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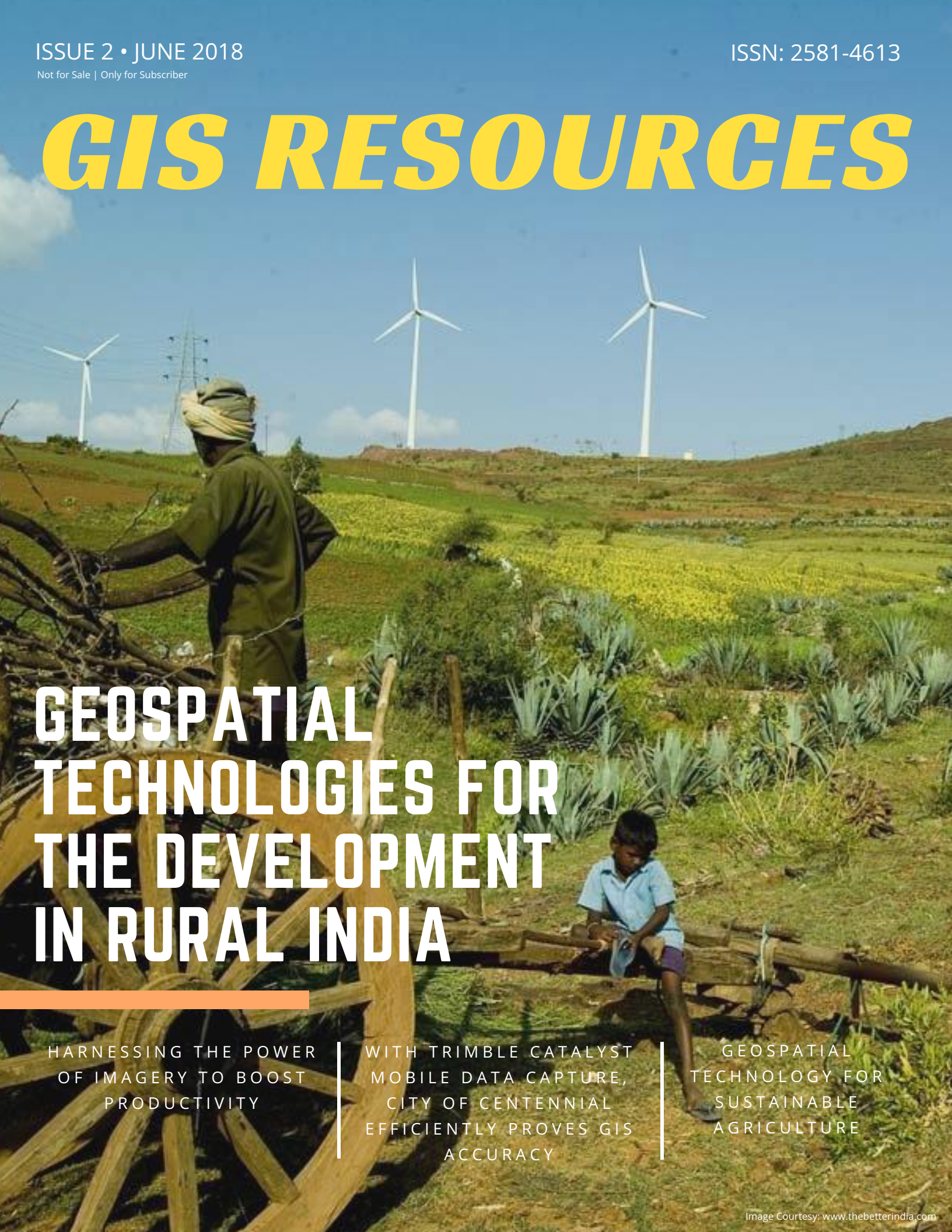
GIS RESOURCES



GEOSPATIAL TECHNOLOGIES FOR THE DEVELOPMENT IN RURAL INDIA

HARNESSING THE POWER OF IMAGERY TO BOOST PRODUCTIVITY

WITH TRIMBLE CATALYST MOBILE DATA CAPTURE, CITY OF CENTENNIAL EFFICIENTLY PROVES GIS ACCURACY

GEOSPATIAL TECHNOLOGY FOR SUSTAINABLE AGRICULTURE

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editor's note

GEOSPATIAL TECHNOLOGIES WILL PLAY AN INCREASING ROLE IN RURAL DEVELOPMENT

Rural development is a complex mix of fulfilling rural aspirations and providing opportunities and avenues to sustain their growth. Rural development is largely dependent on the demography & socio-economic pattern of a region. One model fits all will not succeed as agrarian, non-agrarian vocations combined with a demographic variation, with their unique legacies, will make it near impossible to implement a single strategy that is thought out in the war rooms by metro-based planners & economists.

However, one thread that is common for rural development is the provision of basic and/or advanced infrastructure in the rural areas to give abilities & tools to the local populace to take control of their lives in order to sustain their growth independently.

Geospatial technologies have a larger role to play in this vital area of infrastructure development. Provision of water, electricity, health facilities, education and resources to store, transport & sell their produce will ensure long-term development in rural areas.

Villages are beginning to prepare maps of the village and its neighborhood to better understand the available resources and to plan for future development. The maps have helped to identify and preserve vital pasture land for their cattle, water bodies for their drinking water, rivers, streams, and canals for irrigation etc.

Advanced Geospatial technologies will enable faster and more accurate surveys to bring electricity, water, gas, optical fiber cables to provide amenities and utilities for the well being of the local populace. With specific information, infrastructure & amenities can be set up.

UAV or Drone-based Remote Sensing technologies are being deployed to a limited extent to estimate crop produce and need for fertilizer & pesticide affecting the quantum of crop production. These technologies can also be used to estimate crop losses due to pest infestation, drought, flood, natural calamity etc to provide information on subsidy, compensation or insurance to the affected person.

Overall Geospatial technologies are certain to play an ever-increasing role in the development of infrastructure in rural India to not only enable their development but also to provide essential services to the rural population.

Ashok Prim
Editor

HARNESSING THE POWER OF IMAGERY TO BOOST PRODUCTIVITY

Deimos Imaging's high-quality and precisely calibrated sensors can support the information needs of precision farming.

by Ana Isabel Martínez

A feasibility study carried out over the entire India showed that, combining our virtual constellation medium and high-resolution sensors, we are capable of imaging the whole country three times per week.

With the second largest population in the world and its continuous growth, India is facing a great number of challenges, such as improving overall food security while making farms more profitable and farmers more capable. Agriculture remains a crucial sector, employing 52% of India's workforce and with some 70% of the country's rural households still depending primarily on it for their livelihood. However, India is transitioning to a knowledge and technology economy, resulting in a migration of workers from agriculture to other new jobs. This change in economics and culture is creating a challenge: how to improve agricultural yield and increase efficiency, without raising costs. Investment in technology is crucial to modernize and implement productive agricultural techniques, but which technologies will present the most easy-to-use and cost-effective solution?

Improving productivity by taking informed-decisions

A farmer usually needs to take around 40 decisions over a crop cycle, from pre-harvesting to post-harvesting phases. Yield, productivity and cost of cultivation will depend on

About Author

Ana Isabel Martínez
Communications Manager
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these decisions. Now, what if the farmer gets to see all the data from his field and also gets help to take an informed decision? This is where geospatial information can help achieve the much-needed boost of productivity in the Indian farmlands.

Deimos Imaging's high-quality and precisely calibrated sensors can support the information needs of precision farming. We provide a wide range of multi-sensor, multi-spectral and multi-resolution imagery that enables frequent monitoring, from continental to plot-level scale.

A feasibility study carried out over the entire India showed that, combining our virtual constellation medium and high-resolution sensors, we are capable of imaging the whole country three times per week. Medium- and high-resolution data are key for large parcels and national phenomena monitoring, such as drought assessment, crop type mapping, food security and overstock risk assessment.

