

Advanced

WELCOME TO GIS!

WATS 4930/6920 & 6915

I can sign any Registration Options Forms (Add/Drop; time conflict, etc.) and answer situation specific questions now or after class.

Utah State University
Registration Options Form - Registrar's Office

Student LAST Name: _____ Student ID (A-Number): _____
Student FIRST Name: _____ Date: _____
Semester: ☐ Fall ☐ Spring ☐ Summer Academic Year: _____

Instructions for adding a course: This section is for CLOSED/FULL courses, courses that always require the instructor's signature for registration, or for auditing. This section is to be signed by the authorized course instructor ONLY.
(Dropping a course does not require instructor's signature and can be done online through 60% of the term/session)

CRN (9 digit)	Dept.	Course #	Section/Credits	Instructor Signature*	Printed Last Name	Sig. Date*	Audit?

Instructions for Course Authorization: This section is for the authorization of PREREQUISITES, Degree/Major, Level, and other restrictions. This section is to be signed by the COURSE ADVISOR or DEPARTMENT HEAD ONLY.
Instructors CANNOT approve any of the restrictions listed above unless they are also the academic advisor!

CRN (9 digit)	Dept.	Course #	Section/Credits	Advisor Signature*	Printed Last Name	Sig. Date*

Instructions for Time Conflict Approval: This section is to approve courses that have conflicting times in the Access/Banner system. If Banner indicates a conflict, this form is REQUIRED, regardless of whether or not the courses actually conflict. This section may, when signed, be submitted to your academic advisor who can grant electronic authorization which will allow you to register online. Or, you may acquire the signatures and return this form to the Registrar's Office.

CRN (9 digit)	Dept.	Course #	Section/Credits	Instructor Signature*	Printed Last Name	Sig. Date*	Audit?

Instructions for Pass / D+, D, F Option: This section is to change the grading mode of a course from standard letter grade to Pass / D+, D, F. A notation of 'P' DOES NOT affect student GPA. D+, D, or F grades WILL BE CALCULATED INTO STUDENT GPA. Your Academic Advisor's signature is required; this option cannot be reversed!

CRN (9 digit)	Dept.	Course #	Section	Credits	Course Title

Academic Advisor Signature*: _____
Advisor Printed Name: _____ Date: _____

Instructions for 18+ credit Approval: This section is to approve a student to take over 18 credits for the semester indicated on this form. This section must be signed by your ACADEMIC ADVISOR. Your advisor also MUST INDICATE the MAXIMUM total number of credits (i.e. 21). You will be sent back to your advisor if the exact number is not written.

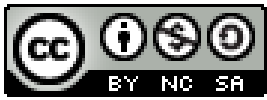
Academic Advisor Name (please print): _____
Academic Advisor Signature*: _____ Date: _____

I authorize this student for a maximum of _____ credits for the indicated term.

I certify that the information above is correct and no unauthorized changes have been made. I also certify that all signatures are authentic and free of forgery. I understand that forging a signature or providing false information can lead to USU suspension.

STUDENT SIGNATURE (required): _____ DATE: _____
For complete registration policies, dates, and other university information, please visit www.usu.edu

FOR OFFICE USE ONLY - Processed By: _____ Date: _____ 06/2009



Slides by [Wheaton et al. \(2009-2014\)](#) is licensed under a [Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License](#)

Watershed Sciences 4930 & 6920

GEOGRAPHIC INFORMATION SYSTEMS

WEEK ONE – Lecture 1

Introduction to Course, Review of Maps & WebGIS

Joe Wheaton

PURPOSE OF TODAY'S LECTURE:



“Introduction to Course, Review of Maps, & WebGIS”

- 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 become a more effective communicator with maps
- Intro to WebGIS

TODAY'S PLAN

I. Introductions

II. Syllabus

III. Review of Maps

IV. WebGIS

V. 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, Ecogeomorphology & 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!
- Tommy Thompson– 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

 beckstrombuzz.blogspot.com/2010/08/changing-majors.html



WHAT CLASS IS RIGHT FOR YOU?

About the Courses (Syllabi)

This page and its subs-pages act as the syllabi for the following Advanced GIS courses offered through Watershed Sciences:

- WATS 4930/6920 - Advanced GIS & Spatial Analyses (3 credits) - 10 Weeks
- WATS 4931/6921 - GIS Research Projects (2 credits) - 5 Weeks
- WATS 6915 - GIS Fundamentals (1 credit) - 4 Weeks

Which Course(s) Should I Take?

WATS 4930/6920 is what you should take if you want to get a comprehensive understanding of GIS and advanced spatial analyses. GEOG 1800 is a prerequisite for WATS 4930.

WATS 6915 is the first four weeks of WATS 6920. The course is targeted at graduate students who want a crash course or refresher introduction to GIS, but don't have the time or need for the full 10 week course. No prior GIS experience is necessary, but the pace is rapid. Its perfect for someone wanting to know how to make some basic maps for their thesis or dissertation, as well as an introduction to building interactive web maps and doing basic spatial analyses.

WATS 4931/6921 is a five week follow up course to WATS 4930/6920, which puts the skills and principles learned in Advanced GIS & Spatial Analyses into practice through student research projects. WATS 4930 is available for capstone credit to Watershed Sciences students. Students will prepare a poster to present in poster session and a mock manuscript for potential publication.

These courses are based on the content from the former WATS 4930/6920 course (4 credits, last offered in Spring 2011), but have been expanded and redesigned to better meet the diverse needs of both our undergraduates and

Syllabus Topics

[Alternative or Follow-Up Courses](#)

[Catalog Description](#)

[Course Policies](#)

[Format](#)

[Grades](#)

[How to Register](#)

[Instructors](#)

[Meeting Times & Place](#)

[Primary Learning Outcomes](#)

[Software](#)

[Text & Readings](#)

WATS 4930/6920 – 10 INTENSE WEEKS

About the Courses (Syllabi)

This page and its subs-pages act as the syllabi for the following Advanced GIS courses offered through Watershed Sciences:

- WATS 4930/6920 - Advanced GIS & Spatial Analyses (3 credits) - 10 Weeks
- WATS 4931/6921 - GIS Research Projects (2 credits) - 5 Weeks
- WATS 6915 - GIS Fundamentals (1 credit) - 4 Weeks

Which Course(s) Should I Take?

WATS 4930/6920 is what you should take if you

Syllabus Topics

[Alternative or Follow-Up Courses](#)

[Catalog Description](#)

[Course Policies](#)

[Format](#)

[Grades](#)

[How to Register](#)

[Instructors](#)

[Meeting Times & Place](#)

WATS 4930/6920 is what you should take if you want to get a comprehensive understanding of GIS and advanced spatial analyses. GEOG 1800 is a prerequisite for WATS 4930.

These courses are based on the content from the former WATS 4930/6920 course (4 credits, last offered in Spring 2011), but have been expanded and redesigned to better meet the diverse needs of both our undergraduates and

ant a crash
prior GIS
some basic
ing basic

iples learned in
ole for capstone
d a mock

WATS 4931/6921 – 5 MORE WEEKS

About the Courses (Syllabi)

This page and its subs-pages act as the syllabi for the following Advanced GIS courses offered through Watershed Sciences:

- WATS 4930/6920 - Advanced GIS & Spatial Analyses (3 credits) - 10 Weeks
- WATS 4931/6921 - GIS Research Projects (2 credits) - 5 Weeks
- WATS 6915 - GIS Fundamentals (1 credit) - 4 Weeks

Which Course(s) Should I Take?

WATS 4930/6920 is what you should take if you want to get a comprehensive understanding of GIS and advanced spatial analyses. GEOG 1800 is a prerequisite for WATS 4930.

WATS 6915 is the first four weeks of WATS 6920. The course is targeted at graduate students who want a crash course or refresher introduction to GIS, but don't have the time or need for the full 10 week course. No prior GIS experience is necessary, but the pace is rapid. Its perfect for someone wanting to know how to make some basic maps for their thesis or dissertation, as well as an introduction to building interactive web maps and doing basic spatial analyses.

WATS 4931/6921 is a five week follow up course to WATS 4930/6920, which puts the skills and principles learned in Advanced GIS & Spatial Analyses into practice through student research projects. WATS 4930 is available for capstone credit to Watershed Sciences students. Students will prepare a poster to present in poster session and a mock manuscript for potential publication.

These courses are based on the content from the former WATS 4930/6920 course (4 credits, last offered in Spring 2011), but have been expanded and redesigned to better meet the diverse needs of both our undergraduates and

Syllabus Topics

[Alternative or Follow-Up Courses](#)

[Catalog Description](#)

[Course Policies](#)

[Format](#)

[Grades](#)

[How to Register](#)

[Instructors](#)

[Meeting Times & Place](#)

[Primary Learning Outcomes](#)

[Software](#)

[Text & Readings](#)

WATS 6915 – 4 INTENSE WEEKS

About the Courses (Syllabi)

This page and its subs-pages act as the syllabi for the following Advanced GIS courses offered through Watershed Sciences:

- WATS 4930/6920 - Advanced GIS & Spatial Analyses (3 credits) - 10 Weeks
- WATS 4931/6921 - GIS Research Projects (2 credits) - 5 Weeks
- WATS 6915 - GIS Fundamentals (1 credit) - 4 Weeks

Which Course(s) Should I Take?

WATS 4930/6920 is what you should take if you want to get a comprehensive understanding of GIS and advanced spatial analyses. GEOG 1800 is a prerequisite for WATS 4930.

WATS 6915 is the first four weeks of WATS 6920. The course is targeted at graduate students who want a crash

WATS 6915 is the first four weeks of WATS 6920. The course is targeted at graduate students who want a crash course or refresher introduction to GIS, but don't have the time or need for the full 10 week course. No prior GIS experience is necessary, but the pace is rapid. Its perfect for someone wanting to know how to make some basic maps for their thesis or dissertation, as well as an introduction to building interactive web maps and doing basic spatial analyses.

Syllabus Topics

[Alternative or Follow-Up Courses](#)

[Catalog Description](#)

[Course Policies](#)

[Format](#)

[Grades](#)

[How to Register](#)

[Instructors](#)

[Meeting Times & Place](#)

[Primary Learning Outcomes](#)

[Software](#)

[Text & Readings](#)

manuscript for potential publication.

These courses are based on the content from the former WATS 4930/6920 course (4 credits, last offered in Spring 2011), but have been expanded and redesigned to better meet the diverse needs of both our undergraduates and

DEATH-GRIP ON THE OBVIOUS

What your friends said about this course was probably true... it is a lot of work



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 how to leverage GIS to do useful analyses and produce compelling maps.

INTRODUCE YOURSELF (< 10 sec.)

- Just your First Name
- Where You're From



TODAY'S PLAN

I. Introductions

II. Syllabus

I. Primary Learning Outcomes

II. Topics

III. Labs

IV. Text & Software

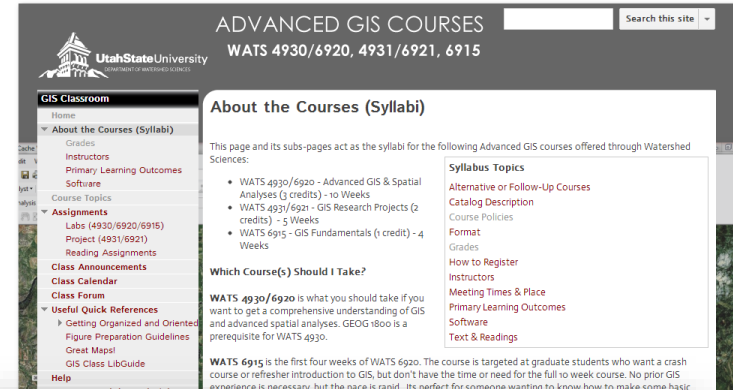
V. Course Policies

VI. Grades

III. Review of Maps

IV. WebGIS

V. Questions/Summary



The screenshot shows the 'ADVANCED GIS COURSES' page for Watershed Sciences at Utah State University. The page lists courses WATS 4930/6920, 4931/6921, and 6915. A sidebar on the left contains a 'GIS Classroom' menu with links to Home, About the Courses (Syllabi), Grades, Instructors, Primary Learning Outcomes, Software, Course Topics, Assignments, Labs, Project, Reading Assignments, Class Announcements, Class Calendar, Class Forum, Useful Quick References, Figure Preparation Guidelines, Great Maps!, GIS Class LibGuide, and Help. The main content area is titled 'About the Courses (Syllabi)' and explains that the page and its sub-pages act as syllabi for the listed courses. It includes a list of courses with their credit hours and durations, a section for 'Which Course(s) Should I Take?' with descriptions for WATS 4930/6920 and WATS 6915, and a 'Syllabus Topics' list.

UtahStateUniversity
UTAH STATE UNIVERSITY
WATERSHED SCIENCES

ADVANCED GIS COURSES
WATS 4930/6920, 4931/6921, 6915

Search this site

About the Courses (Syllabi)

This page and its sub-pages act as the syllabi for the following Advanced GIS courses offered through Watershed Sciences:

- WATS 4930/6920 - Advanced GIS & Spatial Analyses (3 credits) - 10 Weeks
- WATS 4931/6921 - GIS Research Projects (2 credits) - 5 Weeks
- WATS 6915 - GIS Fundamentals (1 credit) - 4 Weeks

Which Course(s) Should I Take?

WATS 4930/6920 is what you should take if you want to get a comprehensive understanding of GIS and advanced spatial analyses. GEOG 4800 is a prerequisite for WATS 4930.

WATS 6915 is the first four weeks of WATS 6920. The course is targeted at graduate students who want a crash course or refresher introduction to GIS, but don't have the time or need for the full 10 week course. No prior GIS experience is necessary, but the pace is rapid. It is perfect for someone wanting to know how to make some basic

Syllabus Topics

- Alternative or Follow-Up Courses
- Catalog Description
- Course Policies
- Format
- Grades
- How to Register
- Instructors
- Meeting Times & Place
- Primary Learning Outcomes
- Software
- Text & Readings

Syllabus Topics

Alternative or Follow-Up Courses

Catalog Description

Course Policies

Format

Grades

How to Register

Instructors


Meeting Times & Place

Primary Learning Outcomes

Software

Text & Readings

ALL YOU NEED TO KNOW...



UtahStateUniversity
DEPARTMENT OF WATERSHED SCIENCES

ADVANCED GIS COURSES
WATS 4930/6920, 4931/6921, 6915

Search this site

GIS Classroom

- Home
- ▼ **About the Courses (Syllabi)**
 - Grades
 - Instructors
 - Primary Learning Outcomes
 - Software
- Course Topics
- ▼ **Assignments**
 - Labs (4930/6920/6915)
 - Project (4931/6921)
 - Reading Assignments
- Class Announcements**
- Class Calendar**
- Class Forum**
- ▼ **Useful Quick References**
 - ▶ Getting Organized and Oriented
 - Figure Preparation Guidelines
 - Great Maps!
 - GIS Class LibGuide
- Help**
- © 2013 Copyright & Disclaimers

Utah State University Links

- Canvas (Submit Assignments)
- Department of Watershed Sciences
- Banner Access
- Current Students
- Prospective Students

About the Courses (Syllabi)

This page and its subs-pages act as the syllabi for the following Advanced GIS courses offered through Watershed Sciences:

- WATS 4930/6920 - Advanced GIS & Spatial Analyses (3 credits) - 10 Weeks
- WATS 4931/6921 - GIS Research Projects (2 credits) - 5 Weeks
- WATS 6915 - GIS Fundamentals (1 credit) - 4 Weeks

Which Course(s) Should I Take?

WATS 4930/6920 is what you should take if you want to get a comprehensive understanding of GIS and advanced spatial analyses. GEOG 1800 is a prerequisite for WATS 4930.

WATS 6915 is the first four weeks of WATS 6920. The course is targeted at graduate students who want a crash course or refresher introduction to GIS, but don't have the time or need for the full 10 week course. No prior GIS experience is necessary, but the pace is rapid. Its perfect for someone wanting to know how to make some basic maps for their thesis or dissertation, as well as an introduction to building interactive web maps and doing basic spatial analyses.

WATS 4931/6921 is a five week follow up course to WATS 4930/6920, which puts the skills and principles learned in Advanced GIS & Spatial Analyses into practice through student research projects. WATS 4930 is available for capstone credit to Watershed Sciences students. Students will prepare a poster to present in poster session and a mock manuscript for potential publication.

Syllabus Topics

- Alternative or Follow-Up Courses
- Catalog Description
- Course Policies
- Format
- Grades
- How to Register
- Instructors
- Meeting Times & Place
- Primary Learning Outcomes
- Software
- Text & Readings

TODAY'S PLAN

I. Introductions

II. Syllabus

I. Primary Learning Outcomes

II. Topics

III. Labs

IV. Text & Software

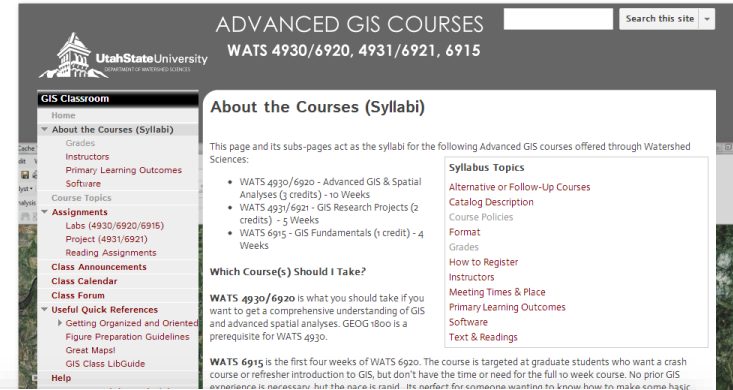
V. Course Policies

VI. Grades

III. Review of Maps

IV. WebGIS

V. Questions/Summary



The screenshot shows the 'ADVANCED GIS COURSES' page for WATS 4930/6920, 4931/6921, and 6915. The page includes a search bar, a navigation menu on the left, and a main content area titled 'About the Courses (Syllabi)'. The navigation menu lists: Home, About the Courses (Syllabi), Grades, Instructors, Primary Learning Outcomes, Software, Course Topics, Assignments, Labs (4930/6920/6915), Project (4931/6921), Reading Assignments, Class Announcements, Class Calendar, Class Forum, Useful Quick References, Getting Organized and Oriented, Figure Preparation Guidelines, Great Maps!, GIS Class LibGuide, and Help. The main content area contains a list of courses, a section for 'Which Course(s) Should I Take?', and a 'Syllabus Topics' section.

ADVANCED GIS COURSES
WATS 4930/6920, 4931/6921, 6915

UtahStateUniversity
Department of Watershed Sciences

GIS Classroom

Home

About the Courses (Syllabi)

Grades

Instructors

Primary Learning Outcomes

Software

Course Topics

Assignments

Labs (4930/6920/6915)

Project (4931/6921)

Reading Assignments

Class Announcements

Class Calendar

Class Forum

Useful Quick References

Getting Organized and Oriented

Figure Preparation Guidelines

Great Maps!

GIS Class LibGuide

Help

About the Courses (Syllabi)

This page and its sub-pages act as the syllabi for the following Advanced GIS courses offered through Watershed Sciences:

- WATS 4930/6920 - Advanced GIS & Spatial Analyses (3 credits) - 10 Weeks
- WATS 4931/6921 - GIS Research Projects (2 credits) - 5 Weeks
- WATS 6915 - GIS Fundamentals (1 credit) - 4 Weeks

Which Course(s) Should I Take?

WATS 4930/6920 is what you should take if you want to get a comprehensive understanding of GIS and advanced spatial analyses. GEOG 4800 is a prerequisite for WATS 4930.

WATS 6915 is the first four weeks of WATS 6920. The course is targeted at graduate students who want a crash course or refresher introduction to GIS, but don't have the time or need for the full 10 week course. No prior GIS experience is necessary, but this name is random - its purpose for someone wanting to know how to make some basic

Syllabus Topics

Alternative or Follow-Up Courses

Catalog Description

Course Policies

Format

Grades

How to Register

Instructors

Meeting Times & Place

Primary Learning Outcomes

Software

Text & Readings

Primary Learning Outcomes

1. Understand the fundamental theory of Geographic Information Science behind Geographic Information Systems (GIS), and in so doing build an awareness of what GIS can and cannot be used for
2. Become proficient in the use of GIS tools to conduct spatial analyses and build maps that are fit-for-purpose and effectively convey the information they are intended to
3. Build confidence in teaching your-self how to undertake new analyses (unfamiliar to you) using GIS, troubleshooting problems in GIS, and seeking help from the GIS community to solve your problems
4. Use GIS analyses to address applied problems and/or research questions
5. Become effective in building maps that can be shared with non-GIS users (e.g. PDF maps and interactive webGIS maps)

The above learning outcomes apply to the courses as follows:

Learning Outcome:	WATS 4930/6920	WATS 4931/6921	WATS 6915
1 - GIS Theory	Core	NA	Core
2 - Proficiency in Spatial Analyses & Cartography	Core	Partial	Partial
3 - Self-Teaching & Troubleshooting	Partial	Core	Partial
4 - Spatial Analysis in Research	NA	Core	NA
5 - Communicating with GIS	Core	Core	Core



gis.joewheaton.org/about/primary-learning-outcomes

GIS in the Field



GIS being used in the field, here with a ground-based LiDAR.

I WANT YOU TO:

- Gain confidence in **teaching yourself** techy-stuff
- Become more **tech-savvy**
- Learn a bunch of **tricks** that set you apart from the rest...
- Use that knowledge to **address problems and questions** that interest you
- Discover how to **stay on top** of rapidly evolving fields...
- Act like a **professional**, not a student



TODAY'S PLAN

I. Introductions

II. Syllabus

I. Primary Learning Outcomes

II. Topics

III. Labs

IV. Text & Software

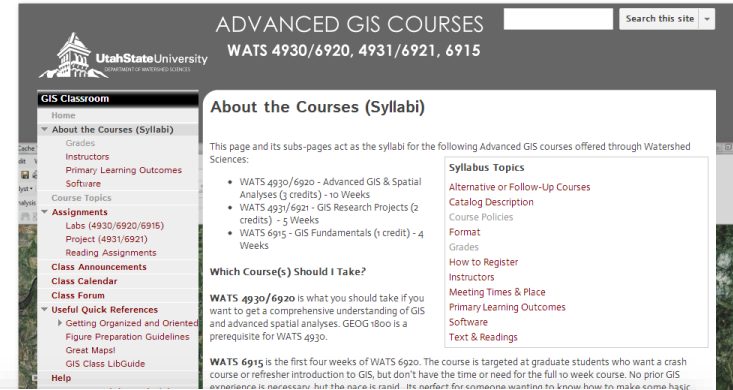
V. Course Policies

VI. Grades

III. Review of Maps

IV. WebGIS

V. Questions/Summary



The screenshot shows the 'ADVANCED GIS COURSES' website for Utah State University. The header includes the university logo and the text 'WATS 4930/6920, 4931/6921, 6915'. A search bar is in the top right. The left sidebar contains a 'GIS Classroom' menu with links to Home, About the Courses (Syllabi), Grades, Instructors, Primary Learning Outcomes, Software, Course Topics, Assignments, Labs (4930/6920/6915), Project (4931/6921), Reading Assignments, Class Announcements, Class Calendar, Class Forum, Useful Quick References, Figure Preparation Guidelines, Great Maps!, GIS Class LibGuide, and Help. The main content area is titled 'About the Courses (Syllabi)' and contains a list of courses with their credits and durations, a section for 'Which Course(s) Should I Take?' with descriptions for WATS 4930/6920 and WATS 6915, and a 'Syllabus Topics' list.

ADVANCED GIS COURSES
WATS 4930/6920, 4931/6921, 6915

About the Courses (Syllabi)

This page and its sub-pages act as the syllabi for the following Advanced GIS courses offered through Watershed Sciences:

- WATS 4930/6920 - Advanced GIS & Spatial Analyses (3 credits) - 10 Weeks
- WATS 4931/6921 - GIS Research Projects (2 credits) - 5 Weeks
- WATS 6915 - GIS Fundamentals (1 credit) - 4 Weeks

Which Course(s) Should I Take?

WATS 4930/6920 is what you should take if you want to get a comprehensive understanding of GIS and advanced spatial analyses. GEOG 4800 is a prerequisite for WATS 4930.

WATS 6915 is the first four weeks of WATS 6920. The course is targeted at graduate students who want a crash course or refresher introduction to GIS, but don't have the time or need for the full 10 week course. No prior GIS experience is necessary, but the pace is rapid. It's perfect for someone wanting to know how to make some basic GIS.

Syllabus Topics

- Alternative or Follow-Up Courses
- Catalog Description
- Course Policies
- Format
- Grades
- How to Register
- Instructors
- Meeting Times & Place
- Primary Learning Outcomes
- Software
- Text & Readings

Syllabus Topics

Alternative or Follow-Up Courses

Catalog Description

Course Policies

Format

Grades

How to Register

Instructors

Meeting Times & Place

Primary Learning Outcomes

Software

Text & Readings

BROAD TOPICS

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

GIS Course(s)	Semester Week	Course Topics	Lecture Dates	Lab
4930, 6920, 6915	WEEK 1	Introduction/Review of GIS	Jan 7 & 9	1. ArcGIS Refersher/Intro & WebGIS
4930, 6920, 6915	WEEK 2	Abstracting the World to Digital Maps	Jan 14 & 16	2. Coordinate Data, Projections & Transformations
4930, 6920, 6915	WEEK 3	Working with Data in GIS	Jan 21 & 22	3. Reproducing Maps - Geologic Map
4930, 6920, 6915	WEEK 4	Working with Data in GIS	Jan 28 & Jan 30	4. Digitizing & Editing & Sharing Data
4930 & 6920	WEEK 5	Vector Analyses	Feb 4 & 6	5. Vector Analysis
4930 & 6920	WEEK 6	Raster Analyses	Feb 13	6. Working w/ DEMs
4930 & 6920	WEEK 7	Raster Analyses	Feb 20	7. Building DEMs
4930 & 6920	WEEK 8	GIS Modeling	Feb 27	8. Morphometric Analyses
4930 & 6920	WEEK 9	Collecting Your Own Data	Mar 4 & 6	9. Blimp & Georeferencing LabLab
Spring Break – March 10 -14				
4930 & 6920	WEEK 10	GIS Modeling & Synthesis	Podcast Lectures	10. Habitat Modeling

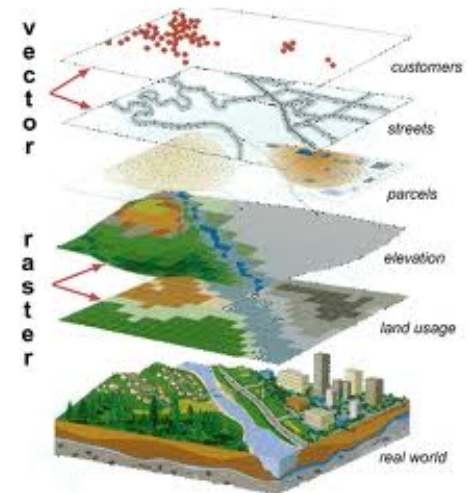
End of WATS 4930/6920

COURSE TOPICS

Course Topics

These courses are organized into a series of [topics](#), which we will cover in the order listed below. For each topic, you will find downloads of lecture materials, links to [reading assignments](#), links to [lab assignments and materials](#), and additional information. Please note, that:

- topic pages may not be fully populated until we get to that topic in lecture; some lecture topics will appear populated with lectures and content from the previous year's lecture.
- topic pages may be updated even after we've covered a topic as typos and inconsistencies are brought to our attention or as we find new material that may help you better understand a topic
- if you find any problems or something that is confusing, please post a comment or question to the [appropriate topic forum](#).



