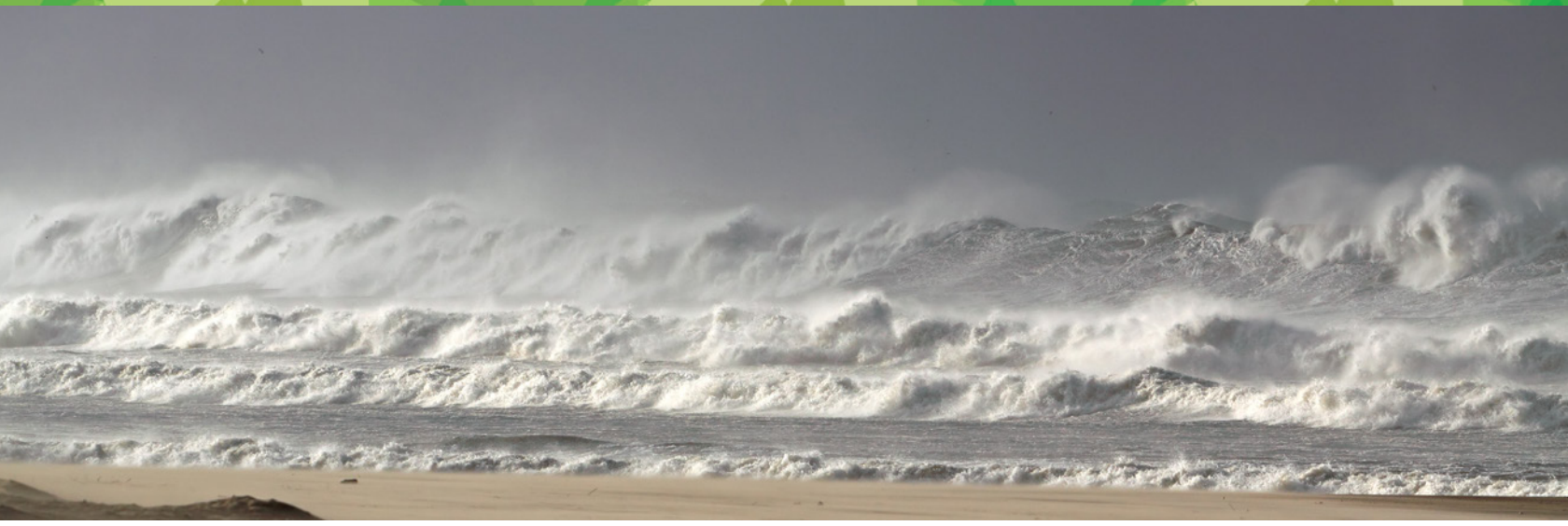
CASE STUDY

HEXAGON GEOSPATIAL

IMPROVING DISASTER PLANNING IN VIRGINIA BEACH

HEXAGON GEOSPATIAL'S SOLUTIONS HELP VIRGINIA BEACH USE DIGITAL ELEVATION MODELING TO PREDICT STORM SURGE



PROFILE

Company: Virginia Beach, Virginia

Website: www.vbgov.com

Description: Virginia Beach is the 39th largest city in the United States and encompasses 307 square miles, with 35 miles of beaches. The city's Center for GIS (CGIS) manages the core GIS services. The primary role is to support GIS operations and spatial information needs. CGIS manages this responsibility by providing the common and core GIS layers and enterprise GIS services to each stakeholder.

Industry: Government

Country: United States

PRODUCT USED

- ERDAS APOLLO
- ERDAS IMAGINE®
- GeoMedia®

KEY BENEFITS

- Improved resolution on DEM from 10 feet to 6 inches, enabling better storm surge analysis
- Converted existing data within 24 hours, as Superstorm Sandy created the need for better geospatial intelligence delivered immediately
- Enhanced 24/7 secure availability of Virginia Beach municipal geospatial data online
- Upgraded ability to precisely plan for storm surge across 307 square miles – and 35 miles of beaches

IDENTIFYING GOALS

Like any other municipality, Virginia Beach owns a certain amount of properties and roadways; in this case, parcels are spread over 307 square miles – and 35 miles of beaches. As a coastal community, the city is very aware of the impact a major storm can have on infrastructure and public safety. Most coastal communities rely on the Sea, Lake, and Overland Surges from Hurricanes (SLOSH) computerized numerical model, developed by the National Weather Service to estimate storm surges, based on historical and current storm data. SLOSH is a good starting point, but municipalities need to combine that information with their geospatial data to create precise 3D property maps.

