

Online GIS Data by Topic – Subject Themes

Tufts University – Fall 2007

Agriculture:

- **US Census of Agriculture**

Census of Agriculture information is available for download into GIS formatted tables.

Instructions:

1. Go to http://www.nass.usda.gov/Data_and_Statistics/Quick_Stats/index.asp
2. At the bottom of the page under the title of 2002 Census of Agriculture select the type of query you want to do. For example you can get data by zip code, county, state, congressional district. Hit the go tab.
3. On the next page you can select the data that you want and the geographical area you are interested in. Once you have made your selections, hit the get data tab.
4. At the end of the table that results, there is an option to "Click here for a GIS version of this output." On the next screen you must choose download dbf, txt, or all GIS files. This will be a table that you can join to your boundary files.

Note: The National Atlas - <http://nationalatlas.gov/> - has a preformatted GIS data set from the 2002 Agriculture Census with information by county for the entire US - it includes a series of basic attribute information about farms, farm expenditures, farm production values, numbers of livestock, etc. - on the National Atlas site, go to the Mapping Professionals link, then to Raw Data, then to Agriculture. There are many more variables available through the Census of Agriculture web site, but this data set will get you a long way.

- **Natural Resources Conservation Service (USDA) Geospatial Gateway -**

<http://datagateway.nrcs.usda.gov/GatewayHome.html> - interactive map gateway to ordering USDA data including soils, precipitation, temperature, and orthophotos (including National Agriculture Imagery Photography - NAIP - products).

Biodiversity Data:

- **National Biological Information Infrastructure (NBII) –**

<http://www.nbio.gov/> - research and data collaborative to share biological data for the US and internationally.

- **NatureServe –**

<http://www.natureserve.org/> - animal and plant distribution GIS data downloads, as well as a wide range of other information and data from NatureServe, a non-profit that works to collect and distribute information for a network of heritage programs and conservation data centers around the world. Go to the *Get Data* link.

- **Global Biodiversity Facility –**

<http://www.gbif.org/> - From the web site: "The GBIF Network already provides access to over 40 million records of occurrences of different organisms. Many of these relate to specimens in natural history museums and herbaria around the world or to living cultures of micro-organisms, but at least a third come from observations of wild organisms. Wherever possible these records include information about the locality where the organisms were found and are used to generate maps of the distribution of these occurrences. Counts of occurrence records are listed against the organism names to which they apply. For genera and taxa of higher ranks, these counts include only those occurrences which have been identified to the taxon concerned. For species these counts include all occurrences for the species and also for any included infraspecific taxa, as well as for any known synonyms."

Other efforts to digitize and georeference museum collection specimens:

- **Fishnet (Fish Network Information System)** - <http://www.fishnet2.net/index.html>
- **MaNIS (Mammal Network Information System)** - <http://manisnet.org/>
- **ORNIS (Ornithological Network Information System)** - <http://olla.berkeley.edu/ornisnet/> - birds
- **HerpNet (Herpetological Network)** – <http://herpnet.org/> - reptiles and amphibians
- **OBIS (Ocean Biogeographic Information System)** – <http://www.iobis.org/> - for marine animals and plants

Business Data:

Business data can be bought from many private data providers. Free Business data is harder to come by but here are some resources; some free and some are available to universities and colleges with subscriptions:

- **US Census Bureau - Business and Industry Data** - <http://www.Census.gov/econ/www/index.html>
- See also the various *State Data Centers* that process and distribute Census population and economic data as well as other Business/finance data - the Census Bureau as a list of these State Data Centers here: <http://www.Census.gov/sdc/www/> or you can do a web search for "state data center" and the name of the state in which you are interested.
- **Geodata.gov (Geospatial One-Stop)** - www.geodata.gov - check out the Business link - specifically for geographic data, but most of it is not free.
- **USA.gov - Business Data and Statistics** - http://www.usa.gov/Business/Business_Data.shtml - not GIS specific, but links to many data portals
- **Reference USA** - <http://www.referenceusa.com> - a database of 14 million US Businesses containing verified data, updated monthly. Search by Business name and type, executive title, sales volume, year established and more. "HealthCare" provides detailed information about physicians and dentists. *Note: you can geocode the Businesses/health care providers using the address field, or you can download the "detailed" version of the data and use the Latitude/Longitude coordinates provided. You will likely get a more accurately located point if you digitized against a local street centerline or parcel GIS layer if one is available.*
Important: Your University Library must have a subscription to this data base to use it.

Census (US) - Current and Historical Data:

Census Overviews

The main US Census Bureau site is at <http://www.Census.gov>. For information about the Census, how it is implemented, what terms mean, etc., go to [Your Gateway to Census 2000](#) - the link to [Introduction to Census 2000 Data](#) provides good overviews and a further link to a number of powerpoint presentations (*Public Use Presentation Library*) put together by Census Bureau staff to explain Census concepts, methods, and variables.

Accessing 2000 Census Data

When using Census information in GIS, you need to have both geographic boundary files (e.g., Census tracts) and the Census data (attribute tables) that join to those boundary files. The tabular attribute data will typically come from either the 100% Census (SF1 and SF2) or from the sample

"long form" sent one out of every several Households (SF3 and SF4). The 100% SF1 data has basic demographic information on population counts, age, gender, race, ethnicity, and household/family relationships. The sample SF3 data contains a wealth of more detailed information including income, employment, education, transportation to work, language, and ancestry.

For 2000 Census geography boundary files:

- **Geography Network - Free Data Resources -**
<http://www.geographynetwork.com/freeresources.html> - you can download TIGER geography data, including streets, water bodies, urban areas Plus the Census geography (e.g., tracts, blockgroups, blocks) and accompanying SF1 data from here
- **Cartographic boundary files from the US Census Bureau -**
http://www.Census.gov/geo/www/cob/bdy_files.html - good place to get the Zip Code Tabulation Area boundaries, but make sure you read about them first - ZCTAs are not the same thing as Zip Codes. See this [ZCTA description site](#) - From the Census Bureau.

Many states also serve Census data in GIS format (e.g., see MassGIS for Massachusetts - <http://www.mass.gov/mgis/Census2000.htm> - which has boundary files and many SF1/SF3 tables already processed for use in GIS)

For 2000 Census data:

- **US Census - American Factfinder -**
<http://factfinder.Census.gov/home/saff/main.html?lang=en> - American Factfinder is the main portal for data viewing, mapping and downloading. Go to the *Data Sets* link to get specific data in a database format that ArcGIS can read and which can be joined to geographic boundary files.
- **US Census Download Center -**
<http://factfinder.Census.gov/servlet/DownloadDatasetServlet?lang=en> - for experienced users, download entire data tables at one shot

See also the various *State Data Centers* that process and distribute Census population and economic data as well as other Business/finance data - the Census Bureau as a list of these State Data Centers here: <http://www.Census.gov/sdc/www/> or you can do a web search for "state data center" and the name of the state in which you are interested.