Additionally, very-high resolution data is the ideal solution for intra-field surveillance, access to information inside small parcels <0.05 ha, disease detection, water stress, yield estimation, information on irrigation, fertilizers, pesticides, inventory and plot delineation. With over 20 sensors at a resolution equal to or better than 1 meter, we guarantee exceptional revisit capabilities. A feasibility study carried over a 12 square kilometers parcel South of New Delhi showed that we can cover it more than 40 times per week in average.

This frequency of fresh imagery allows for the management of crop field irrigation with unprecedented precision. The status of every area can be assessed daily and irrigation can be commanded with incredible precision, resulting in huge water savings and a large increase in crop yields. In addition, this allows an early detection of crop illnesses, enabling the farmer to take quick action to minimize crop damage.

Enabling Transformational Insights with UrtheDaily™

As a natural evolution from our virtual constellation and given the importance of satellite imagery in the farming industry, we are developing a new constellation specifically designed for precision agriculture and monitoring purposes: UrtheDaily™. This planned constellation will provide high-quality, multispectral optical imagery of the Earth's entire landmass (excluding Antarctica) every day, at the same time, from the same altitude, directly into your applications. The spectral bands of the constellation are specifically selected to match Landsat-8, Sentinel-2, RapidEye and Deimos- 1 bands, to ease the constant and automatic in-flight cross-calibration with trusted references, minimize the effects due to atmospheric variations, and to provide improved accuracy of key information products. With its exceptional capabilities, UrtheDaily™ will present a disruptive and problem-solving technology that can foster sustainable development, not only in India, but worldwide.

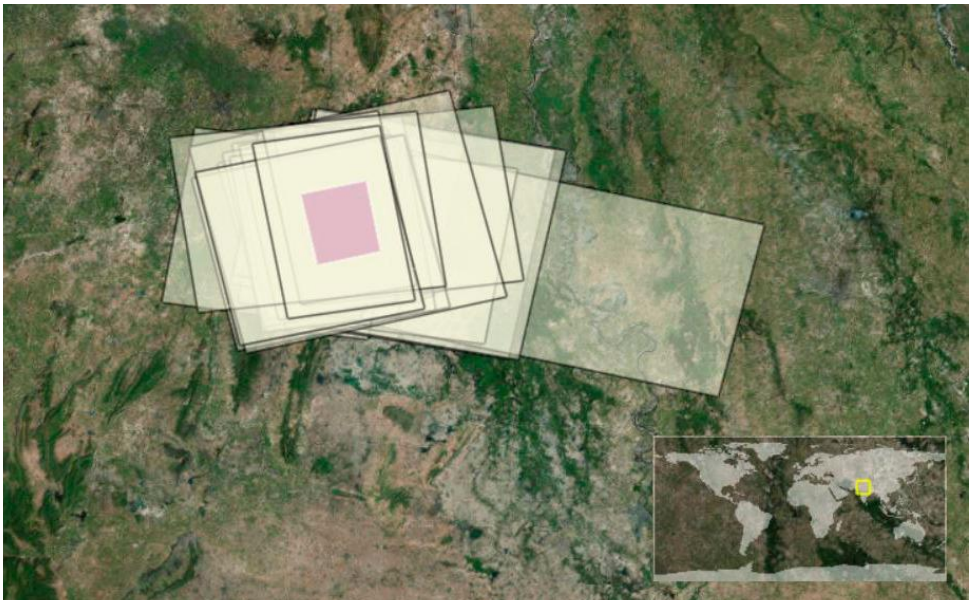


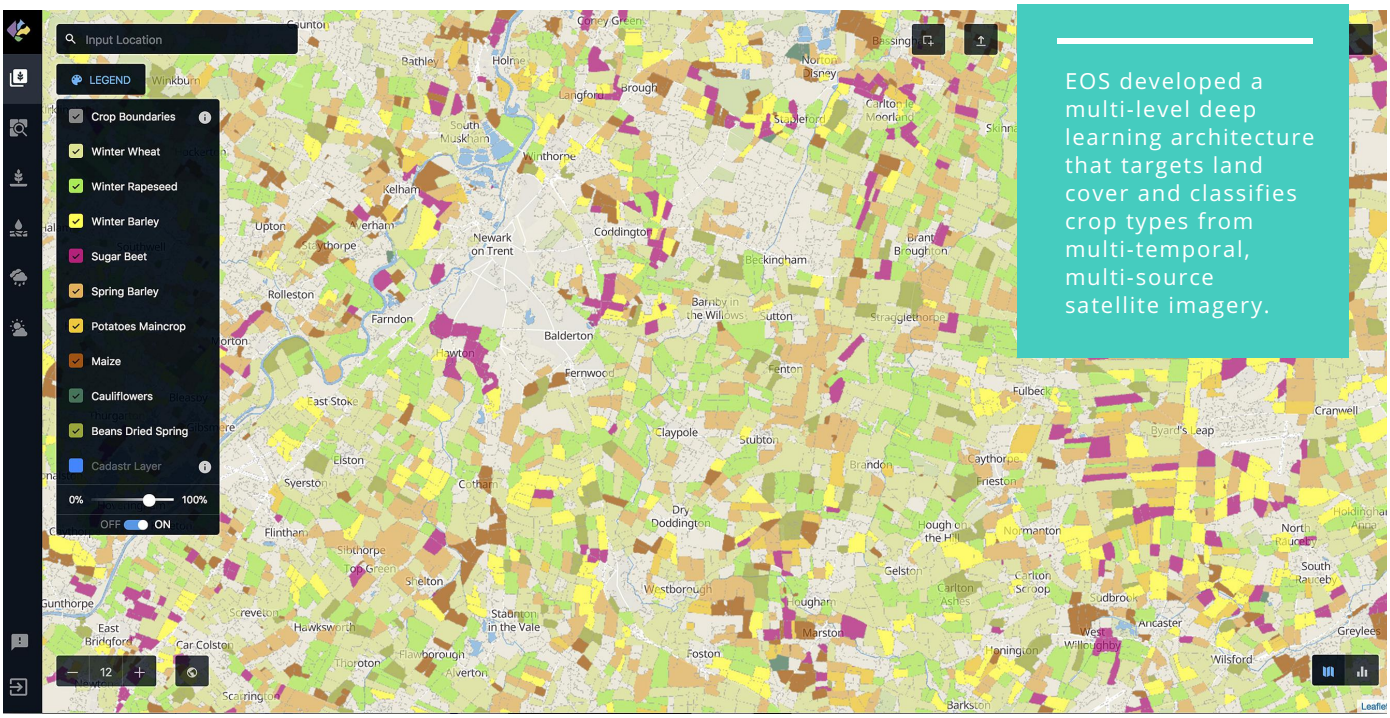
Figure 1. Shows the feasibility study for covering a 12 square kilometers area, South of New Delhi, during one week with Deimos Imaging's very-high resolution sensors.

Figure 2. Shows an image of agriculture structures South of New Delhi captured by Deimos-2

REMOTE SENSING DATA FOR AGRICULTURE

EOS Crop Monitoring is a unique tool that includes both historical and current observations. This allows quick identification of a field's performance throughout the growing season as well as high-risk areas affected by droughts, floods, hail, etc.

by Earth Observing System (EOS)



EOS developed a multi-level deep learning architecture that targets land cover and classifies crop types from multi-temporal, multi-source satellite imagery.

Earth Observing System (EOS), a Menlo Park based startup, announces the release of a unique cloud-based platform called EOS Crop Monitoring, which provides solutions for Input Suppliers, Farmers, Commodity Traders, Crop Insurance companies, and all members of the Agriculture supply-chain. EOS Crop Monitoring is the result of three years of extensive collaboration between EOS' dedicated team of data scientists and software engineers and Fortune 500 industry partners. The result is a product that applies to a growing body of real-world issues.

