



THE POWER OF CHANGE

THE WORLD IS CONSTANTLY CHANGING, BOTH FOR BETTER AND FOR WORSE. GEOSPATIAL TECHNOLOGY HAS THE POWER TO DRIVE PROGRESS BY ADAPTING TO THESE CHANGES, ARGUES CLAUDIO MINGRINO

We live in a world in which the only constant is change. There are the negative changes, such as those brought about by the global challenges in the Middle East, Africa and Ukraine, and of refugees migrating to avoid war and natural disasters. With those changes come the challenges of feeding the people of emerging nations, managing a dwindling supply of potable water, and coping with rising tides and diminishing shorelines.

Yet some of those same regions provide powerful examples of positive change. Many places are embracing the concept of the smart city, bringing intelligence to civic growth, and using social intelligence to collect and process data that enhances municipal efforts in sectors from construction, security, traffic, infrastructure management, energy, and emergency response.

Managers and decision-makers across those sectors recognise the power of geospatial technology and want to harness it. They need information to make life-changing decisions, and they do not care how that information was derived.

They need to detect change, to adapt to it and to mitigate it, even to drive it. They spend their lives immersed in change and recognise its dynamic nature better than most people. They want the tools that they use to be equally dynamic, but easy to use.

It is a complex process, creating tools that offer simplicity. Organisations have some common needs, but more often their requirements are unique to their structure, resources, and missions.

Geospatial technology in action

Geospatial technology has the power to drive progress. In East Africa, for example, farming practices are ripe for an update to enable them to better feed the populace, but to teach modern techniques requires access to timely data. To meet this need, UK companies Sterling GEO and McKenzie Intelligence Services partnered to better understand and monitor East African farming practices. By using the spectral profiling tool in ERDAS IMAGINE, the partnership was able to differentiate between healthy, under-used, and poorly managed farming practices in the region by estimating the chemical composition of materials, such as vegetation.

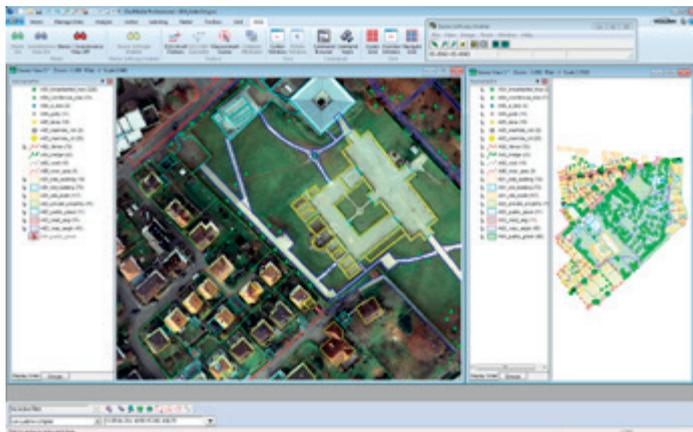
With that insight, they were able to use visuals from Skybox Imaging's SkySat-1 and SkySat-2 constellations and maps from Google to achieve access, timeliness and repeatable temporal passes over East African farms, enabling the partnership to monitor agricultural activity. It's a major step toward establishing a footprint that can increase crop production.

Skybox Imaging's recent entry into the lower-cost, high-volume nanosatellite realm, along with improved image quality of its products, should make the company and its competitors important factors in the next decade of geospatial data production. Where satellite images have been historic – hours, days, or even weeks old – the more frequent passes of nanosatellites and the image fidelity of their products will rival those of unmanned aerial vehicles (UAVs). When combined with the proliferation of mobile sensors on the ground, ever-evolving open sources of data, and an organisation's internal information, geospatial customers have the raw materials to create a clearer situational awareness than ever before.