Accessing historical Census data:

- **National Historic GIS Project -**
<http://www.nhgis.org/> - project to digitize and distribute aggregated Census data for US Census - 1790-2000. Also included are boundary GIS shape files for previous Censuses. An invaluable site for historic research in the US with easy-to-use interface.
- **Historical Census Browser** (University of Virginia, Geospatial and Statistical Data Center) - <http://fisher.lib.virginia.edu/collections/stats/histCensus/> - this is an excellent site for viewing historical Census data and understanding what kinds of information previous US Censuses recorded. It does not have download capabilities and does not include GIS boundary files (use the National Historic GIS Project site above for that). I suggest that you go to this one first if you are not familiar with historic Census information.
- **IPUMS USA - Integrated Public Use Microdata** (Minnesota Population Center, University of Minnesota) - <http://USa.ipums.org/USa/> - very good site with Census samples from different years, information about previous Censuses, including enumeration forms (the questions asked) and lists of variables for all US Censuses. Also has an international section.
- **ICPSR - Historical, Demographic, Economic, and Social Data: The United States, 1790–1970 -**

<http://webapp.icpsr.umich.edu/cocoon/ICPSR-STUDY/00003.xml> - Tufts University (and many other university researchers) can download historical US Census data from this site. *Note this site is for experienced users.* See the university reference librarian for assistance. To view data from this series, see the [Historic Census Browser](#) from the University of Virginia described above.

Climate Change and Biogeochemical Dynamics:

- **National Climate Data Center (NOAA)** - <http://www.ncdc.noaa.gov/oa/ncdc.html> - From the web site: "world's largest archive of weather data" - not specifically GIS, but some of it can be used in GIS programs.
- **National Center for Atmospheric Research (NCAR) - NCAR GIS Initiative** – <http://www.gis.ucar.edu/> - From the web site: "The Geographic Information Systems (GIS) Strategic Initiative at the National Center for Atmospheric Research (NCAR) is an interdisciplinary effort to foster collaborative science, spatial data interoperability, and knowledge sharing with GIS." Look at the tutorials link for tutorials about how to import netCDF data (widely used in the atmospheric sciences, into ArcGIS 9.2).
- **GIS Climate Change Scenarios** - NCAR - <http://www.gisclimatechange.org/> - From the web site: "This GIS data portal provides access to free global datasets of climate change scenarios generated for the 4th Assessment Report of the [Intergovernmental Panel on Climate Change](#) (IPCC) by the [Community Climate System Model](#) (CCSM). The datasets can be downloaded in a common GIS format (i.e., shapefiles) or text file format". See also the **Intergovernmental Panel on Climate Change - Data Distribution Center** - <http://www.ipcc-data.org/> .
- **PRISM (Oregon State University)** - <http://prism.oregonstate.edu/> - From the web site: "This OSU PRISM Group web site provides access to the highest-quality spatial climate data sets currently available. These data sets were created using the PRISM climate mapping system, developed by Dr. Christopher Daly, PRISM Group director. PRISM is unique in that it incorporates a spatial climate knowledge base that accounts for rain shadows, temperature inversions, coastal effects, and more in the climate mapping process."
- **National Assessment of Coastal Vulnerability to Sea Level Rise (USGS Woods Hole Field Center)** - <http://woodshole.er.usgs.gov/project-pages/cvi/> - includes links to a preliminary GIS data set that attempts to give a national overview of coastal vulnerability to sea level rise, Plus a number of reports and regional studies.
- **Atlas of the Biosphere** (The University of Wisconsin) - <http://www.sage.wisc.edu/atlas/> - From the web site: "The Atlas of the Biosphere is a project of the University of Wisconsin's Institute for Environmental Studies' Center for Sustainability and the Global Environment (SAGE). Our goal is to provide more information about the environment, and human interactions with the environment, than any other source. We will make every effort to distribute the data as freely as possible, and will provide original sources in the cases where we are not allowed to." Well-organized and documented set of global data.
- **Biogeochemical Dynamics Distributed Active Archive Center** (Oak Ridge National Laboratory) - <http://www.daac.ornl.gov/> - data and models from NASA-sponsored research on climate change, cycling of greenhouse gases, biodiversity, etc. From the web site: "The Oak Ridge National Laboratory Distributed Active Archive Center (ORNL DAAC) is a NASA-sponsored source for biogeochemical and ecological data and models useful in environmental research. All of our data sets and model products are free of any costs to you (including shipping)." To

use the data and models on this site, it assumes you have training and knowledge of ecological and biogeochemical modeling and database design.

- **Global Land Cover Facility** - <http://glcf.umiacs.umd.edu/index.shtml> - From the GCLF web site: "The GLCF is a center for land cover science with a focus on research using remotely sensed satellite data and products to assess land cover change for local to global systems." - find data and publications here. The use of data on this site assumes good knowledge of ecological and biogeochemical modeling and database design.
- **National Biological Information Infrastructure (NBII)** - <http://www.nbio.gov/> - research and data collaborative to share biological data for the US and internationally.

Coastal Zone and Marine Data:

- **US NOAA National Ocean Service** - <http://www.oceanservice.noaa.gov/welcome.html> - go to Data Explorer link for data set descriptions and download - data on coastal zone habitats, vulnerability, oil spills, natural hazards, and coastal mapping.
- **Historic Maps and Charts - Office of Coast Survey (NOAA)** - <http://nauticalcharts.noaa.gov/csdl/ctp/abstract.htm> - this site gives download access to hundreds of historic coastal maps and charts nationwide
- **USGS Coastal and Marine Geology Program - Internet Map Server and GIS Data** - <http://coastalmap.marine.USgs.gov/> - this site has both internet map servers for the coastal regions of the US and, if you go to the various data catalog links, to downloadable GIS data.
- **National Assessment of Coastal Vulnerability to Sea Level Rise (USGS Woods Hole Field Center)** - <http://woodshole.er.USgs.gov/project-pages/cvi/> - includes links to a preliminary GIS data set that attempts to give a national overview of coastal vulnerability to sea level rise, Plus a number of reports and regional studies.
- **Reefbase** - <http://www.reefbase.org> - a clearinghouse of information regarding coral reefs. From the web site: "ReefBase is the official database of the Global Coral Reef Monitoring Network (GCRMN), as well as the International Coral Reef Action Network (ICRAN).

Education:

- **National Center for Education Statistics - Common Core of Data** - <http://nces.ed.gov/ccd/index.asp> - tabular data for schools across the nation, including address tables in Microsoft Access that can be brought into GIS via address-matching. *Note: they also have a "locale" data set with longitude and latitude information already geocoded (under the Data Resources - Data Files link).*

Elevation Data:

- **USGS - National Elevation Data Set** - <http://ned.usgs.gov/> - for the US, this is the primary source of digital elevation models, including SRTM data (for the US only - for international SRTM data, see the links described in the SRTM section below).
- **GTOPO** - 1 km x 1km digital elevation models available for the entire world - <http://edc.usgs.gov/products/elevation/gtopo30/gtopo30.html> - these are 1 km digital elevation models - not high resolution but good for large regions, continents - created from paper maps.