EOS Crop Monitoring allows its partners to extract valuable insights from remote sensing data, e.g., crop types classification maps, crop yield forecasts, field boundaries, vegetation indices, crop conditions, soil moisture and weather data on a field, regional or country scale. EOS Crop Monitoring can be licensed as a White-Label product; thereby, providing EOS partners with platform-based services for their own customers/users to increase interaction between all members of the agricultural value chain.

Submitted By

EARTH OBSERVING SYSTEM
Listening To The Pulse Of The Planet

Menlo Park, CA 94027
USA
Email: *info@eos.com*

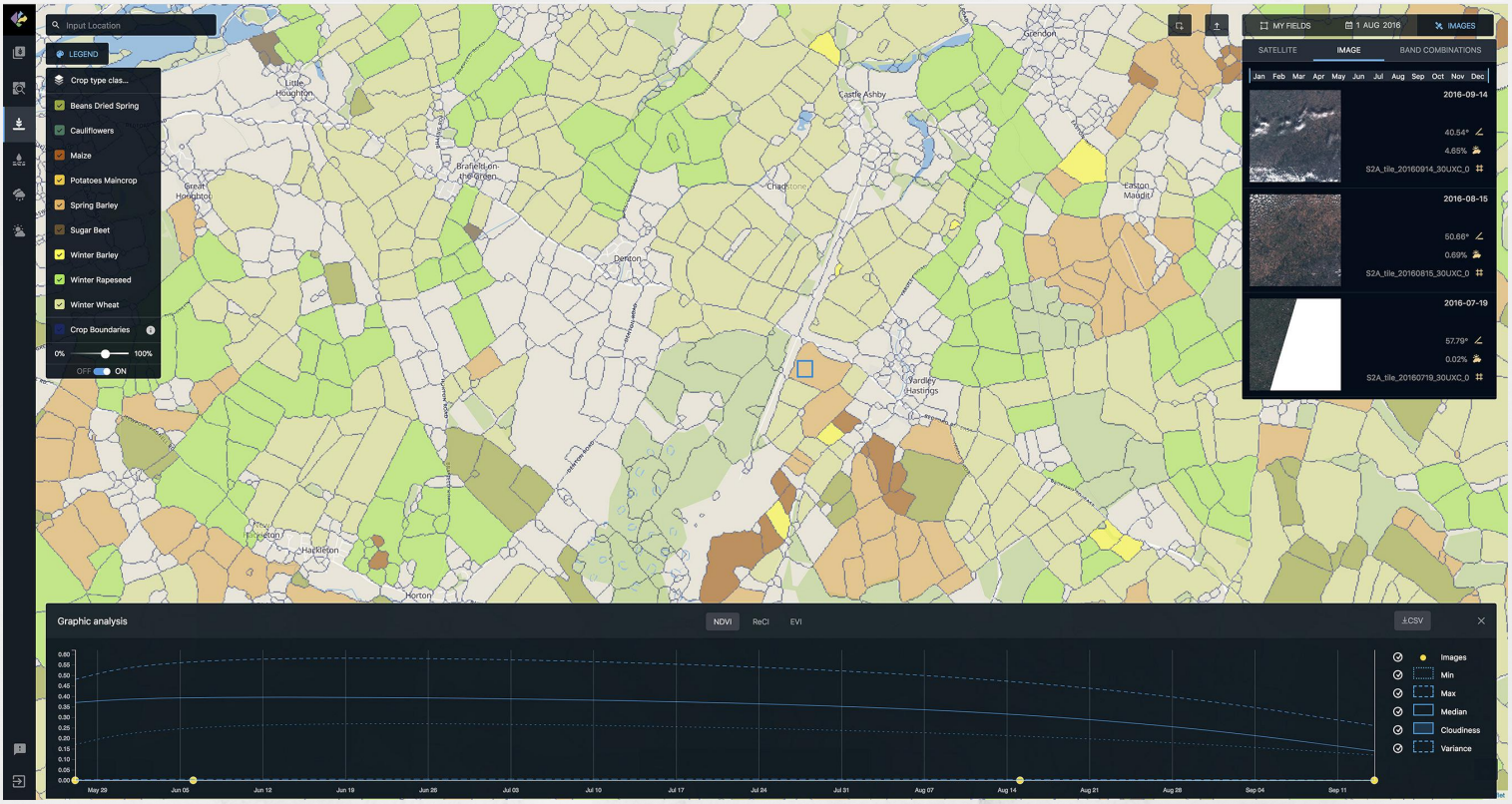


Figure 1. NDVI time series

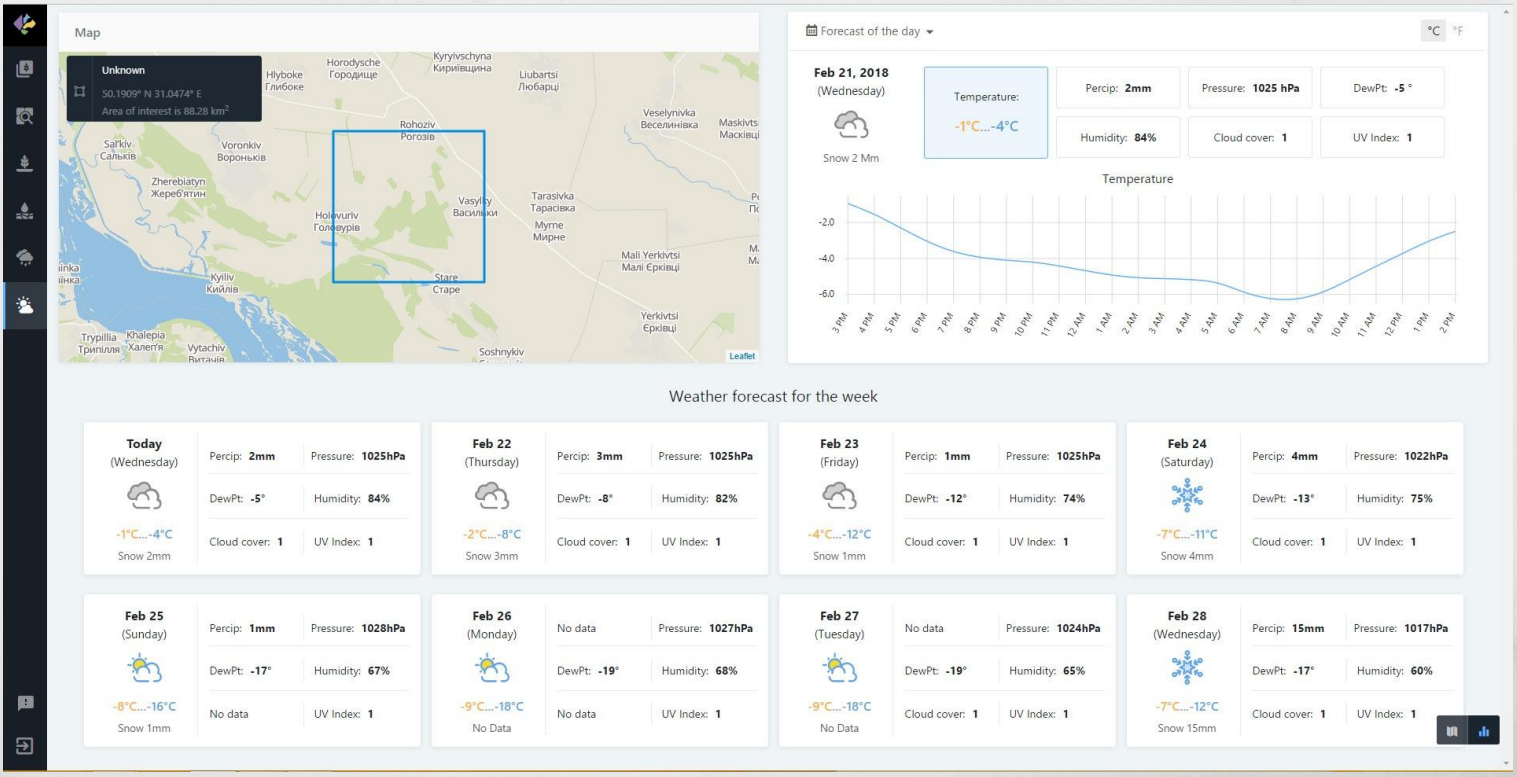


Figure 2. Weather forecast for the week

EOS developed a multi-level deep learning architecture that targets land cover and classifies crop types from multi-temporal, multi-source satellite imagery. The key element of the architecture is an unsupervised neural network that is used for optical imagery segmentation and missing data restoration.

