Watershed Sciences 4930 & 6920
GEOGRAPHIC INFORMATION SYSTEMS

WEEK ONE – Lecture 1
Introduction to Course & Review of Maps
Joe Wheaton

PURPOSE OF TODAY’S LECTURE:
“Introduction to Course & Review of Maps” is to:
• Cover Introductions
• Go through syllabus & define goals of course
  - Manage your expectations about course & my expectations of you
  - Answer any questions you have about course logistics
• Review some basics about maps to help you do better on lab assignments and a more effective communicator with maps

TODAY’S PLAN
I. Introductions
II. Syllabus
III. Review of Maps
IV. Questions/Summary

WHO IS THIS JOE WHEATON GUY?
• Assistant Professor in Watershed Sciences (since 2009)
• Fluvial Geomorphologist
• Education:
  - Started studying Civil Engineering at Utah State University
  - BSc in Hydrology from University of California at Davis
  - MS in Hydrologic Sciences from University of California at Davis
  - PhD in Geography at University of Southampton (England)
• Professional Background:
  - Consulting Civil Engineering (California - 4 years)
  - Researcher – Fluvial Geomorphology & Ecohydraulics (since 2000)
  - Lecturer (i.e. Assistant Professor) in Physical Geography at Aberystwyth University (Wales - 2 years)
  - Research Assistant Professor in Geology at Idaho State University (1 year)

YOUR TA & UTF
• Shannon Belmont – Lab Instructor
  - Be nice to her as she’ll be grading your work!
• Erin Fleming – Undergrad Teaching Fellow

HOW MANY OF YOU….
• Registered for this course because you were told you had to?
• Registered for this course because you thought it might be interesting and you wanted to learn a valuable skill?
• Have changed your major?
• Have some GIS experience
• Taken a GIS course before
• Like maps
• Want to be here
What class is right for you?

**WATS 4930/6920 – 10 INTENSE WEEKS**

- **WATS 4930**: 21
- **WATS 6920**: 28

**WATS 4931/6921 – 5 MORE WEEKS**

- **WATS 4931**: 5
- **WATS 6921**: 7

**WATS 6915 – 4 INTENSE WEEKS**

- **WATS 6915**: 8

Surgeon General Warning:

These classes are a ton of work! Continuing may cause headaches, shortness of breath, loss of sleep, and increased stress levels. But you just might learn a lot about GIS too.
**TODAY’S PLAN**

1. Introductions
2. **Syllabus**
   - I. Primary Learning Outcomes
   - II. Topics
   - III. Labs
   - IV. Text & Software
   - V. Course Policies
   - VI. Grades
3. III. Review of Maps
4. IV. Questions/Summary

**ALL YOU NEED TO KNOW…**

[http://gis.joe-wheaton.org](http://gis.joe-wheaton.org)

**BROAD TOPICS**

- Introduction/Review of GIS
- Abstracting the World to Digital Maps
- Working with Data in GIS & Geoprocessing
- Uncertainty & Vector Analyses
- Raster Analyses
- GIS Modeling
- Collecting Your Own Data
COURSE TOPICS

TOPIC PAGES ARE A REFERENCE

CALENDAR ON GIS.JOEWEATON.ORG

TODAY’S PLAN

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LABS ARE EVERYTHING!

- You only really learn GIS by doing it
- WATS 4930/6920
  - 10 Guided Labs
    - Due following week
  - 1 Self Paced Lab
- WATS 6915
  - First 4 Labs
    - Due them at your own pace... BUT

LABS CAN BE DONE ANYWHERE

- Data you need is online
- Instructions are spelled out on lab pages often w/video tutorials
- Bring headphones!
- ALWAYS backup to a portable drive
  - As often as you’re comfortable redoing something
- Encourage you to work off your own machine
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SOFTWARE - ArcGIS

TEXT

COURSE POLICIES
• Just be respectful of your peers
• Turn off your phones
• No texting in lectures
• Laptops fine for notes/demos

COMMON SENSE

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**GRADES**

**Grade Overview**

Our primary concern is that you engage in achieving the learning objectives for this course. Your grade is a cumulative concern to us, and if you are effectively learning your grade should be a moot point. However, we recognize how reallocated some of you may be grades and we have allocated the possible course guidelines below to keep everyone's expectations about what you need to do to earn the grade you want.