Shuttle Radar Topography Mission (SRTM) data - the SRTM data is the most up to date digital elevation data available for the entire world

To learn about SRTM data, go to the NASA SRTM site - <http://www2.jpl.nasa.gov/srtm/>

The USGS distributes the SRTM data and has more information about it - <http://srtm.usgs.gov/>

Finally, the following sites have good access to international SRTM data and in the case of the Hydrosheds program, to good derived hydrographic data as well:

- **USGS - Hydrosheds -**

<http://hydrosheds.cr.usgs.gov/> - digital elevation models (DEMs) and hydrologic base data derived from the Shuttle Radar Topography Mission and other sources at 90 meter grid cell resolution - more detailed than the Hydro 1K data, but not available for the whole world yet (as of 5/1/2007, South America, Central America, and Asia are complete). See the web site for details on how the SRTM and other data sources were processed and for status of other areas and expected completion dates. If you are looking for DEMs for areas outside the US, this should be your first choice. If not available here, go to the **CGIAR SRTM** site (below)

- **CGIAR (Consortium for Spatial Information) -**

<http://srtm.csi.cgiar.org/> - CGIAR has a very easy interface for downloading finished (void-filled) SRTM 90 meter digital elevation models. *Note: if you have trouble identifying your area on the small CGIAR map, you can click on the Google Earth SRTM KML link further down the CGIAR page to use Google Earth to locate your data more accurately.* If you download GeoTiff format files (which work well in ArcGIS), make sure to follow the directions in the SRTM FAQ page (http://srtm.csi.cgiar.org/SRTM_FAQ.asp) regarding fixing the problem with cell values of -32768. These values should be set to NO DATA. The FAQ explains what equation to use (OUTGRID = setnull (SRTMDEM == -32768, SRTMDEM) - you can use this equation in the Spatial Analyst Raster Calculator. Replace OUTGRID with the name of your new fixed SRTM tile (e.g., fix4210), and substitute the name of your original SRTM file for the "SRTMDEM" in the equation. E.g., for an SRTM called z_42_10.TIF that I downloaded, I used the following function in the Raster Calculator:

```
fix4210setnull([GISDataSources:Z_42_10.TIF] == -32768, [GISDataSources:Z_42_10.TIF])
```

This creates a new grid, fix4210, that has all values of -32768 set to No Data, and all other values set to whatever they were in the original SRTM DEM. *Note: you also can use the Mosaic to New Raster command under the Data Management - Raster Toolbox in ArcGIS 9 to mosaic multiple tiles to a single raster.* While you're doing this, you should probably specify a projected coordinate system so that the other surface, hydro, etc. functions will work properly.

- **LIDAR Data - USGS Center for Lidar Information Coordination and Knowledge (CLICK) -**

<http://lidar.cr.usgs.gov/> - From the web site: "The goal of CLICK is to facilitate data access, user coordination and education of lidar remote sensing for scientific needs." There is no downloadable data here, but this is a good resource for understanding LIDAR data.

Energy:

- **National Renewable Energy Laboratory - GIS Site -**

<http://www.nrel.gov/gis/> - "The National Renewable Energy Laboratory's Geographic Information System (GIS) team analyzes wind, solar, biomass, geothermal, and other energy resources and inputs the data into the GIS--Geographic Information System." The site includes downloadable GIS data (must register) as well as maps and interactive viewers.

- **eGRID (EPA) - Emissions & Generation Resource Integrated Database -**

<http://www.epa.gov/cleanenergy/egrid/index.htm> - Comprehensive inventory of environmental attributes of electric power systems in the US. The preeminent source of air emissions data for the electric power sector, eGRID is based on available plant-specific data

for all US electricity generating plants that provide power to the electric grid and report data to the US government. eGRID contains air emissions data for nitrogen oxides, sulfur dioxide, carbon dioxide, and mercury. Plant facilities have latitude and longitude fields, meaning they can be brought into GIS.

- **Energy Information Administration** - <http://www.eia.doe.gov/> - the main site for US energy statistics from the US Government (Department of Energy) - no GIS data but lots of tabular data on a variety of topics - mostly national or state level (state level can be joined to state GIS layer) - see for example, the *Energy Consumption, Price, and Expenditure by State* - <http://www.eia.doe.gov/emeu/states/seds.html> - the tables are in HTML but these can be easily brought into Excel and then into ArcGIS if joined to a state data layer. (Save the page as html, then open in Excel)
- **Great Basin Center for Geothermal Energy (University of Nevada, Reno)** - <http://www.unr.edu/geothermal/> - a wealth of information and data on geothermal energy (actual and potential) for the US Great Basin region. GIS data is very well organized and documented and available for download. Also see the Google Earth application.
- **Idaho National Laboratory Geothermal Energy Site (US Department of Energy)** - <http://geothermal.id.doe.gov/> - research and data on geothermal energy in the Western US, includes downloadable GIS data files by state for geothermal resource maps. Well documented.
- **Southern Methodist University Geothermal Laboratory** - <http://www.smu.edu/geothermal/> - research and data on geothermal energy in the US. Includes downloadable state by state geo-coded tabular data sets of drill wells with temperature, depth, etc., for estimating heat flow. Also shows the Geothermal Energy Map of North America.

Environmental Analysis Tools for ArcGIS:

- **SpatialEcology.com** - <http://www.spataleecology.com/> - this site is home to a very good and sophisticated set of ArcGIS tools written by Hawthorne Beyer called Hawth's Tools. You can download and install these tools in ArcGIS. The author has very good documentation on his web site. Some of the tools are basic (e.g., calculating area for polygons) and some are much more advanced.
- **Habitat Digitizer for ArcView 9** (National Center for Coastal Ocean Science) - <http://ccma.nos.noaa.gov/products/biogeography/digitizer/welcome.html> - extension to aid digitizing habitat from georeferenced orthophotos and other data sets.
- **NOAA Coastal Services Center - Coastal Water Quality - Analysis Tools** - <http://www.csc.noaa.gov/crs/cwq/tools.html> (GIS based analysis tools) - includes tools for impervio US surface analysis and nonpoint source pollution and erosion comparison

Environmental Data - Facilities and Pollutants:

- **EPA EnviroFacts** - <http://www.epa.gov/enviro/> - From the Envirofacts web site: "A single point of access to select US EPA environmental data. This website provides access to several EPA databases to provide you with information about environmental activities that may affect air, water, and land anywhere in the United States. With Envirofacts, you can learn more about these environmental activities in your area or you can generate maps of environmental information."
- **EPA Envirofacts - Geospatial Data Download** - http://www.epa.gov/enviro/geo_data.html - you can now download a single GIS shape file with point data for all the following facilities:
 - Superfund National Priorities List (NPL)
 - RCRAInfo - Treatment, Storage, Disposal facilities