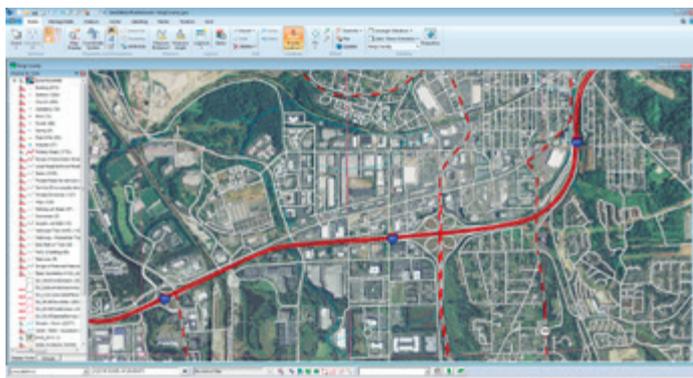
The price of Big Data

But that comes with a price. Big data is becoming bigger, and we must race to develop the tools to keep up with this data deluge. Often we can see change coming but can do little to alter it. We need a plan to cope with that change which is flexible and able to react in real-time. Southern California gets its water from the state's northern mountains through four aqueducts, and all of them cross the San Andreas Fault, an active seismic activity generator. A major earthquake could be devastating, disrupting water flow to many of the area's 24 million people for a year. Water officials in Southern California are seeking real-time solutions to cope with what a future that many see as inevitable.

The key term here is 'real-time'. This matches the geospatial industry's definition of change and it is why we are focusing on real-time solutions. For example, Hexagon Geospatial is working on a Geospatial Interoperability Framework (GISF) to record world events as they happen. Data from seismic or weather anomalies, acts of war or any other event that might affect infrastructure can be passed on from the GISF to GIS systems to facilitate real-time analysis, trend detection, and decision-making.



Organisations can enhance the ability to capture data in 3D with Hexagon Geospatial's ImageStation, which provides a more dynamic view of change while also delivering data across multiple platforms



Hexagon Geospatial's GeoMedia enables organisations to manage change by extracting intelligence from geospatial data for presenting actionable information

"Monitoring and controlling operations of critical infrastructure, such as bridges, railway tracks, vehicle-tracking, access covers and street signs, in the context of GIS, are key applications for this real-time connection," says Shekhar Gupta, who is working on the GISF project. "Being able to take sensor data and dynamically combine it with historic data from a GIS creates a real-world analytical context that enables real-time decision-making."

The GISF will be powerful, but it will require a system that can handle this influx of remotely generated data effectively and efficiently. So too will all the other elements of social change and environmental change – all the changes are driving the geospatial industry to make changes within itself to develop tools to manage a data continuum that begins with 2.5 exabytes of new daily input, and grows with each new sensor or data requirement.

They are tools that can combine LIDAR and imagery, photogrammetry and radar, along with other GPS elements into a package for analysis, then can present results in a way that will promote visualisation and interactivity that can engender dialogue among a decision-making group. Increasingly, those decision makers require that the presentation be more transparent and easier to use.

The geospatial industry is developing tools that can do a combination of all of those things. All those requirements work in lockstep with an increased cognisance of the bottom line. Return-on-investment in geospatial is a growing actor in spending for organisations, especially in austere financial times.

For example, with our Power Portfolio 2015 product, we are also responding to customers who want to advance the democratisation of data to get more managers involved in decision-making. Often when a manager in one department of an organisation can see what a counterpart in another department is getting from a data presentation, the first manager can use that same data, perhaps presented in a different way, in making a decision.

Frequently, too, the manager wants the "data behind the map," as the military calls it. In that, the manager wants the raw materials that generated the presentation to apply them to a different scenario to make a decision. While the capability of getting that data behind the map isn't necessarily new, the demand for it is increasing because managers are learning more about what GIS systems can do for them.

Geospatial professionals don't have all of the answers, but we have or can get the data to answer most of the questions. Sometimes those answers are the products of non-geospatial professionals with creative minds asking questions we hadn't imagined.

These scenarios push our industry to become more solutions driven. Can a presentation on sales forecasts be used to optimise delivery routes? Can a water presentation help farmers decide what they should plant next spring? Interactive representations of carbon change in the atmosphere can help bring new life to the debate over the diminishing rainforest. How will a mine affect the environment?

The industry is meeting the challenge of war and its victims with quickly customised maps. It is feeding people with farming that uses images along with seed, fertiliser and water. It is advising governments of a future of diminishing land and ever-rising water.

We're doing all of this because the geospatial industry is responding to quickly changing situations with quickly changing products. That too is becoming a constant.

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