizen science project that explores the interconnections of the Earth Systems. The reasons for this are to provide a holistic understanding of watersheds, provide a pathway for teachers and students for volunteer monitoring, and better address the new educational standards (based on Next Generation Science Standards and Common Core) for South Dakota.

The professional development opportunities range in scope from an hour presentation at a conference (13 conducted) to a full day workshop (6 conducted) an immersive multi-day opportunity (12 conducted). We use recognized best practices of inquiry and experiences recommended by the Lawrence Hall of Science and Beetles Project, both from the University of California Berkeley. The professional development opportunities are evaluated by numbers served and a delayed self-report. The Limnology workshop, delivered by the Northeast Glacial Lakes Project, uses numbers served and a pre and post test.

There were 379 educators served by thirty one (31) professional development opportunities. An invitation to complete a delayed evaluation was sent out, meaning the evaluation took place anywhere from one week to three years after the workshop. This is in contrast to an immediate evaluation which is conducted immediately after the workshop. Delayed evaluations provide more summative insights in the long term value and usefulness of the content, while immediate evaluations are useful for formative insights. The challenge with delayed evaluations is that the response rate tends to be lower.

The evaluation was sent to 72 educators who engaged in 12 multi day workshops. Sixteen of them have replied, a response rate of 22%. The educators participated in workshops ranging from June 2015 - June 2017.

- 68% of respondents felt strongly or very strongly they learned something that helped them professionally.

- 68% indicated a strong or very strong response they use something they learned with their students (the main indicator of increased capacity to deliver education).
- 75% felt the workshops were valuable.
- 75% would recommend the workshops to a colleague.

#### Limnology Workshop

The Limnology Workshop served twenty four (24) teachers. Participants saw content knowledge scores increase 45% in a pre and post survey. More discussion about the limnology workshops is available in individual reports.

#### Summary

The professional development opportunities seem to be valued with a strong majority of those who took a multiday workshop using materials provided and three fourths finding value. A future goal is to engage more educators in actively collecting and reporting GLOBE data, specifically hydrology data. Currently, only four educators have reported GLOBE data. This is similar to the GLOBE participation rates in other states.

### 9.0 Youth and Student

Youth and student products are any activity or resource targeted to students or schools outside of the Water Festival. The primary outcome is to increase awareness or knowledge of watersheds. There were 3,000 students served in 18 events.

The events included:

- On shore activities during the 8th grade PE kayaking unit. Half the class measured dissolved oxygen while the other half kayaked, and then they switched.
- Macroinvertebrate BioBlitz. Students participated in a macroinvertebrate identification activity during History Adventures week.
- GLOBE Team. High school students participated in a GLOBE research summit for students.
- Earth Day open houses at the South Dakota Discovery Center.
- GLOBE App training. High school students participated in recruiting and training citizen science volunteers.

The Youth and Student product also supported other educational outreach efforts. The East Dakota Water Development District is updating their educational kits (completion date: June 30, 2017). Pennington County used Youth and Student support to reach 750 students.

#### Summary

The Youth and Student product is a small but essential product in a state with few funding opportunities to support watershed and environmental education. The numbers served, more than half of water festival numbers, indicate there is a need for and interest in having this funding available. A future goal is to leverage sub-recipients as partners.