Virginia Beach is going one step further, using digital elevation modeling for predictive flood surge analysis. A digital elevation model (DEM) is a digital model or 3D representation of a given area's surface terrain. A DEM allows users to zero in on a parcel of land to help determine how its elevation impacts planning for accurate floodplain maps, transportation infrastructure, land use management, and more.

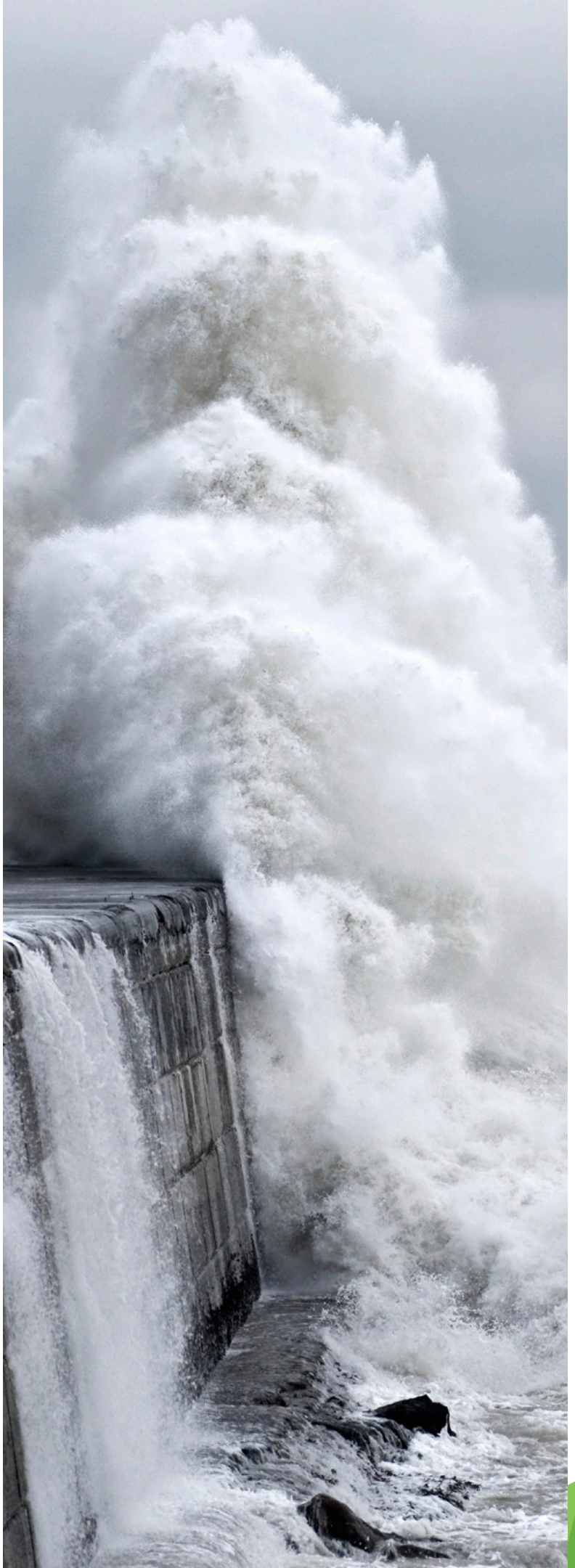
OVERCOMING CHALLENGES

- Provide predictive storm surge analysis for disaster planning
- Create one unified information GIS source for each municipally or privately owned parcel
- Increase accuracy of digital elevation maps
- Improve on SLOSH storm surge predictive capabilities

REALIZING RESULTS

The city implemented GeoMedia® 3D, a GeoMedia add-on product that extends the functionality of Hexagon Geospatial's solutions through an integrated 3D visualization and analysis environment. Now, Virginia Beach utilizes Hexagon Geospatial's solution to produce more intuitive 3D DEMs, and more fully developed maps showing location, height, dimensions, and other pertinent information by parcel.

