Strategies for Successful recruitment of Geoscience majors: Conceptual Framework and Practical Suggestions

Raising Community Awareness

Bernhardt Saini-Eidukat
North Dakota State University, Fargo

GSA Workshop, Denver 2007
Saturday, 27 October

Raising Community Awareness

Two main strategies:

- **Get the Good Word Out!**
- **Community Service**

Getting out the Word

Take advantage of services provided by your University Relations office

Professional staff will create and disseminate to the media:

- News releases on events and people.
- Leads and contact information for feature stories.

Clay foundation making Fargo a 'city on stilts'

By Mike Nowatzki
mnowatzki@forumcomm.com

A 45-foot-high Ferris wheel will eventually tower over customers inside the new Scheels All Sports store being built along Fargo's 45th Street South.

But the massive structure already stretches more than twice that length underground.

More than 100 concrete supports, known as caissons, plunge from the building's foundation through 105 feet of unstable clay before hitting firm glacial deposits, said Jeff Pfingsten, the project's construction manager for R.L. Engebretson of Fargo.

It's a common construction method for big buildings in the Red River Valley, plagued with some of the nation's worst ground for construction.

"Every major load-bearing structure here in the Red River Valley must be supported," said Donald Schwert, a North Dakota State University geology professor who has done extensive research on Fargo's earthen foundation.

Schwert will explain how Fargo is "a city on stilts" during NDSU's 47th Faculty Lectureship at 7 p.m. Tuesday in the Memorial Union's Century Theater. The presentation is free and open to the public.

A map produced by the North Dakota Geological Survey in 1974 showed the state's largest city located in a sea of red, denoting poor construction conditions.

STILTS: Back Page

First of two parts

LOSING GROUND

▶ **Monday:** Counties and cities are looking at riverfront setback regulations.

If you go

▶ **What:** NDSU's 47th Faculty Lectureship, "A City on Stilts: The Geology Under Fargo," by geology professor Donald Schwert. Free and open to the public

▶ **When:** 7 p.m. Tuesday

▶ **Where:** Century Theater, NDSU Memorial Union

STILTS: Severe water conditions bring on shifts

From Page A1

When the southern tip of glacial Lake Agassiz retreated from North Dakota 9,000 years ago, it left behind a Red River Valley covered in a thick blanket of expansive, highly problematic clay, Schwert said.

The clay was deposited by the Sheyenne River as it cut through shale and formed the valley that now embraces Valley City, he said.

The shale was broken down into a clay called Smectite.

"These are clays that love to take in water, and when they take in water they swell," Schwert said. "And they also love to give off water, so during times of drought, they contract."

Going for a ride

As a result, the city of Fargo goes for a ride during times of severe high or low water, Schwert said. Walls and foundations shift in houses. Water mains break. Sections of street may tilt or bulge.

Fargo's jelly underbelly forces the city to take extra measures when building roads and bridges, City Engineer Mark Bittner said.

For example, a typical street in Bismarck uses 2 to 4 inches of asphalt. Fargo, on the other hand, must lay 8 to 10 inches of gravel before topping it with 6 to 10 inches of asphalt, Bittner said.

"And they probably still have better streets than we do," he said.

Fargo also must truck in all of its gravel from the edges of glacial Lake Agassiz.

"Pretty soon we'll have most of Minnesota in town here, one truck at a time," Bittner quipped.

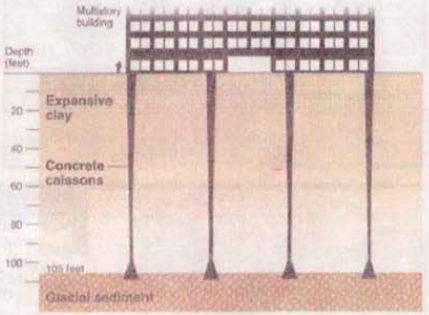
Long, hollow tubes of steel called piles are used to support structures where caissons are impractical. For example, the new Main Avenue bridge connecting Fargo and Moorhead used 45,300 feet of steel piles.

Piles and caissons can add significantly to the cost of building projects, Schwert said. Fargo's water treatment plant along Fifth Street South required 351 caissons at a cost of $2 million. The Fargodome required 200 caissons, while the Bison Sports Arena needed 64. The new 265,000-square-foot Scheels store used 103 caissons.

Soft ground

A 1974 North Dakota Geological Survey map showed that Fargo-Moorhead sits on land considered poor for general construction.