WATS 4930/6920 Topics

Note that Weeks 1-4 are WATS 6915 Topics.

Course Topics (by week)

Week 01: Introduction/Review of GIS

Week 02: Abstracting the World to Digital Maps

Week 03 & 04: Working with Data in GIS

Week 05: Vector Analyses

Week 06 & 07: Raster Analyses

Week 08 & 09: GIS Modeling

Week 10: Collecting Your Own Data & Course Synthesis

TOPIC PAGES ARE A REFERENCE

[Course Topics](#) >

Week 02: Abstracting the World to Digital Maps

Contents

- 1 Background
 - 1.1 Introduction to Topic
 - 1.2 Why we're Covering it
 - 1.3 Learning Outcomes
- 2 Lectures
 - 2.1 Projections & Coordinate Systems
 - 2.2 Data Types
- 3 Additional Resources
 - 3.1 Data Types
 - 3.2 Projections & Coordinate Systems
 - 3.3 Making Good Maps

Key Links and Dates

Lecture Date(s):

[See Calendar](#)

Reading Assignments

[See Here for Reading Assignments](#)

Lab Assignment(s)

[Lab 02 - Making Good Maps from Existing Data & Georeferencing](#)

Discussion

[Week 02](#)

Background

Introduction to Topic

The spatial or geographic representation of the world has to be abstracted into specific data types to be used in GIS. GIS is all about data and until you appreciate how that data is represented digitally you can not make effective maps. Data is added into maps in GIS as layers which can be overlayed.

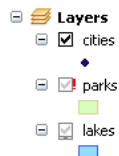
One of the most frustrating and typical complaints of GIS students is that *'my data just disappeared! It was there when I saved it now its gone!'* This is indicated by the notorious red exclamation point **!** next to your layer. The reason for this is simple, the link between your [map document](#) and the location the data was previously stored has been broken. Many things can break it, and it is easy to [repair](#).

Another common complaint amongst naive and newbie GIS users is that *'my data doesn't lineup when I overlay it!'* This is most typically because a [projection](#) and [coordinate system](#) was either not or not correctly defined.

This week, we will help you better understand how data is represented in GIS and how those layers are projected to make maps.

Why we're Covering it

You can not make effective use of GIS without an in depth understanding of the a) choices you have in data types to



represent your spatial data, and b) the projections & coordinate systems necessary to locate your spatial data correctly. ArcGIS makes some of these choices so easy for you that you can get yourself in trouble. As such, the next two lectures are designed to expose you to each of these aspects, whereas the [lab](#) will put those concepts and theories to practice by having you make some *good* maps with different data types and then taking some unprojected data and [georeferencing](#) it.

Although you SHOULD recall most or all of this if you have taken the [prerequisites](#), my past experience has been that most students are very weak when it comes to understanding these fundamentals and it hinders them from progressing as a GIS user. Review never hurts, and we'll take you further and more in depth than you've hopefully gone before.

Learning Outcomes

These lectures, readings and Labs [03](#) & [04](#) all help fulfill [primary learning outcomes](#) 1 & 2.

Lectures

Projections & Coordinate Systems

Here we dive into the details of what allows us to overlay data so seemingly seamlessly in GIS: projections and coordinate systems. Without projections and coordinate systems, GIS would not be possible.

- 2012 [Tuesday Lecture - PDF](#) w/ 2 slides per page
- 2012 [Tuesday Lecture - PDF](#) w/ 6 slides per page
- 2012 [Video of Tuesday's Lecture](#)

Data Types

Here we review what you should already know, but will surely have forgotten because it is not so exciting. We'll try and make it interesting....

- 2012 [Thursday Lecture](#) - PDF w/ 2 slides per page
- 2012 [Thursday Lecture](#) - PDF w/ 6 slides per page
- 2012 [Video of Thursday's Lecture](#)

Additional Resources


Below are some very useful references on projections and coordinate systems from ESRI's online help (ArcGIS Resource Center), which you should browse through and make sure you understand.

- [How a GIS represents and models geographic information](#)

Data Types

- [Three fundamental representations of geographic information layers](#)

CALENDAR ON GIS.JOEWEHEATON.ORG

**UtahStateUniversity**
DEPARTMENT OF WATERSHED SCIENCES

ADVANCED GIS COURSES
WATS 4930/6920, 4931/6921, 6915

Search this site

GIS Classroom

- Home
- About the Courses (Syllabi)
 - Grades
 - Instructors
 - Primary Learning Outcomes
 - Software
- Course Topics
- Assignments
 - Labs (4930/6920/6915)
 - Project (4931/6921)
 - Reading Assignments
- Class Announcements
- Class Calendar
- Class Forum
- Useful Quick References
 - Getting Organized and Oriented
 - Figure Preparation Guidelines
 - Nice Maps!
 - GIS Class LibGuide
- Help
- © 2013 Copyright & Disclaimers

Utah State University Links

- Canvas (Submit Assignments)
- Department of Watershed Sciences
- Banner Access
- Current Students
- Prospective Students
- Open Course Ware

Other Links

- ESRI Support

Class Calendar

These calendars show the course and lecture schedules (updated regularly). They do not show due dates for assignments. See [here](#) and the [Canvas](#) Calendar for assignment deadlines and instructions.

Contents

- 1 WATS 4930/6920
- 2 WATS 4931/6921
- 3 Joe's Office Hours

Note: You can click on any event to see information on the lecture topic (under description). If you use Google Calendars, you can save it to your own Google Calendar.

WATS 4930/6920
WATS 4930/6920, 6915 Lecture Schedule

Today ◀ ▶ Monday, January 6 ▾

Print Week Month Agenda

Tuesday, January 7
10:30am WATS 4930/6920 - Lecture on: Intro to GIS, WebGIS & Course
Thursday, January 9
10:30am WATS 4930/6920 - Lecture on - Projections & Coordinate Systems
Tuesday, January 14
10:30am WATS 4930/6920 - Lecture on - Data Types
Thursday, January 16
10:30am WATS 4930/6920 - Lecture on - Raster Imagery & Data Sources
Tuesday, January 21

**UtahStateUniversity**

WATS 4930

TODAY'S PLAN

I. Introductions

II. Syllabus

I. Primary Learning Outcomes

II. Topics

III. Labs

IV. Text & Software

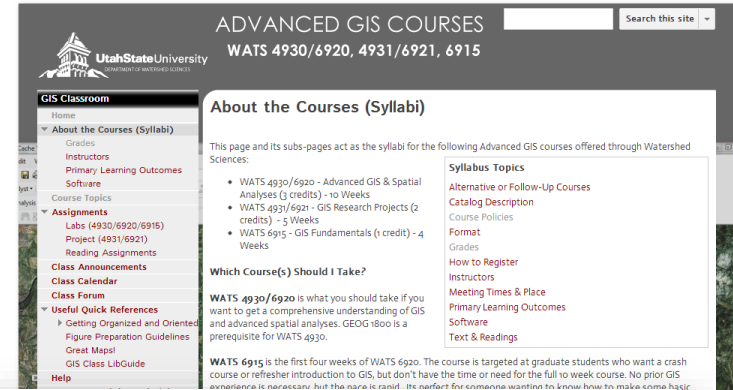
V. Course Policies

VI. Grades

III. Review of Maps

IV. WebGIS

V. Questions/Summary



The screenshot shows the 'ADVANCED GIS COURSES' website for Watershed Sciences. The header includes the Utah State University logo and the URL 'gis.joewheaton.org/about'. The main content area is titled 'About the Courses (Syllabi)' and lists several courses: WATS 4930/6920 - Advanced GIS & Spatial Analyses (3 credits) - 10 Weeks, WATS 4931/6921 - GIS Research Projects (2 credits) - 5 Weeks, and WATS 6915 - GIS Fundamentals (1 credit) - 4 Weeks. A sidebar on the left contains a 'GIS Classroom' menu with links to Home, About the Courses (Syllabi), Grades, Instructors, Primary Learning Outcomes, Software, Course Topics, Assignments, Labs (4930/6920/6915), Project (4931/6921), Reading Assignments, Class Announcements, Class Calendar, Class Forum, Useful Quick References, Figure Preparation Guidelines, Great Maps!, GIS Class LibGuide, and Help. The main content area also includes a 'Which Course(s) Should I Take?' section and a 'Syllabus Topics' section with links to Alternative or Follow-Up Courses, Catalog Description, Course Policies, Format, Grades, How to Register, Instructors, Meeting Times & Place, Primary Learning Outcomes, Software, and Text & Readings.

Syllabus Topics

[Alternative or Follow-Up Courses](#)

[Catalog Description](#)

[Course Policies](#)

[Format](#)

[Grades](#)

[How to Register](#)

[Instructors](#)

[Meeting Times & Place](#)

[Primary Learning Outcomes](#)

[Software](#)

[Text & Readings](#)

LABS ARE EVERYTHING!

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

Assignments >

Labs (4930/6920/6915)

Below are links to each of the lab assignments. Please note that many of these lab pages will not be completely populated/updated until a lab is assigned. Even after a lab is assigned, the online instructions may be updated to provide clarifications, fix typos, or elaborate on points of confusion as they arise (so refresh F5 your browser often to override pages stored in your web browser's cache). If you find any problems with an assigned lab, please post a thread to the relevant lab forum on the [Class Forum](#). See [here](#) for more information on the [lab facilities](#) and [here](#) for more information on [lab software](#). WATS 4930/6920 students will complete labs 1-10 below. WATS 6915 students will only complete labs 1 - 4.

Lab Assignments

Lab 01 - ArcGIS Refresher & Intro to WebGIS

Lab 02 - Coordinate Data, Projections & Transformations

Lab 03 - Reproducing Maps - Geologic Map

Lab 04 - Digitizing, Editing & Sharing Data

Lab 05 - Vector Analyses

Lab 06 - Working with DEMs

Lab 07 - Building DEMs

Lab 08 - Morphometric Analyses

Lab 09 - Habitat Modeling

Lab 10 - Blimp & Georeferencing

Old Labs

Lab Submission Guidelines

In [Lab 01](#), you will learn how to create your own website using Google Sites. You will maintain your own website for at least the duration of the course. All of your lab assignments will be produced as one or more web pages on your website. The GIS maps you produce will either be [PDEs](#) (hosted on your website), images or dynamic google maps (specified in each lab's instructions). For each lab, these maps will be embedded in web pages you create so you can share them with anyone. Your primary audience is usually defined for you in your lab assignment, but your TA and Instructor are other obvious target audiences. However, the whole wide world can see your website (if you permit them to) so you should produce something professional that you can be proud of and use as a

Fieldwork for Lab 10



LABS CAN BE DONE ANYWHERE

- Data you need is online
- Instructions are spelt 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

Assignments > Labs (4930/6920/6915) >

Lab 01 - ArcGIS Refresher & Intro to WebGIS

Contents

- 1 Introduction to Lab
 - 1.1 Background
 - 1.2 Prerequisites
- 2 Lab Objectives
- 3 Lab Tasks
 - 3.1 Task 1 - Create Study Site Map
 - 3.2 Task 2 - Create your own GIS Website
 - 3.3 Task 3 - Publish Maps to Your Website
- 4 What to Submit
- 5 Suggested Instructions & Workflows
- 6 Additional Resources
 - 6.1 Lab Introduction Lecture Slides
 - 6.2 Related Tutorials & Help for ArcGIS
 - 6.3 Related Tutorials & Help for Google Sites

Key Links & Dates

Corresponding Lecture Topic(s)
[Week 01: Introduction/Review of GIS](#)
[See all Topics](#)


Lab Due Date
Submitted before start of next week's lab on [Canvas](#)
[See Calendar](#)

Relevant Discussion(s):

- [Lab 01](#)
- [Week 01](#)

Introduction to Lab

Background



In this lab we are refreshing your memory about (or introducing you to) ArcGIS (version 10) and reminding you about some of the critical steps in making good maps with ArcMap. There are usually multiple ways in ArcGIS to achieve the same endpoint, and for now we will just walk you through one workflow. As with all labs, we will separate the lab tasks and what you have to submit from some suggested instructions and/or workflows. Once we have created a map, we will export it in multiple formats, which we will publish as both static map figures and interactive webGIS maps on your own website.

For this lab, pretend that you are doing research (vaguely defined) at Tony Grove Lake. We simply need to draw a map of our study site and share that map with non GIS users.

Prerequisites

TODAY'S PLAN

I. Introductions

II. Syllabus

I. Primary Learning Outcomes

II. Topics

III. Labs

IV. Text & Software

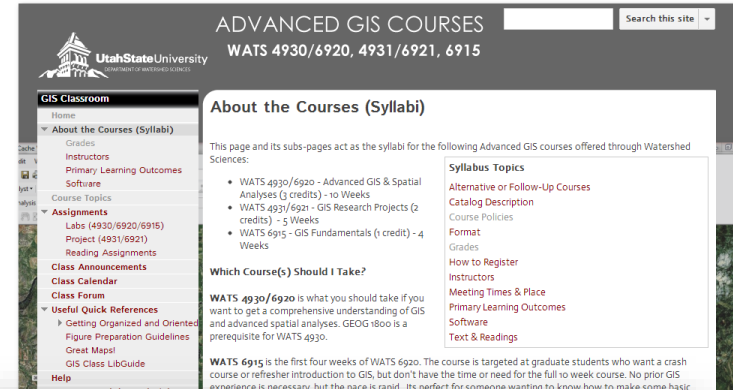
V. Course Policies

VI. Grades

III. Review of Maps

IV. WebGIS

V. Questions/Summary



The screenshot shows the 'ADVANCED GIS COURSES' website for Watershed Sciences. The header includes the Utah State University logo and the URL 'gis.joewheaton.org/about'. The main content area is titled 'About the Courses (Syllabi)' and lists several courses: WATS 4930/6920 - Advanced GIS & Spatial Analyses (3 credits) - 10 Weeks, WATS 4931/6921 - GIS Research Projects (2 credits) - 5 Weeks, and WATS 6915 - GIS Fundamentals (1 credit) - 4 Weeks. A sidebar on the left contains a 'GIS Classroom' menu with links to Home, About the Courses (Syllabi), Grades, Instructors, Primary Learning Outcomes, Software, Course Topics, Assignments, Labs (4930/6920/6915), Project (4931/6921), Reading Assignments, Class Announcements, Class Calendar, Class Forum, Useful Quick References, Figure Preparation Guidelines, Great Maps!, GIS Class LibGuide, and Help.

Syllabus Topics

Alternative or Follow-Up Courses

Catalog Description

Course Policies

Format

Grades

How to Register

Instructors

Meeting Times & Place

Primary Learning Outcomes

Software

Text & Readings

TEXT

[About the Courses \(Syllabi\) >](#)

Text & Readings

WATS 4931/6921 has no required text. WATS 4930/6920 & WATS 6915 share the same required text book:

Required Text:

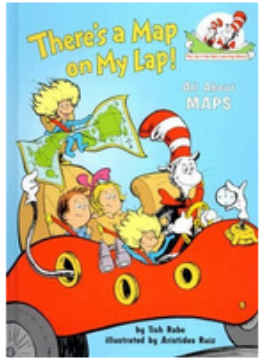
- Bolstad, P., 2005. GIS Fundamentals: A first text on Geographic Information Systems. Eider Press, 620 pp.

Dr. Bolstad has put a lot of resources associated with this book [online for free](#).

Other Readings:

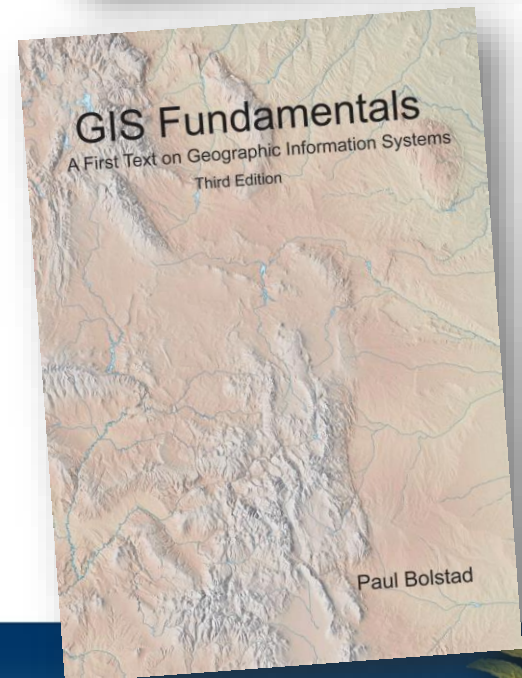
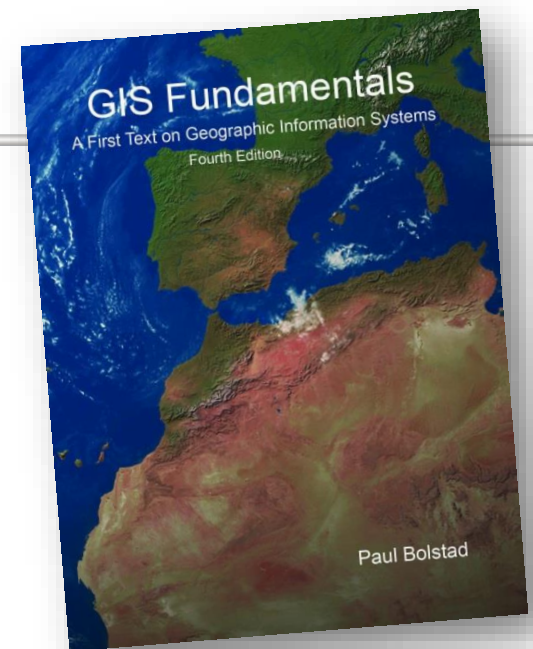
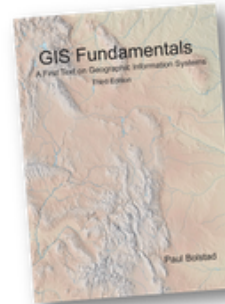
See [here](#) for reading assignments.

Recommended Text:



You may think this is ridiculous, but much of what you need to know (and students frequently forget) is covered in this Dr. Suess Book! In fact, the six C's you will be graded on are based on principles outlined in this book that a 3 year old can understand!

Rabe, T., 2002. There's a Map on my Lap! All About Maps. Random House Books. 48 pp.



SOFTWARE – ArcGIS & Google Maps/Earth

GIS Classroom

Home

▼ About the Courses (Syllabi)

Grades

Instructors

Primary Learning Outcomes

Software

Course Topics

▼ Assignments

Labs (4930/6920/6915)

Project (4931/6921)

Reading Assignments

Class Announcements

Class Calendar

Class Forum

▼ Useful Quick References

▼ Getting Organized and Oriented

ArcGIS 10 Desktop Orientation

File Management

Figure Preparation Guidelines

Great Maps!

GIS Class LibGuide

Help

© 2013 Copyright & Disclaimers

Utah State University Links

Canvas (Submit Assignments)

Department of Watershed Sciences

Banner Access

Current Students

Prospective Students

Open Course Ware

Other Links

ESRI Support

ArcGIS 10 Help

joewheaton.org

Ecogeomorphology & Topographic Analysis Lab


Quinney Library Labs

BSGIS Lab

About the Courses (Syllabi) >

Software

GIS



We will primarily use [ESRI's ArcGIS 10 Desktop](#) (ArcInfo version with all extensions), which is available for your use on all the QL304 and QL306 machines. The Quinney Labs all have ArcGIS 10.1 installed on them. You can and are welcome to complete the labs in ArcGIS 10.0 or 10.1*. Although the lab computers can work, we highly recommend you working off your own laptop (if you have one). As students, you are entitled to a free one-year student license of ArcGIS for installation on your personal computer (see [here](#) for details). Grad students, if you want a version for your research, it can be acquired for free through USU Software Licensing (<https://hd.usu.edu/software/>).

The reason we use ArcGIS is because it is the industry standard and the vast majority of employers, universities and agencies you may end up working for will most likely be using ArcGIS as well. All of the principles and theory we learn in this course, will apply to any GIS software.

*ArcMap projects are not compatible when working between versions 10.0 and 10.1. When working in 10.1 you will have to "save a copy" of your map project and then "save as type" and choose version 10.0 in order to open project in 10.0.


- [ArcGIS Installation Instructions](#)

Open Source Desktop GIS Alternatives to ArcGIS

- [MapWindow GIS](#) – Free, open source GIS desktop application and programming component (only runs in Windows).
- [Landserf](#) - Free GIS, that focuses on modeling of land surface (i.e. DEMS). Java based GIS runs in Linux, Mac and Windows
- [GRASS GIS](#) – Originally developed by the [U.S. Army Corps of Engineers](#), open source: a complete GIS
- [SAGA GIS](#) – System for Automated Geoscientific Analysis- a hybrid GIS software.
- [Quantum GIS](#) – QGIS is an Open Source GIS that runs on Linux, Unix, Mac OS X, and Windows.

Website & WebGIS

You are welcome to use any software, hosting and servers that you wish to use, are knowledgeable about and can support dynamic webGIS applications. However, it is strongly recommend that you use [Google Sites](#) for your website and [Google Maps](#) for your webGIS applications. We will only provide support for Google Sites and Google Maps in lab. The reason we suggest these is because they are free, easy-to-use, and require no programming experience. Moreover, [Google Maps](#) and [Google Earth](#) are familiar to most web users to whom your spatial analyses and maps might be targeted. However, there are plenty of viable free and commercial alternatives out there.

 UtahStateUniversity

WATS 4930

DESPITE WHAT IMPRESSION ESRI GIVES



- They are not the ONLY game in town
- There are lots of commercial and open source alternatives
- If you have interest in these, you may consider WILD 6900 -

Follow Up Courses

At Utah State University

There are too many courses to list, which employ GIS skills that you might learn in WATS 4930/6920 or an equivalent. However, here are a few follow ups that you might find useful:

Course	Title	Cr	Trm	Notes:
CEE 2240	Engineering Surveying	3	Sp, Su	Fundamentals of geomatics & tachometric surveying.
WILD 6900 (section 3)	GIS Programming with Python I	1	Sp	This is a great follow up that focuses on geoprocessing and scripting in ArcGIS (1/2 Semester)
WILD 6900 (section 4)	GIS Programming with Python II	1	Sp	This section focuses on Python scripting with OpenSource GIS libraries (1/2 semester)
WATS 6900	Restoration Monitoring: Geomorphic Change Detection	1	Su	This is an ICRRR short course I teach in Park City the week after finals.

SOFTWARE FOR GIS:

Full GIS

- ESRI, Inc.
- MapInfo
- MapWindow
- LandSerf
- Saga GIS
- Quantum GIS
- Intergraph
- Bentley Systems (MicroStation)
- Autodesk (AutoCAD MAP)

Vector GIS

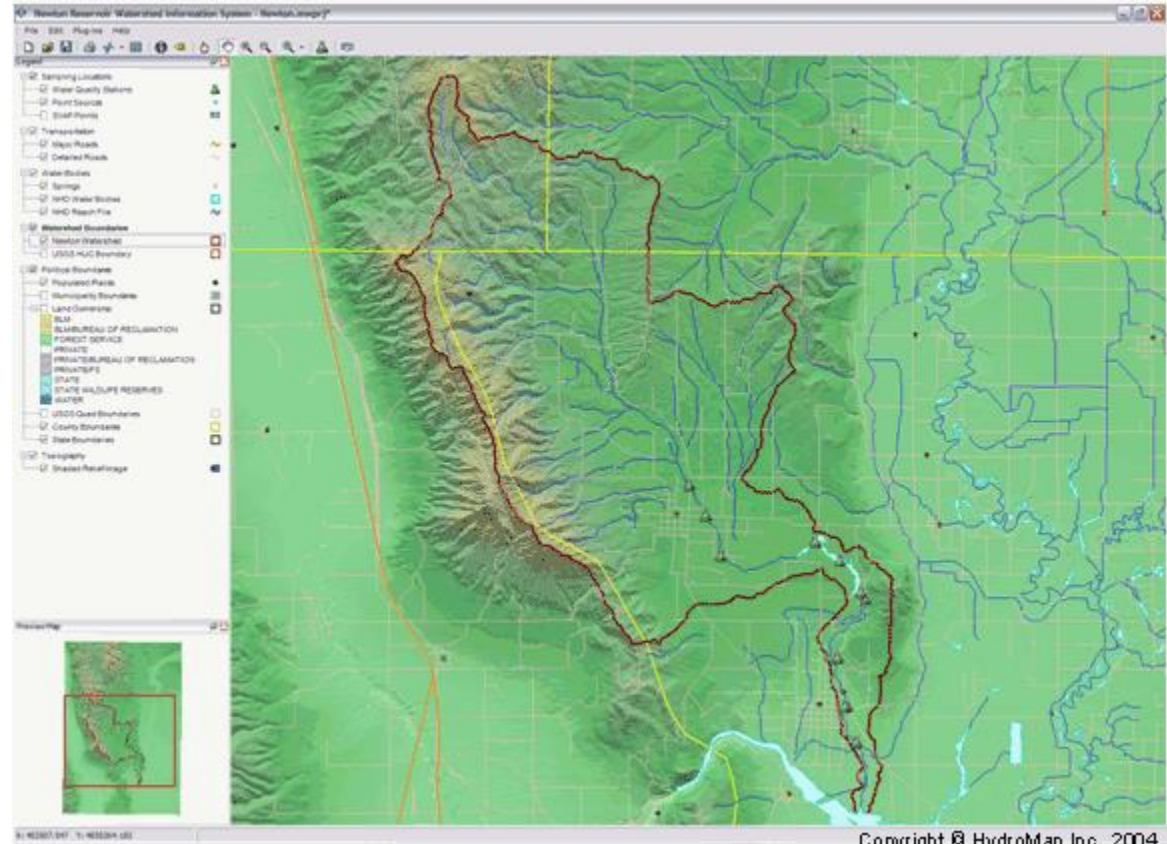
- Smallworld Systems
Manifold
- Maptitude

Raster GIS

- ERDAS/Imagine
 - long established leader in remote sensing
 - acquired by Leica Geosystems in 2001
- ER MAPPER
 - aggressive newcomer originating in Australia
- ENVI,
 - relative newcomer, radar specialization
 - acquired by Kodak in 2000
- PCI--Geomatica
 - long-term Canadian player
- CARIS
 - newer Canadian entry
- GRASS (Rutgers Univ.)
- IDRISI (Clark Univ)
 - pioneering, university-developed package

MAPWINDOW

- Free! Open-source GIS
- Developed both here at USU and up at ISU
- Like lots...
Extendible,
Simple



MapWindow
GIS

LandSerf

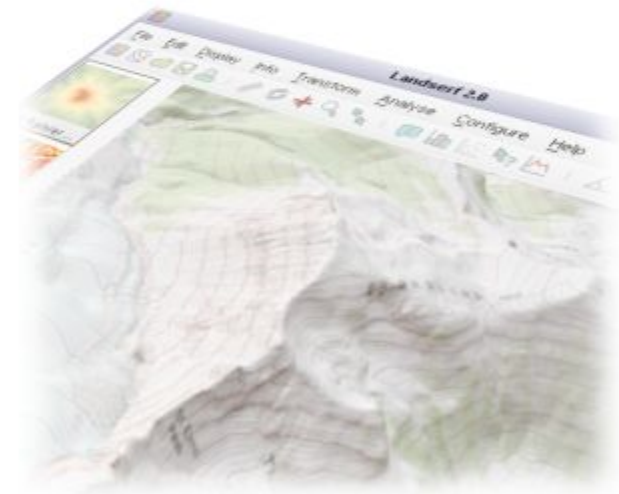


landserf.org | [Image gallery](#) | [Discussion forum](#) | [Download latest version](#) | [Jo Wood's Homepage](#)

LandSerf is a freely available Geographical Information System (GIS) for the visualisation and analysis of surfaces. Applications include visualisation of landscapes; geomorphological analysis; gaming development; GIS file conversion; map output; archaeological mapping and analysis; surface modelling and many others. It runs on any platform that supports the Java Runtime Environment (Windows, MacOSX, Unix, Linux etc.)

