**DEQ 319 Mini Grant application February 2, 2009**

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Organization: Bureau of Land Management

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Project title and location:

Water Quality Workshop, Missouri Breaks Interpretive Center, Fort Benton, MT

What nonpoint source pollutions or water quality issue is being addressed:

The Missouri River will be used as a sampling station to instruct educators about different water quality issues. Participants will include both educators from the area and educational docents who provide student programming at the center. Participants will complete a series of stations, learning basic water quality testing and techniques. The goal of the workshop is to develop a comfort level with the subject among the educators and docents and also to provide them with the necessary materials and equipment needed to return to their classrooms (or the interpretive center) to share the lessons with students in school or attending programs at the center.

What activities are planned to address this water resource issue:

A water flow model and erosion model will be part of the demonstration to make the connection between human activity on the surrounding landscapes and their impacts on water quality. Use of benthic macro invertebrates will be used to statistically determine the level of water quality in the river at the sampling station. A test kit will be used to determine chemical parameters such as dissolved oxygen, pH, alkalinity, etc.

Agenda

9:00 a.m. Opening introductions and overview of day

9: 15 Water flow model (each person will make their own using different types of soil samples, plastic drink cups, syringes and tubing with food coloring. This activity will set the rational for water quality testing.

9:40 Make Turbidity Tubes and Macro-invertebrate kick screens so each participant will have their own.

10:00 Go to the river with Kick Screens, Turbidity Tubes, and water sample jars. Demonstrate and practice using the turbidity tubes to test water transparency. Demonstrate and practice methods of collecting, identifying, and cataloguing Macro-Invertebrates. Introduce Project Aquatic from U.S. Fish, Wildlife and Parks. Do “Water Canaries” Project Aquatic lesson with Macro-Invertebrates collected. Take water temperature. Talk about rational of what these samples relate to. Gather water samples.

11:00 Return to classroom with water samples to introduce protocols for Dissolved Oxygen, pH, Nitrate and practice using equipment in water quality labs that participants will receive.

12:00 Lunch

12:30 Application of protocol and techniques at the Missouri River field sites. What did we learn from our samples? Implications of findings and discussion regarding the Missouri River Conservation District.

1:30 Introduce Project Aquatic Books. Do activity “Are You Me? “

2:00 Break into groups. Each group will choose an activity from the Project Aquatic manual and teach it to the rest of the class. This technique gets the participants into the manuals so they have the comfort level to use the activities with their classes. This will demonstrate and cover many of the activities for the entire class.

4:00 Wrap-up of workshop. Final evaluations. Where to go for more information; funding sources for more equipment.

Who are the instructors/project leaders and what are their qualifications?

Primary instructors:

Ruth Carlstrom MA, retired educator, talented and gifted ed., Project Wild/Aquatic/Learning Tree/ GLOBE (Global Learning and Observations to Benefit the Environment) Co-ordinator/Facilitator, Science Fair Director

Bill Peterson, Award Winning Retired High School Science Educator, Cascade Schools, Science Fair Coordinator

Assistant instructors:

Connie Jacobs, BA Geography/Environment Studies. Interpretive Center Director, education program developer and aquatic ecology program presenter.

Vicky Marquis, Missouri River Conservation District Council Coordinator, program presenter and assistant (presentation - funding opportunities for schools).

If equipment is being purchased where will it be housed and how will it be maintained?

Equipment purchased will be distributed to the participants for use upon return to their classrooms. The educators will be maintaining the equipment upon their return to the classroom. One complete set of equipment will remain at the Missouri Breaks Interpretive Center for use in aquatic ecology programs presented there.

If funding is needed for a specific site event where is it, how will transportation be provided and what contingencies have been made for rain days or alternative locations:

The workshop will be held at the Missouri River Breaks Interpretive Center and will take place rain or shine. The center can offer space for classroom instruction as well as river based stations and instruction. The Missouri River is approximately 25 yards from the center’s doors. Participants will be asked to bring clothing appropriate for outdoor conditions.

What are expected measureable outcomes and long term impacts of the project:

Participants will be asked to complete a survey/program evaluation at the end of the workshop. Evaluations will ask for rating the various stations, material, time-line, clarity of instruction, as well as asking for feedback/comments regarding greater need for this type of workshop.

Long term impacts will be tremendous as educators return to the classroom and share this information with students for many years to come. Docents will provide an opportunity to expand the number aquatic ecology programs offered at the interpretive center. Potential impact may reach hundreds of Montana students annually.