Expansive clay left over from glacial Lake Agassiz requires major building projects, such as the Radisson Hotel in Fargo and the Scheels All Sports store under construction on 45th Street South, to be supported with concrete caissons that extend 105 feet underground until they hit firmer glacial sediment.



Source: Donald Schwert, NDSU geology professor The Forum

Mount Fargo's legacy

Fargo has learned some tough lessons about its geology during the city's 134-year history.

In June 1955, the Fargo Grain Terminal Elevator collapsed when the subsurface clay shifted under its tremendous weight.

The elevator's designers figured a broad slab of concrete would be adequate to support it, Schwert said.

What they didn't understand, he said, is the expansive underground clays behave like a bowl full of Jell-O pudding: push down in one spot, and the pudding simply rises in another.

That's what happened when Fargo created its first and only ski hill in the mid-1980s, facetiously dubbed "Mount Fargo."

Land excavated for the Bluemont Lakes development in south Fargo was donated to the city to build a ski hill on undeveloped land about 500 yards northeast of the intersection of Interstate 29 and 32nd Avenue South.

The hill began to slowly sink into the soft, wet clay, and in 1984, its weight pushed up a baby Mount Fargo.

The original Mount Fargo stood in an uneasy equilibrium as development continued around it. Then, in June 1991, it became active. The hill started moving in spots, making nearby homeowners uneasy, Schwert said. He climbed to the top of the hill to check it out.

"I was scared," he said. "It was moving here and moving there, and the police were down there with bullhorns saying, 'Get off of Mount Fargo!' " he recalled.

The city eventually trimmed off the top of Mount Fargo and used the clay to build dikes, he said.

Schwert said it's not his intent to cause alarm. He simply wants residents to be conscious of the earth beneath their feet and the innovative engineering required to build North Dakota's largest city.

"We can live compatibly in this type of vulnerable setting," he said.

Readers can reach Forum reporter Mike Nowatzki at (701) 241-5528

Local Newspaper Articles

Getting out the Word

Team heading to Antarctica

NDSU professor, students prepare for research expedition

By Bryce Haugen
bhaugen@forumcomm.com

It's the coldest, most desolate place on earth.

Antarctica's springtime temperatures are cold enough to freeze peanut butter and toothpaste. Only a few organisms can survive.

But that doesn't daunt North Dakota State University geology professor Allan Ashworth, who, joined by two students and field partner Adam Lewis, will brave extreme conditions on an expedition to the continent in October.

"There's an excitement in being in a place where few people have been before," said Ashworth, who's making his fourth trip to Antarctica.

The continent is a geologist's paradise, containing a vast untapped record of the Earth's climate history.

As the world grapples with concerns about global warming, research in Antarctica can reveal new insights into past warming and cooling trends, Ashworth said.

"It's thrilling to be a part of that," he said. "It's a privilege to be in that position as a scientist."

On previous visits, Ashworth collected plant, mollusk and insect fossils. The fossil record is the only way to get an idea of what temperatures were like millions of years ago, he said.

Ashworth's discovery of a fossilized fly pupa earned him international attention.

He hypothesized that the fly's ancestors lived in Antarctica – a suggestion that contradicted scientists who believe all flies in the Southern Hemisphere evolved from northern ancestors.

An article about the fly appeared in a 2003 issue of the science journal Nature.

This is the first time Ashworth will take students to Antarctica.

The upcoming trip will bring the crew to the dry valleys of the Transantarctic Mountains in an area between the outlet glaciers of the Polar Plateau.

He hopes the students use the trip to develop their own geology careers, creating a new generation of researchers.

Andrew Podoll, an NDSU senior geology student, said he never dreamed he would get the opportunity to go to the continent.

"If you can study in Antarctica, you can study almost anywhere," he said. "It's probably the best field geology area in the world."

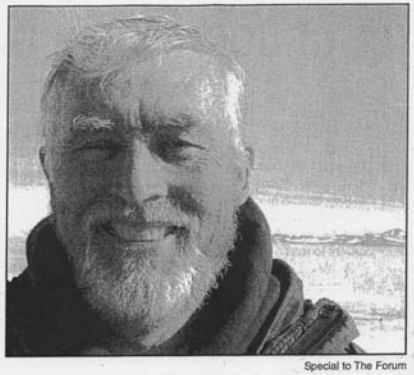
Anne Aghion, an Emmy winning filmmaker, will accompany the research team for several weeks during the two-month trip. She'll also join a team from the University of Wyoming that plans to measure the hole in the ozone layer.