Features:

- Handles multiple surface models - raster digital elevation models (DEMs), vector Triangulated Irregular Networks (TINs), contours and metric surface networks (MSNs).
- Interactive 3D viewing and 'flythrough' of surfaces on platforms that support OpenGL.
- A range of powerful and interactive visualisation techniques including lighting/shade models, multiple image blending and dynamic graphical query.
- Raster and vector transformation including image rectification and map projection.
- Multi-scale surface processing based on quadratic regression.
- Fractal and polynomial surface generation for modelling and simulation.
- Multi-scale parameter and feature extraction (slope, aspect, curvature etc.).
- Import and export of common raster and vector formats.
- Integration with Garmin GPS receivers.



- <http://www.soi.city.ac.uk/~jwo/landserf/>



TODAY'S PLAN

I. Introductions

II. Syllabus

I. Primary Learning Outcomes

II. Topics

III. Labs

IV. Text & Software

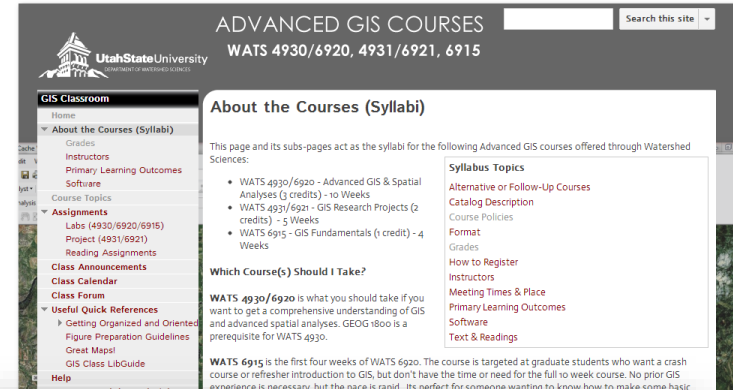
V. Course Policies

VI. Grades

III. Review of Maps

IV. WebGIS

V. Questions/Summary



The screenshot shows the 'ADVANCED GIS COURSES' page for WATS 4930/6920, 4931/6921, 6915. It features a navigation menu on the left with links to 'About the Courses (Syllabi)', 'Grades', 'Instructors', 'Primary Learning Outcomes', 'Software', 'Course Topics', 'Assignments', 'Labs (4930/6920/6915)', 'Project (4931/6921)', 'Reading Assignments', 'Class Announcements', 'Class Calendar', 'Class Forum', 'Useful Quick References', 'Figure Preparation Guidelines', 'Great Maps!', 'GIS Class LibGuide', and 'Help'. The main content area is titled 'About the Courses (Syllabi)' and includes a list of courses, a section for 'Which Course(s) Should I Take?', and a 'Syllabus Topics' section.

ADVANCED GIS COURSES
WATS 4930/6920, 4931/6921, 6915

UtahStateUniversity
Department of Watershed Sciences

GIS Classroom

Home

About the Courses (Syllabi)

Grades

Instructors

Primary Learning Outcomes

Software

Course Topics

Assignments

Labs (4930/6920/6915)

Project (4931/6921)

Reading Assignments

Class Announcements

Class Calendar

Class Forum

Useful Quick References

Figure Preparation Guidelines

Great Maps!

GIS Class LibGuide

Help

About the Courses (Syllabi)

This page and its sub-pages act as the syllabi for the following Advanced GIS courses offered through Watershed Sciences:

- WATS 4930/6920 - Advanced GIS & Spatial Analyses (3 credits) - 10 Weeks
- WATS 4931/6921 - GIS Research Projects (2 credits) - 5 Weeks
- WATS 6915 - GIS Fundamentals (1 credit) - 4 Weeks

Which Course(s) Should I Take?

WATS 4930/6920 is what you should take if you want to get a comprehensive understanding of GIS and advanced spatial analyses. GEOG 4800 is a prerequisite for WATS 4930.

WATS 6915 is the first four weeks of WATS 6920. The course is targeted at graduate students who want a crash course or refresher introduction to GIS, but don't have the time or need for the full 10 week course. No prior GIS experience is necessary, but the pace is rapid. It is perfect for someone wanting to know how to make some basic GIS.

Syllabus Topics

Alternative or Follow-Up Courses

Catalog Description

Course Policies

Format

Grades

How to Register

Instructors

Meeting Times & Place

Primary Learning Outcomes

Software

Text & Readings

Syllabus Topics

Alternative or Follow-Up Courses

Catalog Description

Course Policies

Format

Grades

How to Register

Instructors

Meeting Times & Place

Primary Learning Outcomes

Software

Text & Readings


COURSE POLICIES

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

[About the Courses \(Syllabi\) >](#)

Course Policies

- *Late work.* Any work submitted past the due date will receive an automatic 10% reduction unless due to a **pre-approved** excused absence. Any work turned in over one week past the due date may not be accepted without prior approval from Shanon Belmont.
- *Working together.* You are welcome and expected to work together on homeworks, readings, lab reports and projects. Please take advantage of our [forum](#) to post questions and help each other out. However, each student must undertake their own analyses, make their own maps, produce their own figures and prepare their own websites and reports. Plagiarism will not be tolerated. Copying figures without appropriate citations or permission will not be tolerated.
- *Academic Dishonesty.* Use common sense. Don't cheat.
- *Lack of Paper Handout Policy.* You will notice that I very rarely provide you handouts in class. I will not provide you with a paper copy of the syllabus, lab handouts, and other materials. The only exceptions to this policy are that I may occasionally provide you a paper handout for in-class exercise or pop quiz. The reasons for this policy are as follows:
 - *Save paper & resources.* There are a lot of course materials. Some people like paper handouts, some don't, some do. If you want to print materials, you are welcome to do so from this website (see copyright disclaimer). I'd prefer not to waste paper, ink and energy on something you may or may not ever look at again.
 - *Dynamic content.* If something is printed, it has the potential to be out of date. By keeping all the course materials, handouts online, they can be updated and/or corrected dynamically through time (you can always look for a 'Last Updated' date stamp on each page). Plus, this [website](#) will be made available to you into the future indefinitely as a resource that you can continue to refer back to (unlike [Canvas](#)).
 - *Regular Updates.* If you will need to access the website regularly to complete the course, this encourages you to interact with the web content more regularly and increases the likelihood that you will find something new when browsing around the site trying to find something.



TODAY'S PLAN

I. Introductions

II. Syllabus

I. Primary Learning Outcomes

II. Topics

III. Labs

IV. Text & Software

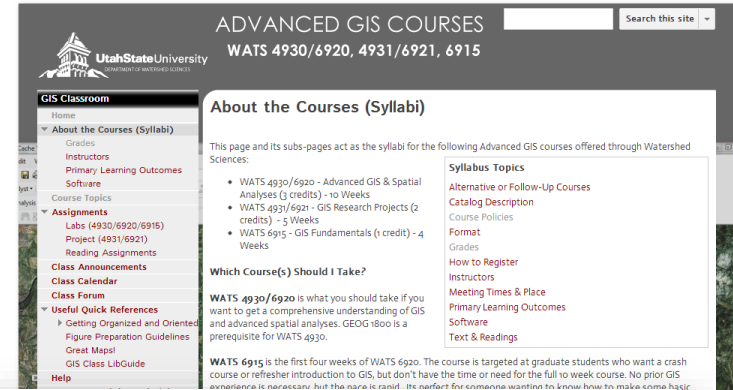
V. Course Policies

VI. Grades

III. Review of Maps

IV. WebGIS

V. Questions/Summary



The screenshot shows the 'ADVANCED GIS COURSES' page for Watershed Sciences at Utah State University. The page lists courses WATS 4930/6920, 4931/6921, and 6915. A sidebar on the left contains a 'GIS Classroom' menu with links to Home, About the Courses (Syllabi), Grades, Instructors, Primary Learning Outcomes, Software, Course Topics, Assignments, Labs (4930/6920/6915), Project (4931/6921), Reading Assignments, Class Announcements, Class Calendar, Class Forum, Useful Quick References, Figure Preparation Guidelines, Great Maps!, GIS Class LibGuide, and Help. The main content area is titled 'About the Courses (Syllabi)' and includes a list of courses, a section for 'Which Course(s) Should I Take?' with descriptions for WATS 4930/6920 and WATS 6915, and a 'Syllabus Topics' list.

ADVANCED GIS COURSES
WATS 4930/6920, 4931/6921, 6915

UtahStateUniversity
UTAH STATE UNIVERSITY
WATERSHED SCIENCES

GIS Classroom

- Home
- About the Courses (Syllabi)
- Grades
- Instructors
- Primary Learning Outcomes
- Software
- Course Topics
- Assignments
- Labs (4930/6920/6915)
- Project (4931/6921)
- Reading Assignments
- Class Announcements
- Class Calendar
- Class Forum
- Useful Quick References
- Figure Preparation Guidelines
- Great Maps!
- GIS Class LibGuide
- Help

About the Courses (Syllabi)

This page and its sub-pages act as the syllabi for the following Advanced GIS courses offered through Watershed Sciences:

- WATS 4930/6920 - Advanced GIS & Spatial Analyses (3 credits) - 10 Weeks
- WATS 4931/6921 - GIS Research Projects (2 credits) - 5 Weeks
- WATS 6915 - GIS Fundamentals (1 credit) - 4 Weeks

Which Course(s) Should I Take?

WATS 4930/6920 is what you should take if you want to get a comprehensive understanding of GIS and advanced spatial analyses. GEOG 4800 is a prerequisite for WATS 4930.

WATS 6915 is the first four weeks of WATS 6920. The course is targeted at graduate students who want a crash course or refresher introduction to GIS, but don't have the time or need for the full 10 week course. No prior GIS experience is necessary, but the pace is rapid. It is perfect for someone wanting to know how to make some basic GIS maps.

Syllabus Topics

- Alternative or Follow-Up Courses
- Catalog Description
- Course Policies
- Format
- Grades
- How to Register
- Instructors
- Meeting Times & Place
- Primary Learning Outcomes
- Software
- Text & Readings

Syllabus Topics

Alternative or Follow-Up Courses

Catalog Description

Course Policies

Format

Grades

How to Register

Instructors

Meeting Times & Place

Primary Learning Outcomes

Software

Text & Readings

GRADES

Grade Overview

Our primary concern is that you engage in achieving the [learning objectives](#) for this course. Your grade is a secondary concern to us, and if you are effectively learning your grade should be a moot point. However, we recognize how motivated some of you are by grades and we have attempted to provide clear guidelines (below) to help manage your expectations about what you need to do to earn the grade you want.

WATS 4930/6920

Your grade consists of lab-based work, a project and occasional quizzes (see [assignments](#)):

- 10 [Lab](#) Reports (2%-10% each) 95%
- Occasional Quizzes (Some in class and some on [Canvas](#)) 5%

WATS 4931/6921

Your grade consists entirely of project-based work (see [Project Components](#)):

- Proposal, 3 Vignettes and Peer Review 15%
- Poster Presentation 15%
- Final Project Manuscript 70%

WATS 6915

Your grade consists of lab-based work (see [assignments](#)):

- 4 [Lab](#) Reports (2%-10% each) 100%

Grading Scale

We will use a standard grading scale:

Grade	% of Available Points
A+	> 97%
A	< 97% to 93%
A-	< 93% to 90%
B+	< 90% to 87%
B	< 87% to 83%
B-	< 83% to 80%
C+	< 80% to 77%
C	< 77% to 73%
C-	< 73% to 70%
D+	< 70% to 67%
D	< 67% to 63%
D-	< 63% to 60%
F	< 60%

TODAY'S PLAN

I. Introductions

II. Syllabus

III. Review of Maps

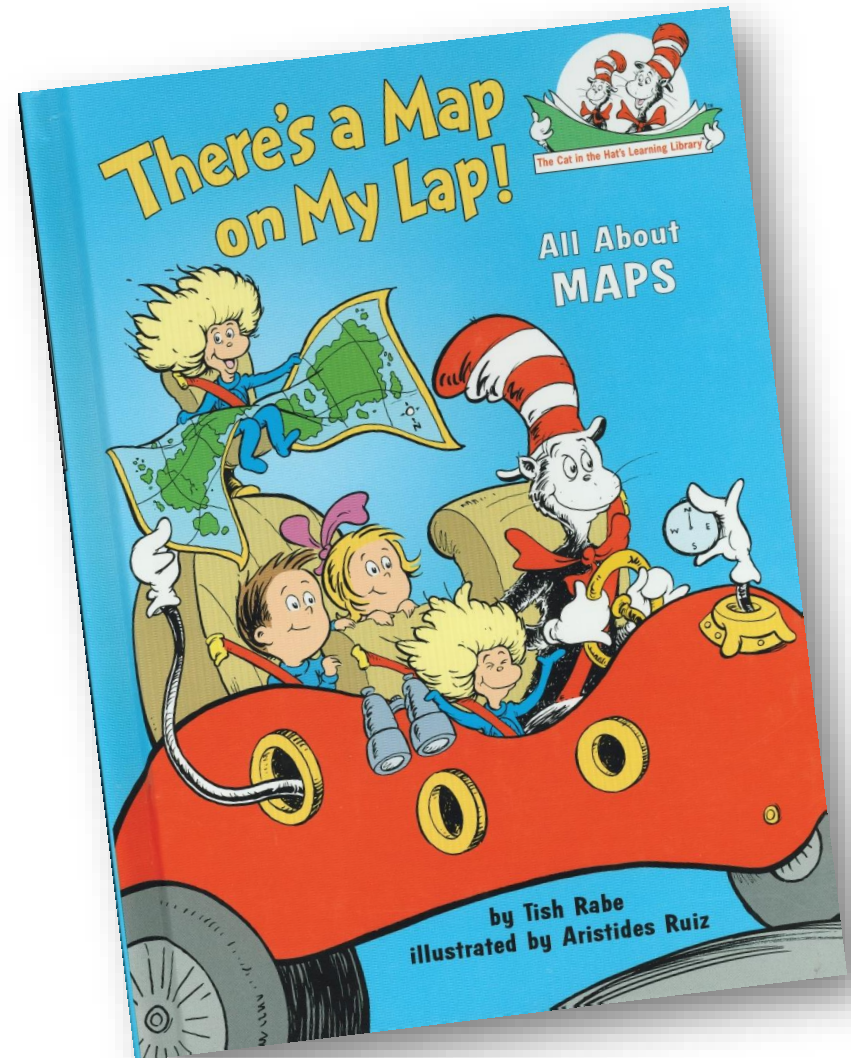
IV. WebGIS

V. Questions/Summary



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

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

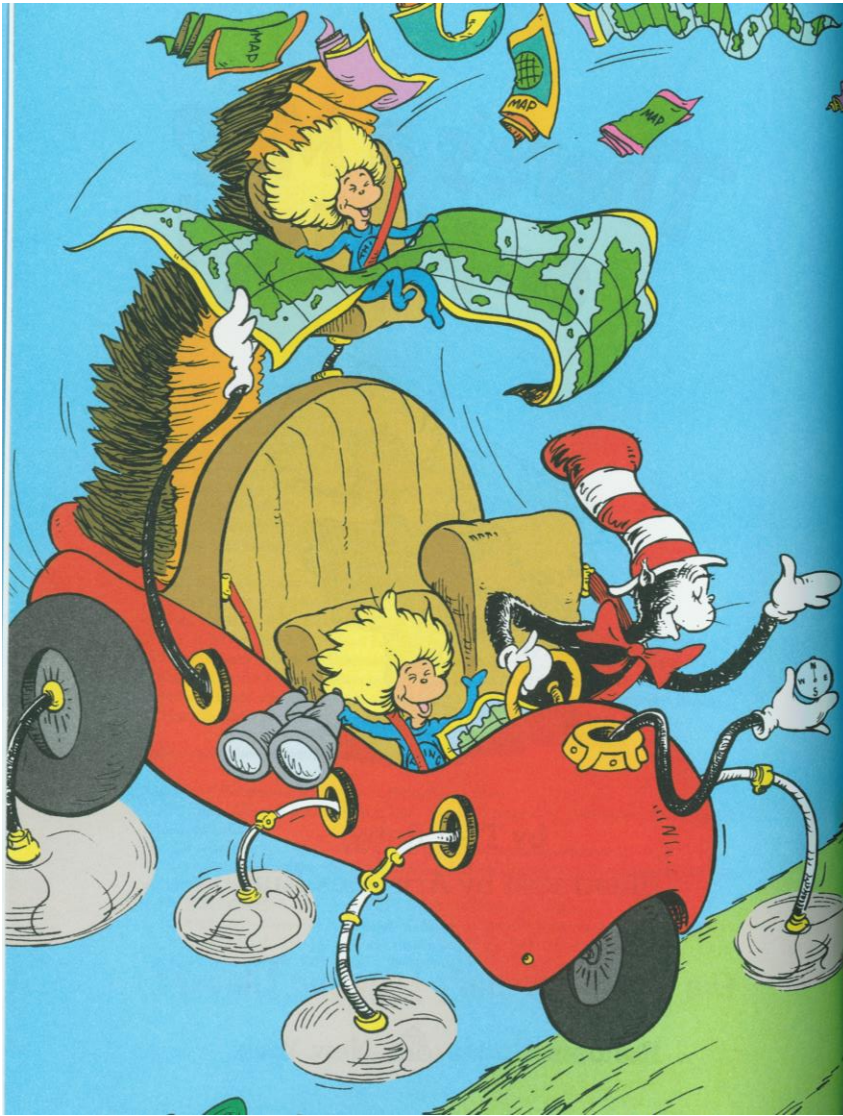


HE CAN'T BE SERIOUS... THIS IS A SENIOR / GRADUATE LEVEL CLASS!

- 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

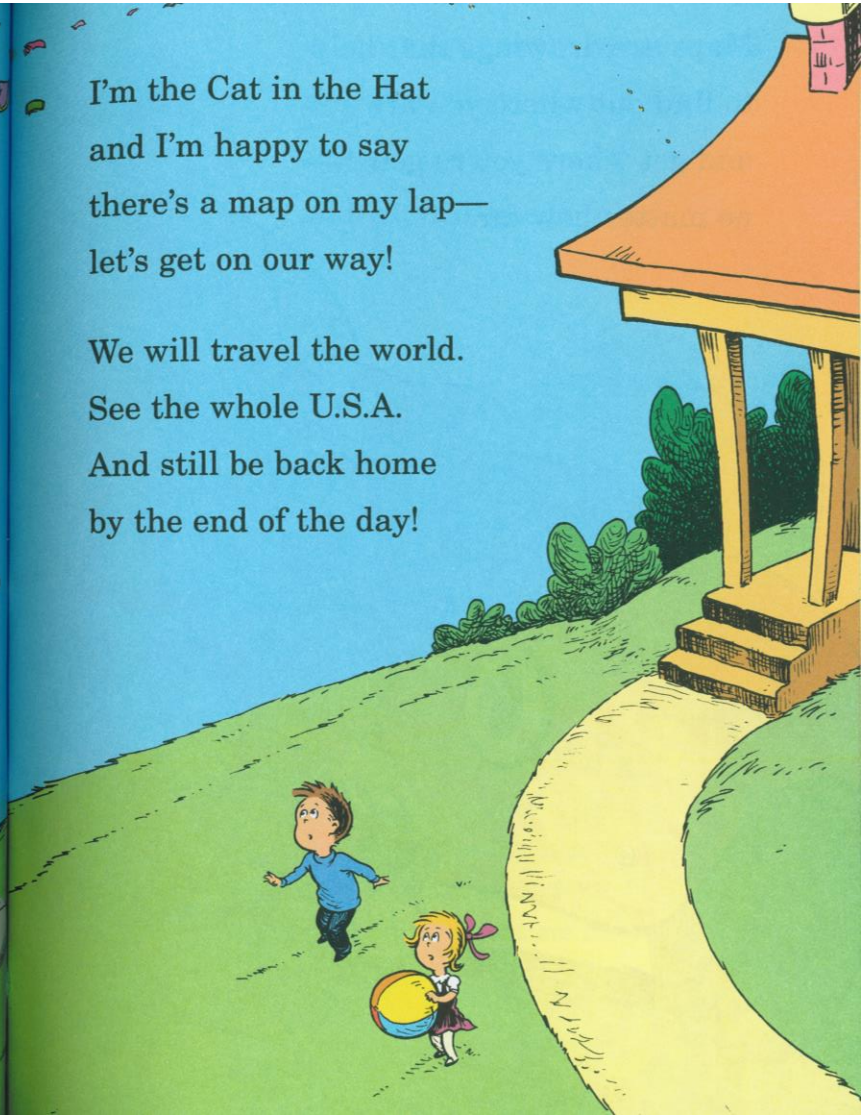


LET'S REFER TO THE CAT IN THE HAT



I'm the Cat in the Hat
and I'm happy to say
there's a map on my lap—
let's get on our way!

We will travel the world.
See the whole U.S.A.
And still be back home
by the end of the day!



WHAT ARE MAPS? ALL HAVE A PURPOSE

Maps are drawings that help to find out where you are and get where you're going—no matter how far.

When mapmakers make maps, they must first decide who will be using the map and what it needs to do.

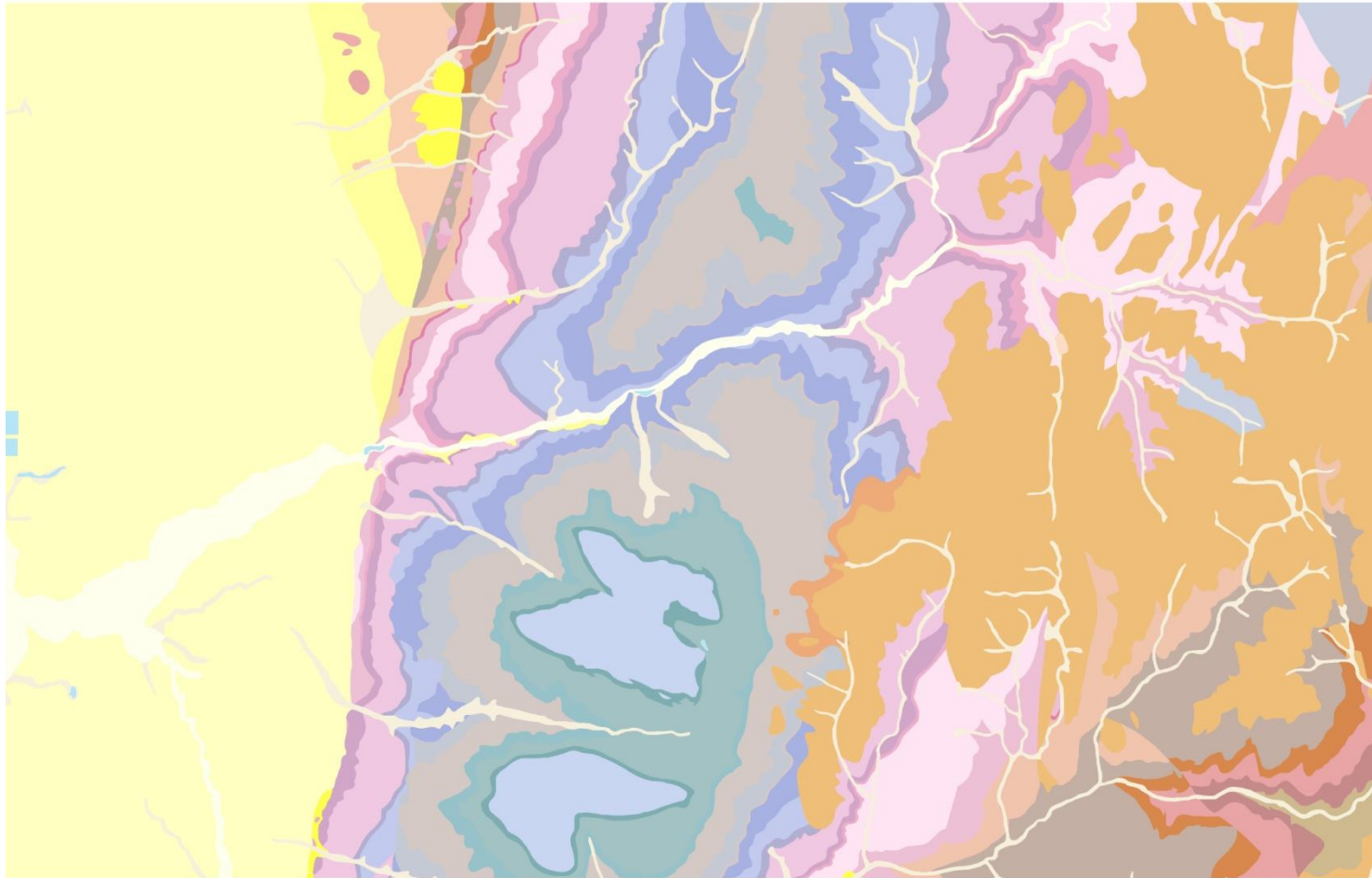


ALL MAPS HAVE A PURPOSE

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

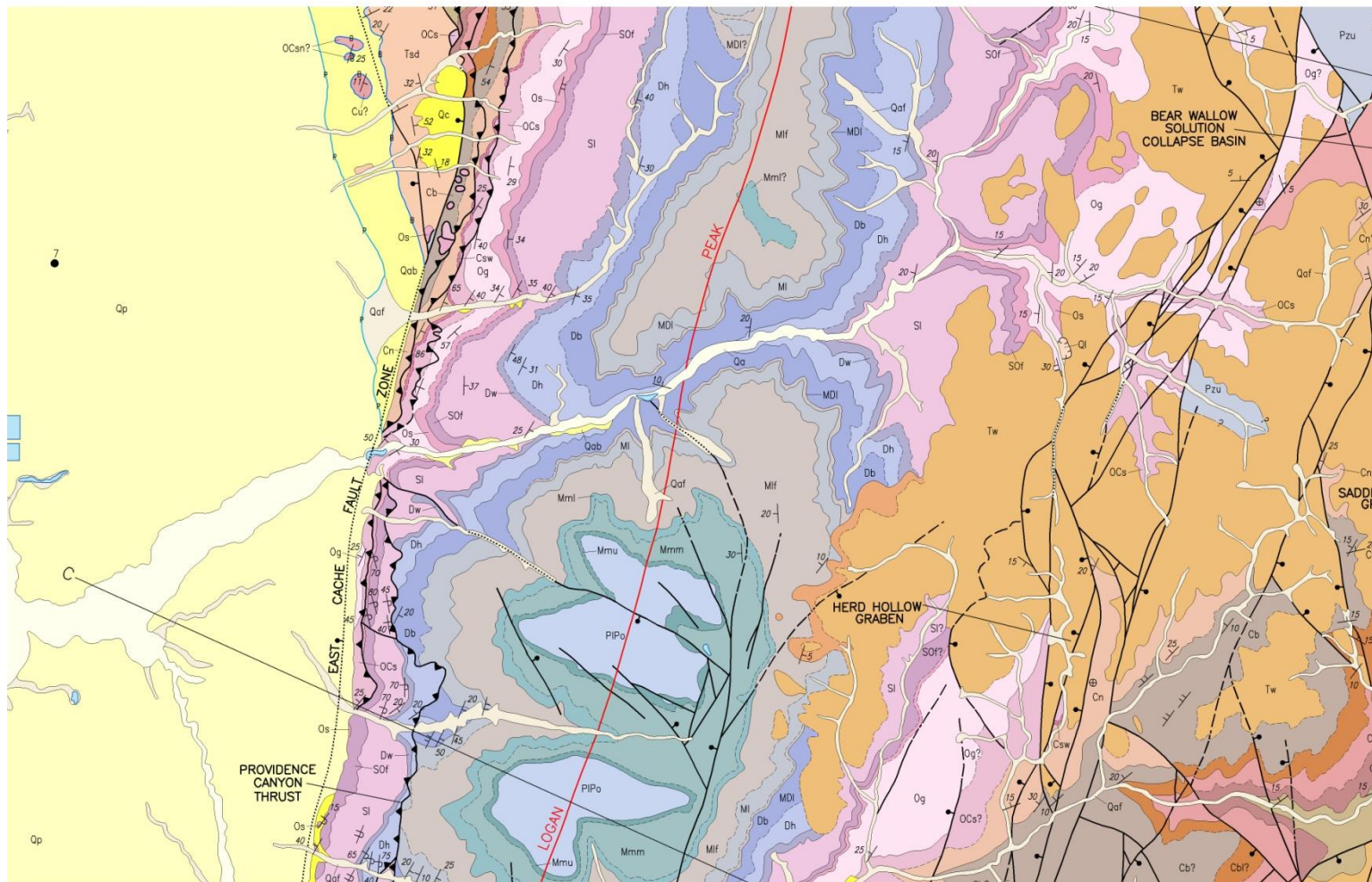
The Map	Example Purpose
Location Map	Show the location of something within a broader geographic context of common knowledge to audience (e.g. state, country, world)
Geology Map	Show spatial distribution of underlying geology
Habitat Map	Show spatial distribution of different habitat types
Topographic Map	Show spatial distribution of elevations
Watershed Map	Show delineated boundary of watershed
Election Map	Show which areas voted for which candidate
Grading Plan	Shows an engineering design for grading and drainage (i.e. how to manipulate topography)

A GEOLOGY MAP: JUST GEOLOGY...



