

Hydroelectric Operations

with AI-Based Pléiades Image Analysis

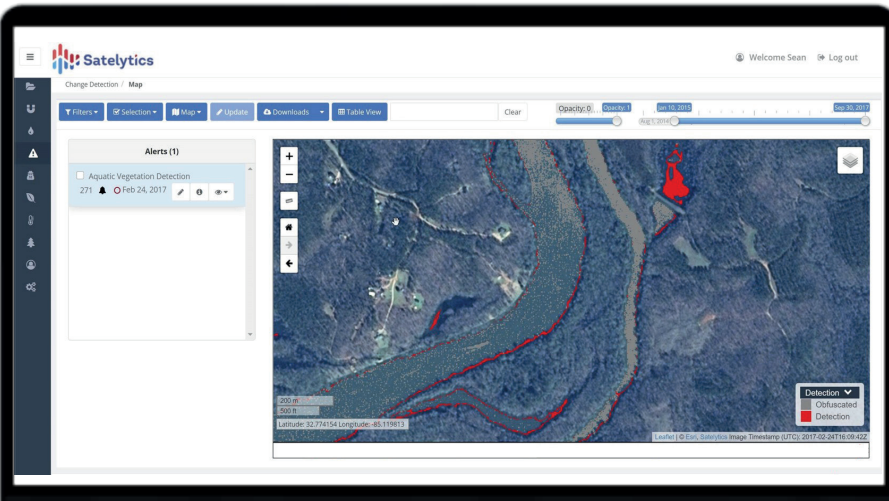
One of the largest energy utilities in the U.S. is turning to AI-based analysis of Airbus' 50cm resolution Pléiades 1A/1B satellite imagery provided by Satelitycs to safeguard the health of lakes and reservoirs in its hydroelectric power network. The technology is enhancing the overall effectiveness of monitoring programs by increasing field crew efficiency and boosting the number of potential water body threats identified each year.

Georgia Power, a subsidiary of The Southern Company, delivers power to more than 2.6 million customers located in 155 of Georgia's 159 counties. Each year, 1.1 million of the utility's 14.1 million Kw hours of electricity are generated by 16 hydroelectric dams located around the state. Georgia Power's Land Department is responsible for managing the 59,000 surface acres of water bodies and 100,000 acres of surrounding properties.

"Land disturbance issues are the primary concerns we are looking for with our surveillance program in the lands around the lakes," said Dawson Ingram, Lake Resources Manager at Georgia Power. "Environmental risk is the biggest issue."

The most common threats relate to construction or expansion of structures on properties adjacent to the shoreline. Clearing the landscape of vegetation is another activity that is monitored. These activities can create conditions where soil, pollutants, and other unwanted debris drain into the reservoirs. Reinforcing bulkheads and building docks can have similar impacts on water condition and shoreline aesthetics.

Private landowners who are planning development on their properties often don't realize special permitting is required for projects to be performed in the buffers and watersheds around the lakes associated with hydroelectric generation, explained Ingram.

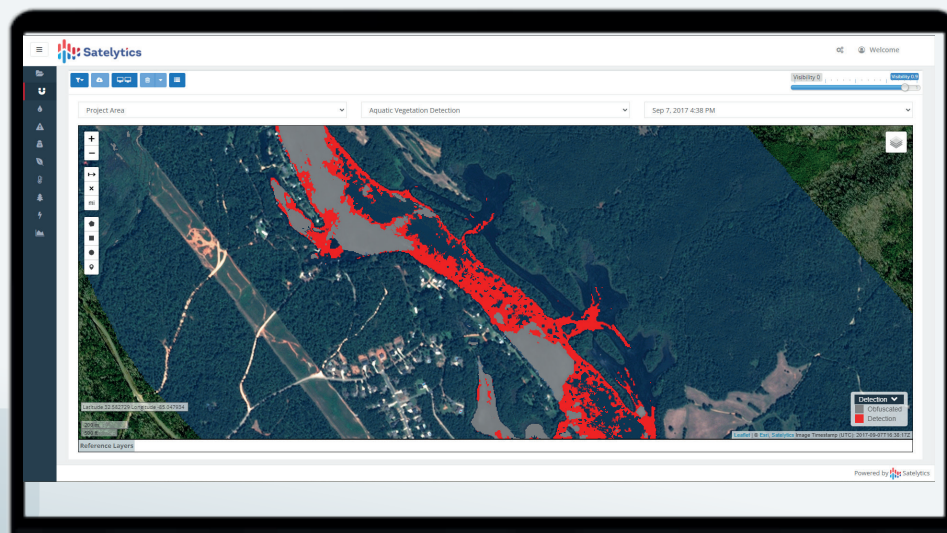


The other aspect is monitoring the water itself for algae and invasive species, Ingram said, adding that some lakes allow water sports while others are used as sources of drinking water. In either case, the utility is tasked with keeping the water as clean as possible.