Her film about the expeditions will air on television throughout the world in fall 2007, including on the Sundance Channel in the U.S.

The film will focus on "the human adventure of the scientists working in an extreme environment," Aghion said from Paris. "I'm interested in the mental space this kind of work brings you to."

"I don't want to betray the science, but it's much more about the people than the science."

Readers can reach Forum reporter Bryce Haugen at (701) 235-7311



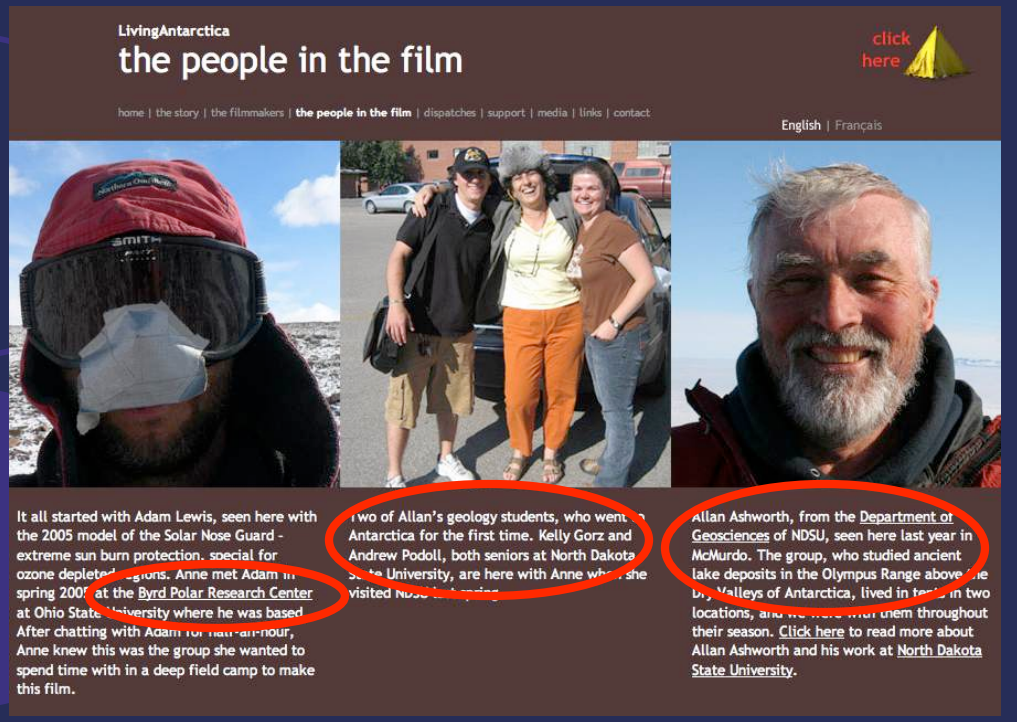
Special to The Forum

Allan Ashworth, a North Dakota State University geology professor, will make his fourth trip to Antarctica in October. On previous trips, he collected plant, mollusk and insect fossils.