A GEOLOGY MAP: MORE VECTOR DATA

A Portion of the Geologic Map of the Logan 30' x 60' Quadrangle



Base from U.S. Geological Survey, 1981
Projection: UTM Zone 12
Units: Meters
Datum: NAD 1927
Spheroid: Clarke 1866



0 1 2 3 4 5 6 7 8 9 10 Kilometers

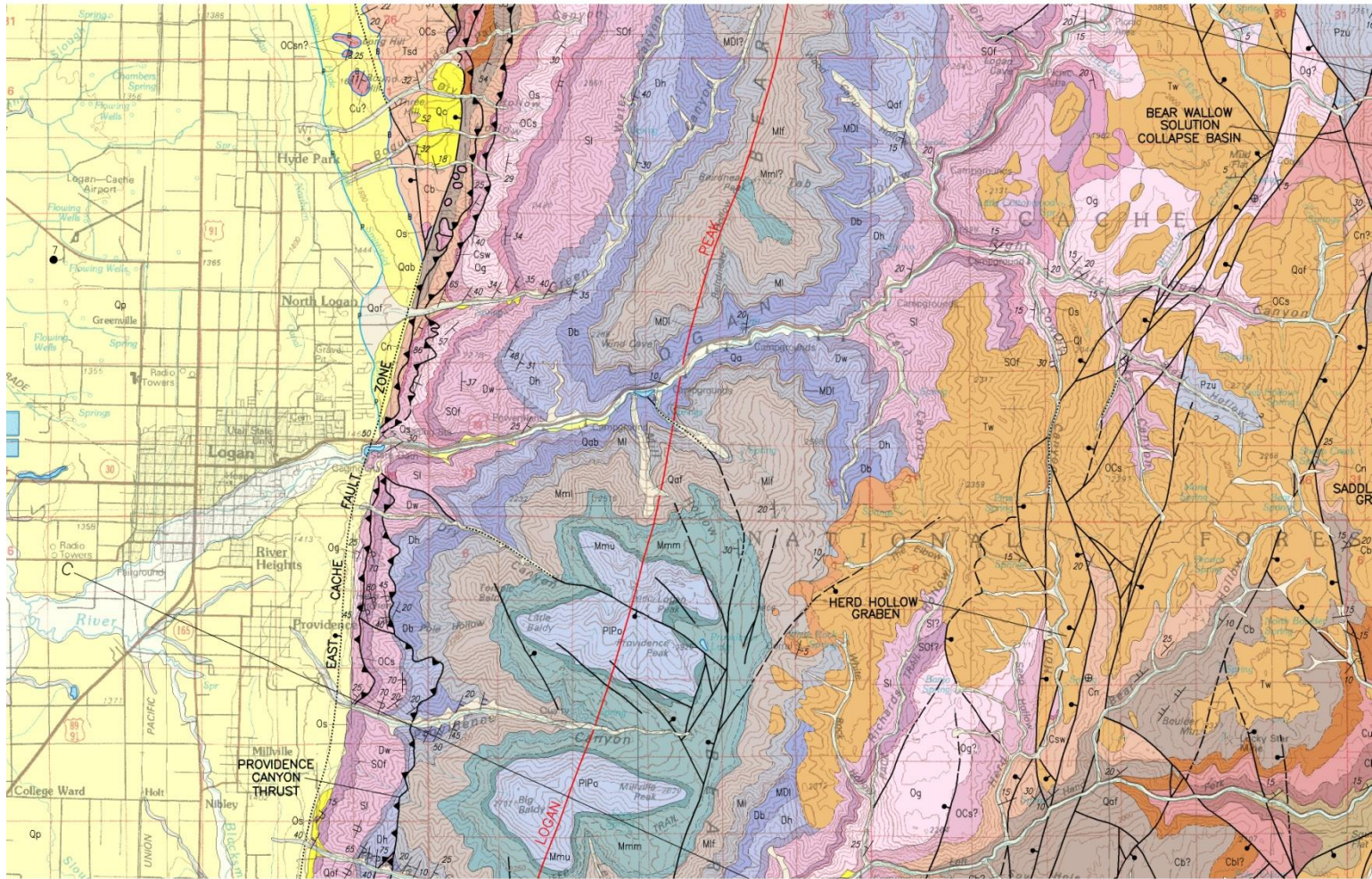


Data from Utah Geological Survey 2006
Miscellaneous Publication MP06-8 DM
Mapping by J.H. Dover

Data from Utah Geological Survey: <http://geology.utah.gov/>

A GEOLOGY MAP: ADD DRG USGS BASE

A Portion of the Geologic Map of the Logan 30' x 60' Quadrangle



Base from U.S. Geological Survey, 1981
Projection: UTM Zone 12
Units: Meters
Datum: NAD 1927
Spheroid: Clarke 1866

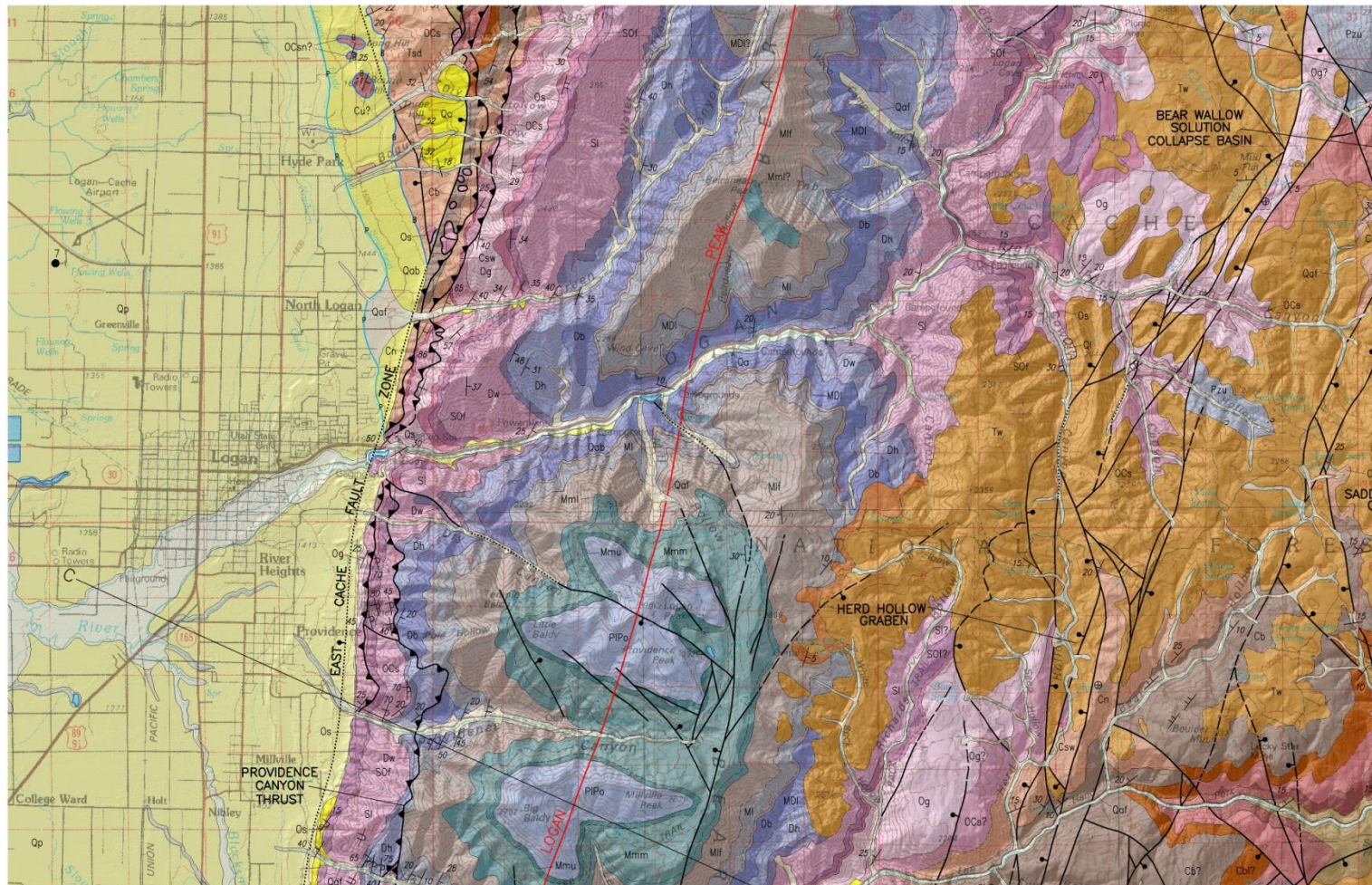


Data from Utah Geological Survey 2006
Miscellaneous Publication MP06-8 DM
Mapping by J.H. Dover



A GEOLOGY MAP: ADD HILLSHADE RASTER

A Portion of the Geologic Map of the Logan 30' x 60' Quadrangle



Base from U.S. Geological Survey, 1981
Projection: UTM Zone 12
Units: Meters
Datum: NAD 1927
Spheroid: Clarke 1866



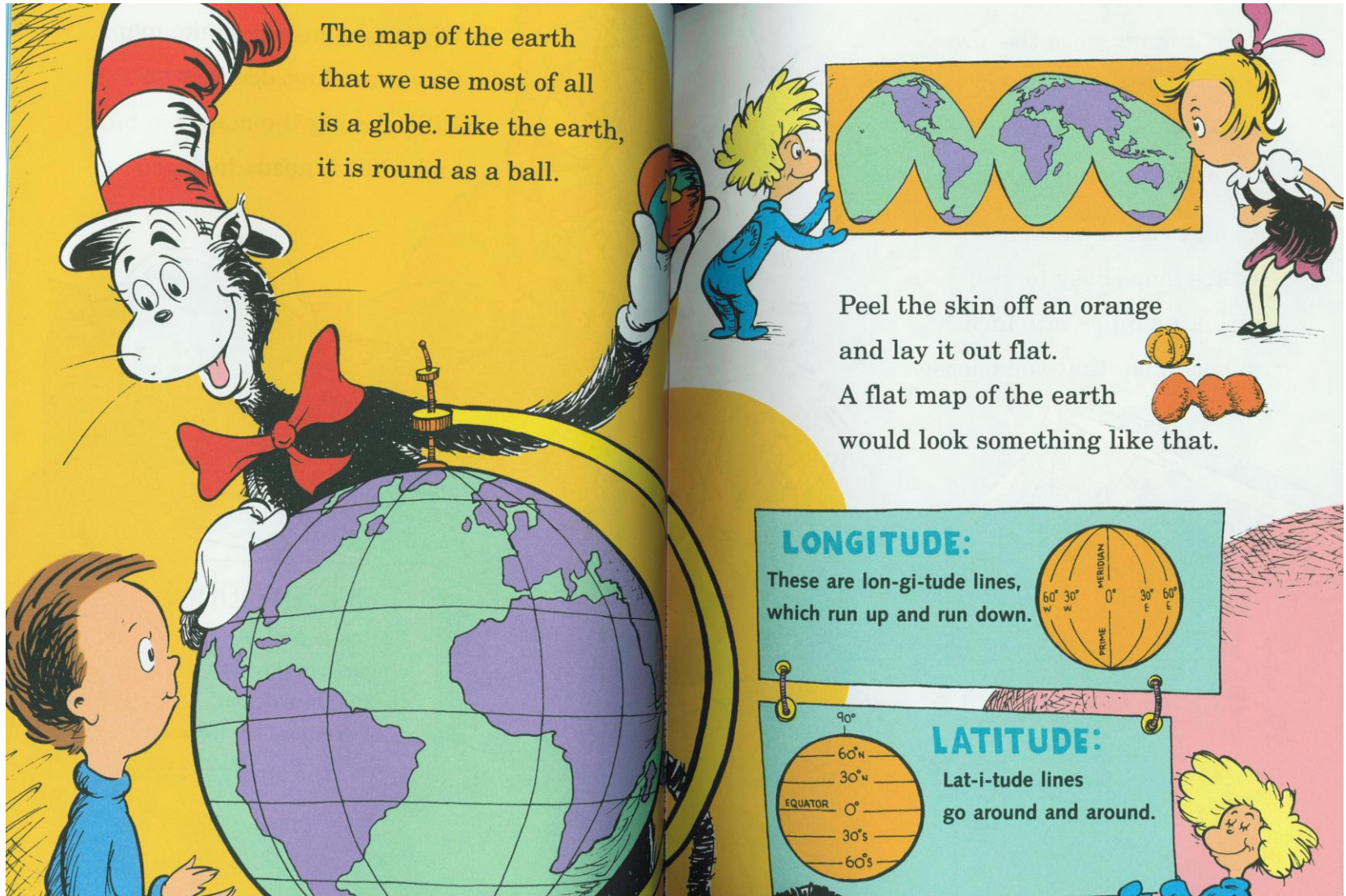
0 1 2 3 4 5 6 7 8 9 10 Kilometers



Data from Utah Geological Survey 2006
Miscellaneous Publication MP06-8 DM
Mapping by J.H. Dover

Data from Utah Geological Survey: <http://geology.utah.gov/>
Topographic Data from: <http://gis.utah.gov/>

PROJECTIONS, LAT & LONG



SCALE

Now, if maps were the size of the places they show, mapmakers would run out of paper, and so . . .

A chart called a scale makes maps easy to use, shrinking miles into inches on each map that you choose.

SCALE

Makes everything smaller and helps you and me carry the world around easily!



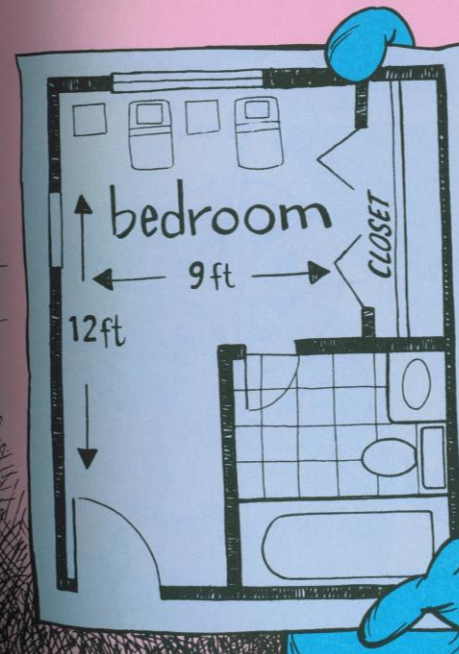
SCALE & PLANS



We used this scale—
one inch equals three feet.
It helped us do something
we both think is neat!
We drew our whole room
so it fits on . . .



. . . one sheet!



DIRECTION / ORIENTATION

There are four main directions.

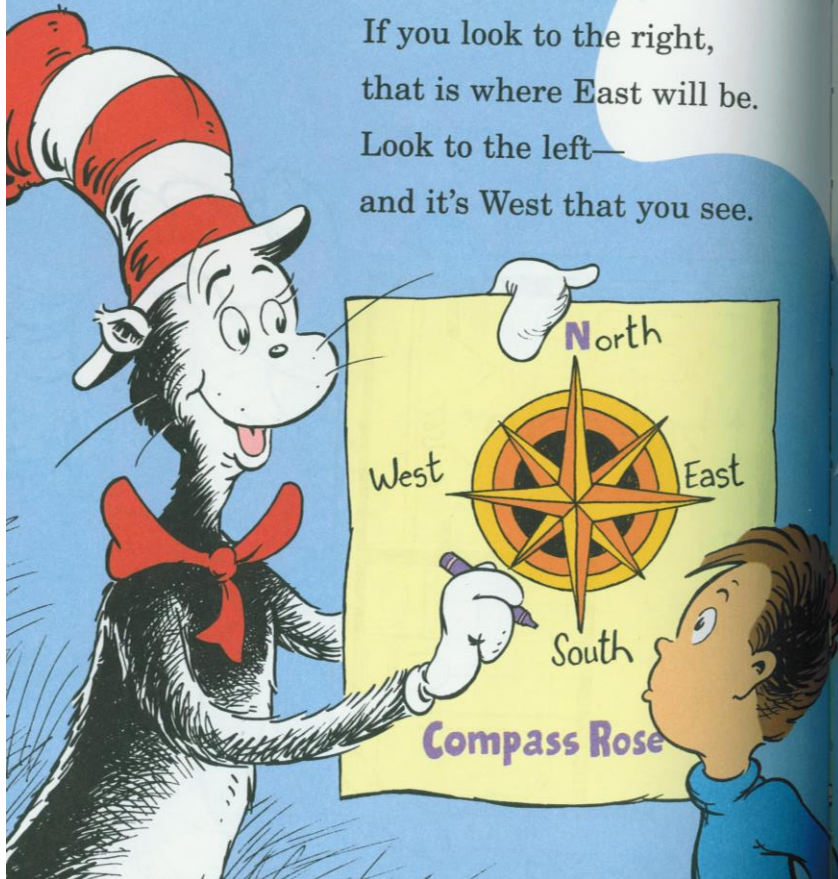
All maps have got 'em.

North is on top.

South down at the bottom.

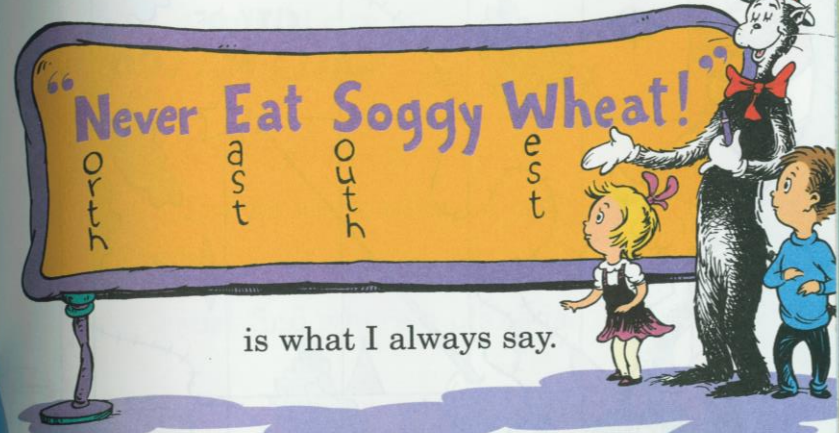
If you look to the right,
that is where East will be.

Look to the left—
and it's West that you see.



To remember all four,

here is one easy way:



is what I always say.

I have here an atlas.

Come on, take a look!

You will find lots of maps
and they're all in this book.



LEGENDS & SYMBOLOGY



Sometimes maps use pictures to show where things are.

A capital city is marked with a star.

A tent shows a campsite.

Tracks show where a train is.

To get to the airport, just find where a plane is.



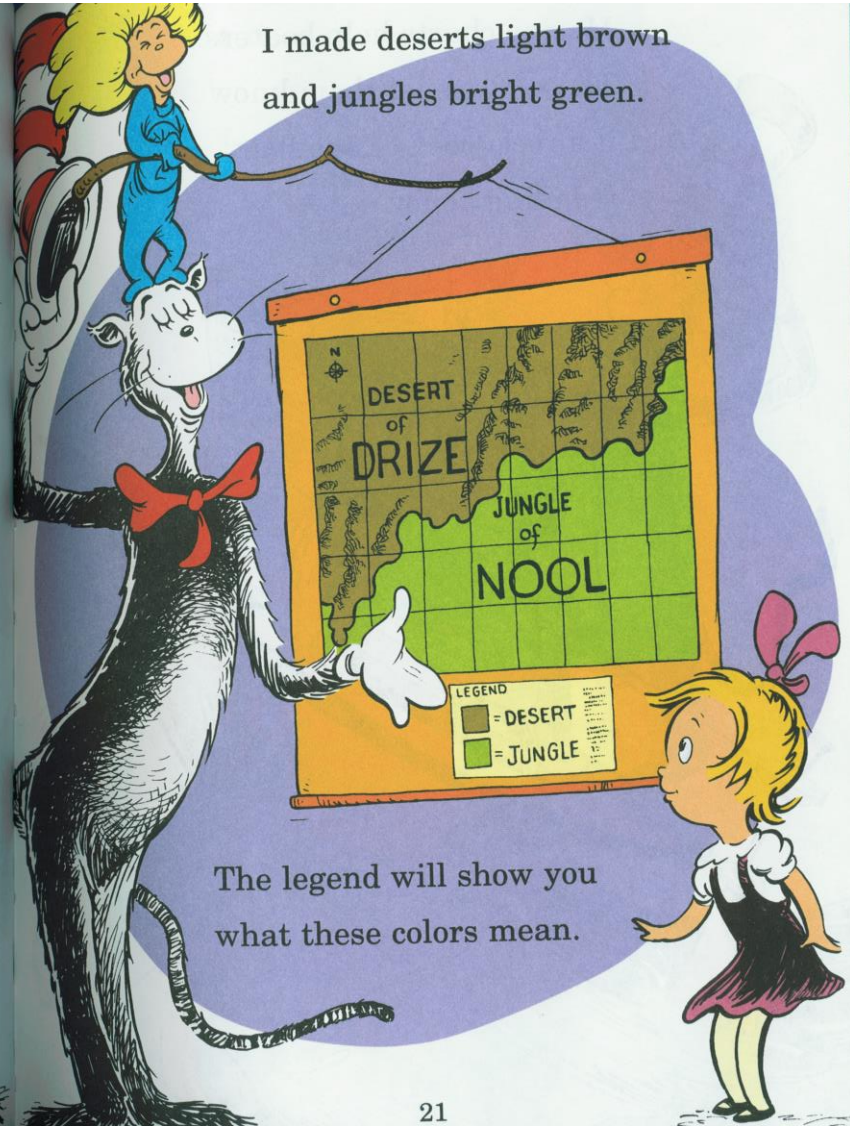
SYMBOLOLOGY – COLORS & HATCHES

Some maps use colors
to tell you a lot.

I used blue where it's cold
and red where it's hot.