- Toxic Release Inventory System - All reported years
- NEPT - National Environmental Performance Track
- Permit Compliance System (PCS) - National Pollutant Discharge Elimination System (NPDES) Majors
- **EPA - Clean Air Markets Program** - <http://www.epa.gov/airmarkets/index.html> - market-based regulatory programs to improve air quality. The site includes GIS data and other data available for download (see the *C-MAPS* site - <http://www.epa.gov/airmarkets/cmap/>), as well as a library of publications and progress reports.
- **EPA - National Emissions Inventory** (air emissions) - <http://www.epa.gov/ttn/chief/net/index.html> - you can download air emissions site information here from the National Emissions Inventory in various database formats (sites have longitude and latitude which can be brought up in ArcGIS). From the web site: "These data are used for air dispersion modeling, regional strategy development, regulation setting, air toxics risk assessment, and tracking trends in emissions over time. Criteria pollutant emissions data for 1990 and 1996 through 2000 are available in the National Emissions Inventory (NEI) database. Hazardous air pollutant (HAP) emissions data are available for 1999." In addition, the 2002 National Emissions Inventory was posted in early 2006.
- **EPA Clearinghouse for Inventories and Emissions Factors** - <http://www.epa.gov/ttn/chief/index.html> - clearinghouse if information related to emissions modeling including data, models, and research.
- **eGRID (EPA) - Emissions & Generation Resource Integrated Database** - <http://www.epa.gov/cleanenergy/egrid/index.htm> - comprehensive inventory of environmental attributes of electric power systems in the US. The preeminent source of air emissions data for the electric power sector, eGRID is based on available plant-specific data for all US electricity generating plants that provide power to the electric grid and report data to the US government. eGRID contains air emissions data for nitrogen oxides, sulfur dioxide, carbon dioxide, and mercury. Plant facilities have latitude and longitude fields, meaning they can be brought into GIS.
- **EPA - Greenhouse Gas Emissions** - <http://epa.gov/climatechange/emissions/index.html> - includes links to state inventories (link on left column) which list emissions by state and sectors within each state.
- **EPA - Greenhouse Gas Emissions Inventory Reports** - <http://www.epa.gov/climatechange/emissions/usinventoryreport.html> - not data, but useful information on quantifying greenhouse gas emissions from various sources
- **Energy Information Administration** - <http://www.eia.doe.gov/> - the main site for US energy statistics from the US Government (Department of Energy) - no GIS data but lots of tabular data on a variety of topics - mostly national or state level (state level can be joined to state GIS layer) - see for example, the *Energy Consumption, Price, and Expenditure by State* <http://www.eia.doe.gov/emeu/states/seds.html> - the tables are in HTML but these can be easily brought into Excel and then into ArcGIS if joined to a state data layer. (Save the page as html, then open it in Excel)

Food Access and Food Security Analysis:

- **Mapping to End Hunger** - New York City Coalition Against Hunger - http://www.nyccah.org/research/map_report.html - This coalition has mapped food retailers, community gardens, farmers markets, food stamp offices, WIC offices, restaurants, and a number of other variables to understand access to food in New York City. The site does not have downloadable GIS data, but it does have a very good report about the project, Plus a fascinating interactive map showing all the data in PDF format. You can also download the

raw data on food sources in Excel format, which offers a good example of how to format data for geocoding in Excel.

- **Summer Food Service Program Map Machine** (US Department of Agriculture) - <http://www.ers.usda.gov/Data/sfsp/> - mapping site for the Summer Food Service Program which combines meals and activities for children during summer school vacation periods. The site has an interactive mapping application, but you can also download the SFSP sites as a comma-delimited text file for mapping.
- **Community Food Security Assessment Toolkit** (US Department of Agriculture) - <http://www.ers.usda.gov/publications/efan02013/> - no GIS data, but very useful information on how to analyze food security at the community level.
- **Food Insecurity and Vulnerability Mapping Service (FAO)** - <http://www.fivims.net/index.jsp?lang=en> - FAO site with map products analyzing food access and insecurity worldwide and by country. Not a good site for downloading GIS data, but good for understanding mapping food problems at a global, national and subnational level.

Forest Mapping and Analysis:

- **2001 Tree Canopy data sets for the US** (Multi-Resolution Land Cover Data, created by a consortium of US government agencies) - <http://www.mrlc.gov/> - this site has the first nationwide canopy cover data set for the US No information on species, but it's possible to use it in conjunction with the land cover data from the same site to estimate evergreen versus deciduous. The MRLC is a consortium of US federal agencies (EPA, USGS, US Forest Service, etc.). See Production Status link for a map of what stage each region is in. Read the metadata to understand the attribute information. The data is a raster data set with 30 meter pixels.
- **US Forest Service GeoData Clearinghouse** - <http://fsgeodata.fs.fed.us/clearinghouse/index.html> - detailed forest data is difficult to find and access. This clearinghouse is a good first start to finding and understanding forest data resources in the US
- **Forest Inventory and Analysis** - US Forest Service - <http://fia.fs.fed.us/> - home to the US Forest Census, links to data, tools, publications, etc. *Note: the exact locations of the forest inventory cannot be provided to protect the privacy of private landowners from whom the data was collected.* Nonetheless, the Forest Service works with researchers to facilitate research without compromising privacy rights.
- **Climate Change Atlas for 80 Tree Species in the Eastern United States** - US Forest Service - <http://www.fs.fed.us/ne/delaware/atlas/>
- **MODIS Active Fire Mapping Program** (USDA Forest Service) - <http://activefiremaps.fs.fed.us/> - you can see active forest fires here and download GIS data for active fires and annual cumulative fires across the US going back to 2000.
- **Harvard Forest Long-Term Ecological Research Unit** - <http://harvardforest.fas.harvard.edu/> - under Research link, there is a data archive that includes print, tabular, and GIS data related to forest research at Harvard Forest and more widely over Massachusetts and New England. Included is a GIS data set for 1830 land use in Massachusetts.

If you're interested in local or state specific forest information, be sure to check out state forest agencies. Washington and Oregon both have fairly extensive GIS data sites.

- **Global Forest Watch** - <http://www.globalforestwatch.org/english/index.htm> - a variety of forest-related data sets from various regions around the globe. Global Forest Watch is an initiative of the [World Resources Institute](#), which has a number of other environmental-related data sets online (go to *Publications* link, then *Data Sets*).

