

Presence of Zebra Mussels in the Red River of North Dakota

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University

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Acknowledgements



NORTH DAKOTA
GAME AND FISH DEPARTMENT

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Zebra Mussels

- Native to Europe
- Veligers (larvae) are motile
- Attach to hard substrates
- High populations



Overview - ZM and the Red River Basin



2015 Red River Sampling

- **Game and Fish was notified that ZM veligers were detected in the Red River in Canada**
 - **Had been zero veligers in previous samplings**
- **We sampled six sites from Wahpeton to Pembina on June 23 and 24**
- **Immediately shipped samples to Montana Game Fish and Parks for identification**

Red River veliger Results 2015

Sample Number	Site	ZM: Presence or Absence	Volume of ½ sample (in mL)	Number of slides (1/2 sample)	Size Range of Veligers (in µm)	Veliger Number in one slide	Approximate number of veligers per sample
1	Pembina	Present	235	16	89x111 to 133x156	13	416
2	Dayton	Present	250	18	133x156	24	864
3	Grand Forks	Present	220	21	89x111	11	462
4	Fargo	Present	220	20	89x111	150	6000
5	Abercrombie	Present	210	24	89x111	4	192
6	Wahpeton	Present	220	26	89x111	10	520



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Other veliger sampling in 2015

- **Sampled Red Tributaries - Goose River, Turtle River, Sheyenne River, Lake Ashtabula, Wild Rice, the Otter Tail River in Breckinridge MN, and the Bois de Sioux**
- **Also Devils Lake, Lake Elsie, Kraft Slough, Twin Lake, and Jamestown Reservoir**
- **No other sites in North Dakota were positive**

What about Adults?

- Fargo water treatment plant checked one of their screens on July 9th – found one live adult
- Grand Forks – USGS found several adults on their equipment
- Searches by ND Game and Fish in October of 2015 showed scattered adult populations from Wahpeton to Drayton

Screen from the Fargo Water Dept.



Photo's provided by Troy Hall, Water Utility Director,
City of Fargo Water Treatment Plant

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Adult Zebra Mussel from the Red River



Summary

- **Veligers were detected in very low numbers in the Red River at Wahpeton in 2011 and 2014**
- **Veligers were found the entire length of the Red River in 2015**
- **One adult ZM found in Fargo in July**
- **3 adults in Grand forks and scattered populations throughout the Red River in October**
- **No adults or veligers have been collected in any other water bodies in North Dakota**

Questions to Ponder

- **Did all veligers come from the Otter Tail system in MN?**
- **What Tributaries may be adding them to the Red?**
- **Have they established colonies in the Red?**
- **Will they spread in ND?**

The Prairie Waters Education and Research Center

Valley City State University



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Introduction

- The Center is a statewide resource for water education, research, and management.
- Four main areas of emphasis:
 - Educational activities for K-12 students
 - Workshops for teachers
 - Professional workshops
 - House the VCSU Macroinvertebrate lab and involve college students in research, education, and outreach activities related to water

10/09/2013

Educational Activities for K-12

- Bring school groups to the Center for water education
 - Displays for the commons area
 - Classroom activities
 - Field trips to nearby resources
- Outreach programs
- Summer Camps







09/23/2014





09/23/2014

Center Use

- In year one served approximately 1200 k - 12 students
- Year two – app 1950
- Year three – app 2250
- Year four – app. 2400