This powerful tool is empowered by EOS EngineTM. Designed as a Platform-as-a-Service (PaaS), EOS EngineTM is massively scalable. It is able to support many types of earth observation data sets and capable of on-the-fly analytics processing system. EOS EngineTM can automatically remove cloud cover and shadows as well as extract valuable information on a different scale with the processing of large-area data.

EOS Crop Monitoring is a unique tool that includes both historical and current observations. This allows quick identification of a field's performance throughout the growing season as well as high-risk areas affected by droughts, floods, hail, etc. EOS Crop Monitoring features include reliable algorithms for more accurate agriculture statistics estimation, crop yield prediction, a seasonal overview of current and historic crop conditions to manage risks and evaluate crop performance.

With an extensive global satellite imagery database, EOS' data analytics provides its partners with new, expanded capabilities, such as the ability to monitor crop production rates in any crop zone at any given time in both numerical and imagery formats.

EOS allows its partners to expand their own applications through a flexible and scalable API to increase operational efficiency, manage risk, and provide substantiated validation. Through the development of its proprietary, data agnostic platform, EOS can deliver images from a variety of satellites to secure near real-time updates within a field or country level applying state-of-the-art performance and industry-leading services.

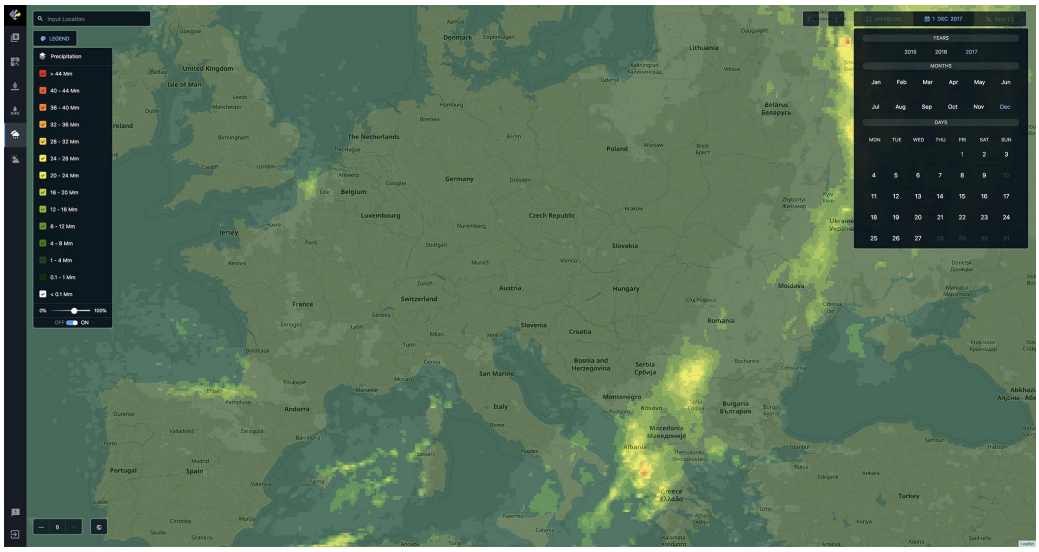


Figure 3. Intensity of precipitation over Europe in December 2017

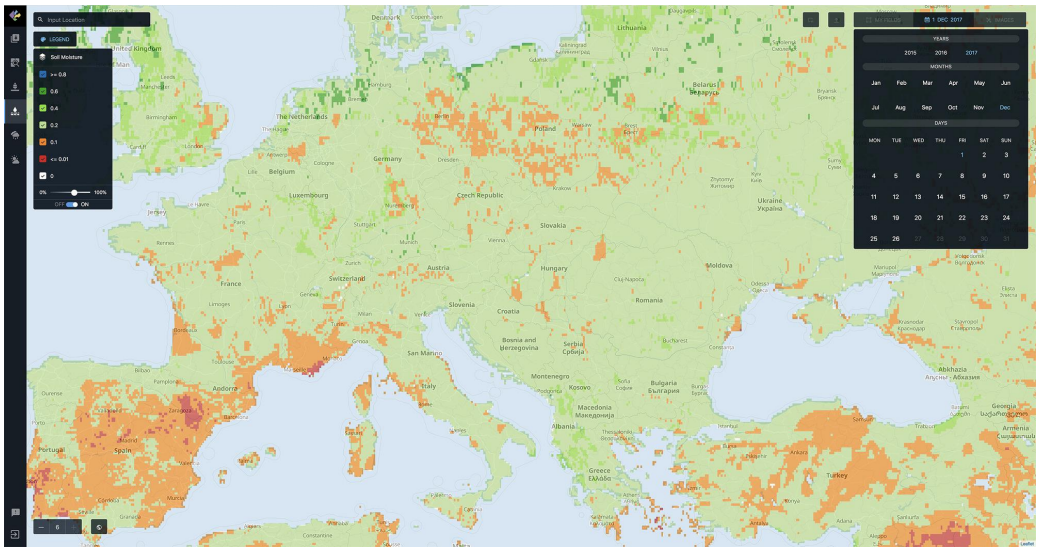


Figure 4. Soil moisture map

EOS' solutions are successfully verified in North America, Europe, and CIS and are currently being developed in ASIA, MENA and South America by applying its own cutting-edge methods and algorithms.

In the context of India exposed to such issues as poor infrastructure, lack of fair and timely compensation against losses, and dramatic climate change, EOS Crop Monitoring can make a big difference. Farmers may claim loan waivers from their insurers on the basis of the remote-sensing maps assessing the crop damage, forecast rice, wheat and other top crops' yield using the satellite data coupled with CCEs, as well as make preparations beforehand in the case of glut (additional warehouses, cold chain facilities, etc.). Small-scale farmers benefit from use of the platform to precisely determine parcel boundaries for better crop assessment.

Explore EOS EngineTM and EOS Crop Monitoring solutions at the website *https://eos.com/agriculture/* or contact the team at: *sales@eos.com*

GEOSPATIAL TECHNOLOGY FOR SUSTAINABLE AGRICULTURE

Geospatial data helps gain insights on how different factors and attributes relate to space and time.

by Dr. Surender Varma Gadhiraju

Field scouting and data collection by Dupont Pioneer Agronomist's

Consistent knowledge driven policies will enable quick development and adoption of advances in geo spatial technologies, benefitting global farming community at large.

Farmers face variety of challenges and uncertainties from changing weather, land degradation, water and nutrient requirements, labor availability, seed suitability, pest insurgence to market demand. Interplay of too many variables have made agriculture very complex and necessitated the intervention of technology that can assist farmers in management and taking timely decisions. ISO Bulletin in 2000 has estimated that around 80% of all data collected involves positional information. Such spatial information can be leveraged adding a valuable component for data driven decisions.

The availability of reliable and timely geospatial information on land, water and environmental conditions and their changes is one of the key prerequisites for sustainable agriculture and food security. Geospatial data helps gain insights on how different factors and attributes relate over space and time.

