What is GIS?

What is geotechnology?

Over the last thirty years, developments in geotechnology have created new opportunities for organizations to use computers to integrate, visualize, and analyze environmental information. Currently available digital mapping tools—ranging from free, internet-driven programs like Google Earth to high-end Geographic Information Systems (GIS) software—make it possible for users to customize maps, investigate patterns and trends, and prepare for future events. Today, the range of geotechnology users includes not only scientists, natural resource managers, and professional planners but local conservation groups, police departments, real-estate brokers, schools, and 4-H Clubs.

What is GIS?

Using GIS, one can integrate layers of geographic information according to their shared geography, regardless of the data source. Layers that are commonly overlaid in a GIS include elevation, hydrological features, roads, land use and land cover, aerial photographs, and satellite imagery. Once the data are entered, GIS users can manipulate all data layers to generate customized maps for a region, look for patterns in mapped features, or create new information by processing one or more of the existing layers. In the marine environment, GIS is being used to produce and distribute detailed nautical charts, track sightings of threatened and endangered species, assess the potential impacts of sea-level rise, describe the locations of habitats, and determine the most suitable locations for marine reserves.

Where can I find GIS data?

GIS has become a widely used medium for gathering, storing, and exchanging environmental information. Data stored within one GIS database can be shared easily with other GIS users. In the United States, a wide variety of GIS-ready data sets can be accessed from national, state, and regional organizations at no or low cost. Many government agencies (e.g., NOAA, USGS, U.S. Census Bureau) have dedicated GIS departments that are tasked with developing, maintaining, and sharing essential data layers. The number of municipalities using GIS is growing every day, creating new opportunities for GIS users to obtain highly detailed city- and town-scale data sets such as property parcels. Many of these data providers can also supply maps of their data sets in file formats (e.g., PDF, JPEG) that can be viewed by people without GIS.

How can I create my own GIS data layers?

In spite of the growing body of GIS data sets, it is not uncommon to find that certain data layers do not exist in digital form or do not possess a suitable level of detail. For local analyses, in-field data gathering has been facilitated by the increased diffusion and affordability of Global Positioning Systems (GPS). GPS data can be integrated easily into GIS to deepen our understanding of the local environment. Data layers can also be created by tracing features from aerial photographs or scanned paper maps. Sketch mapping on charts and maps is another approach for gathering specialized information from locally knowledgeable people, such as fishermen, harbor masters, tourism operators, and long-time residents.

How can I start mapping Muscongus Bay issues of importance to me?

Like many information technologies, GIS has become easier to use and more affordable over time. Developing effective GIS capacity, however, remains a significant investment, especially for groups that only use the technology occasionally. For basic mapping needs, a variety of web tools allow users to generate basic maps of areas featuring transportation networks, political boundaries, demographic information, and in some places aerial images. Some mapping websites and freely available programs allow users to add their own information, such as GPS waypoints or tracks, to the map. Groups requiring more-specialized GIS services can get support from a growing network of dedicated GIS service providers.

Where can I find some mapping tools and data?

a) Internet mapping sites (capable of generating base maps)
   - Google Maps: http://maps.google.com
   - Microsoft Virtual Earth: http://maps.live.com
   - MapQuest: http://www.mapquest.com

b) Internet mapping sites (content specific)
   - USGS National Map: http://nationalmap.gov
   - U.S. Census: http://factfinder.census.gov
   - Gulf of Maine Council on the Marine Environment: http://www.gulfofmaine.org
   - Gulf of Maine Ocean Observing System: http://www.gomoos.org

c) Virtual globes
   - Google Earth: http://earth.google.com
   - NASA World Wind: http://worldwind.arc.nasa.gov
   - Microsoft Virtual Earth 3-D: http://maps.live.com

d) Free GIS programs
   - ArcGIS Explorer: http://www.esri.com/software/arcgis/explorer/index.html
   - Geographic Resources Analysis Support System (GRASS): http://grass.itc.it
   - TatukGIS: http://www.tatukgis.com

e) Online GIS data providers
   - Geography Network: http://www.geographynetwork.com
   - GIS Data Depot: http://data.geocomm.com
   - Maine Office of GIS: http://apollo.ogis.state.me.us

f) Non-profit GIS service providers
   - Center for Community GIS: http://www.community-gis.org
   - GreenInfo Network: http://www.greeninfo.org
   - Sheepscot Valley Conservation Association: http://www.sheepscot.org/gis_page.html

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