

Geology 210
Geomorphology – Professor Mary Savina

Fall 2013

Rivers in Space and Time – A comparative study with digital posters

Maps are human constructs and interpretations. Most maps attempt to portray features in relationship to each other for specific purposes: understanding how Mediterranean cities relate to Jerusalem or Mecca (as the keystones of particular religions), allowing sailors to plot accurate courses across oceans, representing the relationships among stations in a subway system, etc. Maps which show particular features, such as a river, in a time sequence, may be useful in discerning how that river has changed with time. In order to use maps in such a way, the historical reasons for the maps must be understood.

This project will be carried out in small groups, partly outside of class time and partly during the Week 6 lab periods and class time in week 7 on October 28 and 30 (two days Mary is gone for the Geological Society of America meetings).

Some overriding questions:

- What was the nature of the river before human intervention?
- In what ways have humans intervened on the river and how are these interventions represented on maps?
- How have human interventions affected the river: hydraulic geometry (width, depth, gradient, velocity, discharge, sediment transport), plan form (e.g., sinuosity) connections with the floodplain, effects on flood frequency, etc.?
- How, in turn, are these changes represented on the historical maps?
- How do maps of different periods represent “reality” in an urban river setting?
- For what purpose have such maps been constructed and how well do they serve those purposes?

Some learning objectives and outcomes (specifics will depend on the group):

- Use historical and contemporary maps (and other images, including air photos) to compare features of the Arno, Lower Mississippi and Cannon River at different periods;
- Use government and other data to construct river patterns and histories;
- Compare the flood history of the Arno and two other rivers in the history and instrumental record to changes in the river’s shape;
- Create an annotated, interactive image using Google Earth to illustrate the changes that have occurred along the Arno or one of the other rivers;

Some assignment details

In groups of three or four, students will complete a comparative analysis of the three river systems. Different groups will undertake these topics:

- Channel plan changes
- Alterations in width, depth and velocity along a stream reach (using available maps and evidence)

- Use of rivers for navigation
- Floods (compare, for instance, the 1993 Mississippi Flood (may have had most effect upstream of the Atchafalaya), 1966 Arno Flood, 2010 Cannon River flood)
- Comparative flood history – record of major floods
- Flow duration and seasonality of flow; consequences of seasonality
- Dams and longitudinal profile change
- Flood control measures and other alterations to the streams, particularly in urban areas.

Each group will probably want to define its topic a little more closely.

Resources:

I am in the process of compiling resources, especially for the Arno River, and I expect to have that list available at lab time week 6.

Digital Poster instructions:

I hope the posters will contain figures and maps, captions and a little text, video and perhaps audio, as appropriate for the topic. The following instructions on using Prezi were written by the project managers, students Sophie Greene and Erica Sheline (in lieu of completing their own poster, these two students managed the project):

Prezi

Prezi is an online poster/presentation-making tool free for anyone with an educational email address.

Getting Started:

- Go to www.prezi.com
- Click the blue “sign up now” button
- Click the orange “student and teacher licenses”
- Enter your Carleton email and set up account

Making a Prezi

- There are many templates, but it might be easiest to use a blank template so that you can fit in your information in the most logical way possible.
- Make sure to notice that you can import video, search images within the Prezi interface, add an infinite number of text boxes.
- Make sure to check out the “Learn & Support” heading for tons of helpful videos, FAQ and the Prezi manual
- Note that you can share your Prezi with group members by clicking the share box on the “Your Prezi” page. If you set all of your group members as “editors,” (v. similar to google docs) you can all edit the Prezi together.

Please come to your project managers if you have any questions! We want you to be able to spend your time learning about rivers, we will help minimize technological hiccups.

Check out our sample Prezi for ideas and templates for your poster:

http://prezi.com/e1xgsfin0pvn/?utm_campaign=share&utm_medium=copy

(you may have to copy and paste the link into your browser)

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