<table>
<thead>
<tr>
<th>Course</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project</td>
<td>30%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>40%</td>
</tr>
</tbody>
</table>

**EVERYTHING YOU NEED TO KNOW TO GET AN A**

- A highly recommended text... $8.99
- If for nothing else, impress your folks

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**HE CAN'T BE SERIOUS... THIS IS A SENIOR / GRADUATE LEVEL CLASS!**

- I am...
- Maps are the ultimate end product of GIS and GIS analyses
- GIS makes it easy to make maps
- Making good and effective maps is an art that is being lost (i.e. cartography)
- You intuitively know this... but you probably forgot

**LET'S REFER TO THE CAT IN THE HAT**

- On the Cat in the Hat, and for happiness to say things a map on my lap
- but I'm on our way
- We will never be the same
- We'll be back here by the end of the day!
ALL MAPS HAVE A PURPOSE

- What point is the map trying to convey?
- Context helps convey that point

<table>
<thead>
<tr>
<th>The Map</th>
<th>Example Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location Map</td>
<td>Show the location of something within a broader geographic context of common knowledge to audience (e.g. state, country, world)</td>
</tr>
<tr>
<td>Geology Map</td>
<td>Show spatial distribution of underlying geology</td>
</tr>
<tr>
<td>Habitat Map</td>
<td>Show spatial distribution of different habitat types</td>
</tr>
<tr>
<td>Topographic Map</td>
<td>Show spatial distribution of elevations</td>
</tr>
<tr>
<td>Watershed Map</td>
<td>Show delineated boundary of watershed</td>
</tr>
<tr>
<td>Election Map</td>
<td>Show which areas voted for which candidate</td>
</tr>
</tbody>
</table>

A GEOLOGY MAP: JUST GEOLOGY...

A GEOLOGY MAP: MORE VECTOR DATA

A GEOLOGY MAP: ADD DRG USGS BASE

A GEOLOGY MAP: ADD HILLSHADE RASTER

PROJECTIONS, LAT & LONG
SOLVING PUZZLES WITH MAPS

PATTERN RECOGNITION

ISN'T THAT NICE?

EVEN HAS A GLOSSARY

WHY SHOULD YOU CARE?

• Making bad maps is easy with GIS!
• You need to know how to speak the language (i.e. nomenclature and terminology matters)
• You need to understand the spatial analyses you perform
• We’re going to grade you based on the Cat and the Hat and the 6 C’s

THE 6 C’s TO EARN BETTER THAN A C

• Colorful (but not cluttered)
• Creative (but not confusing)
• Consistent
• Context (location, coordinates, scale, orientation, setting)
• Convincing (fit for purpose)
• CORRECT
READING FOR THURSDAY

Reading Assignments will always be posted on the course website...

- I will try to highlight reading for you at the end of most lectures
  - Read Chapter One of Bolstad: “An Introduction to GIS”
- In general, you should get in the habit of checking the website. For this Thursday, see:
  - http://gis.joewheaton.org

THURSDAY’S READING/HOMEWORK:

THIS WEEK’S LAB

Introduction

- Lab 01 – ArcGIS Refresher & Intro to WebGIS
  - You’ll make a very basic map in ArcGIS just to get you used to working in ArcGIS again ;)
  - You will create a website that will be the repository for ALL of your lab assignments
  - You will publish your map and build an interactive google map on your website...

Everything you need:

http://gis.joewheaton.org/assignments/labs/lab01

NEXT LECTURE

On Thursday:

- Detailed Review of GIS & Intro to WebGIS
TODAY'S SUMMARY

• Nice to meet you...
• Syllabus is on http://gis.joewheaton.org
• Cat in the Hat and excellent reference
• 6’ C’s to avoid a C

QUESTIONS??

• Post other questions to our Class Forum at http://forum.bluezone.usu.edu/gis