Geospatial data gives information about an incident/phenomena occurring in a particular location in a structured layer format enabling easier quantitative and qualitative analysis. Geospatial technology in agriculture is essentially geared towards planting the right seed, at the right location, using the right proportion of inputs and for timely

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intervention when needed. Precise spatial control over farm inputs helps reduce expenses and produces a higher yield environmentally friendly farm. The need for accurate geospatial data has become evident to both Industry and government organizations.

Geospatial technology essentially comprises of three components, data collection (via platforms like uav's/satellites/sensor networks), GIS (for visualization and analytics), and GPS (for recording positional information). Geospatial data cover a broad range of locational attributes that include administrative, environmental, economic, transportation, and many other thematic categories, such as weather and soil types. All these data are collated to make sense using data analytics.

Technology platforms like UAVs (or drones) are gaining popularity to quickly scout fields in search of disease and deficiencies, reducing the time it takes to identify problem areas that may impact the health of the entire farm. New systems approach using such UAV's are being developed all over the world. It comprises of flight planning, imager used (RGB/IR/Thermal), platforms (Precision Hawk, Asctec Falcon 8, DJI Inspire, 3d Robotics Solo etc.) and appropriate processing software.

Below are few use cases of UAS in agriculture:

- Plant stand count
- Nitrogen deficiency
- Disease occurrence and Damage Estimations
- Soil studies
- Fertilizer/Pesticide prescription maps

Though the role of advanced technology and analytics are well established in research community, they are still looked down with a measure of skepticism. The long-term trend of declining numbers of farms and increase in average age of farmers along with changing weather patterns threaten the state of food security, if farming is not predictable and profitable.

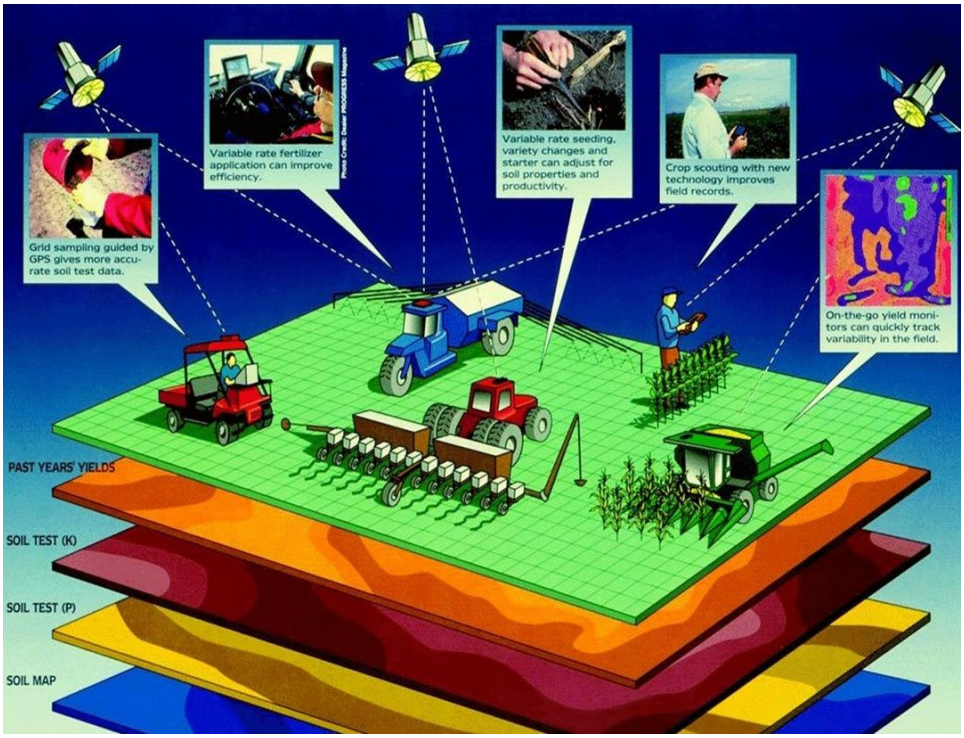


Figure 1. Integration of diverse data and analytics for precision agriculture
(Image source: GPS4US)

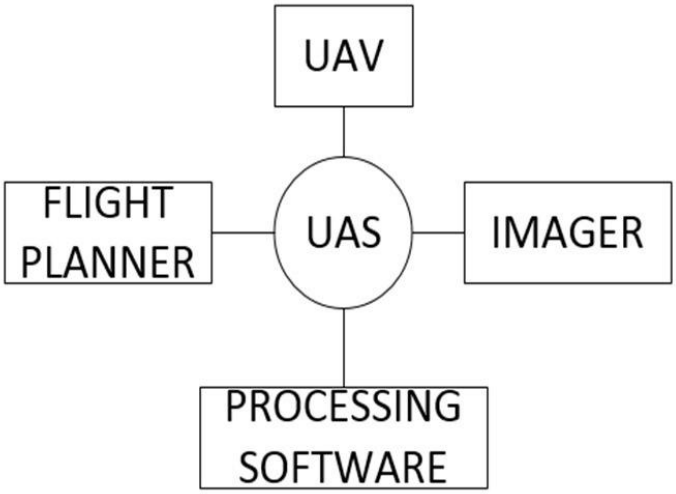
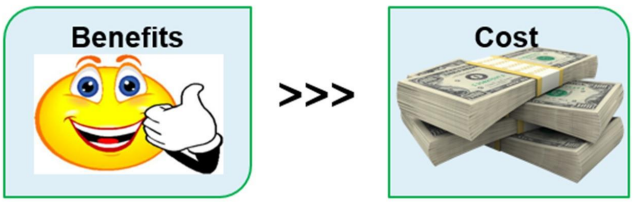


Figure 2. Components of Unmanned Aerial System

Geospatial technologies offer very valuable tools and are essential for sustainable development and management of agriculture. Policy makers, academicians and industry should proactively engage in devising standards for different data types and ensure quality data is easily accessible in public domain. Consistent knowledge driven policies will enable quick development and adoption of advances in geospatial technologies, benefiting global farming community at large.

