GEOG/GEOL 312: GEOMORPHOLOGY

http://www4.uwsp.edu/geo/faculty/lemke/geomorphology

Dr. K. A. Lemke
Office: Science B345

klemke@uwsp.edu
Phone: 715-346-2709

WHY STUDY GEOMORPHOLOGY?

Geomorphology involves study of the characteristics, origin and development of landforms.

The Southern Alps, Queenstown, New Zealand

Have you ever seen a breath-taking landscape and wondered how something that beautiful came to exist? Or perhaps you've seen several very different, but equally inspiring landscapes and wondered why all places do not look the same? The landscape in Wisconsin is very unlike the landscape in Hawaii or the landscape in Alaska. Why? In fact, we don't need to travel that far to see differences in the landscape – the steep hills and valleys of southwestern Wisconsin look quite different from the flat landscape of central Wisconsin, which is quite different from the pocked, irregular landscape of northern Wisconsin. One reason for studying geomorphology is to satisfy our innate curiosity about the natural world around us, in particular the surface forms of the earth, our home.

Another reason for studying geomorphology is more practical. We live on and in a particular landscape. The characteristics of that landscape impact the way we go about living in that place. For example, the flat landscape of central Wisconsin is covered by a porous layer of sand that although good for growing potatoes and beans, requires irrigation despite the fact that natural precipitation is sufficient for growing these crops. How water drains from the landscape is an important aspect of geomorphology. How soils form is an important aspect of geomorphology. Both water and soil are important for our survival; we need water to drink and soil in which to grow our food.

Many people have moved to the west coast of North America in part for the scenery. In addition to water and soil characteristics, people living there also need to worry about whether landslides may cover their homes with mud and rocks or carry their homes into the Pacific Ocean. The stability of the land surface is an important aspect of geomorphology. These are examples of applied geomorphology – the use of geomorphological knowledge for planning, engineering, and safety concerns related to human settlements.

Another reason for studying geomorphology is to help us understand not only about the earth as it is today, during our lifetime, but also as it may have been in the past long before we were here. Climate change is a hot issue in current events these days. How can we be sure that the climate is changing? If we can figure out whether the climate of the earth has always been like it is today or whether it's changed over time, that knowledge can help us predict how the climate might change (or not) in the future. If global warming and cooling has happened before, then we shoul not be surprised to find it happening again. One way to determine past climatic conditions is to study the landscape. What types of landforms are associated with different climatic conditions? Wisconsin again provides a good example. Every time you walk or drive around central Wisconsin, the landscape you see is a glacial landscape; the landforms are glacial landforms but we certainly don't have a glacial climate here today. Without knowledge of geomorphology, you might not realize that some landforms we see today are the result of processes no longer at work on the landscape due to things such as climate change.

These are only a few reasons for studying geomorphology. There are plenty more: ecologists may need to know something about geomorphology in order to understand why certain plants or animals thrive where they do; river restoration efforts require an understanding of the natural processes that shape river channels and how those processes interact with aquatic ecosystems; environmental engineers studying

Glacial deposits, Wisconsin.

pollution sources and sinks may need to understand the processes shaping the landscape if they want to understand how pollutants got to be where they are or if they want to predict where pollutants might potentially end up in the future. So whether you simply want to know how that beautiful mountain landscape was created or whether you're more interested in how we live on and in the land, the study of geomorphology is important.

COURSE OUTCOMES: You should be able to:

1) explain how water, weathering, ice and gravity modify and shape the landscape;
2) describe characteristics of landforms produced by water, weathering, ice and gravity, and identify examples of these landforms in photos, on topographic maps, and in real life;
3) measure and calculate landform characteristics such as height, slope and width from topographic maps and stereo air photos, and draw topographic profiles;
4) use appropriate field and laboratory methods and instruments to measure stream characteristics;
5) calculate stresses and forces working on the landscape, explain the meaning of your calculated values, and relate these values to landscape characteristics; and,
6) apply the scientific method in geomorphology and communicate your findings orally and in writing.

CONTACT INSTRUCTOR

Office Hours – Science B345

Tuesday and Thursday 10:00-11:00 and by appointment. Please use my office hours! If you have a conflict with office hours but need help, please let me know and I'll arrange a time to meet that works for both of us.

Email – klemke@uwsp.edu

Feel free to use email to ask me questions or get information related to the class. I usually check my email twice a day – first thing in the morning when I get to work, and last thing in the afternoon before I go home. I try to respond to all emails within 24 hours except on weekends. I do not check my email on weekends. Please use your university email account for all email regarding this class.

Potholes, Porcupine Mountain State Park, Michigan.