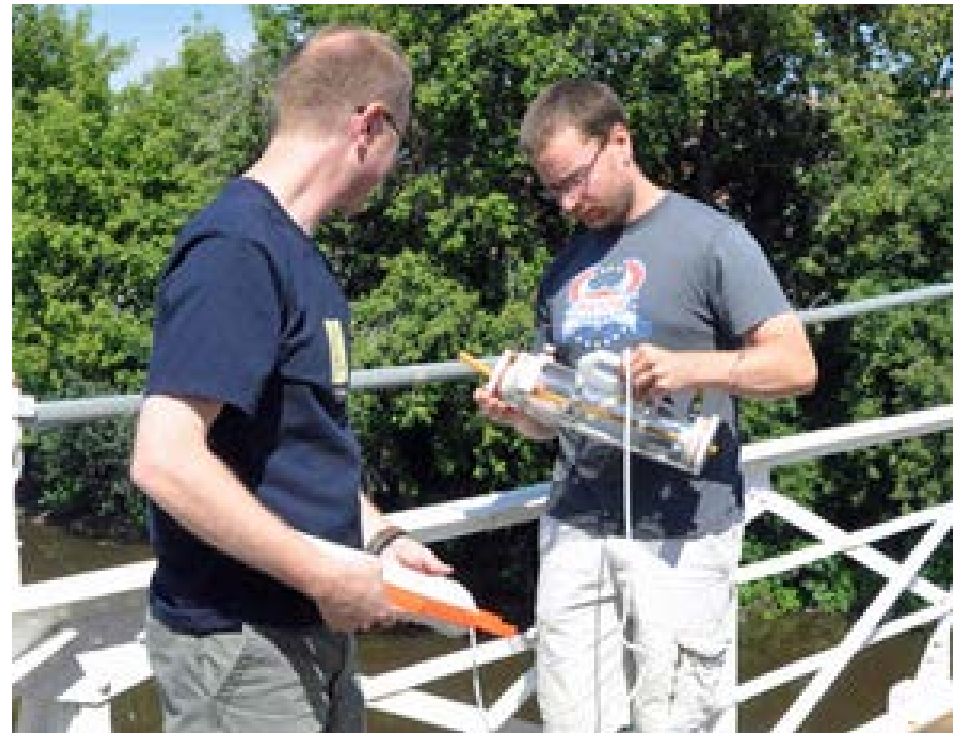
River Watch

- Part of our mission is to oversee the River Watch program in ND
- Gives high school students experience in taking water quality measurements in their local area



River Watch

- We provide equipment:
 - YSI multiprobe sonde
 - Water sampling bottle
 - Hach Turbidimeter
 - Turbidity tube