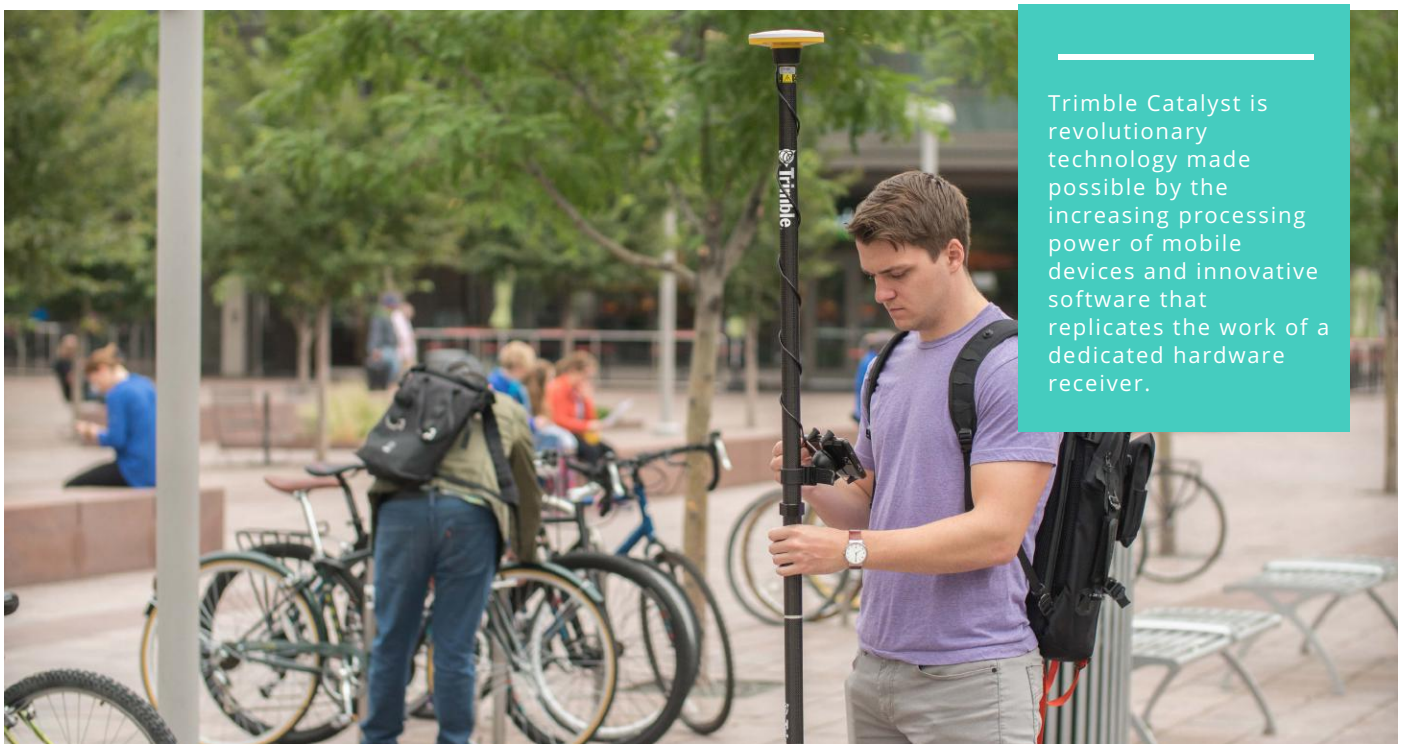


Note: *Opinions expressed in this article are the author's own and do not reflect the view of DowDuPont™ nor represent official communication.*

WITH TRIMBLE CATALYST MOBILE DATA CAPTURE, CITY OF CENTENNIAL EFFICIENTLY PROVES GIS ACCURACY

Using Trimble's software defined receiver for mobile devices, Colorado city collects and verifies data for park serving 107,000 residents.

by Gareth Gibson



Trimble Catalyst is revolutionary technology made possible by the increasing processing power of mobile devices and innovative software that replicates the work of a dedicated hardware receiver.

Aiming to be a model small government, Colorado's City of Centennial actively seeks technology to streamline processes and provide better data. With an opportunity to test a new mobile service for location accuracy and data verification, the city's Geographic Information Systems (GIS) specialist gathered 50 data points for public works assets at the city's crown jewel, Centennial Center Park.

Challenge

Accurate and up-to-date mapping of systems and assets is critical for local governments and utilities to contend with aging infrastructure, weather events and increasingly high customer expectations. When problems arise, municipalities and utility providers must quickly and accurately locate utilities to provide the best possible response for residents.

The City of Centennial since 2008 has partnered with global engineering company CH2M to manage its public works ranging from traffic engineering to fiber optic cable to snow removal. The successful public-private partnership, often cited as a model of small government, puts a

About Author

Gareth Gibson
Business Development Manager, Geospatial,
Trimble

premium on efficient processes.

Incorporated in 2001, the city began with a clean slate and a desire to create a place of pride for its residents. Focused on a small government, the city partnered with other agencies and the private sector for most of its services, including public works. Since bringing on CH2M to assist with day-to-day public works operations, Centennial has demonstrated the benefits of a public-private partnership, including a flexible system to adjust service quantities based on changing priorities and demands.

It takes good data to maintain that flexibility and efficiency. When CH2M's senior geographic information system (GIS) specialist, John Londo, considered options for upgrading the city's paper and PDF infrastructure maps, he turned to online GIS and mobile applications to capture data in the field.

In the past, users like Londo needed specialized hardware solutions or handheld receivers for their own devices to pinpoint locations to achieve better than typical location-enabled five meters of accuracy.

As part of an early adopter program, Londo was invited to test centimeter-level mapping accuracy on a mobile device using Trimble Catalyst, a software-defined Global Navigation Satellite System (GNSS) receiver for Android devices, integrated with Esri's Collector for ArcGIS app for field data collection.

Trimble Catalyst is revolutionary technology made possible by the increasing processing power of mobile devices and innovative software that replicates the work of a dedicated hardware receiver.

It is an innovation that dovetails with Bring Your Own Device (BYOD) activity in the field and the ability to gather and verify positions quickly on personal smartphones, enabling more mapping and GIS professionals

Figure 1. Centennial Center Park

in the utility space to rely on personal mobile devices for information gathering.

Solution

Londo took the combined Trimble Catalyst with Esri's Collector for ArcGIS system for a test drive at Centennial Center Park, which was designed to provide year-round family friendly enjoyment with a playground, splash pad, amphitheater, plaza and two shelters, all equipped with electricity.

Using Trimble Catalyst on an Android tablet connected to the plug-and-play Catalyst DA1 antenna on a pole, Londo collected about 50 data points for streetlights, hardscaping, electric junction boxes, and other public works assets across the 11-acre park.

By integrating with a wide range of applications and providing a dual-frequency, multi-constellation receiver picking up signals from the DA1, Trimble Catalyst made it possible for Londo to collect data points that were then added to Collector for ArcGIS field software, a collaborative solution for the creation of maps, scenes, layers, analytics and data.

The antenna's small size also makes it easy to store and use on demand, while the Trimble Catalyst subscription gives users the flexibility to choose the level of accuracy to suit their application needs from meter level to centimeters.

> ***"The DA1 antenna is the piece that plugs into your phone or tablet and allows you to have that high accuracy."***
>
> John Londo
> Senior GIS specialist, CH2M

"In the past, you would go and shoot a bunch of stuff and think, yes, that looked good, but what you were seeing were the points on a blank screen with no reference data," he said. This sometimes led to discovering assets that weren't correctly shot in the field. "Now, while we're out there, we can see everything we need to verify data quality on-the-fly, and can say, 'ok, we missed this manhole cover there or this valve there.'"

For utilities and municipalities, comprehensive digital site maps are invaluable when facing a challenging operating environment that makes accurate and up-to-date mapping of systems and assets more critical than ever.

Previously, public works employees or utility workers might use their smart phones to determine the

location of certain assets, but positioning accuracy was limited to meters. Today, using Trimble Catalyst with a DA1 antenna and their Android devices, field workers can determine how close they are to an asset within centimeters.

Results

For public works and utility professionals, Trimble Catalyst's high-accuracy, on-demand Positioning-as-a-Service is convenient, scalable and, most importantly, can be delivered straight to select Android-based handhelds, smartphones and tablets via state-of-the-art antenna technology.

This flexible access to powerful GNSS technology also allows a wider variety of public works and utility workers to collect and verify the GIS data needed for municipalities to make efficient and informed decisions.

Londo estimates the solution of Trimble Catalyst and Collector for ArcGIS saves about two hours of processing time after a day of collecting data. Because the system displays reliable accuracy estimates while in the field, it is easy to make sure features aren't missed that would force a return to the site. The ability to see and prove accuracy in the field through reference data also adds efficiency to the process, Londo said.

"I haven't been able to do that with a GeoXH, or a handheld unit," he said. "That was the big part I noticed."

By comparison, using professional mapping equipment comes with a much higher cost and isn't always practical. "It's a separate technology solution used for a very specific task," Londo says. "You can't make a phone call on it. You can't text on it.

All it does is capture those points." By contrast, using Trimble Catalyst and Collector for ArcGIS, the crew could gather accurate, verifiable data with a minimal investment.

"If it was just Catalyst by itself, I'd say it's a definite cost saving and it's easy to use," Londo says, "but as a bonus, it also works flawlessly with the Collector for ArcGIS app. The interaction of the two together is the biggest selling point."