Global Data Sets - Base Maps, Physical, Topography, Natural Resources, and Ecosystems:

- **Geo Net Names Information Server** (National Geospatial Intelligence Agency) - <http://earth-info.nga.mil/gns/html/index.html> - under the *Country File* link, you can download a tabular list of places by country, which includes longitude and latitude, then bring these up as points in GIS (in ArcGIS, use the Tools - Add XY Data function. The only attributes are name and type (using a code described on the web site) and the data is not very accurate, but is still good general source of place name points.
- **NGA Raster Roam** - (National Geospatial Intelligence Agency) – <http://geoengine.nga.mil/> - you can download VMAP1 and VMAP2 data for some parts of the world from here. Not the easiest user interface, but it does work! Read the HELP section first. *Mapability.com* (<http://www.mapability.com/info/index.html>) has more information and more help for these data sets.
- **Geocover Landsat Mosaics** – <https://zulu.ssc.nasa.gov/mrsid/>;- you can download orthorectified Landsat mosaics for the whole world from an easy to use interface. Images are from 1990 or 2000. Take a look at GeoCover Tutorial for useful background information on satellite imagery. *Note: the images are georeferenced but seem to lack coordinate system definitions.* You must define the coordinate system before use. The coordinate system is UTM WGS 84, and the zone number is in the name - for example, the name "N-13-25_2000_loc", means UTM Zone 13 N. Images from the southern hemisphere should take the UTM north zone not the south. For example "S-21-10_2000_loc" should have its coordinate system defined as UTM Zone 21 N, not Zone 21 S.
- **Global Land Cover Facility** - <http://glcf.umiacs.umd.edu/index.shtml> - From the GCLF web site: "The GCLF is a center for land cover science with a focus. on research using remotely sensed satellite data and products to assess land cover change for local to global systems." - find data and publications here.
- **CIESIN Center for International Earth Science Information Network** - <http://www.ciesin.org/> - From the web site: "The Center for International Earth Science Information Network (CIESIN) is a center within the Earth Institute at Columbia University. CIESIN works at the intersection of the social, natural, and information sciences, and specializes in on-line data and information management, spatial data integration and training, and interdisciplinary research related to human interactions in the environment." Be sure to look at the links to their project and programs (left side of site) - including the World Data Center (<http://www.gateway.ciesin.org/wdc/>) and the Socio-Economic Data and Applications Center (<http://sedac.ciesin.columbia.edu/>). CIESIN has new world population data sets that are of particular use.
- **CGIAR** (Consortium for Spatial Information) - <http://www.csi.cgiar.org/> - From the web site: "The **Consortium for Spatial Information (CGIAR-CSI)** is an initiative of the many geospatial scientists within the Consultative Group for International Agriculture Research (CGIAR), linking the efforts of CGIAR scientists, national and international partners, and others working to apply and advance Geospatial Science for International Sustainable Agriculture Development, Natural Resource Management, Biodiversity Conservation, and Poverty Alleviation in Developing Countries. See the links for variety of geospatial information. *NOTE: CGIAR has a very easy interface for downloading finished SRTM 90 meter digital elevation models* - see <http://srtm.csi.cgiar.org/>
- **International Water Management Institute - Remote Sensing/GIS Center** - <http://www.iwmidsp.org/iwmi/info/main.asp> - Lots of good GIS data, including boundary data

and water-related data (more detailed for individual project watersheds). Very slow connection (coming from Sri Lanka). You need to register and this takes a few hours to validate. The site organization assumes you know what you're doing - not a lot of help or metadata. Also check out their RS/GIS Links page.

- **Hydro 1K** - hydrographic data derived from the GTOPO 1 kilometer digital elevation models <http://edc.usgs.gov/products/elevation/gtopo30/hydro/index.html> - These are 1 km DEM-derived hydrographic data (elevation, slope, streams, aspect) - not highly accurate but better than nothing and available for the entire world in shape/grid format (downloads as .tar file)
- **USGS - Hydrosheds** – <http://hydrosheds.cr.usgs.gov/> - digital elevation models and hydrologic base data derived from the Shuttle Radar Topography Mission and other sources at 90 meter grid cell resolution - more detailed than the Hydro 1K data, but not available for the whole world yet (as of 8/07, there is data for South America and most of eastern Asia). See the web site for details on how the SRTM and other data sources were processed and for status of other areas and expected completion dates.
- **World Resources Institute** – <http://www.wri.org/> - The World Resources Institute makes public many of the data sets used in their reports, including GIS data. You can see a list of available data sets by going to the *Publications* link, then *Datasets*, or go to the individual projects/Earth Trends categories and click on data links if available.
- **Global Runoff Data Center** – <http://grdc.bafg.de/> - digital world-wide repository of river discharge data, including mean, minimum, maximum monthly discharges and time series of most major rivers of the world. Plus GIS data for basins and river networks. Data requesters must identify themselves first, agree to usage requirements, and wait for approval.
- **Atlas of the Biosphere** (The University of Wisconsin) – <http://www.sage.wisc.edu/atlas/> - From the web site: "The Atlas of the Biosphere is a project of the University of Wisconsin's Institute for Environmental Studies' Center for Sustainability and the Global Environment (SAGE). Our goal is to provide more information about the environment, and human interactions with the environment, than any other source. We will make every effort to distribute the data as freely as possible, and will provide original sources in the cases where we are not allowed to." Very good and well-organized and documented set of global data.
- **CIAT - International Center for Tropical Agriculture** – <http://www.ciat.cgiar.org/> - this organization uses GIS in many projects, and has several tools available. Not sure if you can download actual data, but a good source to find out about GIS and natural resources research, especially in Asia and Africa.

Global Data Sets - Demographics, Economic, Health, Poverty, Development:

- **Global Poverty Mapping Project** (CIESIN, Columbia University) - <http://www.ciesin.columbia.edu/povmap/> - **CIESIN** (Center for International Earth Science Information Network, Columbia University) - <http://www.ciesin.org/> - a wealth of information, data sets, and projects
- **SEDAC** (Socio Economic Data and Application Center) - <http://sedac.ciesin.columbia.edu/> - a program within CIESIN that specializes in socio-economic data
- **Landscan** (Oak Ridge National Laboratory, US) -

<http://www.ornl.gov/sci/landscan/> gridded population data on 30"x30" cell size, available for university research and Federal agencies for free download after registration.

- **World Bank - Poverty Issue web site** –
[World Bank – Poverty Issue](#) -
<http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTPOVERTY/0,,menuPK:336998~pagePK:149018~piPK:149093~theSitePK:336992,00.html> - see link for poverty mapping
- **Demographic and Health Surveys (DHS)** - <http://www.measuredhs.com/start.cfm> - DHS analyzes and distributes survey results regarding health, nutrition, HIV for over 75 countries. This site does not have GIS data per se, but does have detailed health surveys, some of which can be used in spatial analysis.
- **Geographically Based Economic Data (GECON, Yale University)** -
<http://www.econ.yale.edu/~nordhaus/GEcon/Gecon.htm> - access to an article by William D. Nordhaus, Yale University - "Geography and Macroeconomics: New Data and Findings" - Nov.11, 2005, prepared for the Proceedings of the National Academy of Sciences, US Documents include methods for derivation of global economic data. Access to data sets is by permission only.
- **IPUMS International** (Minnesota Population Center, University of Minnesota) -
<http://international.ipums.org/international/> - From the web site: "IPUMS-International is a project dedicated to collecting and distributing Census data from around the world." Not GIS data, but has tabular Census data.