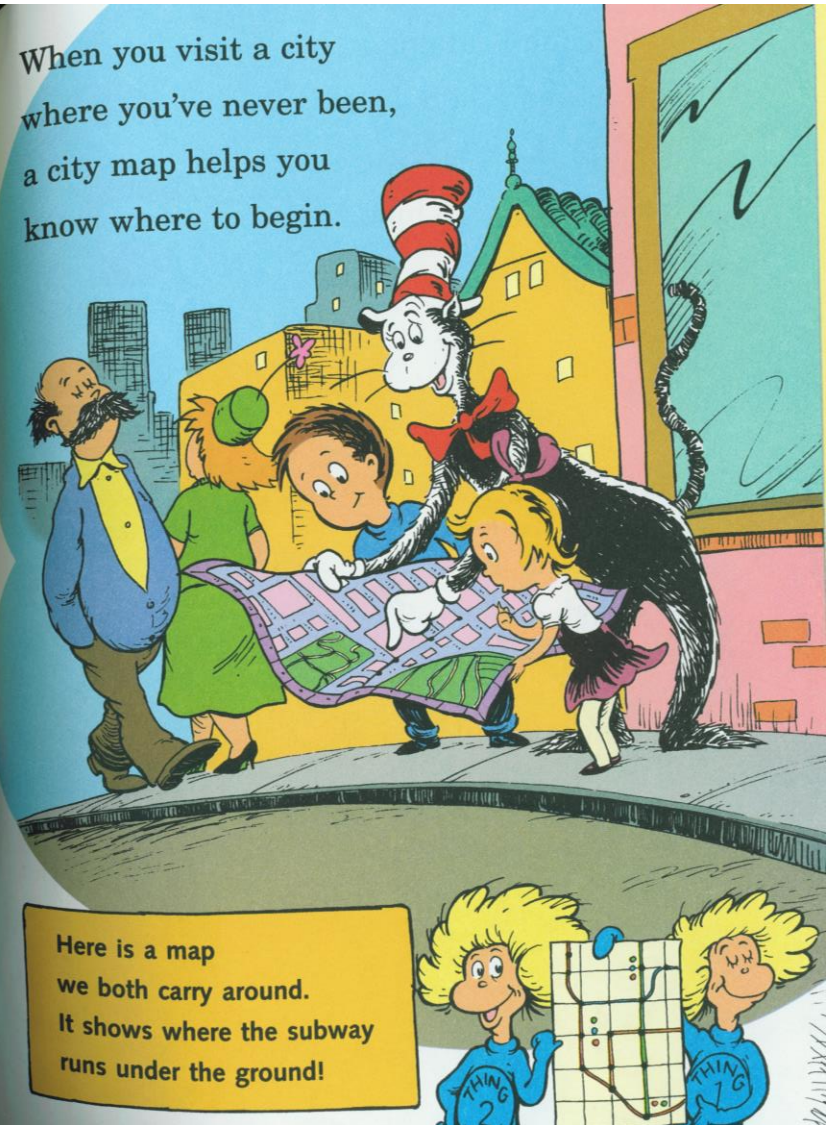
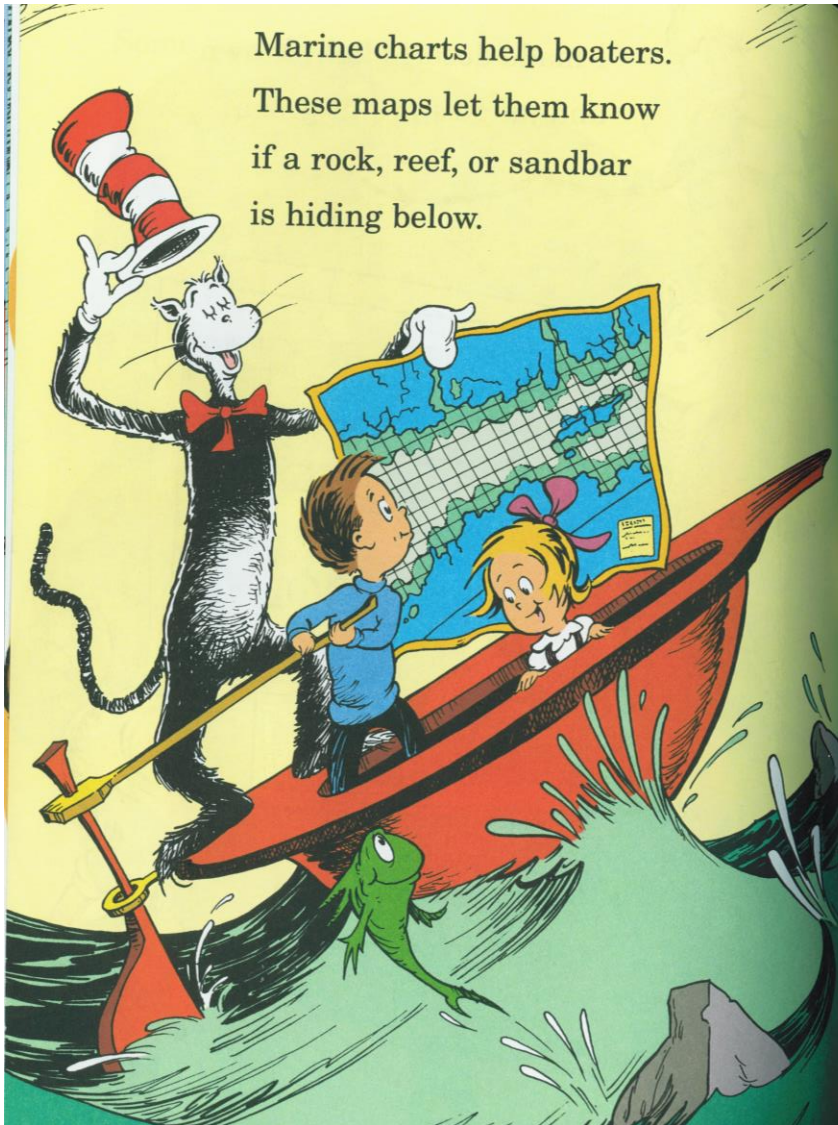


I made deserts light brown
and jungles bright green.

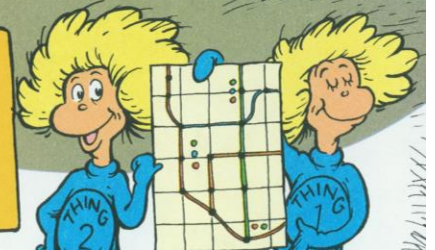


The legend will show you
what these colors mean.

SYMBOLS, LINE-TYPES, ABSTRACTIONS

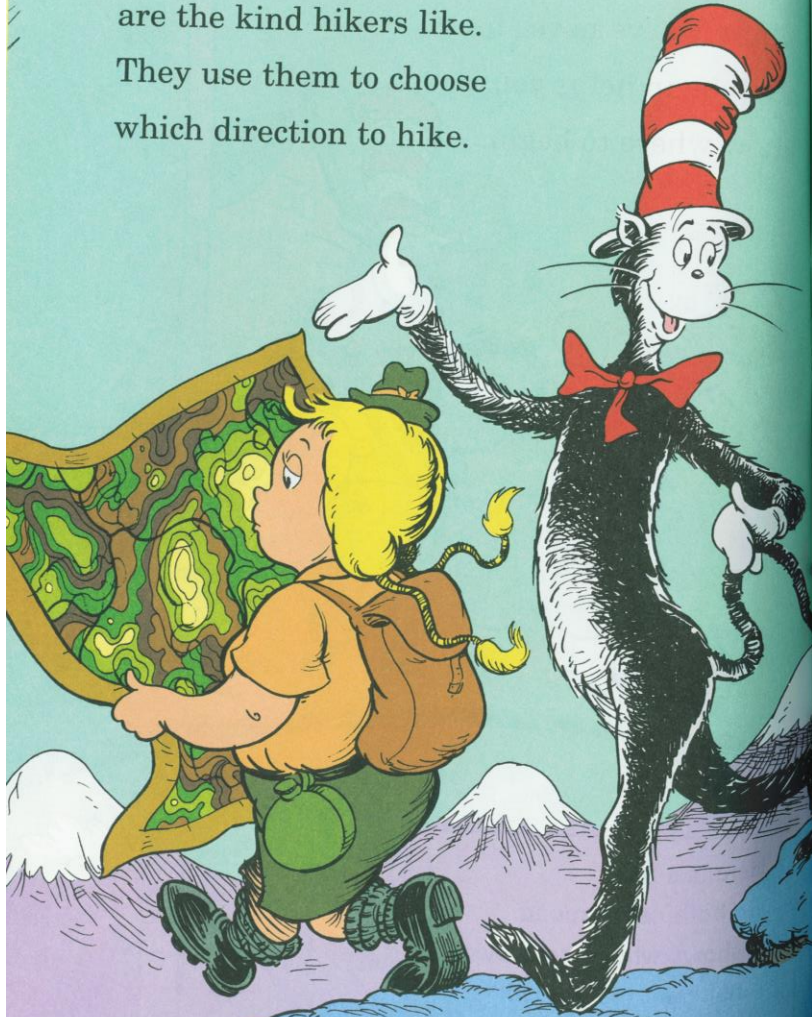


Here is a map
we both carry around.
It shows where the subway
runs under the ground!



TOPOGRAPHIC MAPS

Top-o-graph-i-cal maps
are the kind hikers like.
They use them to choose
which direction to hike.



24

They show where the land
rises hilly and steep
or goes down into valleys
all rocky and deep.

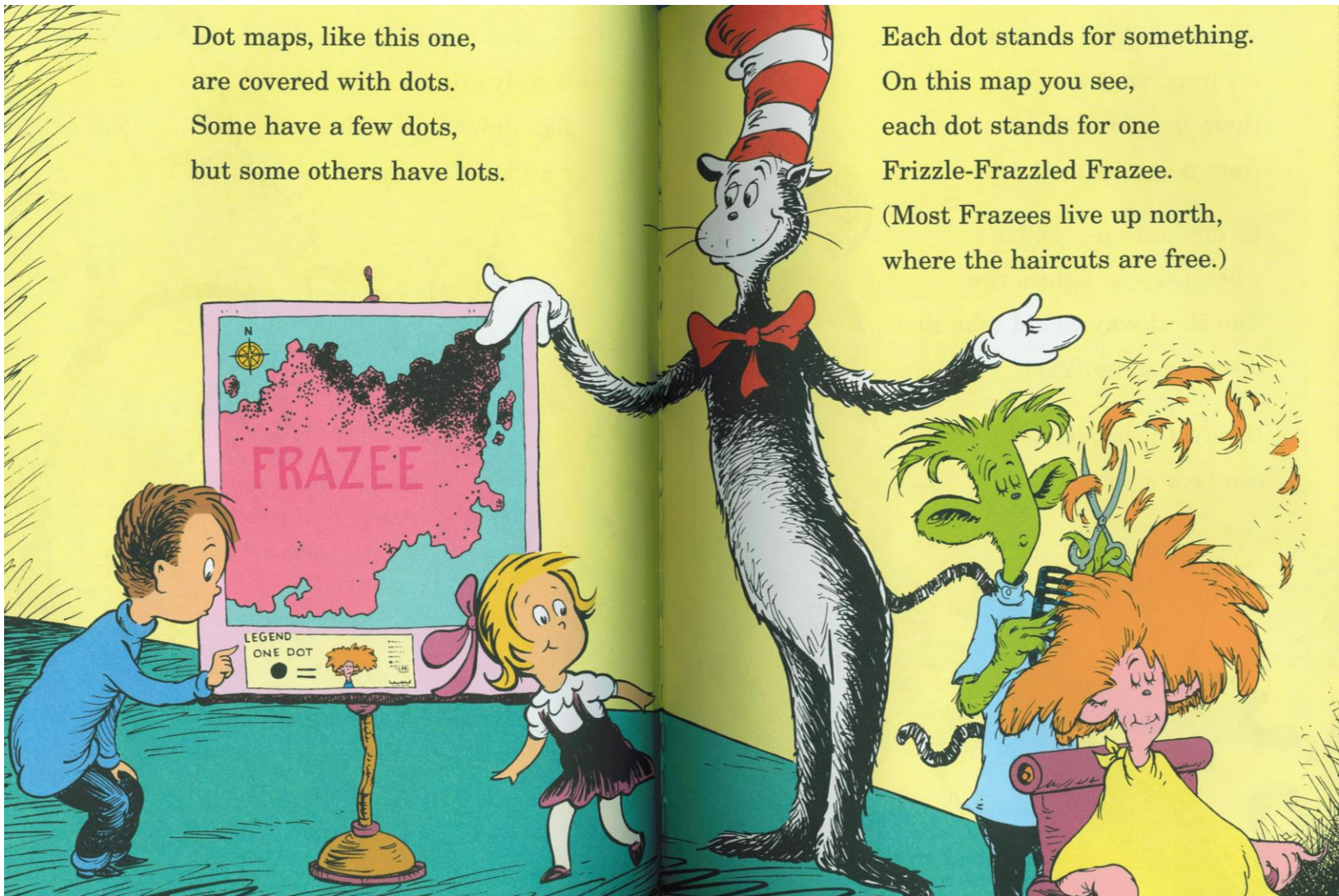


25

SYMBOLIC REPRESENTATION

Dot maps, like this one,
are covered with dots.
Some have a few dots,
but some others have lots.

Each dot stands for something.
On this map you see,
each dot stands for one
Frizzle-Frazzled Frazee.
(Most Frazees live up north,
where the haircuts are free.)

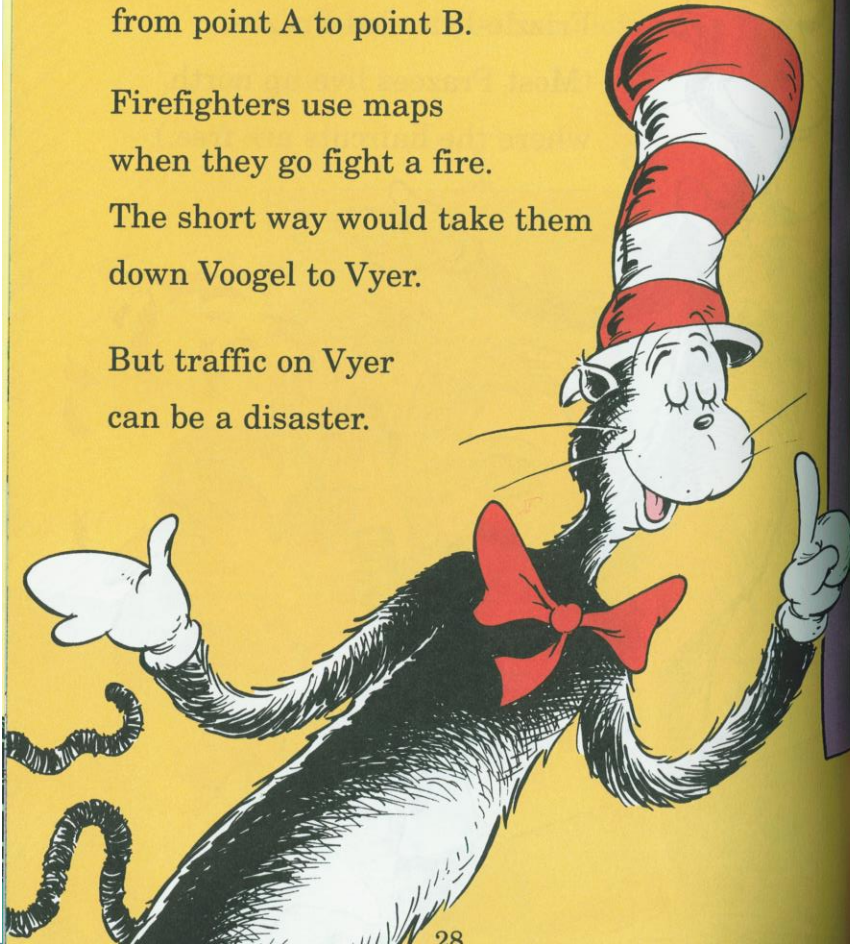


ROUTE ANALYSES (MIN. COST)

When you look at a map,
it's important to see
there is more than one way
from point A to point B.

Firefighters use maps
when they go fight a fire.
The short way would take them
down Voogel to Vyer.

But traffic on Vyer
can be a disaster.



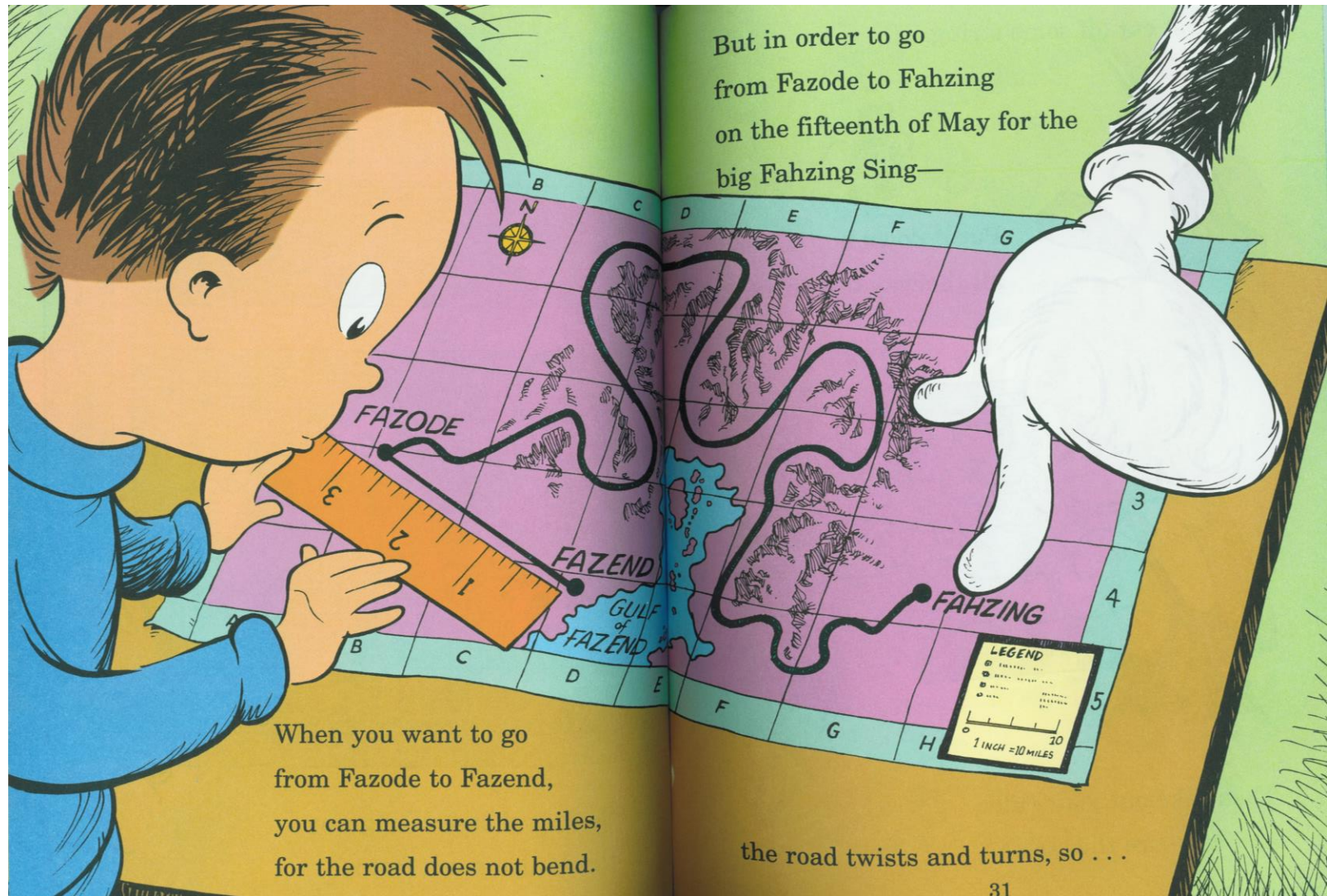
28



So they choose a long way
that's also much faster.

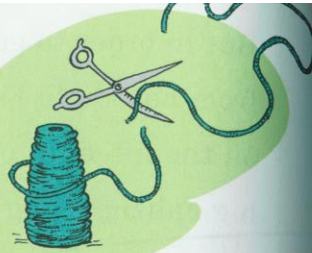
29

MEASUREMENT QUERIES



THE EVER RELIABLE STRING TECHNIQUE

... first cut off some string.



Put it down on the road
all the way to Fahzing.

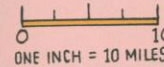


Then take out your ruler
and measure the string.



32

The scale on this map
helps you see that it's far.
One inch equals ten miles, so ...



... you should take the car!



GRID REFERENCES & COORDINATES

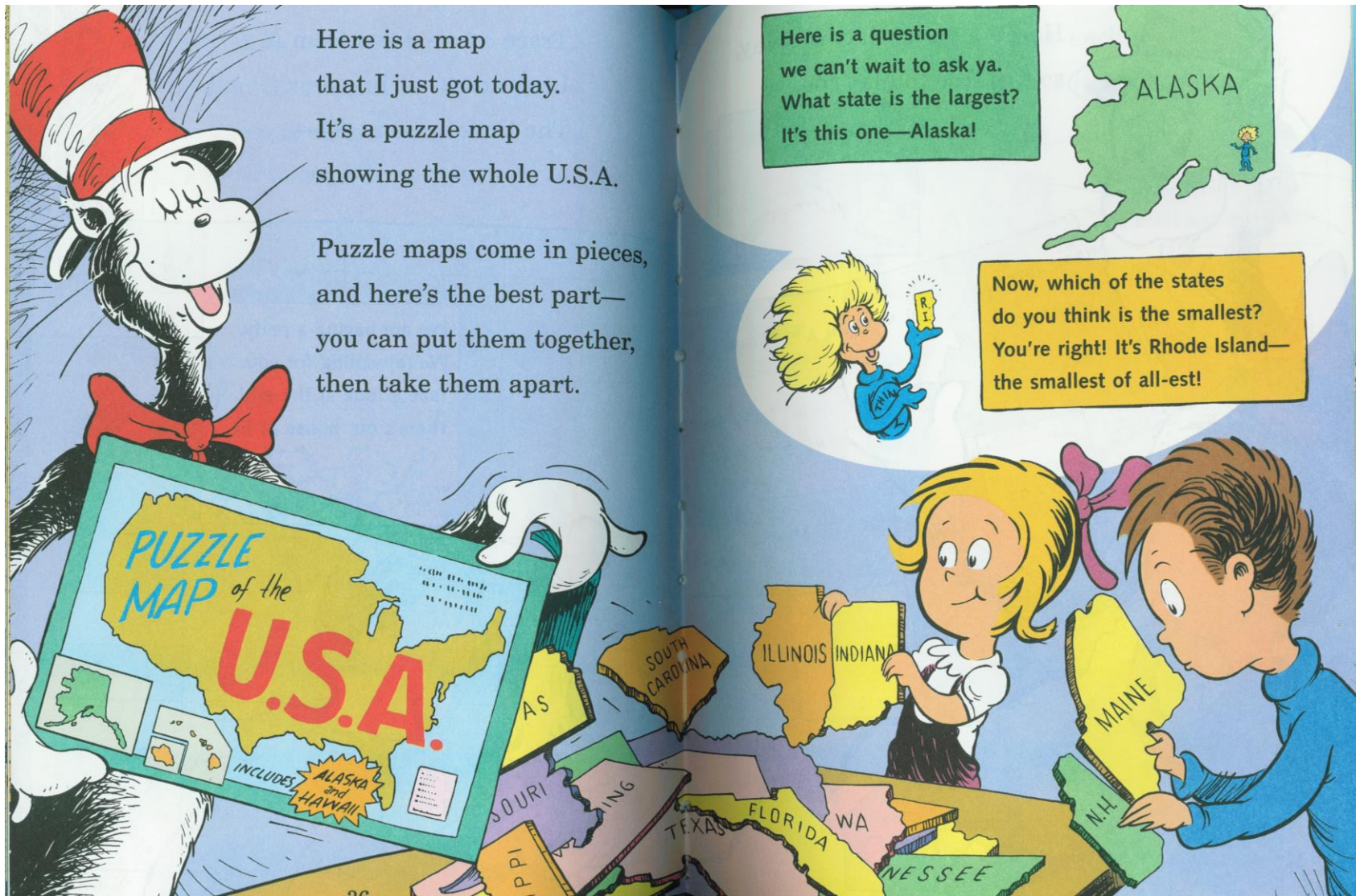
Use this trick to read maps.
You'll be glad that you did.
Some are covered with lines.
This is known as a grid.

There are letters on top.
Numbers run down the side.
Want to find where you are?
Let the grid be your guide.

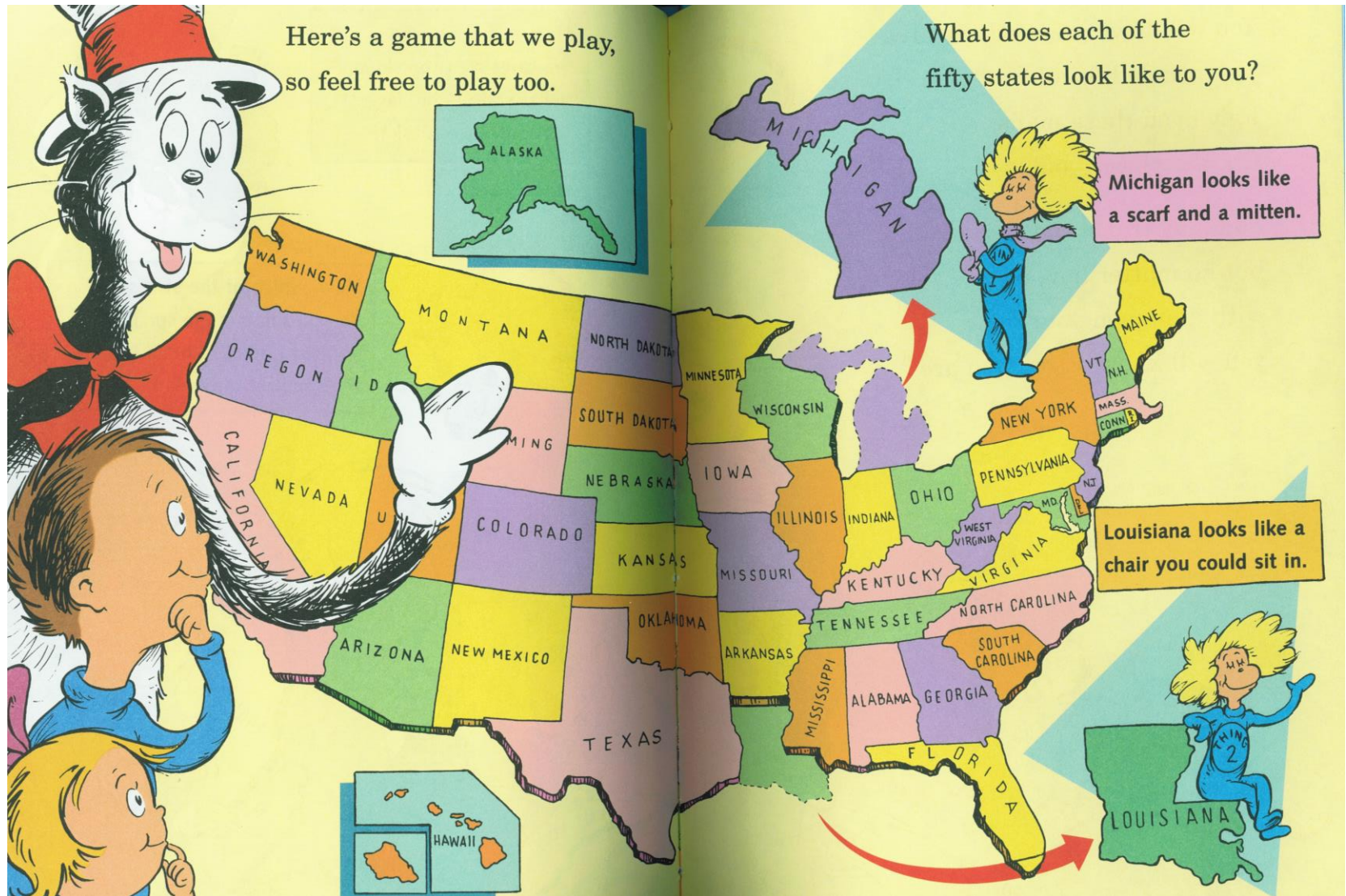
Trace a line down from A.
Look across at line four.
The lines cross at A4—
at your very own door!



