Atchafalaya-Wax Lake Deltas: An Update on Geologic and Oceanographic Impacts of the Latest Mississippi River Delta-Switching Event

Harry H. Roberts[1], Nan Walker[1], Rob Cunningham[2], and Susan Majersky[3]
[1] Coastal Studies Institute, Louisiana State University, Baton Rouge, LA
[2] Center for Coastal Energy, and Environmental Resources, Louisiana State University, Baton Rouge, LA
[3] Dept. of Oceanography and Coastal Sciences, Louisiana State University, LA

This youngest episode of 'delta switching' started centuries ago but because of inland sedimentation it has resulted in delta-building at the coast only since the 1950s. Data from high altitude color-infrared photography acquired by NASA and USGS plus hydrographic data from Atchafalaya River and Wax Lake Outlets comprise 125.8 km^2 of new land above the -0.3 m (-1 ft) datum (~ mean low tide). Since 1981 growth of the Wax Lake delta has averaged -2.9 km^2/yr above this reference level. The lower Atchafalaya River delta, which was the first to appear (in 1973), has grown at a slower average of 1.9 km2/yr over this same period. The Wax Lake delta did not start rapid growth until about 1981 because of sedimentation in local inland basins (e.g., Wax Lake). Growth of the Atchafalaya delta has slowed because of the efficiency of sediment transport to the adjacent continental shelf via a dredged navigational channel coupled with siltation of secondary channels. Both deltas are comprised of sand-rich lobes (3-4 m thick) that systematically fuse to form rapidly expanding deltas that have nearly filled Atchafalaya Bay. Suspended sediments that by-pass the deltas form a distinct plume that extends far beyond Atchafalaya Bay. During medium-to-high discharge conditions (>4250 m3/s) the plume may extend up to 50 km and cover an area of over 7400 km^2. Plume area and location is highly variable and depends largely on wind direction, speed, and duration. Suspended sediment deposition is impacting the shelf and the downdrift Chenier Plain coast.

Accessing State Ground-Water Database and Displaying Geospatial Data Through Innovative GIS/Internet Technologies

Marc Robichaud
Texas Water Development Board, Austin, TX

The main objective of this project was to utilize current GIS/Internet technology to efficiently disseminate hydrological data for the State of Texas to the public. The Texas Water Development Board maintains an INFORMIX relational database (RDB) that contains records for over 118,000 water wells of the estimated 1,000,000 wells statewide. The database also contains detailed information on well location, elevation, depth, well type, owner, aquifer, driller, construction, water-quality, and water-level data. The water quality information includes analyses of major cations and anions and other infrequent constituents. The database contains more than 82,000 total analyses from 47,000 ground-water sites, close to 190,000 infrequent constituents, and 513,000 water levels. In addition to the database, the TWDB maintains USGS 7.5 minute topographic maps with plotted well locations. The database and maps are primarily used by TWDB staff, water districts, and planners to project future water supplies and usage, and by environmental consultants in site assessment/feasibility studies.

A combination of GIS software, Internet software and Visual Basic programming was utilized in developing an application that would function within the agency to serve TWDB staff and outside the agency to distribute information via the World Wide Web (WWW). Visual Basic and ESRI's object-oriented programming language (AVENUE) were utilized to customize a Graphical User Interface that would allow users with little or no experience to easily access the TWDB ground-water database. Water well locations are displayed on detailed base maps. The application allows the query of geospatial and tabular data. Specific searches of the INFORMIX database can also be performed through SQL statements.

TWDB planners, geologists, and field staff currently respond to more than 300 inquiries a month and provide ground-water information in digital or hard-copy format. Given the recent explosion of WWW usage, sharing geospatial data via the an Internet/intranet application is a cost-effective solution to providing the public with access to large databases.

Deepwater Site Characterization: the Preliminary Results of the Deep-Tow Survey of Pigmy Basin and Alaminos Canyon, Gulf of Mexico

Anne K Rutledge, William R. Bryant, Wayne A. Dunlap, and Jia-Yuh Liu
Texas A&M University, College Station, TX

The growth in exploration efforts targeting the continental slope of the Gulf of Mexico has fostered an awareness of the scarcity of information available on the geology and processes characteristic of the slope environment. The Offshore Technology Research Center's Deepwater Site Characterization project was conceived in response to this need. An integral part of the project is a series of