Health-related Data:

- **Health Resources and Services Administration** (US Department of Health and Human Services - HRSA Geospatial Data Clearinghouse - <http://datawarehouse.hrsa.gov/>. from the web site:
 - HRSA awarded grant data, including grantee names, contacts, awarded amounts by fiscal year
 - HRSA supported health care service delivery sites, including Health Centers, Ryan White CARE Act Ambulatory/Outpatient Medical care sites, National Health Service Corps clinician sites, and Nursing Education Loan Repayment sites
 - Health Professional Shortage Areas
 - Medically Underserved Areas and Populations
 - Hospitals, skilled nursing facilities and other Medicare-approved providers
 - 2000 US population data from the US Census and 2004 population data from Claritas
 - Births and infant deaths
 - Geographic data including Census. tracts, congressional districts, counties, States, roads, bodies of water
- **National Center for Health Statistics - GIS (US Center for Disease Control)** -
<http://www.cdc.gov/nchs/gis.htm> - very extensive site with information about health and mapping. See especially the "Links to Related Sites" link for long list of health mapping sites, including the useful "Resources for Creating Public Health Maps"
(<http://www.cdc.gov/epiinfo/maps.htm>)
- **CDC Wonder** -
<http://wonder.cdc.gov/> - single point access to a wide variety of reports and public health data
- **MassChip (Massachusetts Community Information Profile, Department of Public Health)** -
<http://masschip.state.ma.us/> - access and query tabular data for Massachusetts at various geographic levels, including town, county, school district, and for the Boston area, urban

neighborhoods. No GIS data, but the tabular data can be linked to existing GIS administrative boundary data sets.

- **Massachusetts Health and Environment Information System** (MassHEIS, Silent Spring Institute) –
<http://library.silent.spring.org/heis/quickstart.asp> - From the web site: "The Massachusetts Health and Environment Information System (MassHEIS) is a pilot project that enables policy makers, researchers, and the public to map health and environmental information about communities in Massachusetts".
- **Demographic and Health Surveys (DHS)** –
<http://www.measuredhs.com/start.cfm> - DHS analyzes and distributes survey results regarding health, nutrition, HIV for over 75 countries. This site does not have GIS data per se, but does have detailed health surveys, some of which can be used in spatial analysis.
- **World Health Organization (WHO) Health Mapping** -
http://www.who.int/health_mapping/en/ - site discusses health mapping applications, has link to a couple places with data download, including the WHO GeoNetwork (<http://www.who.int/geonetwork/srv/en/main.search>)
- **Web Sites for GIS Health Data** (Stanford University Libraries and Information Services) -
<http://www-sul.stanford.edu/depts/gis/medical.html>

Historic Maps - New England, Massachusetts, and Boston:

- **Historic USGS Maps of New England and New York** (University of New Hampshire) -
<http://docs.unh.edu/nhtopos/nhtopos.htm> - digital copies of older USGS topographic maps, download them and georeference them in ArcGIS or Google Earth.
- **University of New Hampshire Library - Digital Collections** -
<http://docs.unh.edu/digital.htm> - includes digital versions of topo maps (above) Plus 1878 geological atlas of New Hampshire and 1892 atlas of New Hampshire cities and towns
- **Historic Maps and Charts - Office of Coast Survey (NOAA)** -
<http://nauticalcharts.noaa.gov/csdl/ctp/abstract.htm> - this site gives download access to hundreds of coastal maps and charts nationwide, including Massachusetts and other New England states and maritime cities.
- **Harvard Forest Long-Term Ecological Research Unit** -
<http://harvardforest.fas.harvard.edu/> - under Research link, there is a data archive that includes print, tabular, and GIS data related to forest research at Harvard Forest and more widely over Massachusetts and New England. Included is a GIS data set for 1830 land use in Massachusetts.

Housing Data:

- **HUD-User (US Department of Housing and Urban Development)** -
<http://www.huduser.org/> - you can download data like sites getting Low Income Housing Tax Credits, with latitude and longitude, for bringing up in GIS, as well as housing affordability and income data used in HUD program funding. Lots of other data as well. Well-written Tip Sheet for using some of the HUD data sets - see [ArcGIS 9.x Tip Sheets](#) under *Working with Special Data – HUD User*.
- **US Census Housing Data** -
<http://www.cens.us.gov/hhes/www/housing.html>
- **Home Mortgage Disclosure Act (HMDA)** -
<http://www.ffiec.gov/hmda/> - "The Home Mortgage Disclosure Act (HMDA) was enacted by Congress in 1975 and is implemented by the Federal Reserve Board's Regulation C. This regulation provides the public loan data that can be used to assist: 1) in determining whether

financial institutions are serving the housing needs of their communities; 2) public officials in distributing public-sector investments so as to attract private investment to areas where it is needed; 3) and in identifying possible discriminatory lending patterns.

- **Community Reinvestment Act** -

<http://www.ffiec.gov/cra/default.htm> - "The Community Reinvestment Act is intended to encourage depository institutions to help meet the credit needs of the communities in which they operate, including low- and moderate-income neighborhoods, consistent with safe and sound banking operations."

Land Characteristics (land cover, impervious cover, vegetation):

- **Multi-Resolution Land Cover Data** (US government agencies) -

<http://www.mrlc.gov/> - good site for downloading the most recent land cover, impervious cover, and canopy cover data sets for the entire US produced by the MRLC Consortium of US federal agencies (EPA, USGS, US Forest Service, etc.). The 1992 landcover data set is complete for the entire US The 2001 landcover, impervious cover, and canopy cover appears to be complete as of February 2007. Read the metadata to understand the attribute information. The data is a raster data set with 30 meter pixels. List of land cover classifications at:

http://www.mrlc.gov/nlcd_definitions.asp

- **USGS Land Cover Institute** -

<http://landcover.usgs.gov/> - good background information on land cover mapping and analysis, publications, research projects, and data sets. Great links to other sites that are doing research and sharing data.

- **Global Land Cover Facility** -

<http://glcf.umiaccs.umd.edu/index.shtml> - From the GCLF web site: "The GLCF is a center for land cover science with a focus on research using remotely sensed satellite data and products to assess land cover change for local to global systems." - find data and publications here. The use of data on this site assumes good knowledge of ecological and biogeochemical modeling and database design.

- **National Biological Information Infrastructure (NBII)** -

<http://www.nbio.gov/> - research and data collaborative to share biological data for the US and internationally.

- **MassGIS Impervious Surface Data Layer** -

http://www.mass.gov/mgis/impervious_surface.htm - 1m square pixels each with a value of 1 for impervious or 0 for non-impervious. Data can be downloaded for individual regions within Massachusetts; the state is subdivided into 33 tiles.

Middle East:

- **Israel Topographic Maps (Survey of Israel)** -

<http://www.mapi.gov.il/page?id=maps/maps> - in Hebrew, but not too difficult to figure out - you can download topographic map images here for georeferencing (the main web site for the Survey of Israel is <http://www.mapi.gov.il/> (Hebrew))

- **Travelers in the Middle East Archive (TIMEA)** - Rice University -

<http://timea.rice.edu/index.html> - From the web site: "The Travelers in the Middle East Archive (TIMEA) is a digital archive that focuses on Western interactions with the Middle East, particularly travels to Egypt during the nineteenth and early twentieth centuries. TIMEA offers electronic texts such as travel guides, museum catalogs, and travel narratives, photographic and hand-drawn images of Egypt, and interactive GIS (Geographic Information Systems) maps of Egypt and Cyprus." No downloadable GIS data, but lots of scanned historic maps that can be georeferenced in GIS or Google Earth.