The Forum

Fargo Forum July 5, 2006

Local Newspaper Articles

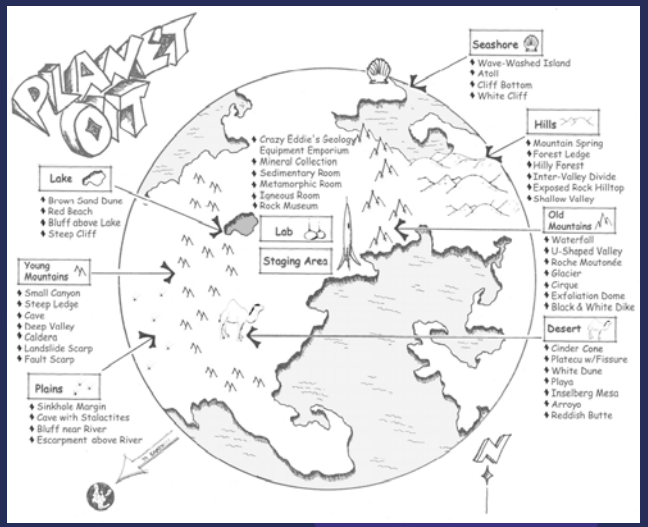


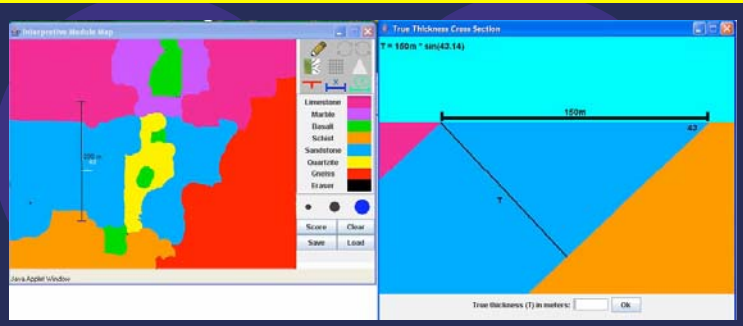
A feature length documentary made by an award-winning filmmaker
(OK, an extreme example)
Courtesy Anne Aghion
http://www.livingantarctica.org

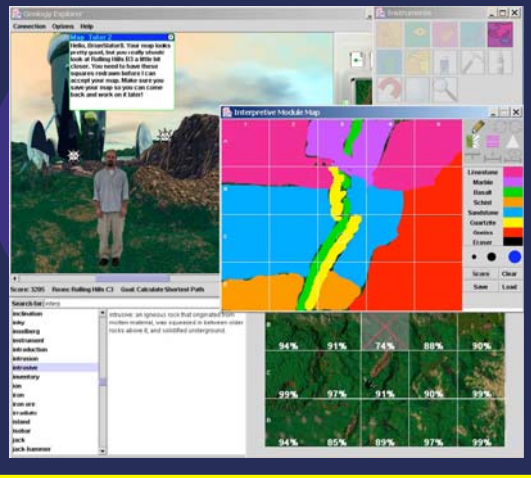
Tie-in with local school kids:
Research project, and live video chats from McMurdo, w/ Fargo 8th graders!

Getting out the Word

Engage K-12 with Geo-oriented SMET activities







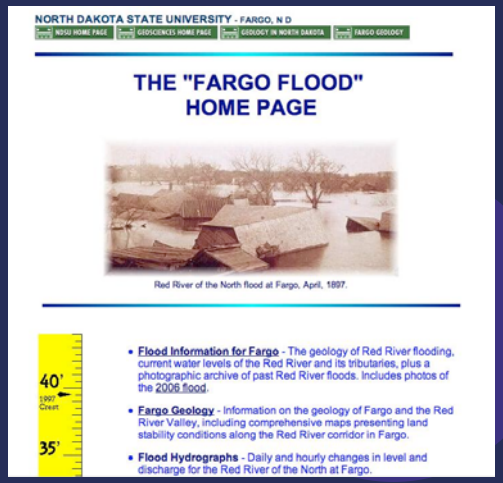
Interactive Virtual Environments: Multi-user Role Playing Games
NDSU WWWIC: World Wide Web Instructional Committee wwwic.ndsu.edu

“Research on Serious Games for Geoscience Education” - NSF-0608082

Community Service

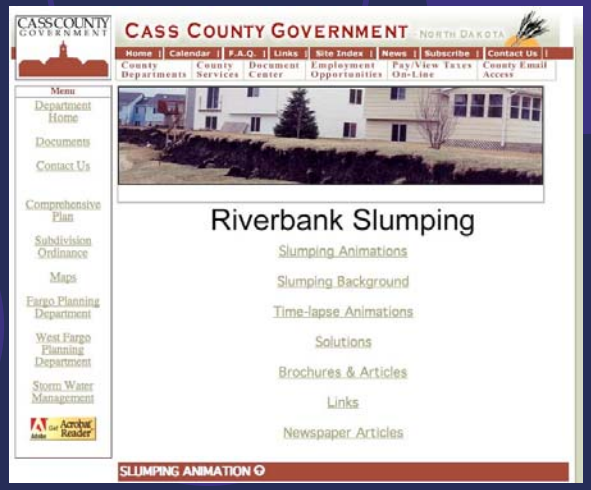
Let me count the ways…

Help create public service web sites for:



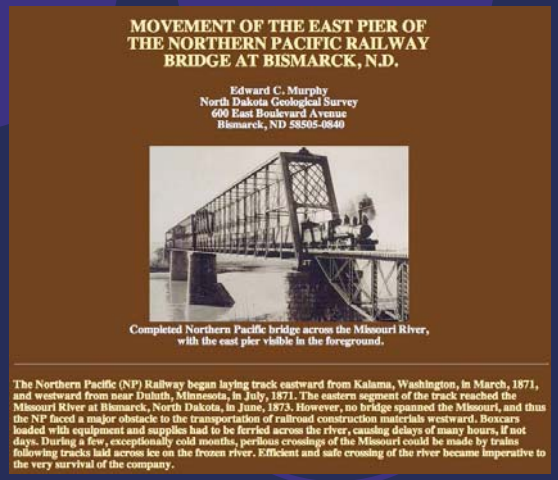
Your Own Dept.

http://www.ndsu.edu/fargoflood/



Your Local Government Agency

http://www.casscountynd.gov/departments/Planning/Slumping.htm



Your State Geological Survey

http://www.ndsu.edu/instruct/schwert/ndgs/bism_brg.htm

"This web site is maintained in public service through a cooperative effort of the North Dakota Geological Survey and by the Department of Geosciences at North Dakota State University"

Community Service - homeowners

Fargo neighborhood seeks buyout supplement funding

By Sarah Coomber
The Forum

Residents of a north Fargo [illegible] the City Commission [illegible] to provide a 15 percent local [illegible] to supplement state and federal funds in [illegible] home buyout program.

The four houses [illegible] 10th Street North and south of Cass County 20, are along the Red River in an area where the bank is slipping. They have been appraised at $118,000 to $121,000, said City Co-[illegible]

[illegible] rose up to his retaining wall.

In response to the homeowners' [illegible], the city asked the state [illegible] some Federal Emergency Management [illegible] from [illegible] 97 flood buyouts [illegible] these houses, Zavoral said. [illegible] program requires a 15 percent local share to supplement 75 percent from FEMA and 10 percent from the state.

So far, the city has not offered to ante up the local share.

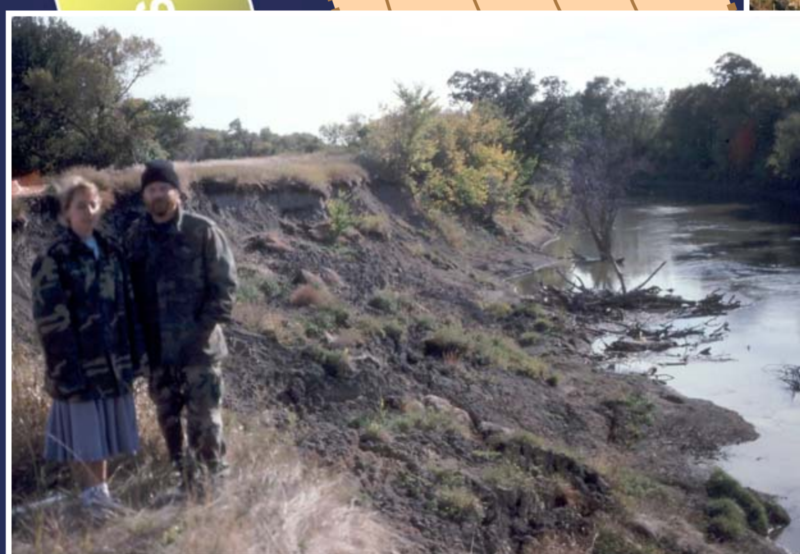
"The city is not responsible for [illegible]

[illegible] 1996, everything was fine. Now if he has to pay 15 percent of the buyout, [illegible] will lose $16,000, and, he added, some families might [illegible] houses. "Why [illegible] have to [illegible] this [illegible]?" he asked. "I [illegible] anything."

Zavoral said the four houses were appraised as if they were located elsewhere in the city and not sliding into the river.