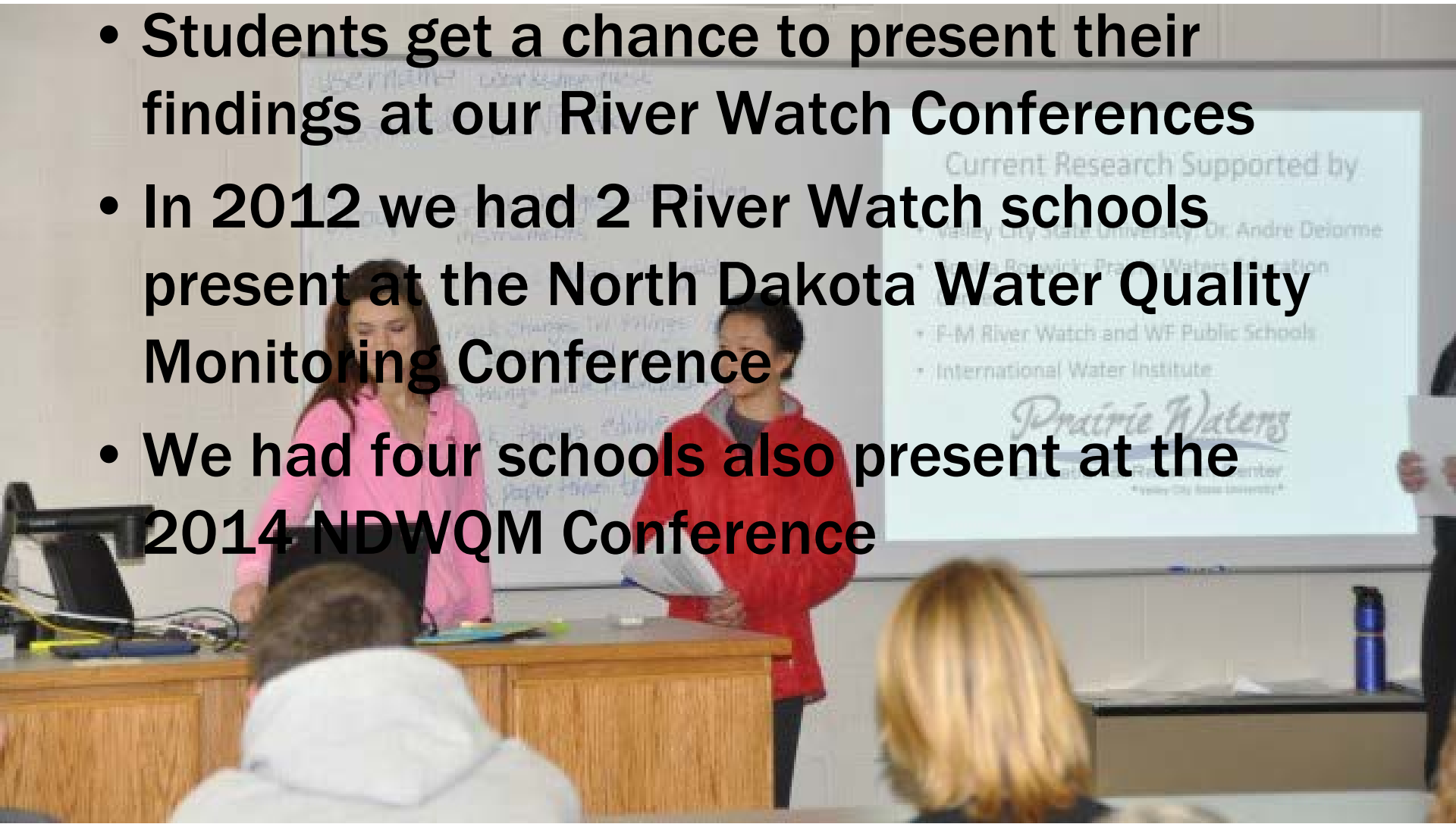


River Watch

- **Training**
 - **Calibrating equipment**
- **Funding**
 - **Cover 60% of transportation and substitute teacher costs**
- **Host River Watch Conference twice a year**
- **Website for data**