CLASS POLICIES

Attendance

There are two hours of lecture each week and two hours of laboratory. Lecture classes meet Tuesday and Thursday 9:00-10:00 in Science D320. Lab meets Monday 9:00-11:00 in Science D320 or D326.

You are expected to attend lecture. Lecture material does not necessarily duplicate material in the textbook and is generally required for successful completion of assignments and lab exercises. We will spend some time in lecture working on assignments and engaging in discussions. Everyone is expected to participate in these activities. Hence, you are expected to attend lecture, to come to class prepared, and to participate in all in-class activities.

You are required to attend lab. Lab activities for the first half of the semester involve team work. Your absence from lab will negatively impact the ability of your team to complete their work. Lab activities for the second half of the semester may require you to use equipment available only during the lab period. Thus, you are required to attend lab, to come to class prepared, and to contribute toward all lab activities.

There are two required field trips (the UWSP Catalog states that field trips may be required). The first field trip is a full-day trip to collect data on the Tomorrow River and will occur on the second or third Friday of the semester. The data from this field trip will form the foundation for the remaining lab activities for the first half of the semester. Two course learning outcomes relate directly to this trip: learning how to use appropriate field methods, and applying the scientific method in geomorphology. Hence it is essential that everyone participate in this field trip. The second field trip is a 2-hour tour of glacial landforms in Portage County that will take place during the regular lab period. There will be no make-up field trips.

You are responsible for all material covered in class. If you miss a class, even for a legitimate reason, you are still responsible for the material covered. It is your responsibility to get notes from a fellow student.

Preparation

You are expected to prepare for class. As a general rule, you should spend approximately two hours outside of class preparing for every hour of class. Since this is a three-credit class, that translates to six hours of preparation outside of class every week. Preparation for class entails reading the textbook, working on assignments or lab exercises, reviewing and working through lecture notes, and any other study activities that will help you learn the material.

Our textbook, Ritter, D.F., R.C. Kochel and J.R. Miller (2011) *Process Geomorphology, 5th ed.* McGraw Hill, NY, is available as a rental text at the university bookstore. Readings

are listed on the course calendar on the course web site (see the top of page 1 for the URL). Do assigned readings before coming to class, reading these pages critically and asking questions as you go –do I understand this? Why is it important to geomorphology? When and how might I use this information? How does this information relate to other information we've discussed in class?

Participation

You are expected to participate in class by asking questions and contributing observations or comments during lecture. You are expected to contribute to any class discussions as well as to any team activities. Failure to participate may negatively impact your grade.

Tests

Exams should be taken at the scheduled time. *Make up exams are allowed only for extreme cause and with a verified excuse.* Bring a calculator to tests. You are not allowed to share calculators during tests. Cell phones, PDAs, tablets, or other devices with calculator functions are not allowed.

Cell Phones and Electronic Devices

Cell phones, PDAs, MP3s, and other electronic devices should be turned off during class (lecture and lab). Talking on cell phones, texting, checking for messages, emailing, and listening to music during class is not allowed. It is rude and distracting to other students in the class and to the instructor. Laptops and tablets are allowed with prior permission from the instructor. All cell phones and other electronic devices except for calculators must be turned off and put away during tests.

Student rights and responsibilities

UWSP has specific guidelines regarding student rights and responsibilities, academic standards and disciplinary procedures, accommodation of religious beliefs, and conduct on university land. These guidelines are explained in the document "Community Rights and Responsibilities" available at: http://www.uwsp.edu/dos/Documents/CommunityRights.pdf

EVALUATION AND GRADING

Your grade is based on homework assignments, lab exercises, exams, and class participation, weighted as follows:

Assignments, participation, quizzes	30%
Labs	40%
Exam 1	15%
Exam 2	15%
Total	100%

I do not assign grades, you earn grades. Letter grade cut-offs are as follows:

A	93–100%	C+	77–79%
A–	90–92%	C	73–76%
B+	87–89%	C–	70–72%
B	83–86%	D	60–69%
B–	80–82%	F	below 60%

Assignments, Participation and Quizzes

Assignments are designed to allow you to practice working with the material discussed in lecture. They often include mathematical calculations followed by questions asking you to interpret or explain the importance and implications of your calculated values. Other assignments provide opportunities to practice identifying landforms in photos, diagrams and on topographic maps. There may also be assignments related to reading assignments or questions that arise in class. In many cases, you will be encouraged (and expected) to consult with your peers – a form of participation, however, everyone must submit their own copy of assignments. There will be several group quizzes throughout the semester related to assignments.

Lab Activities

Tomorrow River, WI 2014

Labs include field work, lab work, map-work, calculations, writing, and oral presentations. Lab activities are designed to give you experience applying the scientific method in geomorphology and to help you develop skills required for working in the field of geomorphology.

