Lecture 1- Introduction to Geog 462 Coastal GIS

Learning Objectives:
1.1 What are some of the course particulars from the overview and schedule?
1.2 Why offer a course in GIS with a theme about coastal issues?
1.3 Why use a watershed approach to examine coastal issues?

1.1 What are some of the course particulars from the overview and schedule?
- The 462 web pages contain overview, schedule with lecture notes, lab assignment links, and pointers to other resources (data, explanations, etc.).
  - Lecture and lab schedule – visit these pages to stay current with the course flow
  - Final authority about grading (instructor in conversation with TAs and your input.)
    - This is meant mainly for dispute resolution
- Expectations of instructors
  - Provide the most interesting and transparent learning experience possible within the bounds of UW policy
- Expectations of the students in the course
  - Come to class – both lecture and lab
  - Stay up to date with the readings – skim before and read after or vice versa
  - Ask questions when issues are not clear
- Session-to-session “learning objectives” are the basis of the exams.

1.2 Why offer a course in GIS with a theme about coastal issues?
- As of 2010, 52% of US population lives in coastal watersheds (see NOAA News). By 2035, 75% of the world’s population will likely be living in coastal areas.
  - Although coastal areas differ from region to region, similar factors such as population growth, land use activity, contamination, regional economics, political institutions, and natural hazards all influence the allocation and use of coastal waters - fresh, salt, and estuarine - from time to time and at different scales.
  - Geographic information system (GIS) technology applied to spatial-temporal problems has considerable potential, and much of that potential is yet unrealized.
- Coastal concepts are interesting because of geographic dynamics. Spatial-temporal change occurs almost everywhere, but particularly in sensitive areas on coasts
  - How do you differentiate a coastline and a shoreline? see Shoreline Management Act of Washington State
  - Pressures on coastal zones from natural events – What natural hazards impact coasts around the world?
  - Pressures exerted by human induced events – What human hazards impact coasts around the world?
- GIS as a useful information technology for coastal zone management applications
  - Coastal zone management has special needs for multiple spatial-temporal scales
- Sustainable development of coasts might well require the use of advanced GIS to address the many management problems.
  - We will look at several ways GIS can be used to perform spatial analysis with a focus on coastal zones supported in part by the Digital Coast.

1.3 Why use a watershed approach to examine coastal issues?
- According to US Environmental Protection Agency (EPA), a watershed approach is the most effective framework to address today's water resource challenges. Watersheds supply drinking water, provide recreation and respite, and sustain life. More than $450 billion in food and fiber, manufactured goods, and tourism depends on clean water and
healthy watersheds. As mentioned earlier, 52% of US population lives in coastal watersheds (see NOAA News).

- A watershed (or basin) approach recommended by the EPA operates most effectively at a regional scale. Drainage areas are of varying scales – catchments, sub-watersheds, watersheds, sub-basins, and basins. Watershed protection aims at targeted, cooperative and integrative action.

- The main principles of a watershed approach are as follows (consider the use of GIS):
  - Target priority problems - Target watersheds should be those where pollution poses greatest risk to human health, ecological resources, desirable uses of water, or a combination of these.
  - Stakeholder involvement - All parties with a stake in the situation should participate in analyzing problems and creating solutions.
  - Integrated solution - Action taken should draw upon full range of methods and tools available, integrating them into a coordinated, multi-organization approach to problems. Scientific understanding and research should be included, but be open to incorporation of new information from local sources.
  - Measure success – Early in the process stakeholders should agree on the ecological and administrative indicators for measuring the progress being made. However, such a collection of indicators should be constituted from a sound conceptual model, for example as recommended by the Washington State Academy of Sciences in their Sound Indicators report.

- Several types of information tools can be used for a watershed approach – databases, water quality models, web mapping tools, particularly for non-point source pollution.

- A concept of neighborhood constitutes a basis of space, temporal, and functional relationships for understanding geographic dynamics of watersheds. This course explores that notion in some detail with regard to coastal human-environment systems. A human-environment system is a collection of human and environment phenomena and their inter-relationships that influence well-being.