City planners can accurately process imagery and terrain data from ERDAS IMAGINE® to update attributes in GIS and CAD files. They can deliver and distribute that geospatial information via the cloud-based ERDAS APOLLO 2013 portal, and leverage GeoMedia to visualize DEMs and manage and analyze geospatial data.



For Virginia Beach, the 3D DEMs produced by Hexagon Geospatial's solution have proven to be invaluable for use in crisis situations, particularly planning evacuations and staging and deploying first responder resources in the face of potential disasters.

Previously, the city used a GIS system that showed all parcels of land at a uniform height of ten feet – barely useful for predicting flood surge in a locality where all the land is at a maximum of 12 feet above sea level. Now, with the power and precision of Intergraph's core geospatial solutions, city officials can zero in on a parcel of property and determine height within six inches.

Those six inches of precision can impact the evacuation plans for thousands of homes, according to Rob Jessen, GIS Coordinator, City of Virginia Beach. As a vacation destination, the city's population fluctuates by as much as three million during the summer. Knowing when and where to evacuate has obvious benefits.

"We had a lot of GIS data, but it was from 2004, and it was all LiDAR data. It wasn't as sophisticated as the information available today. It was very cumbersome; it was in 1,500 different tiles, with 36,000 points in each, representing an area of more than 300 square miles," Jessen describes. "Because of the resolution of that data (showing everything at ten feet), when we tried to generate information, it would appear that the entire city was a floodplain. And due to the highly susceptible nature of our topography to storm surge, we needed accurate reality-based tools to predict and respond."

In 2012, Virginia Beach had a looming problem – shared with most of the East Coast of the USA. Superstorm Sandy was on its way, bringing high pressure and higher wind speeds to bear on more than 600 miles of coastline.

The incomplete flood surge information the city could generate would compel a complete evacuation – a logistical nightmare. Jessen acted quickly, uploading nearly a terabyte of LiDAR data onto an FTP site. In less than 24 hours, using ERDAS IMAGINE on a laptop, Hexagon Geospatial pulled a six-inch resolution model from the data, enabling Virginia Beach to accurately predict storm surge within inches.

Jessen explains that Hexagon Geospatial "did all this for us in less than 24 hours, when we had been told by other companies that it would take at least six months to repurpose the data."

Hexagon Geospatial delivered the information via ERDAS APOLLO, creating DEMs that Virginia Beach used to immediately target specific evacuation areas. City officials can be very specific when using their VB Alert system to notify residents of possible evacuations by neighborhood, or even sub-neighborhood. During Superstorm Sandy, for example, "We have a peninsula nearby that we didn't evacuate because we were predicting the hit would be minor, and we were correct. Being able to precisely predict impacts when a storm is coming, and only use the VB Alert system where and when it's absolutely necessary has really improved the response rates," he continues. "The feedback we've received has been so positive that we've expanded the alert beyond land lines to cell phones, and residents can register for alert at home and work locations."

What it all means is Virginia Beach has a cutting-edge solution for predicting flood surge, as well as for more mundane uses such as more accurately assessing properties for taxes, tracking cable, electric, and water lines, assigning new street addresses, and the like.

ABOUT HEXAGON GEOSPATIAL

Hexagon Geospatial helps you make sense of the dynamically changing world. Known globally as a maker of leading-edge technology, we enable our customers to easily transform their data into actionable information, shortening the lifecycle from the moment of change to action. Hexagon Geospatial provides the software products and platforms to a large variety of customers through direct sales, channel partners, and Hexagon businesses. For more information, visit www.hexagongeospatial.com or contact us at marketing@hexagongeospatial.com.

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