Figure 1: Aquatic Vegetation Detection by Satelitycs along a reservoir and nearby waterways.

The more daunting aquatic threat, however, is invasive vegetation such as hydrilla. This plant can not only cause unwanted changes to water quality and other plant life, but it can also grow rapidly to the point where it chokes off flow into dams and causes damage to the hydroelectric system. For Georgia Power, the challenge is finding invasive aquatic plants like hydrilla before they grow out of control.

Figure 2: Aquatic Vegetation Detection provided by Satelitycs helps pinpoint where potential risks are in the waterways, such as hydrilla.



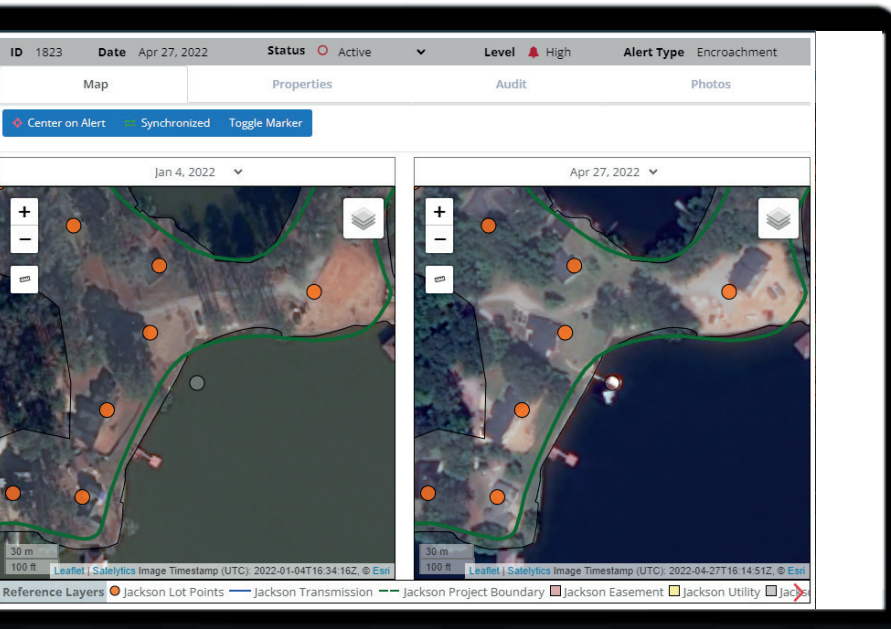
Finding Problems on Land and in Water

Like many utilities, Georgia Power seeks to accomplish more with the resources it has. This means making its field surveillance teams more efficient in their efforts to patrol thousands of acres in and around the lakes. In 2016, the utility turned to Satelytics, a leader in cloud-based AI geospatial analytics to automate much of the surveillance process.

Satelytics schedules image acquisitions of the lakes and their buffer zones by the 50cm Pléiades 1A/1B satellites four times per year through the Airbus OneAtlas platform. The analytics firm then applies algorithms on the near-infrared bands to detect land disturbances, vegetative clearing, and other signs of construction on land or at the shoreline itself. Separate algorithms, also processing the near IR data, detect

aquatic plant growth in the water often to depths of two feet. The firm uses change detection algorithms to pinpoint subtle differences in the terrain, vegetation, and building structures from one season to the next.

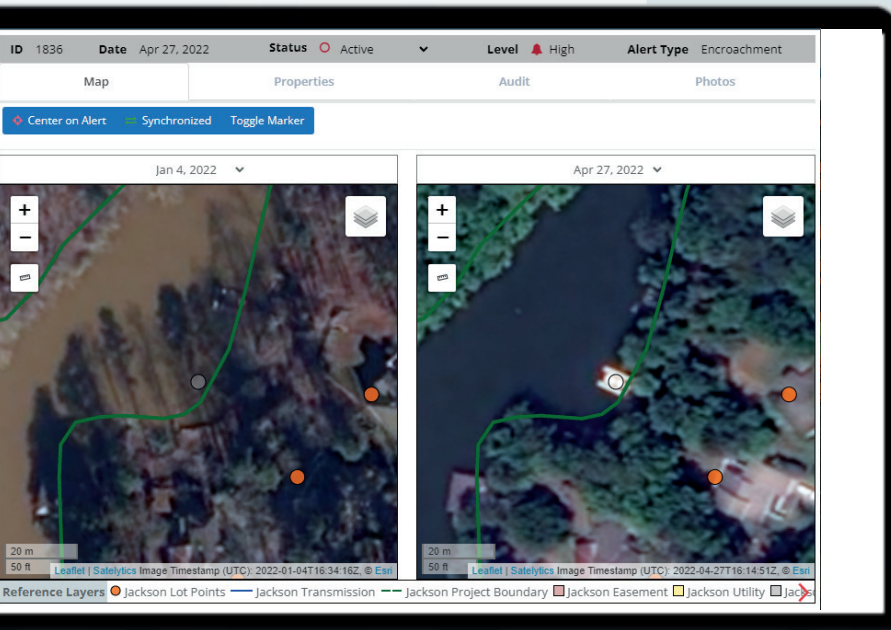
“The Pleiades 1A/1B near-infrared data is 50cm resolution which permits us to provide results with specificity for Georgia Power, and that means matching changes in reservoir shorelines to specific real estate records,” said Satelytics’ Chief Marketing Officer, Jay Almlie. “We could not accomplish this with coarser resolution data.”