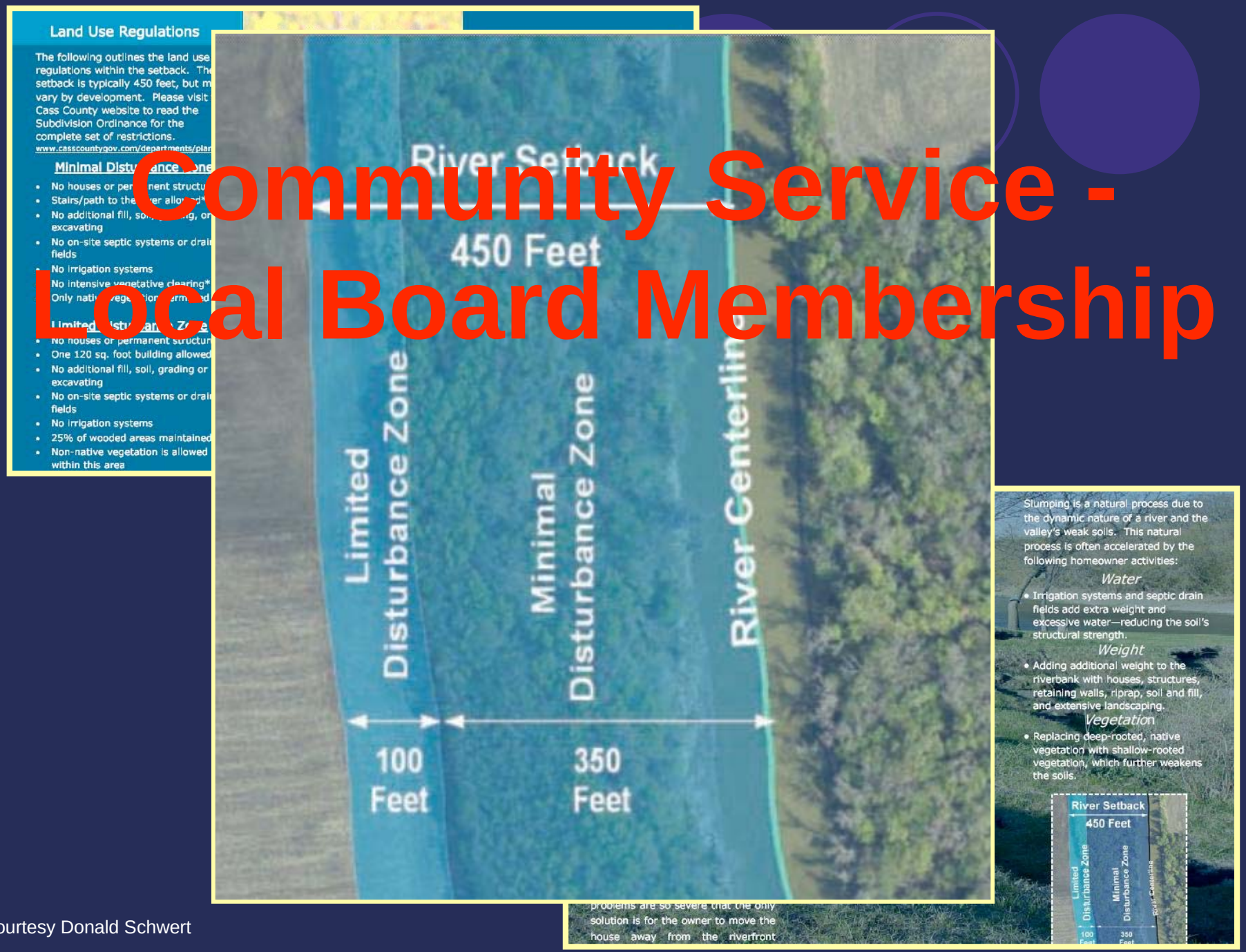
In other business, the board will consider:

[illegible] amending the 1999 Commu-[illegible]



Courtesy Donald Schwert

Community Service - Local Board Membership



Courtesy Donald Schwert

Community Service

Expanding Your Horizons!

Junior high school girls from across North Dakota, Minnesota and South Dakota spend an April Saturday morning at NDSU's campus. The conference is part of a national effort to encourage young women to consider math and science-related careers.

http://www.litchville-marion.k12.nd.us/gerriharris1.htm

"Sunday Academy" for Tribal High School students

Takes place at Tribal Colleges

Thanks to the NDSU College of Engineering for organizing Sunday Academy, and to ND-EPSCoR NSF for funding.

Community Service

Engage all age groups / audiences…

Presentations to community groups / service clubs (Rotary, Sons of Norway, etc.)

Science Olympiad / State and Regional Science Fairs

Visits to grade schools / high schools - **consider asking your majors to visit their former high schools, and give a talk in chem, bio, or physics class!**

Community Education / Life-long learning / Elderhostel

Governor's School (high school students on campus during the summer)

Your local Rock Club / Spelunking club

Inviting Public Speakers to engage with the public

River Keepers / Environmental Awareness

(Your ideas here …)

Acknowledgments:

The Faculty and Students of NDSU Geosciences
GSA
Carolyn Eyles and Randy Richardson