Figure 2. Trimble Catalyst DA1 antenna

Since trying Trimble Catalyst with Collector for ArcGIS, Londo has used the system to verify fiber optic cable and electrical boxes, and he plans to use it more frequently in water and wastewater settings as he manages GIS for other projects in New Mexico, Florida and Georgia.

"With utilities, water and wastewater, assets are constantly getting buried in the sand or weeds, so Catalyst would have a broad application," Londo said, "and you can't get higher accuracy for a better price."

Trimble Catalyst in India

The central government of India has taken on many significant initiatives to build and enhance rural and urban infrastructure. The initiatives comprise three major segments: physical, social and environmental. The attention in the rural segment is more directed toward land modernisation, village-level broadband connectivity, rural electrification, rural road and rail connectivity, and health and hygiene. These require enormous amounts of spatial data collection, processing and management across various stages of program implementation.

A scalable, cost effective, open, workflow-integrated and precise data capture tool/solution will enhance the significance of survey and GIS components in these mission-critical programs.

Trimble Catalyst, along with an appropriate subscription-based workflow software, is being positioned as the solution for these large-scale flagship programs. Some of the initial work with Trimble Catalyst in India is expected to turn into pilot implementations soon, which will pave the way for mass deployment.

Figure 3. Trimble Catalyst in the field

INFRASTRUCTURE DEVELOPMENT MONITORING IN RURAL INDIA AFTER CYCLONE PHAILIN USING GOOGLE EARTH SATELLITE IMAGE

Its highly prerogative that we must focus Remote Sensing methods more on mitigation and preparedness rather than rescue.

by Dr. Jajnaseni Rout and Dr. Adikanda Ojha

Image Courtesy: Public Radio International

The infrastructure development has monitored through Google Earth Satellite Imagery makes it possible to collect data of dangerous or inaccessible areas.

Extremely Severe Cyclonic Storm Phailin was the most intense tropical cyclone to make landfall in India since the 1999 Odisha Super cyclone in India. The system was first noted as a tropical depression on October 4, 2013. It emerged into the Andaman Sea during the next day and moved west-northwest into an improving environment for further development before the system was named Phailin on October 9, after it had developed into a cyclonic storm and passed over the Andaman and Nicobar Islands into the Bay of Bengal.

It made landfall on 12th October 2013 near Gopalpur in Odisha coast at around 2130 IST (1600 UTC). It subsequently weakened over land as a result of frictional forces, before it was last noted on October 14, as it degenerated into a well marked area of low pressure.

Cyclone Phailin, hit Odisha during October 2013 with wind gusts of 220 KPH affecting 14,500 villages, 90,000 households & damaging 780,000 hectares of Crop. The high winds and gushing sea that the cyclone brought to Chilika Lake and its surrounding area which is India's largest coastal lagoon and home to a large number of endangered animal and plant species, had hit the eco-system that may take years to recover.

However, OSDMA in collaboration

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with NDMA evacuated over 1 million people & limiting the loss of life to a double digit figure. But despite limited loss of life, the catastrophic storm severely impacted the state, particularly the Districts of Ganjam, Puri & Khordha with a property damage cost of US$1.45 billion.

Due to Government of India (GoI) intervention, World Bank Mission visited Odisha for assessment of damage & need of the Post Phailin impact i.e. specifically life, property & livelihoods of the affected. World Bank, Based on the findings, agreed to extend assistance for disaster recovery & future risk reduction. This being the position, 30,000 disaster resilient houses has been taken up under Odisha Disaster Recovery Project (ODRP) within 5 km from the High Tide Line (HTL) in Ganjam, Khordha & Puri Districts of Odisha.

Odisha State Disaster Management Authority (OSDAMA) has established houses under Odisha Disaster Recovery Project (ODRP) for Rural Odisha Development.

Government has provided not only home but also with sanitation facility and highly developed road. The infrastructure development has monitored through Google Earth Satellite Imagery. The Imagery of the year 2009, 2013 before Phailin and 2017 has used for monitoring the development. Remote sensing makes it possible to collect data of dangerous or inaccessible areas.

Remote sensing applications include monitoring deforestation in areas such as the Amazon Basin, glacial features in Arctic and Antarctic regions, and depth sounding of coastal and ocean depths. Military collection during the Cold War made use of stand-off collection of data about dangerous border areas. Remote sensing also replaces costly and slow data collection on the ground, ensuring in the process that areas or objects are not disturbed.

Figure 1. Satellite Image of year 2009

Figure 2. Satellite Image of year 2013

Figure 3. Satellite Image of year 2017

BUSINESS

March 16 - June 15, 2018

Eli Tamanaha Joins PrecisionHawk as Vice President of Strategic Initiatives

PrecisionHawk Inc., – a leading provider of enterprise drone technology– has recently announced that Eli Tamanaha, co-founder and former chief technology officer of DroneBase, will be joining PrecisionHawk in a newly created position reporting to CEO Michael Chasen. The selection of Tamanaha underscores PrecisionHawk's position as the vanguard of aerial intelligence that drives operational insights and as a drone industry pioneer.

senseFly Announces the Appointment of New CEO, Gilles Labossière

senseFly, the leading provider of professional mapping drones and a commercial drone subsidiary of Parrot Group, has appointed its new CEO, Gilles Labossière. Labossière is the Executive Vice President and COO of Parrot Group, a position he will continue to hold as he focuses on boosting senseFly's growth in the professional drone space.

Woolpert Hires Geospatial Scientist Steve Ambrose as Program Director for Government Solutions

Woolpert has hired Steve Ambrose as Program Director for its Government Solutions market. Ambrose's extensive experience with disaster management, remote sensing and applied science will support the firm's work with critical infrastructure, natural disasters, climate change and information systems.

Autodesk Appoints Karen Blasing To Board Of Directors

Autodesk, Inc. has appointed Karen Blasing to its Board of Directors. Most recently CFO of Guidewire Software, Blasing has more than 25 years of financial leadership experience. She will also serve as a member of the company's Audit Committee. Ms. Blasing most recently served as Chief Financial Officer of Guidewire Software, where she led the financial operations of the company and helped establish a technology platform that enhances insurers' ability to engage and empower their customers and employees.

National Geospatial-Intelligence Agency Awards Leidos $250 Million Task Orders

Leidos was awarded 7 task orders by the National Geospatial-Intelligence Agency (NGA) under the Multi-Intelligence Analytical & Collection Support Services (MACSS) program. The task orders will be executed over the next five and a half years at a total contract value of approximately $250 million.

Woolpert Awarded $2M PennDOT Photogrammetry Contract

he Pennsylvania Department of Transportation (PennDOT) has signed Woolpert to one of three statewide photogrammetry contracts. The five-year, $2 million contract is for geodetic survey and photogrammetric mapping, including stereo-compliant aerial and mobile lidar collections.

Deimos Imaging Awarded Contract Exceeding USD $2,6M By The Brazilian MoD

Deimos Imaging has entered into a contract with the Brazilian Ministry of Defence's Aeronautics Command (COMAER) exceeding $2.6 million US dollars. The Contract requires Deimos Imaging to supply Earth Observation products and services from the Deimos-2 satellite, during an initial period of three years that could be extended up to five years. Payments are expected to be spread equally over the initial three-year period.

Esri Location Intelligence to Integrate with SAP HANA Spatial Services

Esri has recently announced that Esri's ArcGIS software is integrating into SAP's latest cloud-based offering, called SAP HANA spatial services, to help customers create location-aware business applications faster. Based on SAP Cloud Platform, the new offering enables businesses to process location data such as complex imagery, as well as visualize and analyze their authoritative data in a geospatial context.

Deimos Imaging Awarded GSA Contract

Deimos Imaging and UrtheCast have been awarded a GSA Multiple Award Schedule (MAS) 070 contract by the U.S. General Services Administration (GSA), the procurement arm of the federal government. This is the first time that a European company in Earth observation services has been awarded such a contract in the U.S., making Deimos Imaging's full portfolio of products and services available to all U.S. government agencies.