SOLVING PUZZLES WITH MAPS



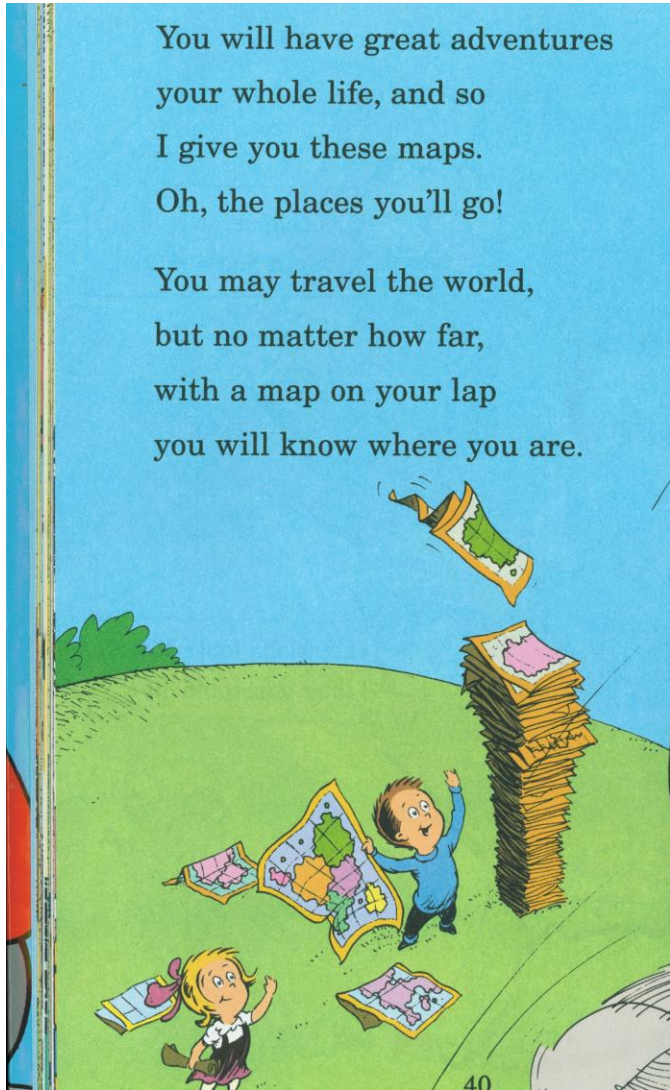
PATTERN RECOGNITION



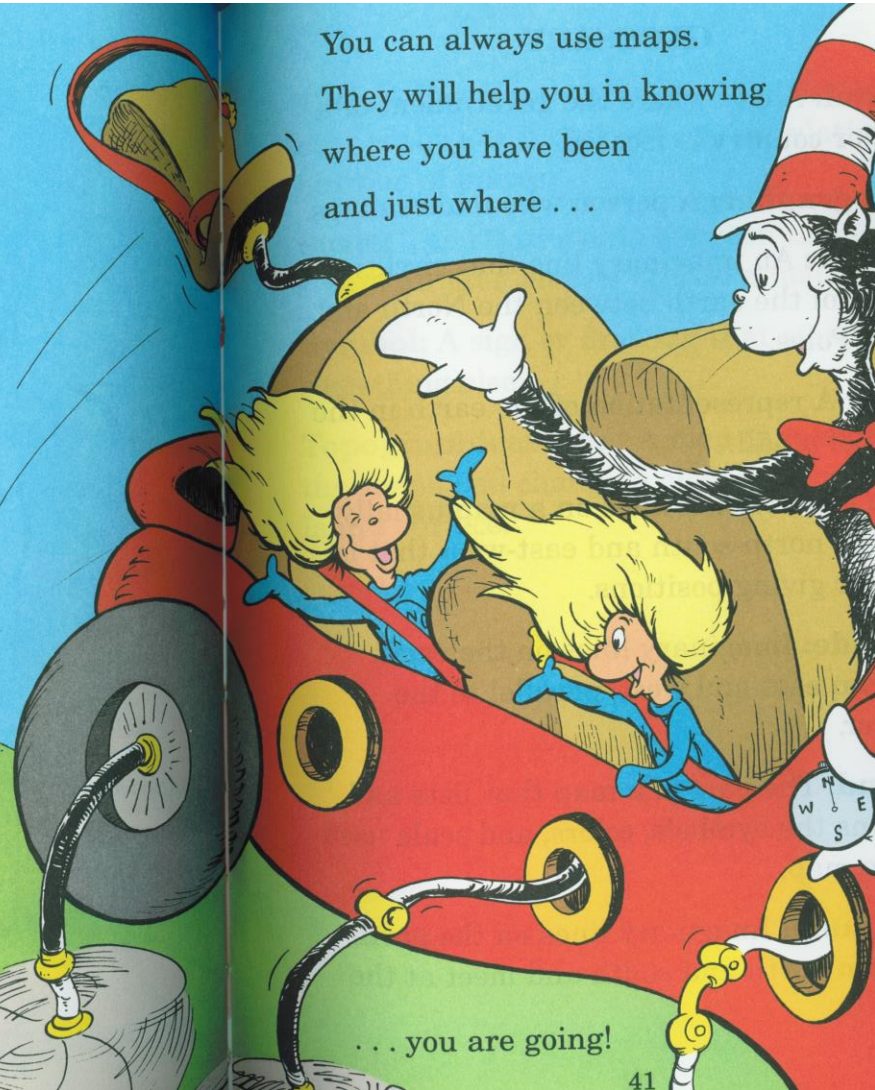
ISN'T THAT NICE?

You will have great adventures
your whole life, and so
I give you these maps.
Oh, the places you'll go!

You may travel the world,
but no matter how far,
with a map on your lap
you will know where you are.



You can always use maps.
They will help you in knowing
where you have been
and just where . . .



. . . you are going!

EVEN HAS A GLOSSARY

GLOSSARY

Capital: A city where the government of a state or country is located.

Cartographer: A person who makes maps.

Equator: An imaginary line that circles the middle of the earth between the North and South Poles.

Globe: A representation of the earth in the shape of a ball.

Grid: A pattern of lines on a map usually running north-south and east-west that is used for giving positions.

Latitude: Imaginary lines on the earth that run east and west, parallel to the equator.

Legend: The part of a map that lists and explains the symbols, colors, and scale used for the map.

Longitude: Imaginary lines on the earth that run north and south and meet at the poles.

Map: A flat representation of the earth or a part of the earth that shows the relative position of places.

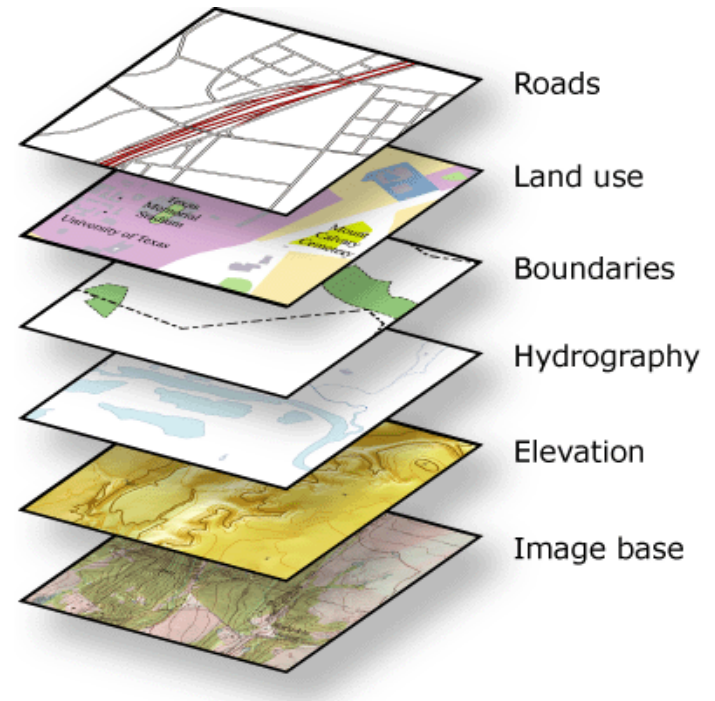
Scale: The relationship between the actual size of an area and its size on a map.

Symbol: A sign or drawing that stands for something else.

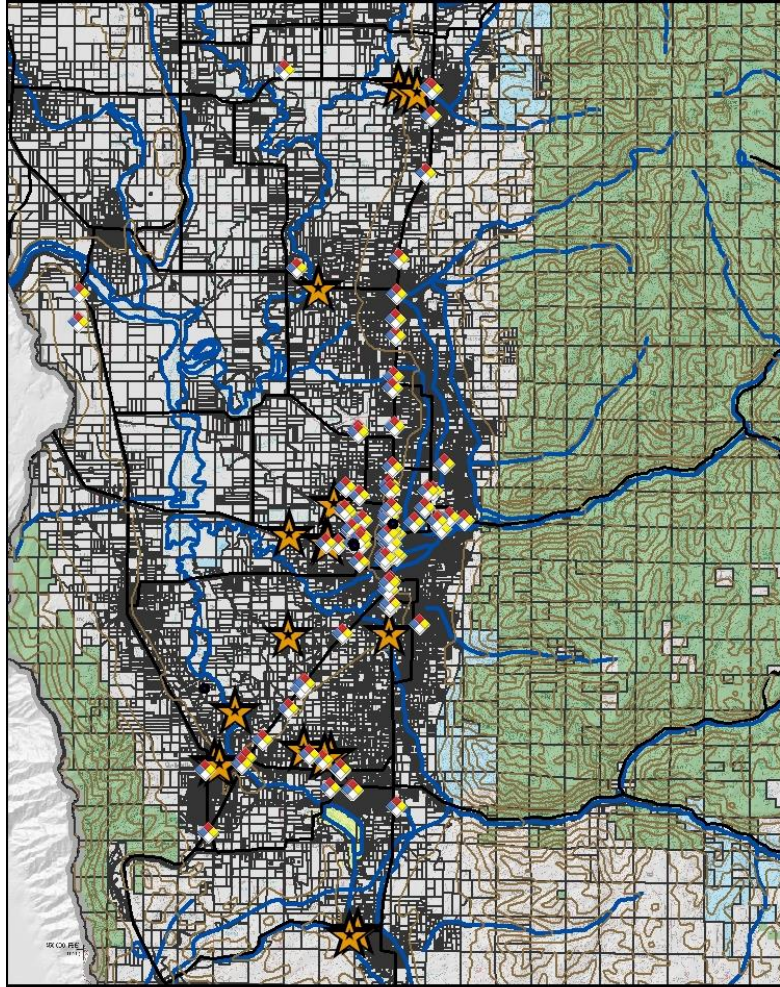
Topographical map: A map that shows the shape and changing elevation of the land's surface.

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

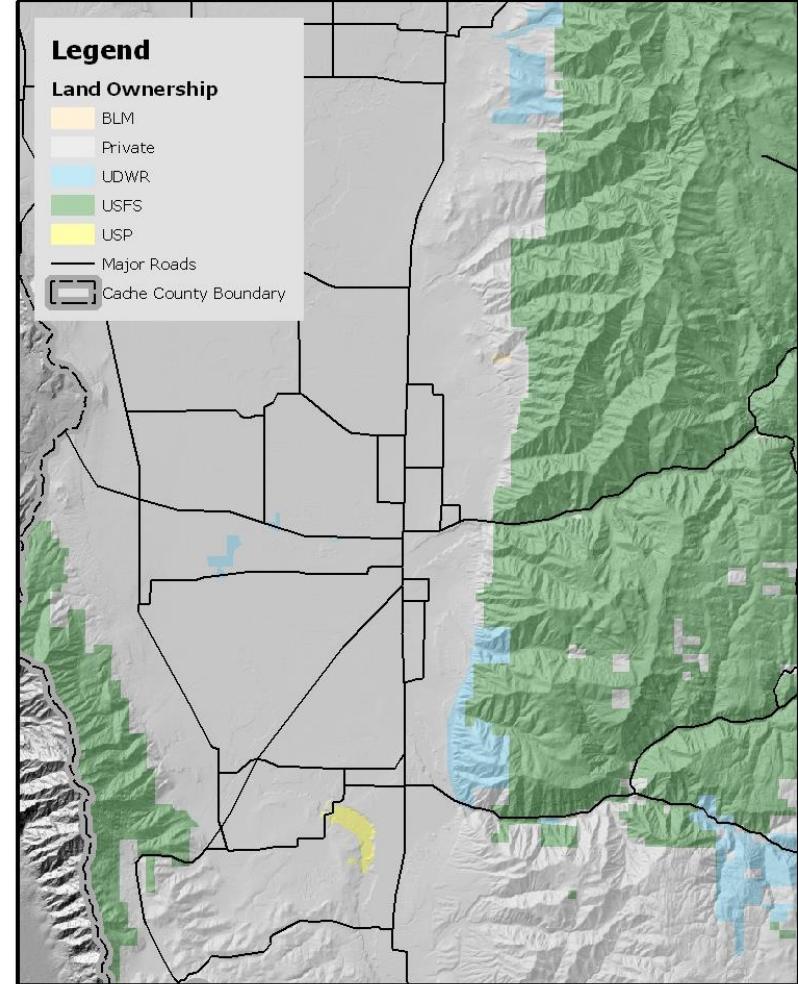


TOO MUCH OVERLAY....



TOO MUCH

0 2 4 6 8 10 Kilometers

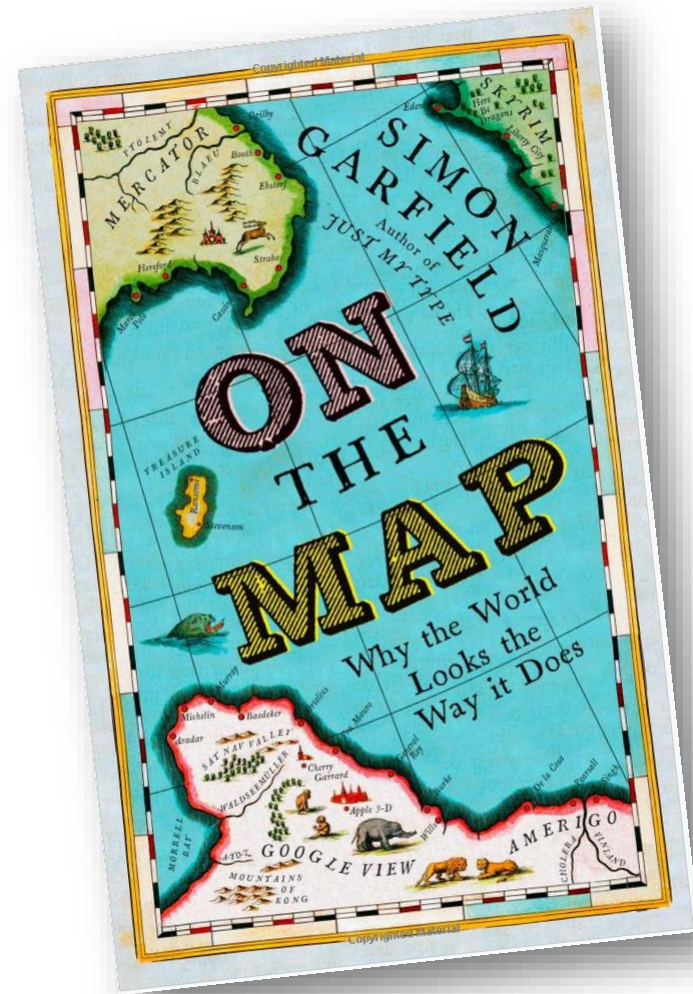


BETTER

0 2 4 6 8 10 Kilometers

THE 6 C's TO EARN BETTER THAN A C

1. Colorful (but not cluttered)
2. Creative (but not confusing)
3. Consistent
4. Context (location, coordinates, scale, orientation, setting)
5. **Convincing (fit for purpose)**
6. CORRECT



ABOUT BEING CORRECT...

- Although you have an ethical responsibility...

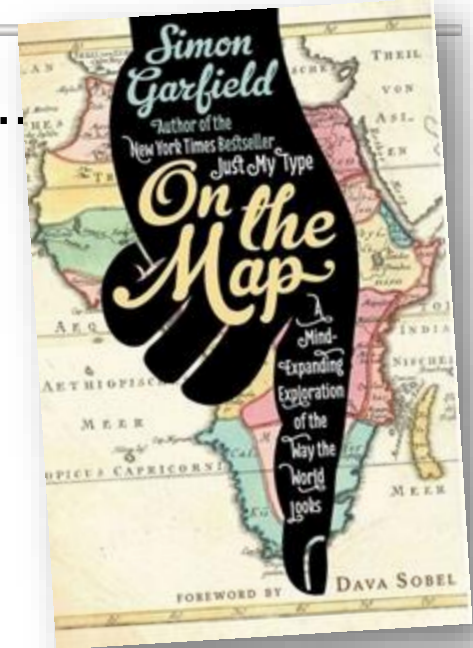


Simon Garfield is a journalist and the best-selling author of *Just My Type*.

Justine Kanter/Gotham

On the power that maps hold in shaping our realities

"It's a bit like another phrase, that history is written by the winners, by the victors. And it's the same with mapmakers. If you have the power to commission a map or make your own map, you're going to make it, you know, reflect your world and reflect your views.



- Good mapmakers (you will be) convey & emphasize what you want to -> This is Cartography

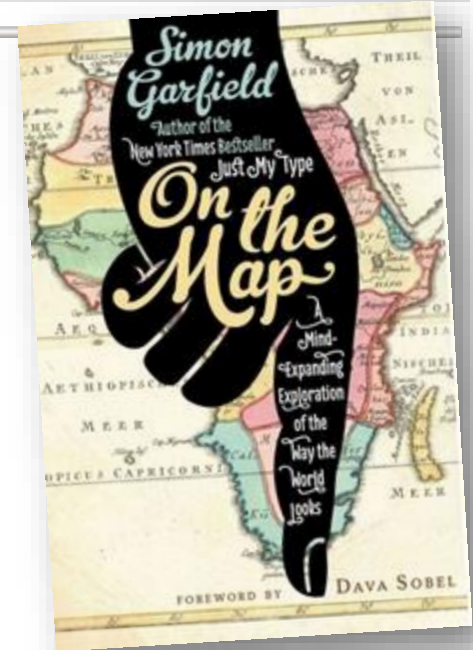
On the impact of the digital revolution

"Well, I fall into two camps here. I use, you know, my maps on my phone. And it's far easier to put my GPS on than to have to consult a map. But gosh, I mean, do we lose a lot. We lose the beauty of maps; we lose the romance of maps; we lose that terrible feeling that we'll never be able to fold up a map again.

"And I think the other thing, you know, we lose, is a sense of how big the world is. Because now we look at our map, there's a real sense of, 'Get me to where I want to go.' Now you get the feeling, actually, 'It's all about me' ... It's a terribly egocentric way of looking at the world. So I think the view of where we are in the world, in the history of the world, is changing. And I think in a way it's one of the biggest, if not *the* biggest impacts of the digital and technological revolution — is how we see ourselves in the world."



Read an excerpt of *On The Map*

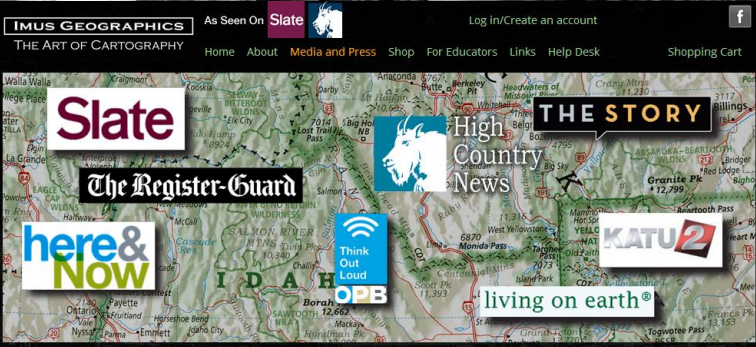


- What is the role of the mapmaker with egocentric maps (i.e. webGIS)?



STILL A FEW CARTOGRAPHERS OUT THERE

• Dave Imus



OMG | See all 1197 items

The best map of the U.S. you'll ever see!

By Jonathan Anker

updated 11:15 AM EST, Thu February 16, 2012

Comments 0 [Share](#) [Tweet](#) [Share](#) [Email](#)

NEED TO KNOW

- Wins 'Best in Show' at major map competition
- Made by one man, when most maps made by corporations
- Creator spent 6,000 hours on it working out of his farmhouse



CULTUREBOX

ARTS, ENTERTAINMENT, AND MORE.

JAN. 2 2012 7:38 AM

The Greatest Paper Map of the United States You'll Ever See

Made by one guy in Oregon.

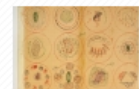
By Seth Stevenson

American mapmaking's most prestigious honor is the "Best of Show" award at the annual competition of the Cartography and Geographic Information Society. The five

most recent winners were all maps designed by large, well-known institutions;

[f](#) [t](#) [m](#)
12.8k 1.5k 0

Slate



how mapmaking?

WATS 4930

TODAY'S PLAN

- I. Introductions
- II. Syllabus
- III. Review of Maps
- IV. WebGIS**
- V. Questions/Summary



Web GIS QUESTIONS

- What is it?
- What's out there?
- What's it used for?
- How does it differ from desktop GIS?
- How is it deployed?
- How could you deploy it?



WHAT IS IT?



- Return to our definition of GIS.... Just implemented and delivered over the web
 - Typically simpler user interface than desktop GIS
 - Typically more complicated backbone...
 - Often free for users

"A GIS is a computer-based system to aid in the collection, maintenance, storage, analysis, output and distribution of spatial data and information."



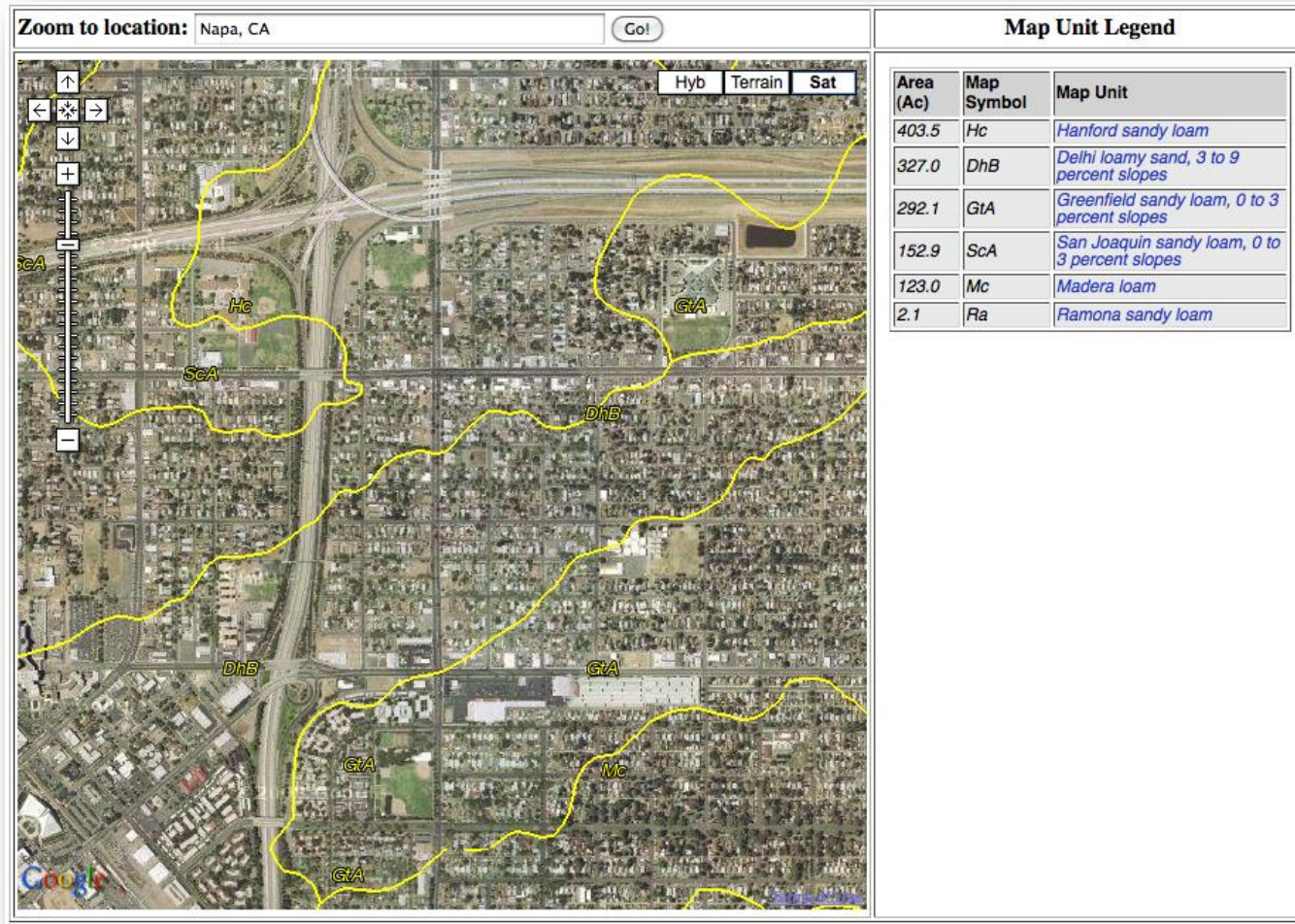
WHAT'S OUT THERE?



- The common map/directions sites
 - Google Maps
 - Bing Maps (Live)
 - Mapquest
- Data viewers
- Data distribution centers
- Personal data repositories
- Project sites...
- Commercial Sites
- Web mapping services (WMS)

RANGE FROM SIMPLE....

- Soil Web via Gmaps



TO COMPLEX...



USDA:NRCS:Geospatial Data Gateway:Order Data - Mozilla Firefox

File Edit View History Bookmarks ScrapBook Tools Help

http://datagateway.nrcs.usda.gov/GDGOrder.aspx

1-WHERE

Order by Interactive Map

Using the map in the center panel navigate to your area of interest. Use the **Select Area** button on the map to start the selector mode. Select an area for your order by pressing the left mouse and dragging the mouse to draw a rectangle. Press the **Finish Area** button on the map to complete the area selection. The coordinates of the rectangle will be moved to the **YOUR ORDER** panel on the far right. Use the **Accept Area** button to accept the coordinates and move to the next step.

WHERE

If you wish to change the method for selecting the order area, click [HERE](#).