Transportation:

- **Bureau of Transportation Statistics - National Transportation Atlas Database 2007** - http://www.bts.gov/publications/national_transportation_atlas_database/2007/ - download a variety of transportation infrastructure data in GIS format.
- **Bureau of Transportation Statistics** - <http://www.bts.gov/> - the BTS has numerous tabular data sets, mostly by state, regarding all aspects of transportation in the US
- **Federal Highway Administration (US) - GIS Data** - <http://www.gis.fhwa.dot.gov/gisData.asp>
- **Transportation Research Bureau** - Census Data for Transportation Planning - <http://www.trbcensus.com/>
- **Boston Metropolitan Planning Organization (MPO)** - <http://www.bostonmpo.org> - the regional group responsible for carrying out the federally mandated regional transportation planning process. The Boston MPO has links to traffic count data and contacts for some other transportation related data for the Boston metropolitan region, as well as research links.
Note: for any metropolitan region, the region's MPO is a good place to start looking for transportation data at the regional/urban level.

US Cities and Metropolitan Regions - GIS Sites:

General Clearinghouse Sites with City and Region Information:

- **Free GIS Data by Region** - Collins Software - http://www.collinssoftware.com/freegis_by_region.htm - this is an excellent and extensive list from Collins Software out of Houston, TX, that seems to be kept up to date - it has links to free GIS data for download. The data is classified by region (country, state, international, with a miscellaneous category as well), and includes good listings for individual cities and regions. Good for both domestic and international data searching. Check here first for a particular city, county, or metropolitan region.
- **Tufts GIS Data Resources Guide** - Tufts GIS staff maintain a listing of GIS data sites concentrating on international and US national clearinghouses, as well as New England states, cities and towns (*see Supplementary Material folder*).

California

- San Diego, CA - SanGIS - <http://www.sangis.org/> - good download access and good metadata to a wealth of urban/metropolitan/environmental GIS data - provided by the City of San Diego, the county of San Diego, and the San Diego Association of Governments (SANDAG). You need to register first, but it is free.
- San Diego - San Diego Association of Governments - <http://www.sandag.org/> - there are a few GIS data sets here not easily found on the SanGIS site, including land use.
- San Francisco, CA - http://www.sfgov.org/site/gis_index.asp?id=366 - lots of city data that you can download after registering and agreeing to their license agreement.

Note: additional data can be downloaded from CASIL (the California Spatial Information Library) - <http://gis.ca.gov/>.

Connecticut

- CLEAR (Center for Land Use Education and Research) - <http://clear.uconn.edu/> - University of Connecticut - good site with both land use research project information and GIS data downloads, mostly focusing on Connecticut, including a number of coastal zone/riparian research projects.
- Connecticut Department of Environmental Protection - GIS Data Download Site - <http://www.ct.gov/dep/cwp/view.asp?a=2698&q=322898>

- Connecticut GIS User to User Network - <http://ctgis.uconn.edu/> - good GIS community site for Connecticut organizations using GIS
- See also the *Online GIS Data Sources* document in the Supplementary Material folder for other Connecticut GIS data sites.

Georgia

- Atlanta Regional Commission (ARC) - http://www.atlantaregional.com/cps/rde/xchg/arc/hs.xsl/547_ENU_HTML.htm - The ARC provides data for the large metropolitan area around Atlanta.

Louisiana

New Orleans and Gulf Coast

- City of New Orleans GIS (has downloadable data): <http://gisweb.cityofno.com/cnogis/> - includes damage assessment and permits for reconstruction from Hurricane Katrina
- Greater New Orleans Community Data Center - <http://www.gnocdc.org/> - a non-profit that focuses on providing data for non-profits
- Louisiana GIS Council: <http://www.doa.state.la.us/lgisc/index.htm>
- USGS - Hurricanes Katrina and Rita Disaster Response web site: <http://gisdata.us.gs.net/hazards/katrina/>
- FEMA Hurricane Katrina Flood Recovery Maps (and GIS data) - http://www.fema.gov/hazard/flood/recoverydata/katrina/katrina_la_gis.shtm - maximum surge data, base flood elevations, etc.
- FEMA Hurricane Katrina Mapping and Analysis Center - <http://www.gismaps.fema.gov/2005pages/rsdrkatrina.shtm> - GIS shape files showing damage and extend of flooding over the period of flooding
- University Consortium for GIS Hurricane Katrina resources - <http://www.ucgis.org/katrina/>

Massachusetts and New England

- See the *Online GIS Data Sources* document in the Supplementary Material folder for a good listing of data sources for Massachusetts and New England that we do not repeat here. *Note: Tufts has acquired a number of local and regional data sets for use only by the Tufts community*
- Boston Metropolitan Area - Metro Boston Data Common - <http://www.metrobostondatacommon.org> - new (2007) site from the Metropolitan Area Planning Council (MAPC) and the Boston Indicators Project. Includes a variety of socio-economic and other data regarding 101 cities and towns in Eastern Massachusetts. The main tool is an online mapper, but it also has tools to extract GIS shape files and Excel tables.

Oregon

- Portland Metro Data Resource Center - <http://www.metro-region.org/pssp.cfm?ProgServID=7> - Metro, a regional government, maintains an extensive GIS database with information concerning the Portland metropolitan area. For the most part it is not downloadable for free, but it has good documentation, online viewing, and is an excellent example of a well-organized metropolitan GIS. *Note: students also may purchase a CD of the RLIS main data set for \$65.*

Texas

- Texas Natural Resources Information System (TNRIS) - <http://www.tnris.org/> - Texas state GIS data clearinghouse, includes Border Information Center
- Austin
 - FTP Site access: ftp://coageoid01.ci.austin.tx.us/GIS-Data/Regional/coa_gis.html - download access to most all of Austin's data sets

- Neighborhood Planning and Zoning Department: Building Permits, Site Plans, Land Use, Major Employers, etc. -<http://www.ci.austin.tx.us/landuse/spatial.htm>
- Capital Area Council of Governments (CAPCOG) - http://www.capcog.org/Information_Clearinghouse/ - downloadable, well-organized data for the Austin Metropolitan Region
- Capitol Metro (transit authority) - <http://www.capmetro.org/gisdata/gisdata.asp> - get GIS data for bus routes, stops, and bus stop amenities (bench, shelter, etc.)
- Capital Area Metropolitan Planning Organization (CAMPO - regional transportation planning) - http://www.campotexas.org/programs_gis.php - traffic counts, transportation planning, bike/ped info - some available for download, some by request
- Dallas / Fort Worth Metro Region
 - North Central Texas Council of Governments (NCTCOG) - <http://www.dfwmaps.com/clearinghouse/> - NCTCOG is a very sophisticated provider and user of GIS data and analysis. You can download GIS data here. See NCTCOG's web site (<http://www.nctcog.org/index.asp>) for many examples of studies and projects using GIS in a wide variety of fields including environmental planning, land use, transportation, long-range planning, river basin planning, and hazard mitigation.
- Houston
 - Rice University - GIS Data for Houston - <http://www.rice.edu/fondren/gdc/datahouston.html> - This site from Rice keeps track of where to find Houston data, most of which is either available for free download or at very low cost.
- San Antonio
 - City of San Antonio Interactive Map Site - <http://maps.sanantonio.gov/> - in addition to viewing data online, this site has an interactive map viewer which you can use to download GIS shape files. Go to the COSA Maps link. To download data, click on the "extract" tool just to the right side of the main map. That will bring up a list of data sets to download.