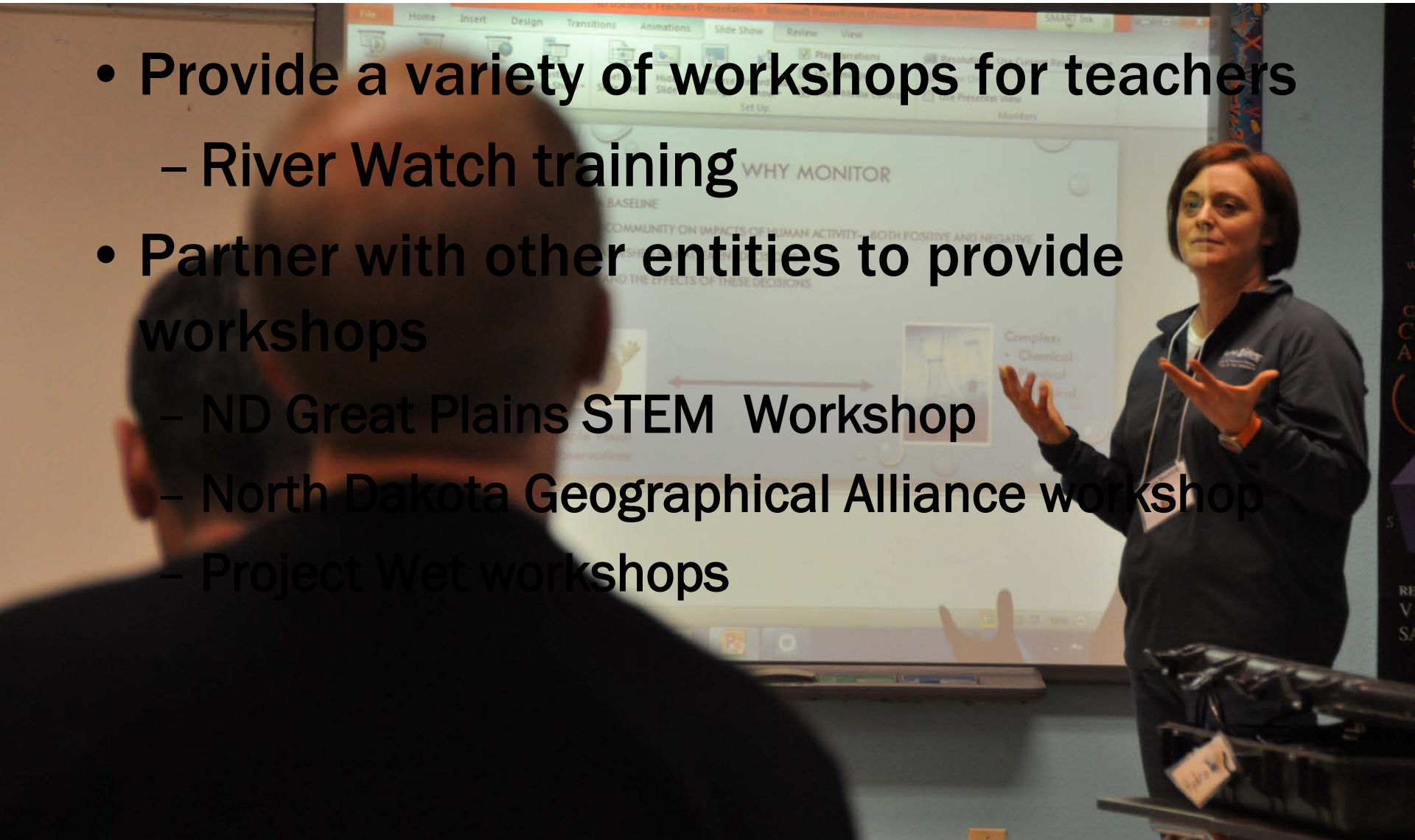
River Watch

- Students get a chance to present their findings at our River Watch Conferences
- In 2012 we had 2 River Watch schools present at the North Dakota Water Quality Monitoring Conference
- We had four schools also present at the 2014 NDWQM Conference



Teacher Workshops

- Provide a variety of workshops for teachers
 - River Watch training
- Partner with other entities to provide workshops
 - ND Great Plains STEM Workshop
 - North Dakota Geographical Alliance workshop
 - Project Wet workshops



Professional workshops

- Work with state agencies to facilitate their needs
 - Workshops for Soil Conservation District and NRCS personnel
 - Currently working with the NDDH to offer a water quality testing certification program