Order by Interactive Map

YOUR ORDER

Order Area (Where): Cache County, Utah

Order Map Layers (What):

Order Format (How): None
Order Projection (How): None
Order Inclusion (How): None
Order Delivery Method (How): None

Order Recipient (Who):

2-WHAT

3-HOW

4-WHO

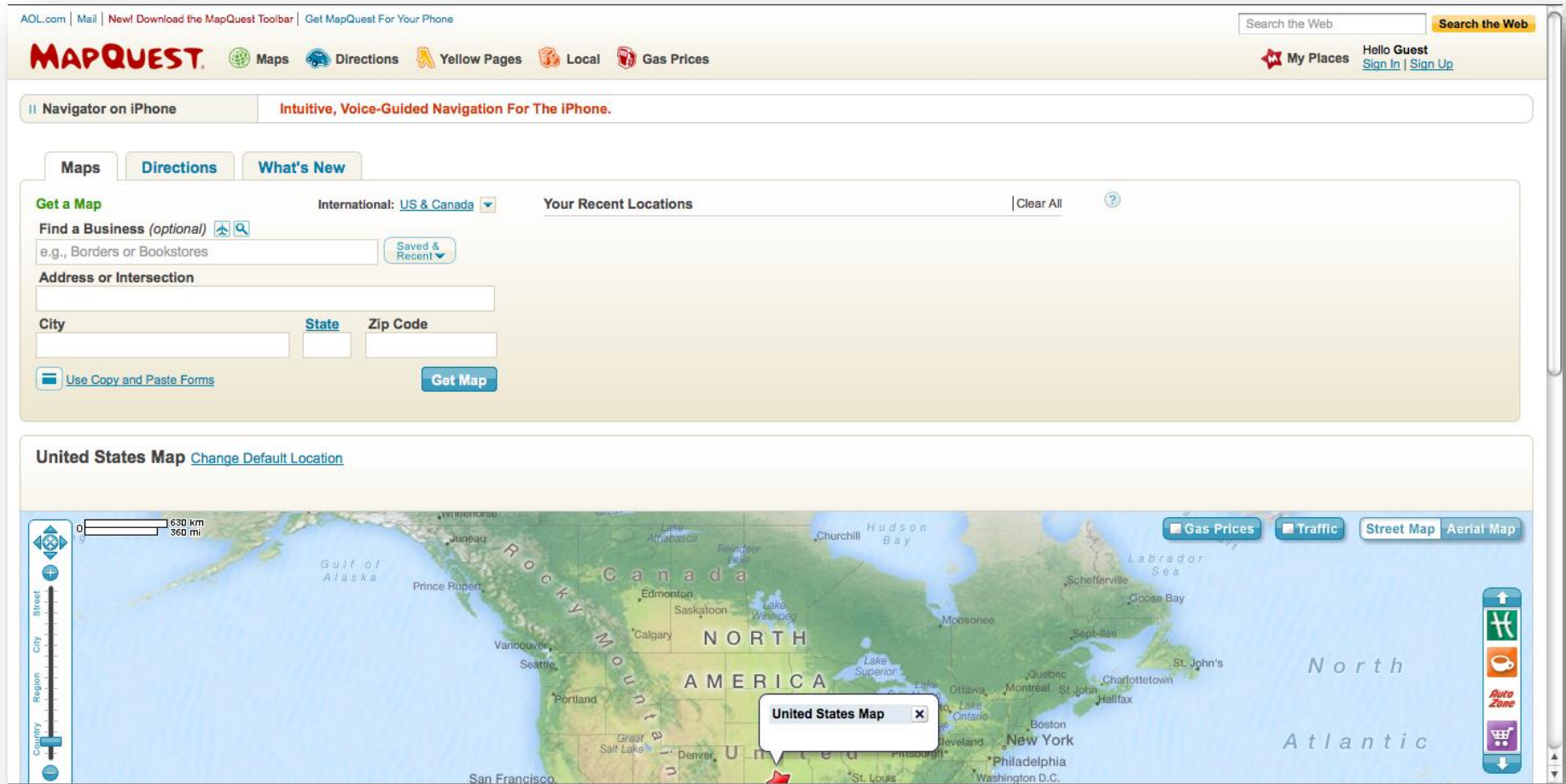
5-REVIEW

Accept Area

Now: Cloudy and 24°F Tonight: 19°F Thu: 32°F

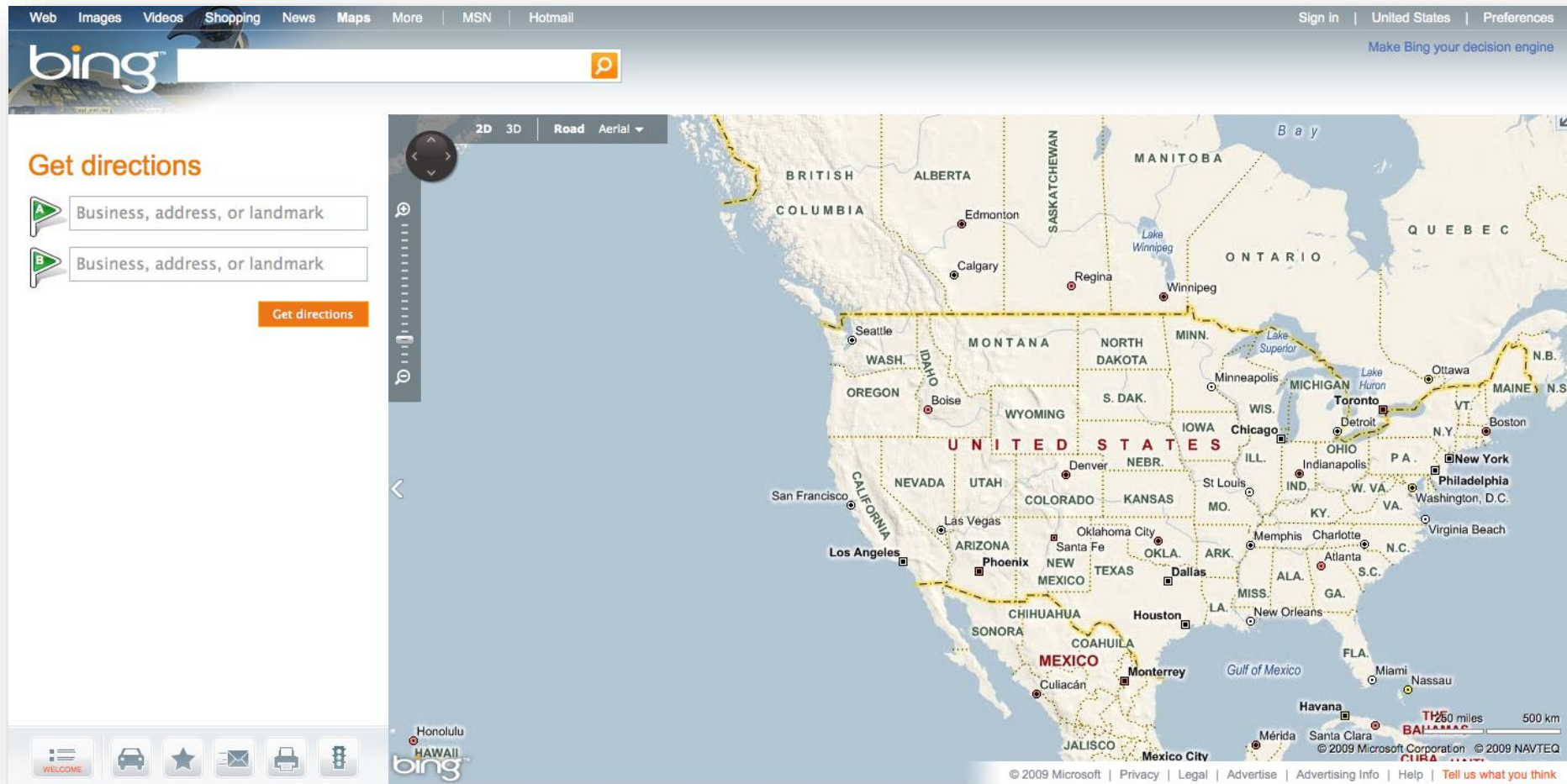
MAPQUEST

- One of the first... lost its marketshare



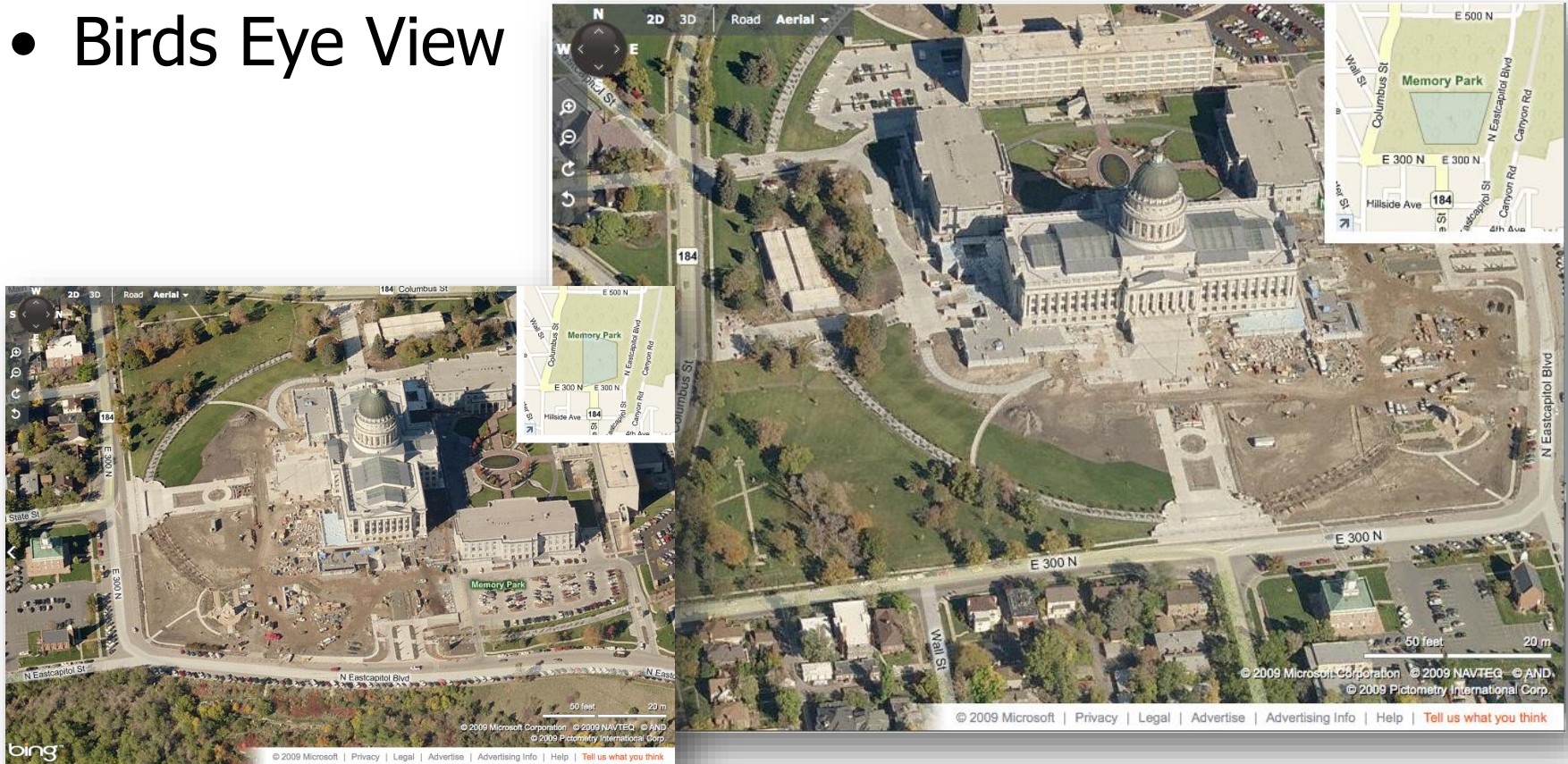
BING.COM/MAPS (FORMERLY LIVE MAPS -> Microsoft)

- Microsoft had to do something... to fight back Google



BING.COM – COOL FEATURES

- Built in 3D Viewer: Virtual Earth (w/ plugin; analogous to Google Earth)
- Birds Eye View



WHAT'S IT USED FOR?

- Just directions?
- A better question is: what is it not used for?

Examples of WebGIS at Work

Backed by ESRI ArcGIS Server:

- [Renewable Energy Atlas of Vermont](#) - See [article](#) from ESRI Observer

Backed by ESRI's ArcGIS Online

- Browse a plethora of public maps at ArcGIS Online's [Gallery](#).
- [Oregon Watershed Enhancement Board Investment Tracker](#)

Backed by GoogleMaps

- [OpenTopography Portal](#)
- [Housing Maps.com](#)
- [10 Great Journeys in a Car](#)
- [2010 Tour de France Route](#) - with interactive profiles
- [2008 Tour de France - Street View](#) ([see video](#))

Backed by Bing Maps

- [Gas Prices](#)
- [2010 Tour de France Route](#) - Different features like Bird's Eye view
- [Photosynth](#)



Web GIS QUESTIONS

- What is it?
- What's out there?
- What's it used for?
- **How does it differ from desktop GIS?**
- How is it deployed?
- How could you deploy it?



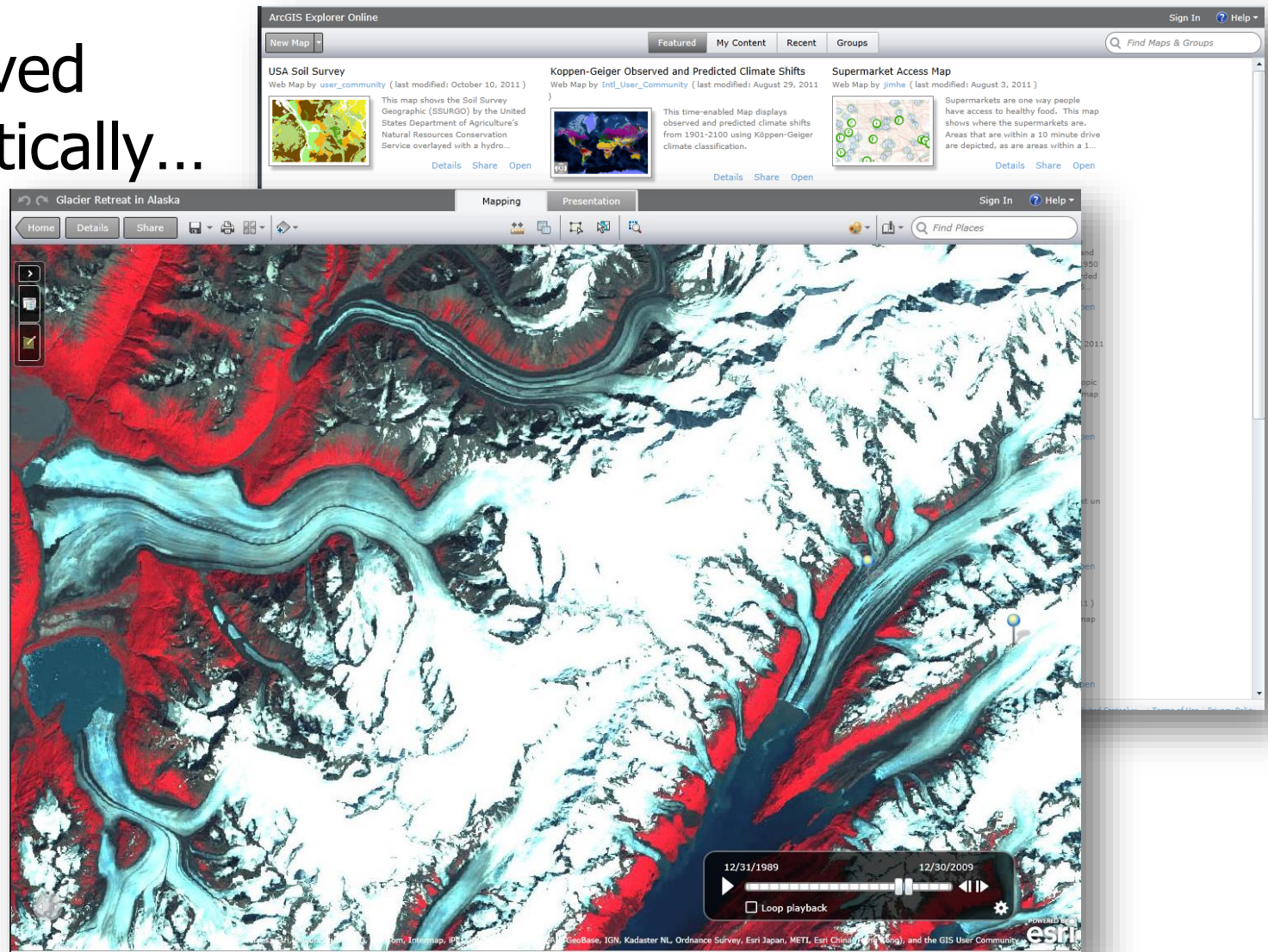
HOW DOES IT DIFFER FROM DESKTOP GIS?

- You can answer this...
- What of the ArcGIS family of products is WebGIS?



ArcGIS EXPLORER ONLINE

- Improved dramatically...



ArcGIS – My Map

The screenshot shows the ArcGIS My Map web application in a browser. The address bar displays www.arcgis.com/home/webmap/viewer.html. The browser's tab bar includes several open tabs: WizCiteWeb, WizAdd, scribble Toolbar, Gmail, scribble Toolbar, Pandora Radio, 2011 Le Tour, Joe Wheaton, WATS-USU, Dictionary, and Web of Science. The application header features the 'ArcGIS My Map' title and navigation links for 'New Map', 'My Content', 'Help', and 'Sign In'. Below the header is a toolbar with icons for 'Details', 'Add', 'Basemap', 'Save', 'Share', 'Print', 'Measure', and 'Bookmarks', along with a search bar labeled 'Find address or place'. On the left side, a sidebar titled 'Make your own map' provides instructions: 'It's easy to make your own map. Just follow these steps: 1. Choose an area. Pan and zoom the map to an area or search by its name or address. 2. Decide what to show. Choose a Basemap then Add layers on top of it. 3. Add more to your map. Create an editable layer to draw features on the map. Display descriptive text, images, and charts for map features in a pop-up. 4. Save and share your map. Give your map a name and description then share it with other people.' The main map area displays a topographic view of North America, including Canada, the United States, and Mexico, with labels for the Pacific Ocean, Atlantic Ocean, Gulf of Mexico, and Caribbean Sea. A scale bar at the bottom left indicates 0, 300, and 600 miles. The bottom of the page contains copyright information for Esri and its partners, and a 'Powered by Esri' logo.

ArcGIS My Map

New Map My Content Help Sign In

Details Add Basemap Save Share Print Measure Bookmarks Find address or place

Make your own map

It's easy to make your own map. Just follow these steps:


- 1. Choose an area.**
Pan and zoom the map to an area or search by its name or address.
- 2. Decide what to show.**
Choose a Basemap then Add layers on top of it.
- 3. Add more to your map.**
Create an editable layer to draw features on the map.
Display descriptive text, images, and charts for map features in a pop-up.
- 4. Save and share your map.**
Give your map a name and description then share it with other people.

Esri.com Terms of Use Privacy Contact Us Report Abuse


Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, AND, USGS, NRCAN, Kadaster NL, and the GIS User Community

POWERED BY esri


WHAT IS A WEB MAP?


 **ArcGIS Resource Center**


HelpBlogsForums





ArcGIS.com





 Overview


 What is ArcGIS Online?


 Types of geographic information


 What's new?


 Getting started


 Working with web maps


 Adding items


 Sharing content


 Finding and opening content


 Overview


 Using search


 Viewing search results


 Opening content


 Item details


 **What is a web map?**


 What is a web application?


 What is a mobile application?


 What is a tool?

 Finding content for ArcGIS desktop products

 Participating in groups

 Managing your account

 Using a subscription


 Terms of use

What is a web map?

[Finding and opening content](#)

Maps are visual presentations of useful information that communicate ideas and designs. They provide an effective metaphor for modeling and organizing geographic information as a series of data layers. For example, you could find a local street map that highlights a new bike path or a map depicting the age distribution of populations across parts of Southern California.


A web map is an interactive display of geographic information that you can use to answer questions. For example, you may find or create a map like the one referenced below that addresses the question, How many people in the United States live within a reasonable walk or drive to a supermarket? This map has layers showing which neighborhoods are within a 10-minute drive or 1-mile walk to a supermarket, and for context, the map has a topographic basemap that includes cities, roads, and buildings overlaid on land cover and shaded relief imagery.



[View map in the ArcGIS.com map viewer](#)

To help answer your questions and make what you see meaningful, web maps include descriptions, legends, and informational pop-up windows as well as tools to pick different basemaps, pan and zoom, find places, and add layers. Once you've created a map, you can share it as a link or through the website, embed it in other sites, and publish your own web mapping application.

Some web maps contain a collection of annotated slides that show a specific view into the map with associated text and graphics. This type of web map is known as a presentation. The slides help communicate the importance of the map's content such as its basemap, features, and layers. You play a presentation with control buttons to start, go forward, go back, end, and so on. Presentations are created in ArcGIS Explorer Online as part of the map and can be viewed from other clients including the ArcGIS.com map viewer and ArcGIS for iOS. Below is an embedded presentation of places to visit in San Diego.

**WATS 4930**

Web GIS QUESTIONS

- What is it?
- What's out there?
- What's it used for?
- How does it differ from desktop GIS?
- **How is it deployed?**
- How could you deploy it?

HOW IS IT DEPLOYED

- What platforms is WebGIS consumed in?
 - Web applications (i.e. browsers)
 - Web services (i.e. desktop GIS)
 - Mobile applications (i.e. your smart phone)
- What software does a user need to use it?
- How is it deployed at the back end?
 - WMS Web Map Services (for user interactivity)
 - Allows creation of web maps that can call up data from multiple servers and sources
 - GIS server(s) for hosting GIS data
 - Other services for doing heavy lifting (number crunching)



YOU SHOULD BE AWARE OF ARCGIS SERVER



What is a service?

A service is a representation of a GIS resource that a server is making available to other computers on a network. This network can be a local one, such as your company's computer system, or it can be a broader network, such as the Internet. The computers on the network that access your service are called clients. When you use ArcGIS Server to publish a service, you are giving clients access to a GIS resource. In many cases, clients can do the same things with the service that they could if a copy of the resource were on their own computer.

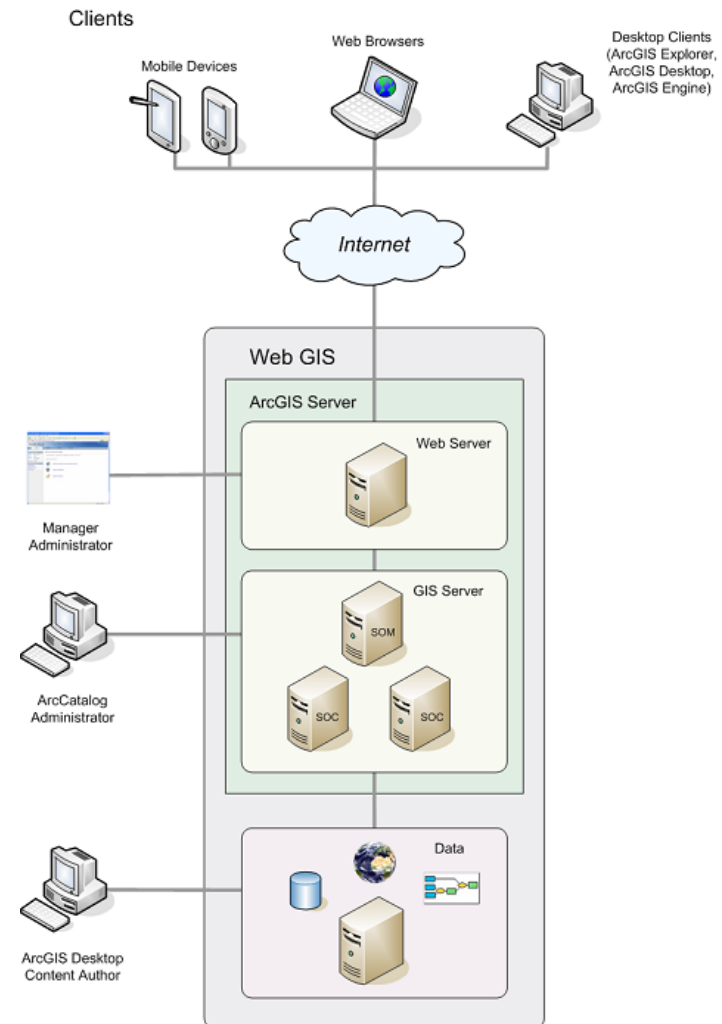
Using ArcGIS Server

As you use ArcGIS Server, you will follow a workflow of three steps to make your geographic information available through the server:

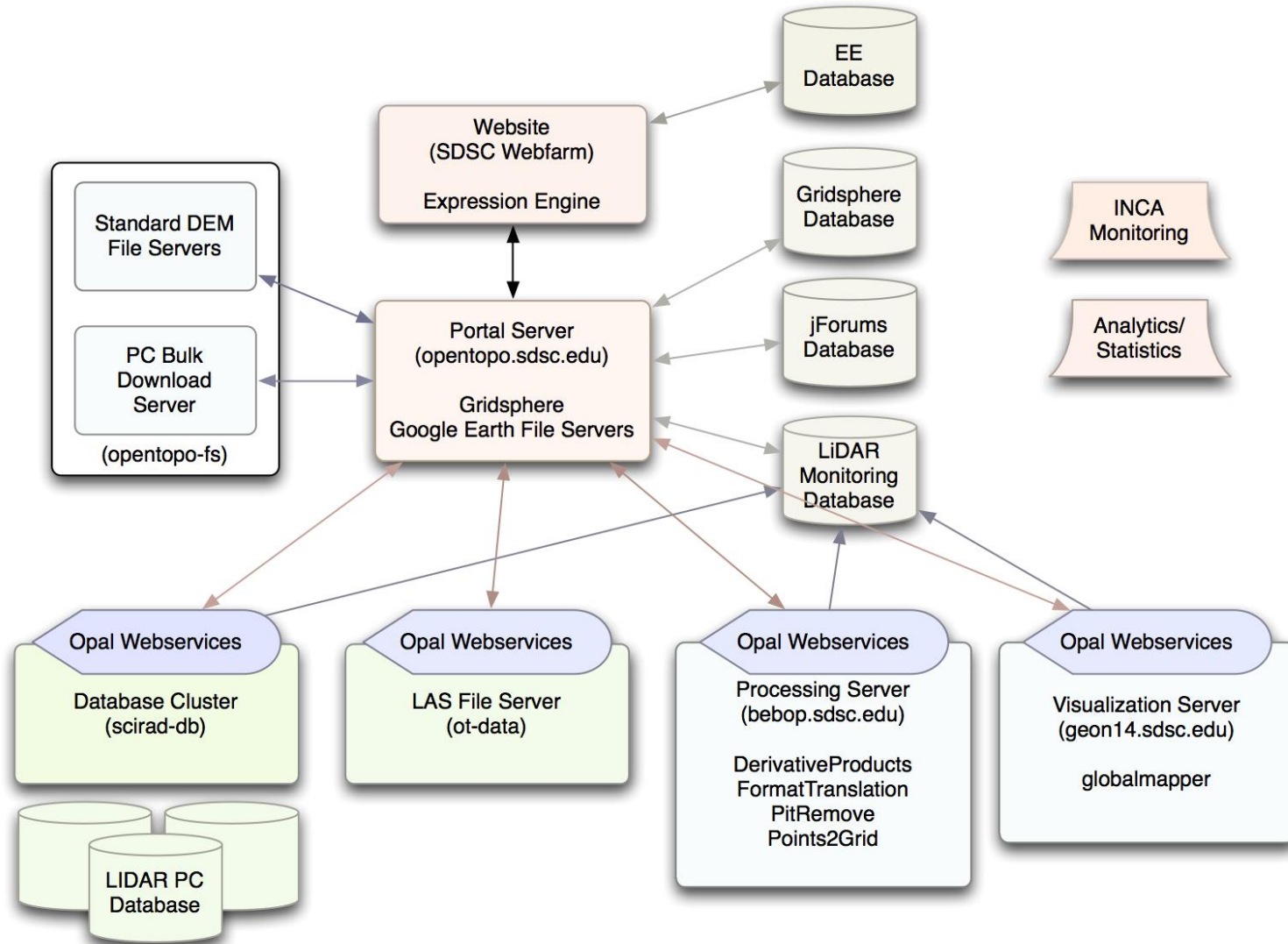
- **Author** the GIS resource using ArcGIS Desktop.
- **Publish** the resource as a service using ArcGIS Server.
- **Use** the service through a client application.