Washington, DC

- District of Columbia Geographic Information System - <http://dcgis.dc.gov/> - a wealth of free downloadable GIS data layers (ESRI shape file format), very well documented. Go to the GIS Data Search link - the search tool is a bit clunky, but you can also browse by alphabet letter.

Water:

US (for global data sets, see below):

- **National Hydrography Data Set (USGS)** – <http://nhd.usgs.gov/> - From the NHD web site: "The National Hydrography Dataset (NHD) is a comprehensive set of digital spatial data that contains information about surface water features such as lakes, ponds, streams, rivers, springs and wells. Within the NHD, surface water features are combined to form "reaches," which provide the framework for linking water-related data to the NHD surface water drainage network. These linkages enable the analysis and display of these water-related data in upstream and downstream order.
- **PRISM (Oregon State University)** – <http://prism.oregonstate.edu/> - Good site for precipitation and other climate data. From the web site: "This OSU PRISM Group web site provides access to the highest-quality spatial climate data sets currently available. These data sets were created using the PRISM climate mapping

system, developed by Dr. Christopher Daly, PRISM Group director. PRISM is unique in that it incorporates a spatial climate knowledge base that accounts for rain shadows, temperature inversions, coastal effects, and more in the climate mapping process."

- **National Wetland Inventory (US Fish and Wildlife Service)** – <http://www.fws.gov/nwi/> - wetlands mapping for the entire US from USGS 1:24,000 topographic maps. *Note: data can be downloaded from this US Fish and Wildlife Service web site, but many states also make these data sets available pre-formatted in state plane coordinate systems (e.g., see MassGIS National Wetland Inventory site - <http://www.mass.gov/mgis/nwi.htm>)*
- **Impervious Cover - Multi-Resolution Land Cover Data** (US government agencies) - <http://www.mrlc.gov/> - 2001 land cover, impervious cover, and canopy cover data set produced by the MRLC Consortium of US federal agencies (EPA, USGS, US Forest Service, etc.). The 1992 landcover data set is complete for the entire US Production of 2001 landcover, impervious cover, and canopy cover is underway - see Production Status link for a map of what stage each region is in. *Note: although the production status may show an area complete, you may have to go to the FTP data download link to actually get the data.* The Dynamic Map download choice does not seem to be updated regularly. Read the metadata to understand the attribute information. The data is a raster data set with 30 meter pixels.
- **USGS - Science in your Watershed - Links by Watershed** - <http://water.usgs.gov/wsc/links.html> - great site for specifying a watershed (e.g., Charles River) and retrieving a comprehensive listing of USGS data for that watershed, including stream flow, water use, GIS data, etc.) - for example, see the links for the [Charles River Watershed](#) - <http://water.usgs.gov/lookup/getwatershed?01090001/www/cgi-bin/lookup/getwatershed>
- **USGS - Water Resources Division Maps and GIS Information** - <http://water.usgs.gov/maps.html> - lots of links to US water data - under the full list link, you'll find dozens of miscellaneous data sets ranging from hydrological basins to geology to water quality to demographic data.
- **National Assessment of Coastal Vulnerability to Sea Level Rise (USGS Woods Hole Field Center)** - <http://woodshole.er.usgs.gov/project-pages/cvi/> - includes links to a preliminary GIS data set that attempts to give a national overview of coastal vulnerability to sea level rise, Plus a number of reports and regional studies.
- **NOAA Coastal Services Center - Coastal Water Quality - Analysis Tools** - <http://www.csc.noaa.gov/crs/cwq/tools.html> (GIS based analysis tools) - include tools for impervious surface analysis and nonpoint source pollution and erosion comparison
- **Learning about using hydrography data in GIS** – <http://www.ce.utexas.edu/prof/maidment/> - this is Professor David Maidment's web site at the Center for Research in Water Resources at the University of Texas at Austin. Dr. Maidment is a hydrologist and an international expert in the use of GIS in hydrologic analysis. Under his Classes link, you can find his course web sites, all of which have exercises and data sets focusing on using water resource information in GIS. See especially the links for *GIS in Water Resources*. There are also videos of his lectures available. *Note: the web site doesn't seem to work with Mozilla, so try it with Internet Explorer.*

Global Water Data Sets:

- **USGS - Hydrosheds** – <http://hydrosheds.cr.usgs.gov/> - digital elevation models and hydrologic base data derived from the Shuttle Radar Topography Mission and other sources at 90 meter grid cell resolution - more detailed than the Hydro 1K data, but not available for the whole world yet (as of 10/18/06, South America is complete). See the web site for details on how the SRTM and other data sources were processed and for status of other areas and expected completion dates.

- **Global Runoff Data Center** – <http://grdc.bafg.de/> - digital world-wide repository of river discharge data, including mean, minimum, maximum monthly discharges and time series of most major rivers of the world, Plus GIS data for basins and river networks. Data requesters must identify themselves first, agree to usage requirements, and wait for approval.
- **Hydro 1K** - hydrographic data derived from the GTOPO 1 kilometer digital elevation models <http://edc.usgs.gov/products/elevation/gtopo30/hydro/index.html> - These are 1 km DEM-derived hydrographic data (elevation, slope, streams, aspect) - not highly accurate but better than nothing and available for the entire world in shape/grid format (downloads as .tar file)
- **Water Resources Programme - Isotope Hydrology (International Atomic Energy Agency)** – http://www-naweb.iaea.org/naweb/ih/IHS_science3.html - Information, including GIS-based online mapping and data download sets, focusing on exploring the "fingerprints" of water for understanding sources, movements, rates of recharge, pathways, etc.
- **International Water Management Institute - Remote Sensing/GIS Center** - <http://www.iwmidsp.org/iwmi/info/main.asp> - Lots of good GIS data, including boundary data and water-related data (more detailed for individual project watersheds). Very slow connection (coming from Sri Lanka). You need to register and this takes a few hours to validate. The site organization assumes you know what you're doing - not a lot of help or metadata. Also check out their RS/GIS Links page.

Weather Data:

- **National Oceanic and Atmospheric Administration (NOAA)** – <http://www.weather.gov/gis/> - National weather data available in GIS format