Technical Description of Geographic Information Gateway

The New York State Office of Planning and Development's Geographic Information Gateway (Gateway) is a unique application for accessing, viewing, and downloading data and information from the Office's various programs and activities. It is built and maintained in a unique content management system and hosted by a commercial ISP. All of the material on the Gateway is composed, edited, and published on development servers prior to public release. From the production server, users can launch interactive thematic maps and data downloads, or browse for New York information developed by the Office of Planning and Development (OPD) and other partners from around the state, region and from across several federal agencies.

Data Sources

The data in the Gateway comes from OPD sources, state and federal agencies. The core data were developed to support OPD programs and projects. Metadata and map or feature services were created and then ingested into the application backend data catalog. The data catalog is built on ESRI's open source GeoData Portal that has been customized for this application. The GeoData Portal can contain any kind of information or data as long as a metadata record exists. The search and browse functions work from the "tags" contained in the metadata. In some cases, there is a direct connection to data from other existing web services.

Data developed by OPD is created using the UTM 18N projection and NAD83 datum. External data available on the Gateway can be in multiple projections, as long as the projection file is included with the metadata and data, it will draw properly in the map viewer. Most data in the Gateway are documented using the Federal Geographic Data Committee Content Standard for Digital Geospatial Metadata (FGDC CSDGM) specification and this documentation is accessible for viewing from each data source.

Focus Areas Content

"Focus Areas" are a unique feature of the website that present interactive stories describing OPD's different programs, such as: The Ocean and Great Lakes Program which will feature focus areas on the Atlantic Ocean, the Great Lakes, and Long Island Sound; Brownfield Opportunity Area Program which will feature a focus area on Neighborhood Revitalization, and; Climate Change & Resiliency program which will feature many focus areas, but will start with one on Sea Level Rise and Community resiliency . Each "Focus Area" contains illustrated stories, which highlight case studies, showcase community success stories, and demonstrate how OPD uses available geographic information to improve planning and decision-making. This section of the website is dynamic and will be updated each time new content is developed by OPD program staff.

Technical Architecture

The application is built on three platforms: (1) a storage tier, which principally uses Amazon AWS EBS services, (2) an application tier where the GeoData Portal, IIS, and ArcGIS Server Enterprise are running, which is driven by an Amazon EC2 instance, and (3) a presentation tier, developed using the ArcGIS API for JavaScript and Angular JS.

Currently, the CMS functionality manages the content and display properties for the "Focus Areas" (e.g., Atlantic Ocean), the Latest Conditions page, each of the Story Maps, and the Map Viewer. Content data are stored in an ArcSDE-PostGreSQL database using tables and feature layers. These are published for use via an ArcGIS Server map service where the information can be consumed (and eventually edited) from a web-based client application.

View Maps and View Focus Areas Maps

Information served by the Gateway can be grouped into nine categories, including: biological; boundaries; commercial fishing; cultivation/farming; cultural & demographic; energy, utilities, & disposal; physical environment; recreation; and, transportation. OPD uses these nine categories to organize and publish data products using web map services. These map services are hosted on the Amazon Cloud and are used to populate various map viewers. All maps are displayed as layers on top of base maps hosted by either Esri or NOAA.

The main map viewer accessible from the Gateway's homepage opens with two data layers pre-loaded: the state's territorial sea boundary, referred to as the Submerged Lands Act Boundary, which is 3 nautical miles from shore for New York's Atlantic coast and the U.S. territorial sea boundary which is 12 nautical miles from shore. All information searchable on the Gateway can be loaded into this map viewer. Map viewers found on Focus Area pages open pre-loaded with information that directly relates to the OPD program responsible for that focus area. In some cases focus area map viewers will open to a regional view of New York State (e.g. Atlantic Ocean). However, once a focus area map viewer has been opened, all searchable information on the Gateway may be added to the viewer.

Our Workflow

When new information or "Focus Area" stories are completed and ready for production, the data are cartographically rendered using ArcMap and published in an ArcGIS Server map service. This service dynamically renders images using a REST-based web services protocol for display in the web application. The content for the "Focus Area" stories is generated as a word or text document with attached map links, images, video, etc., which are then transferred to the published map service. As a data driven application, the front-end client application will automatically display the new story content once the webpage is reloaded.