See: http://help.arcgis.com/en/arcgisserver/10.0/help/arcgis_server_dotnet_help/

The ArcGIS Server System Architecture

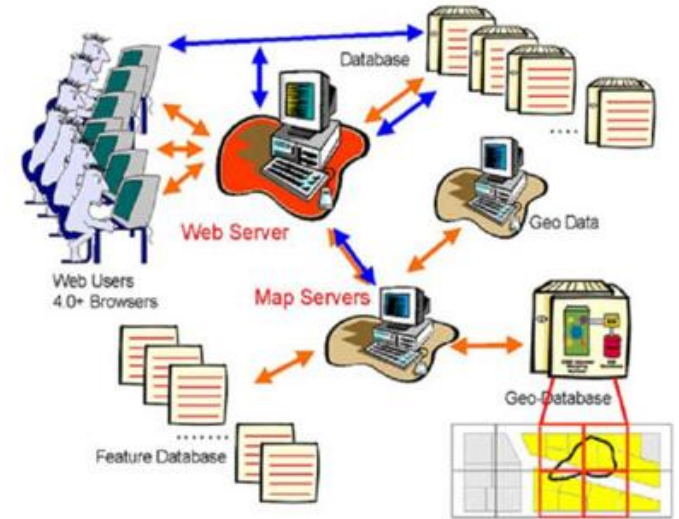
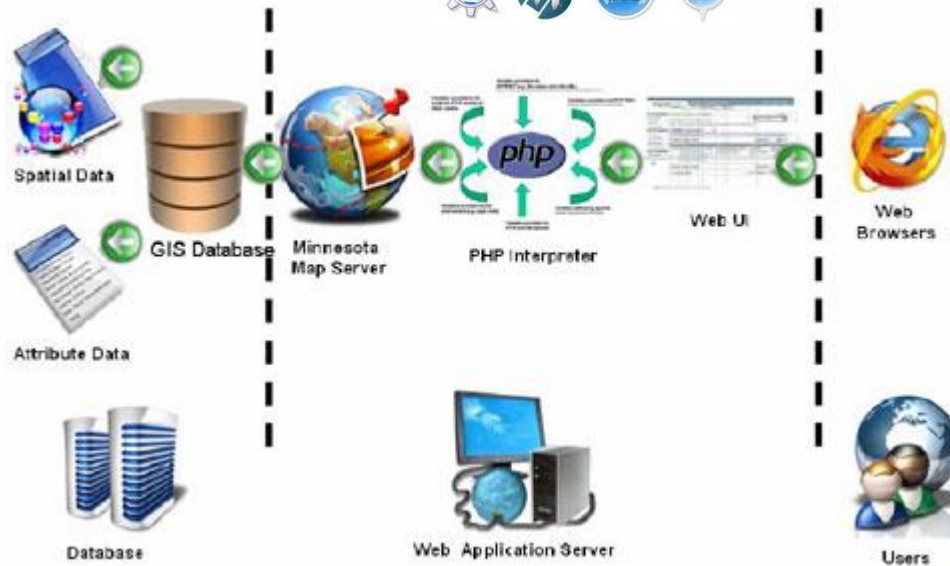


OPEN TOPOGRAPHY... SYSTEM ARCHITECTURE



SOME OTHER CARTOONS...

The arrows and components can vary, but on the outside... there is always the client... blind to the details of the blackbox behind their browser:



Web GIS QUESTIONS

- What is it?
- What's out there?
- What's it used for?
- How does it differ from desktop GIS?
- How is it deployed?
- **How could you deploy it?**

TODAY'S PLAN

I. Introductions

II. Syllabus

III. Review of Maps

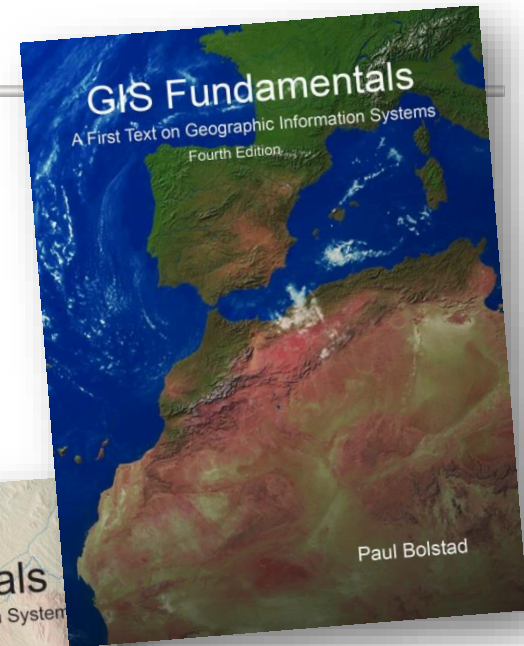
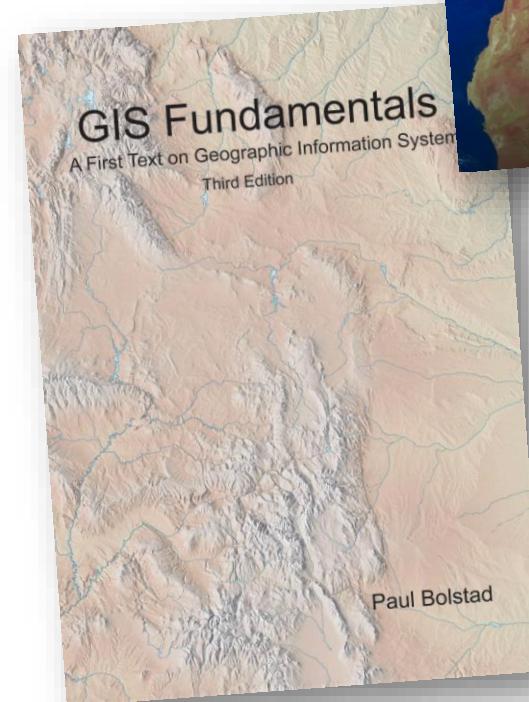
IV. WebGIS

V. Announcements / Summary / Questions

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:

GIS Classroom

Home

About the Courses (Syllabi)

Grades

Instructors

Primary Learning Outcomes

Software

Course Topics

Assignments

Labs (4930/6920/6915)

Project (4931/6921)

Reading Assignments

Class Announcements

Class Calendar

Class Forum

Useful Quick References

Getting Organized and Oriented

Figure Preparation Guidelines

Nice Maps!

GIS Class LibGuide

Help

© 2013 Copyright & Disclaimers

Utah State University Links

Canvas (Submit Assignments)

Department of Watershed Sciences

Banner Access

Current Students

Prospective Students

Open Course Ware

Other Links

ESRI Support

Assignments > Reading Assignments >

First Week's Homework - Due Thursday, January 9th


posted 23 hours ago by Joe Wheaton [updated 23 hours ago]

All of the following nine tasks are considered your homework and should be completed by **Thursday, January 9, 2014:**

1. Skim Chapter One of [Bolstad \(2005\)](#) text book
2. Browse & become familiar with organization of [Course Website](#)
3. Confirm that you have [Canvas](#) access - You'll need this for submitting assignments
4. Register as a user for the [Class Forum](#) - You'll need this for posting and answering questions
5. If you do not already have an ESRI Global Account, go to [ESRI Support](#) and follow the Create New ESRI Account link. ALSO, log into [ArcGIS.com](#) and register your global ESRI account for access to ArcGIS Online (see [here](#) if confused) - You'll need this for posting to ESRI's discussion forums, subscribing to alerts, and making online maps with ArcGIS Online.
6. Install [ArcGIS](#) on your own machine (if you have one)
7. If you do not already have a Google [Gmail account](#) (not your Aggiemail account), create one. - You'll need this for creating your Google Sites website and making Google Maps.
8. Make sure you have a secure means of remembering all these different usernames and passwords (e.g. [LastPass](#)). For this class alone, you will have need to regularly use the following credentials:

- USU Banner strong ID & Password for [Canvas](#)
- Quinney Lab - (uses your A number and password)
- [Class Forum](#)
- [Gmail](#)
- [Esri Support](#) and [ArcGIS.com](#)

Sorry for the long list of instructions.... But you better get used to it!



NEXT LECTURE

On Thursday:

- Projections & Coordinate Systems



YOUR QUIZ FOR THURSDAY

- Find an example of a good map and a bad map and explain why in terms of the 6 C's
- Post these two examples as URL's or images and your justification to the class forum at:
 - GIS Questions & Discussions -> Week 02 -> Quiz 1
 - <http://forum.bluezone.usu.edu/gis/viewforum.php?f=30>
 - Post before Tuesday's Lecture
 - Feel free to comment on others...
 - Also SUBMIT your links to CANVAS under Quiz 1 So I can give you credit
- PURPOSE:
 - Develop a critical eye about other's maps, so that you can make your own maps better
 - Familiarize you with grading criteria

READING FOR THURSDAY

- Read Chapter Three of Bolstad: "Map Projections & Coordinate Systems" (pp. 69-122)
 - Skim 70-72 (History)
 - Read pp. 72-119 in detail

Utah State University
DEPARTMENT OF WATER-RELATED SCIENCES

ADVANCED GIS COURSES
WATS 4930/6920, 4931/6921, 6915

Search this site

GIS Classroom

- Home
- About the Courses (Syllabi)
 - Grades
 - Instructors
 - Primary Learning Outcomes
 - Software
- Course Topics
- Assignments
 - Labs (4930/6920/6915)
 - Project (4931/6921)
 - Reading Assignments
- Class Announcements
- Class Calendar
- Class Forum
- Useful Quick References
 - Getting Organized and Oriented
 - Figure Preparation Guidelines
 - Great Maps!
 - GIS Class LibGuide
- Help
- © 2013 Copyright & Disclaimers

Utah State University Links

Assignments > Reading Assignments >

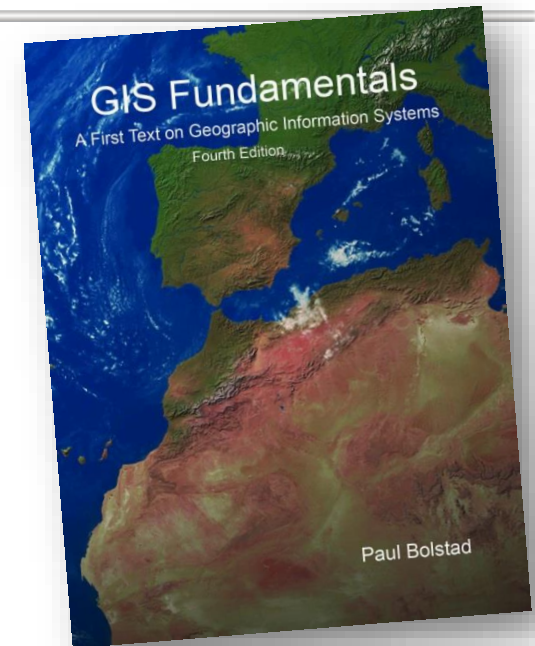
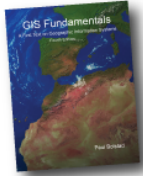
Reading for Tuesday, January 15th
posted a minute ago by Joe Wheaton

Finish reading the following by **Tuesday, January 15, 2013** (before lecture):

- Read the following from Chapter Three (Map Projections & Coordinate Systems) of **Bolstad (2005)**
 - skim pp 70-72 (early measurements)
 - Read rest of chapter in detail pp 72-119
 - Can you answer the study questions 3.2-3.9 on p 119?
- You may also have a look at the following useful ESRI Help Topics:
 - [Georeferencing and Coordinate Systems](#)
 - [What are map projections?](#)
 - [Projection Basics for the GIS Professional](#)
 - [Identifying an unknown coordinate systems](#)

Comments

You have no permission to add comments.



ArcGIS Resource Center

Desktop 10

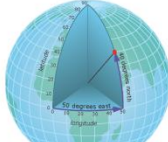
Introduction to the ArcGIS help Library

- What's New in ArcGIS 10
- Introduction
- What is GIS?
- How maps are used in GIS
- How maps are used in GIS
- Elements of geographic information
- How a GIS represents and models geographic information
- Map applications provide the primary user interface for GIS
- Map documents and Web maps
- Interoperability—Working with geographic data
- Where to next?
- ArcGIS resources
- Professional library
- Administrative library
- Copyright information
- License agreement
- ArcGIS acknowledgment

Describing the correct location and shape of features requires a coordinate framework for defining real-world locations. A geographic coordinate system is used to assign geographic locations to objects. A global coordinate system of latitude and longitude is one such framework. Another is a planar or Cartesian coordinate system derived from the global framework. Maps represent locations on the earth's surface using grids, georeferenced, and for maps labeled with various ground locations—both in measures of latitude and longitude and in projected coordinate systems, such as UTM meters. The geographic elements contained in various map layers are drawn in a specific order (one on top of another) for the given map output. GIS datasets contain coordinate locations within a global or Cartesian coordinate system to record geographic locations and shapes. In this way, multiple GIS data layers can be overlaid onto the earth's surface.

Latitude and longitude

One method for describing the position of a geographic location on the earth's surface is using spherical measures of latitude and longitude. These are measures of the angles (in degrees) from the center of the earth to a point on the earth's surface. This type of coordinate reference system is often referred to as a geographic coordinate system.



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>



GREAT ESPRESSO COURSE OPPORTUNITY

Class Announcements >

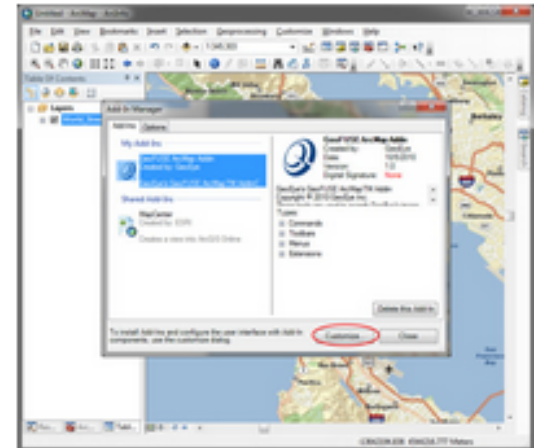
Want to learn how to build GIS Applications? Register Now!

posted 11 minutes ago by Joe Wheaton

Dr. Philip Bailey (adjunct in WATS and principle of [North Arrow Research](#)) will be teaching an espresso short course on **'Building Professional GIS Applications'** this February in Logan. If you want to learn how to take your geoprocessing workflows and algorithms, and turn them into professional GIS applications (e.g. stand-alone utilities, ArcGIS Plugins, ArcGIS Addins, toolbars) this workshop is for you.

The course will be taught over four sessions:

- February 10th, 12th and 13th in the evening from 5:00 PM to 9:00 PM
- And February 15th (Saturday) in the morning from 9:00 AM to 12:00 Noon



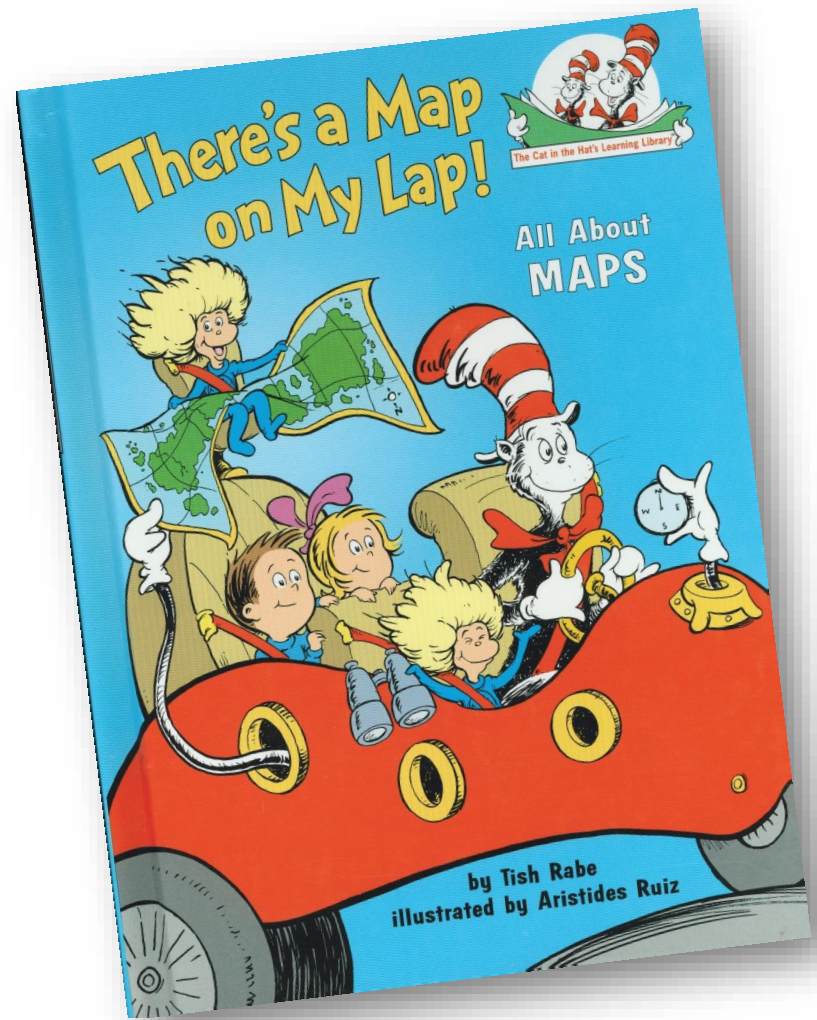
To register, go to Banner and register for WATS 6900 - Section 11: Building Professional GIS Applications; CRN 26893

REGISTER EARLY! Space is limited and the last day to add without signature is January 10th; (late adds will be allowed up to January 29th).

- Visit: <http://gis.joewheaton.org/classroom-news/wanttolearnhowtobuildgisapplicationsregisternow>

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**



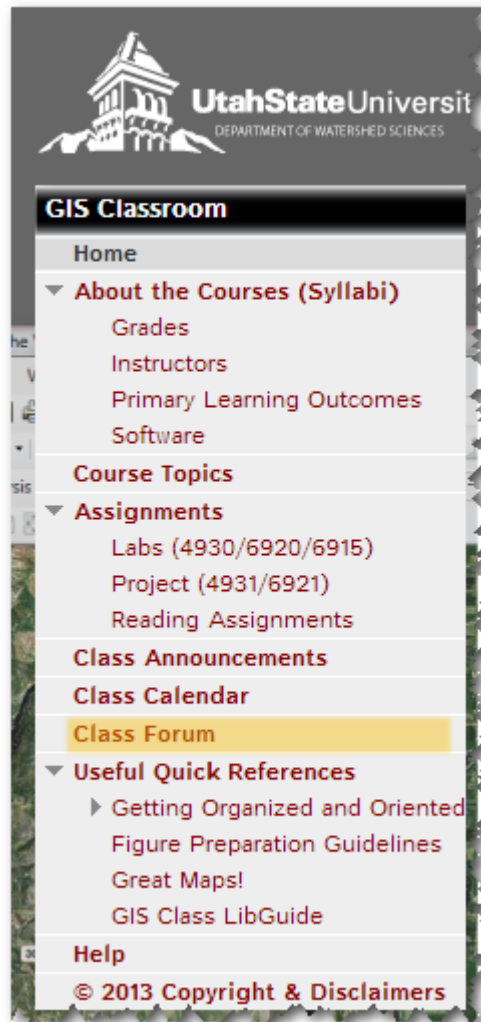
REMEMBER, I WANT YOU TO:

- Gain confidence in **teaching yourself** techy-stuff
- Become more **tech-savvy**
- Learn a bunch of **tricks** that set you apart from the rest...
- Use that knowledge to **address problems and questions** that interest you
- Discover how to **stay on top** of rapidly evolving fields...
- Act like a **professional**, not a student



QUESTIONS??

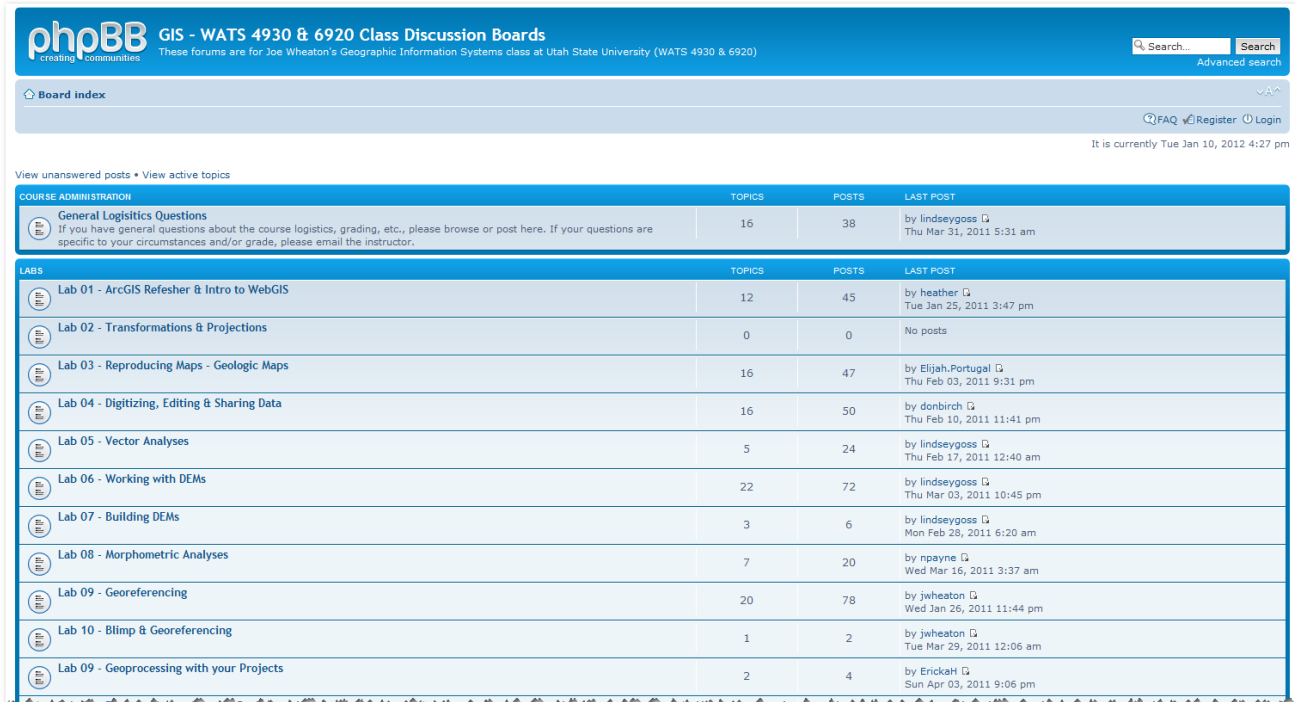
- Post other questions to our Class Forum at <http://forum.bluezone.usu.edu/gis>



UtahStateUniversity
DEPARTMENT OF WATERSHED SCIENCES

GIS Classroom

- Home
- ▼ **About the Courses (Syllabi)**
 - Grades
 - Instructors
 - Primary Learning Outcomes
 - Software
- Course Topics**
- ▼ **Assignments**
 - Labs (4930/6920/6915)
 - Project (4931/6921)
 - Reading Assignments
- Class Announcements**
- Class Calendar**
- Class Forum**
- ▼ **Useful Quick References**
 - Getting Organized and Oriented
 - Figure Preparation Guidelines
 - Great Maps!
 - GIS Class LibGuide
- Help**
- © 2013 Copyright & Disclaimers



phpBB GIS - WATS 4930 & 6920 Class Discussion Boards
These forums are for Joe Wheaton's Geographic Information Systems class at Utah State University (WATS 4930 & 6920)



Search... Search
Advanced search






















Board index

FAQ Register Login

It is currently Tue Jan 10, 2012 4:27 pm

View unanswered posts • View active topics

COURSE ADMINISTRATION	TOPICS	POSTS	LAST POST
 General Logistics Questions If you have general questions about the course logistics, grading, etc., please browse or post here. If your questions are specific to your circumstances and/or grade, please email the instructor.	16	38	by lindseygoss  Thu Mar 31, 2011 5:31 am

LABS	TOPICS	POSTS	LAST POST
 Lab 01 - ArcGIS Refresher & Intro to WebGIS	12	45	by heather  Tue Jan 25, 2011 3:47 pm
 Lab 02 - Transformations & Projections	0	0	No posts
 Lab 03 - Reproducing Maps - Geologic Maps	16	47	by Elijah.Portugal  Thu Feb 03, 2011 9:31 pm
 Lab 04 - Digitizing, Editing & Sharing Data	16	50	by donbirch  Thu Feb 10, 2011 11:41 pm
 Lab 05 - Vector Analyses	5	24	by lindseygoss  Thu Feb 17, 2011 12:40 am
 Lab 06 - Working with DEMs	22	72	by lindseygoss  Thu Mar 03, 2011 10:45 pm
 Lab 07 - Building DEMs	3	6	by lindseygoss  Mon Feb 28, 2011 6:20 am
 Lab 08 - Morphometric Analyses	7	20	by npayne  Wed Mar 16, 2011 3:37 am
 Lab 09 - Georeferencing	20	78	by jwheaton  Wed Jan 26, 2011 11:44 pm
 Lab 10 - Blimp & Georeferencing	1	2	by jwheaton  Tue Mar 29, 2011 12:06 am
 Lab 09 - Geoprocessing with your Projects	2	4	by ErickaH  Sun Apr 03, 2011 9:06 pm