Georgia Power has found that seasonal image acquisitions are ideal for its monitoring activities, but special satellite collects may be requested to coincide with planned lake management. For example, the water levels in the lakes are purposely lowered every few years to give property owners a chance to repair bulkheads and docks. Satelytics schedules acquisitions before and after these events to document the work.

Figure 3&4:

Satelytics’ encroachment algorithm indicates that structures have been built since the last image capture - indicating a possible risk for the utility.



Georgia Power’s Ingram confirmed the teams are finding more non-compliance issues now than they did before using the satellite-based method. And timeliness is key to the value of the information

“This service makes the field crews more effective by pointing them in the direction where their expertise is needed [to bring landowners into compliance] or remediate a situation,” said Almlie. “They don’t waste time scouting for problems.”

Airbus has put a lot of thought into how they deliver data to us and automate that delivery,” said Almlie. “This means we receive the data in a predictable format at a predictable time after capture, which allows our automation to ingest it, analyze it, and produce actionable results for Georgia Power within hours of data capture.”

Satelytics delivers the analysis results to the utility in a variety of formats, including text/email alerts and a GIS-based dashboard. Georgia Power has found the information so timely and accurate that it is now

collaborating with Satelytics to build an API to deliver information directly into the utility’s existing work order management system. This will task crews to make in-person visits to properties where issues are detected.

The Land Department’s success with AI-based satellite image analysis has not gone unnoticed at Georgia Power. Other departments within the utility, including Vegetation Management, are now considering adopting the Satelytics technology for other monitoring applications.

Georgia Power

Georgia Power is the largest electric subsidiary of Southern Company (NYSE: SO), America’s premier energy company. Value, Reliability, Customer Service and Stewardship are the cornerstones of the Company’s promise to 2.6 million customers in all but four of Georgia’s 159 counties. Committed to delivering clean, safe, reliable, and affordable energy at rates below the national average, Georgia Power maintains a diverse, innovative generation mix that includes nuclear, coal and natural gas, as well as renewables such as solar, hydroelectric and wind. Georgia Power focuses on delivering world-class service to its customers every day and the Company is recognized by J.D. Power and Associates as an industry leader in customer satisfaction. For more information, visit www.GeorgiaPower.com and connect with the Company on Facebook (Facebook.com/GeorgiaPower), Twitter (Twitter.com/GeorgiaPower) and Instagram (Instagram.com/ga_power).

Southern Company (NYSE: SO) is a leading energy provider serving 9 million residential and commercial customers across the Southeast and beyond through its family of companies. Providing clean, safe, reliable and affordable energy with excellent service is our mission. The company has electric operating companies in three states, natural gas distribution companies in four states, a competitive generation company, a leading distributed energy infrastructure company with

national capabilities, a fiber optics network, and telecommunications services. Through an industry-leading commitment to innovation, resilience, and sustainability, we are taking action to meet our customers’ and communities’ needs while advancing our commitment to net zero emissions by 2050. Our uncompromising values ensure we put the needs of those we serve at the center of everything we do and are the key to our sustained success. We are transforming energy into economic, environmental and social progress for tomorrow. Our corporate culture and hiring practices have earned the company national awards and recognition from numerous organizations, including Forbes, Military Times, DiversityInc, Black Enterprise, J.D. Power, Fortune, Human Rights Campaign and more. To learn more, visit www.southerncompany.com.

About Satelytics

Satelytics is a software company, producing geospatial analytics for early detection, location, and — in many instances — quantification of our customers’ most pressing challenges. The Ohio-based company uses science, software, and technology to deliver valuable services to customers to identify problems before they become disasters — environmentally, financially, or otherwise. Learn more about Satelytics here.

About Airbus

Airbus, provides users with proprietary access to the world’s most comprehensive commercial satellite constellation combining optical imagery from Pléiades Neo, Pléiades, SPOT, Vision-1 as well as radar data from TerraSAR-X, TanDEM-X and PAZ). Combining Airbus data with unrivalled expertise in satellite imagery acquisition, data processing, fusion, dissemination, and intelligence extraction helps Airbus to deliver a broad product and services portfolio spanning the entire geo-information value chain.

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