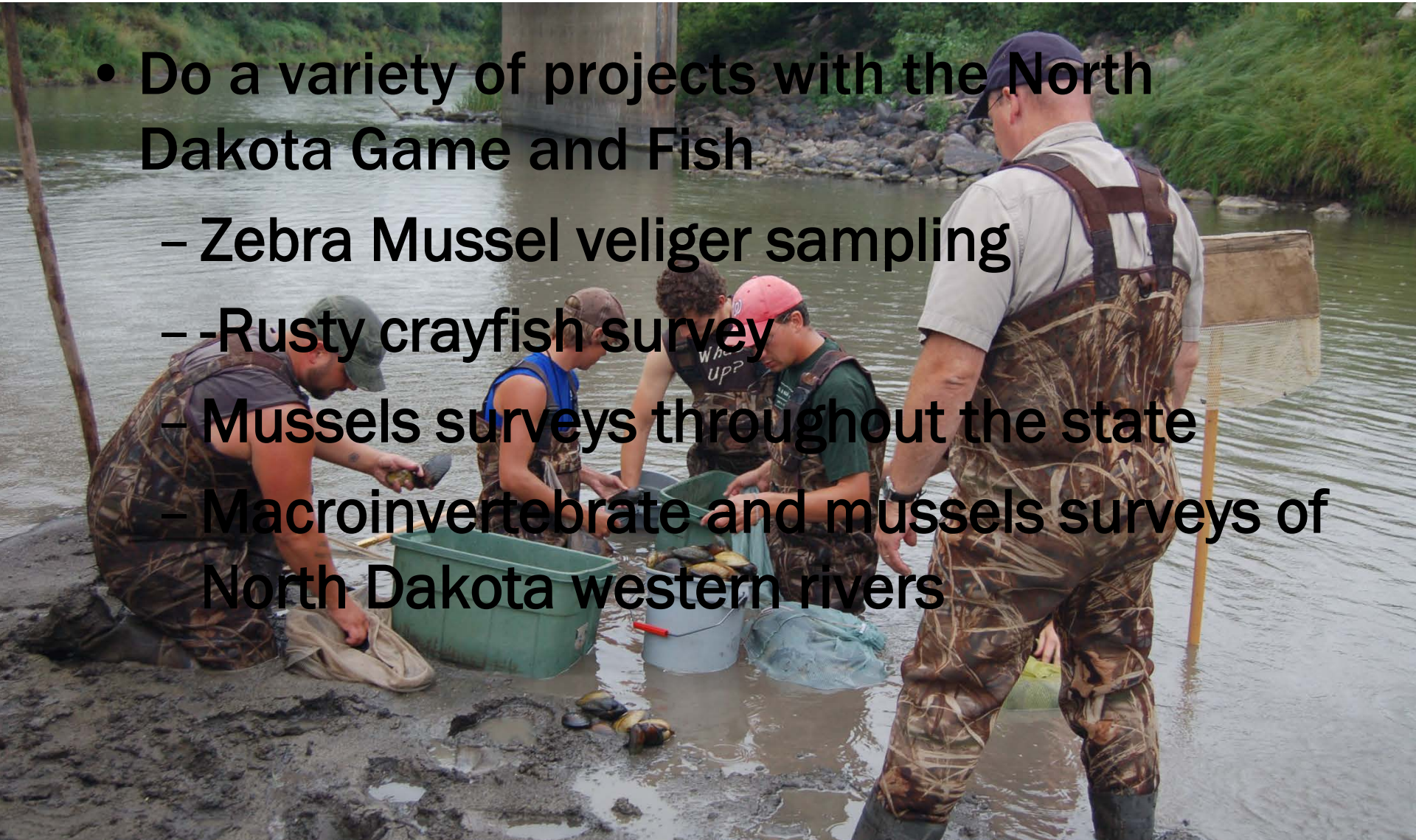
Macroinvertebrate Lab – Student Research

- Continue providing opportunities for undergraduate experiences and research
 - Water quality measurements on Lake Ashtabula for the Army Corps of Engineers
 - Macroinvertebrate sorting and identification for the North Dakota Department of Health



Macroinvertebrate Lab – Student Research

- Do a variety of projects with the North Dakota Game and Fish
 - Zebra Mussel veliger sampling
 - Rusty crayfish survey
 - Mussels surveys throughout the state
 - Macroinvertebrate and mussels surveys of North Dakota western rivers



Partners

- North Dakota Department of Health
- ND Game and Fish
- ND Parks
- Project Wet – State Water Commission
- Soil Conservation Districts
- NRCS
- ND Envirothon
- Eco - Ed
- US Fish and Wildlife Service
- Army Corp of Engineers
- North Dakota Natural Resources Trust
- Great Plains STEM Center

Personnel

- **Dr. Andre DeLorme - Director**
- **Bonita Roswick – Education Specialist**
- **Louis Wieland – Lab Manager**

Questions?



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