What skills and abilities are to be developed from the project and what knowledge is to be gained from the project activities:

The participants will learn and practice the following skills so that they are confident to teach them to students. They will use their own test kits, construct supplies for aquatic sampling and take these materials home with them after the workshop.

The following aquatic ecology lessons will be introduced and practiced:

* Sampling site selection
* Construct sampling materials (kick screen)
* Invertebrate collection/methods
* Dichotomous Key/Invertebrate Identification and Classification
* Statistical Analysis of Collection to Determine Water Quality

The following hydrology investigations will be introduced and practiced:

* How to Perform Hydrology Investigations
  + Collecting the water sample
  + Water Transparency protocol
  + Water temperature protocol
  + Dissolved Oxygen protocol
  + pH protocol
  + Nitrate protocol

The following activities from Project Wild Aquatic will be introduced and practiced at time allows:

* Are You Me?
* Hooks and Ladders
* Riparian Retreat
* To Dam or Not to Dam
* Turtle Hurdles
* Water Canaries

How will Pre and Post project participant knowledge, skills or behaviors be evaluated:

With the application process participants will be asked to describe their previous experience, knowledge, skills or ability with aquatic ecology and water quality testing. This course will be designed for people with limited exposure to the topics and techniques that will be offered at the workshop.

Upon completion of the workshop participants will be asked to complete an evaluation. They will also be asked to describe how the course increased their understanding of the material and how they anticipate using the material. Feedback will be sought regarding need for the course, expanding the course (to two days) and how often this course might be presented.

What is the cost of the project and where is the 40% local non-federal in-kind or cash match coming from. List by line item all the anticipated expenses and match sources:

The course will be free for participants since they will incur travel costs, possibly lodging expenses and per diem requirements. This grant will pay for supplies, materials for kits and lunch for the participants. Two presenters will be coming to Fort Benton from out of town. These two should be reimbursed for mileage since they will be donating their time for the workshop.

**319 Grant Cost and Match Budget**

**Budget Break Down in Table Format:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Costs | Instructors | Travel | Equipment | Food | Classroom |
| Prep for workshop | 150.00 |  |  |  |  |
| Purchase materials |  |  | 1220.00 |  |  |
| Present workshop | 825.00 | 125.00 |  |  | 150.00 |
| Food, refreshments |  |  |  | 125.00 |  |
|  |  |  |  |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| In Kind | Instructors | Materials | Classroom | Travel |  |
| Workshop | 825.00 |  |  | 50.00 |  |
| Project Aquatic workbooks |  | 300.00 |  |  |  |
| Workshop location |  |  | 150.00 |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

**Narrative of Costs and Match:**

Costs:

Instructors (three are non-federal):

* Program prep, set-up, etc. One instructor, 25.00/hour x 6 hours 150.00
* Day of Workshop:
* One instructor = 25.00/hour x 9 hours = 225.00/day X 3 instructors 675.00
* Mileage, one @ .55/mi x 68 mi x two ways 75.00
* Mileage, one @ .55/mi x 46 mi x two ways 50.00
* Lunch, snacks, refreshments for participants and instructors 125.00

**1075.00**

Materials:

* Kick screen (screen, wood laths, staples, tape, etc.) 5.00 ea X 15 participants 75.00
* Turbidity tubes (tubes, caps, glue) 6.00 ea X 15 participants 90.00
* Syringes, thermometers, tweezers, etc. 45.00
* Water Analysis test kits (one per school, or first 10 participants) 70.00 ea x 10 700.00
* Water Analysis test kits (four participants to share/split two kits) 70.00 ea x 2 140.00
* Water Analysis test kits (one to remain on site at interpretive center) 70.00 70.00
* Misc. supplies 100.00

**1220.00**

Facility Use:

* Interpretive Center Classroom, 1 day 150.00

**150.00**

Total Costs **2445.00**

In Kind:

* Project Aquatic teacher workbooks, 15 (estimate 20.00 ea) free 300.00
* Interpretive Center, Classroom 150.00
* Instructor time, three non-federal 825.00
* Instructor travel, one @50.00 50.00

Total In Kind **1325.00**

**Total Grant Request 1500.00**

What opportunities exist for project continuation or expansion:

With continued funding this workshop could be offered on an occasional basis as long as there is need or interest from the educational community. Education docents at the center could also attend whenever this workshop is offered.