About half of the lab activities involve group work. Group projects are graded based on the quality of the work submitted. The grade assigned to the finished project, however, may not necessarily be the grade that each individual member of the group receives. *Each member of the group will receive an individual grade* based in part on the quality of the submitted assignment and in part on their individual contribution to the finished assignment. After completing group assignments, each individual must fill out an evaluation form assessing the quality and quantity of contributions from each member of the group, including themselves. Your peers should not be punished for your failure to do an equal share of the work and you should not be punished for the failure of other group members to do their share of the work. You should be rewarded for whatever work you actually do. As a result, *all members of a particular group may not receive the same grade for a particular lab assignment.*

The remainder of the lab activities are individual activities. In these cases, you are allowed to work with other students on the activities, but each student must submit their own lab exercise. You may discuss answers with other students, but you still need to write your own answers to the questions. No credit will be awarded for answers that have been copied verbatim from another student.

Failure to hand in lab exercises on time will result in an automatic 20% grade penalty. Beyond a certain date, which will be announced in class, late labs will not be accepted except for extenuating circumstances.

Exams

Exams are 2-hours long; the mid-term will take place during a lab session and the final exam will take place during finals week. Exams consist of a mixture of short answer questions, landform identifications on diagrams, maps or photos, and mathematical calculations (be sure to bring a calculator!). Mathematical formulas will be provided as part of the exam. It is more important that you understand when and how to use a formula, and how to interpret the results, than it is to memorize the formula.

There will be no multiple choice questions. Preparation for exams consisting of short answers is different from that required for multiple choice tests. On a multiple choice test, you just need to be able to recognize the correct answers. On a short answer test, you need to pull all the necessary information out of your head. Be sure to adjust you study sessions accordingly. In addition, your writing skills count on a short answer test, not just your knowledge of the topic.

COURSE MATERIALS

Class Web Site

http://www4.uwsp.edu/geo/faculty/lemke/geomorphology

The class web site contains a calendar with lecture topics, lab activities, homework assignments and test dates. There are lecture outlines to help you prepare for class and to aid in taking notes during class. Do not assume, however, that having access to the lecture outlines means you do not need to take notes during class. You still need to take notes. The outlines are not a substitute for your own notes; they are to aid you in taking your own notes.

Handouts, homework assignments and lab exercises will generally be linked on the class web site as pdf files. You need to print your own assignments and labs as they will generally not be handed out in class.

Geography/Geology Classes Server

Material for this class (handouts, assignments, lab exercises) will also be stored on the Geography/Geology Department's "Classes" server. To access the Classes server, you need to map a network drive (unless you have already done this for another class, in which case you should not need to do it again). When you map the network drive for the first time, check the box to reconnect to the server every time you login to the university network so you don't need to map the drive again.

To map a network drive from computers in the SIAL:

- Double click on *My Computer*
- Click on *Map Network Drive*
- Specify a letter to represent this drive (e.g. "Y")
- Type: \\uwsp.edu\files\cls\geo\classes

To map a network drive from your PC at home:

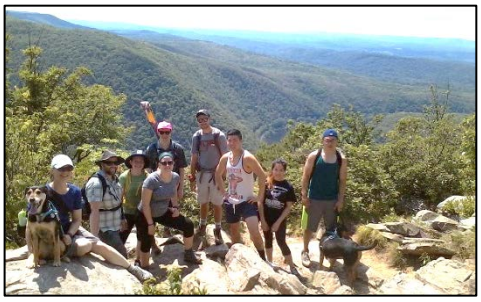
- Double click on *My Computer*
- Click on *Map Network Drive*
- Specify a letter to represent this drive (e.g. "Y")
- Type: https://files.uwsp.edu/cls/geo/classes/

To map a network drive from your Mac at home:

- Double click on *Go*
- Click on *Connect to server*
- Type: https://files.uwsp.edu/cls/geo/classes/

Once you have mapped the network drive, look for the folder named "Geog312" (it's near the top of the list). The first folder, "Class Documents," contains copies of all the handouts, assignments, labs, and some other material that everyone in the class may want access to. Please do not alter any of the documents in this folder or its subfolders. Please do not remove any of the documents from this folder or any of its subfolders. If you want your own copy of any of these documents, copy and paste those documents to your UWSP-H drive, a USB drive, or to your team folder.

The class will be divided into teams for the group lab work. There will a folder for each team. All data and work related to our team projects must be stored in your team folder. Do not store files you create for team projects on thumb drives or your H-drive or some other drive that only you have access to. In this way, every team member will have access to all the relevant files. You can create subfolders within your team folder to help organize information. Do not store any personal files or files related to other classes in the Geog352 folder on the Classes drive.



Your instructor and her dog Mica (far left) exploring the geomorphology of the Delaware Water Gap, PA.