Bentley Systems Acquires Plaxis, and Complementary SoilVision, to Integrate Geotechnical Engineering within Digital Workflows for Infrastructure Projects

Bentley Systems has recently announced the acquisition of Plaxis, the leading provider of geotechnical software, based in Delft, Netherlands, and the agreement to acquire soil engineering software provider SoilVision, based in Saskatchewan, Canada. The acquisitions, with Bentley's market-leading borehole reporting and data management software gINT, serve to make Bentley a complete source for geotechnical professionals "going digital." Finally, BIM advancements can be extended to the essential subsurface engineering of every infrastructure project.

East View Geospatial Now Offering PlanetSAT 10-meter Global Mosaic

East View Geospatial (EVG) has announced the availability of PlanetSAT Global #2018, the most up-to-date global imagery basemap. Produced by EVG partner PlanetObserver, PlanetSat Global #2018 has an unmatched 10-meter resolution and provides accurate geographic information for any part of the world. Users benefit from a seamless view of the Earth with recent cloud-free satellite imagery in high-quality natural colors.

Greece Launches Its Own Space Agency – Hellenic Space Organization

Almost a year and a half since the first announcement of its creation, the Hellenic Space Agency was officially launched on March 19, by Minister for Digital Policy Nikos Pappas and General Secretary for Telecommunications and Post Vassilis Maglaras. Greece has been a member of ESA since 2005 and has invested millions of euros in ESA's research programmes but was one of the few member states lacking a national institution. Greece expects to gain from the new agency, among them, telecommunications infrastructure, defense, medical applications, agriculture, environmental monitoring, fire prevention and control.

JAXA Successfully Deployed First Kenyan Satellite

On May 11, 2018, the first CubeSat developed under the KiboCUBE programme has been successfully deployed from the Japanese Experiment Module "Kibo" of the International Space Station. This CubeSat, named "1KUNS-PF" was developed by a team from the University of Nairobi. 1KUNS-PF was developed as Kenya's first satellite, and the University of Nairobi will operate the CubeSat after its deployment from "Kibo".

Esri Announces Release of Sentinel-2 Image Services

Esri has announced that it is releasing Sentinel-2 Image Services to all Esri users for no additional cost. Sentinel-2 is an Earth Observation Satellite that provides multi-spectral imagery for any location in the world at 10-meter resolution. Currently in beta, the service is updated daily with new imagery for all ground locations every 5 to 7 days. The Sentinel-2 Image Services provide temporal, multi-spectral imagery of the entire globe for improved monitoring.

Sri Lanka Survey Department Released New Sri Lanka Maps

After 18 years, the Sri Lanka Survey Department (SLSD), the national surveying and mapping organization under the Ministry of Land and Land Development have decided to update the geographical map of Sri Lanka. The new map produced by the 1:500 ratio will include features like Moragahakanda reservoir and various other schemes. Measures have been taken to produce printed copies of this map by June mid, while digital maps are made available.

Belarus, Russia, Kazakhstan to Make Space Satellites Together

Belarus, Russia, and Kazakhstan have come to terms on manufacturing cooperation for making satellites for the remote sensing of Earth. The decision was made at the latest session of the interstate working group in charge of working out the interstate government program "Integrated system of providing space and geoinformation services based on national sources of remote Earth sensing data", as reported by BelTA.

Sentinel-3B, 7th Satellite of the Copernicus Programme Launched Successfully

On 25 April 2018 at 19:57 CEST, the Earth observation satellite Sentinel-3B lifted off on a Rockot launcher from the Russian cosmodrome in Plesetsk. With Sentinel-3B, the seventh satellite of the Copernicus programme has been launched and the first four satellite missions of the Copernicus space segment are now complete. The oceans are the focus of the mission, but large-scale changes in land areas will also be recorded.

Studying Soil Erosion from Space

Geologist and geochemist Isaac Larsen at the University of Massachusetts Amherst has a grant from NASA to study soils in a whole new way, from space. Isaac Larsen is an expert in soil production, erosion, human impact and the evolution of the agricultural landscape, Larsen has been awarded a three-year, $265,000 New Investigator Program grant from NASA's Earth Science Division. Most of this work will use existing images, Larsen says. He and a graduate student will come up with creative ways to use space-based data to study Earth's soils not only using public NASA data, but also high-resolution commercial images that NASA and the National Geospatial-Intelligence Agency can make available for research by agreement with private companies.

Hyperspectral Instrument DESIS En Route to International Space Station in 2018

The German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt; DLR) and the United States corporation Teledyne Brown Engineering (TBE) are announcing the completion of the development and manufacturing process of the DLR Earth Sensing Imaging Spectrometer (DESIS) hardware. The DESIS environment and resource monitoring system will launch to the ISS in the summer of 2018.The hyperspectral sensor system has a spatial resolution of 30 metres. DESIS will be DLR's first instrument for the analysis of hyperspectral data on the ISS. The continuous coverage of the Visible Near Infrared (VNIR) spectral range makes DESIS a multi-purpose instrument, which will help to gain new knowledge about agriculture, biodiversity, geology and mineralogy, coastal zones, water ecosystems, desertification and to detect changes in general.

Sketch Design for New Belarusian-Russian Satellite in 2019

Belarusian and Russian specialists have already started creating a new satellite for the extremely high resolution remote sensing of Earth. According to the source, they intend to finish its initial design in 2019. The results will determine the final deadline for creating the satellite, the volume and the cost of the work. The new satellite will expand the Belarusian-Russian constellation of satellites for the remote sensing of Earth. It will boast improved parameters in comparison with the existing satellite and will be able to tackle more tasks.

TCarta Delivers Satellite-Derived Land/Sea Floor Surface Models for Caribbean Disaster Recovery

TCarta, a global provider of marine geospatial products, has delivered pre- and post-disaster surface models for the Caribbean islands of Antigua and Barbuda for use in Hurricane Irma recovery efforts. The satellite-derived surface models contain seamless datasets of onshore elevation and offshore water depth measurements for each island. TCarta won a competitive tender, which specifically requested end products derived from satellite imagery. For the seafloor dataset, the TCarta team generated Satellite Derived Bathymetry products by extracting accurate water depth measurements from high-resolution multispectral imagery acquired by the DigitalGlobe WorldView satellites. In the clear Caribbean waters around Antigua and Barbuda, bathymetric points were delivered on a 2-meter spacing to deeper than 20 meters. TCarta team created digital surface models of the terrain on Antigua and Barbuda, utilizing a technique to derive surface elevations at 0.5-meter point spacing from multiple WorldView images captured over the islands. Vegetation was then removed from surface models to yield bare-Earth elevation models.

Earth-i Releases Its First Full-Colour Video of Earth Taken From Space

Earth-i has released the first video taken by VividX2, the technology prototype for its Vivid-i Constellation. Launched on 12 January 2018, VividX2 is the world's first commercial satellite able to provide full-colour video of life on Earth. Weighing 100kg and measuring approximately 1 cubic metre, VividX2 is orbiting at 505km above the Earth and travelling at approximately 7km per second. At the heart of the satellite is an Ultra High Definition camera that captures high-resolution images for any location on Earth – and also films up to two minutes of video at a time as it passes over each target.

Genesys International Corporation Ltd Bags Prestigious TAPI Mapping Project Using LIDAR

Genesys International Corporation Ltd has been awarded the prestigious TAPI mapping project using LIDAR. won against international competition – this project win is an extension of the company's expertise in handling complex and mission critical mapping projects in the infrastructure space using latest mapping technologies. The Turkmenistan – Afghanistan – Pakistan – India (TAPI) Gas Pipeline Project will serve as an important energy input for India.

Remote Sensing to Detect Horizontal Motion of Glacier Grounding Lines

The UK Centre for Polar Observation and Modelling (CPOM) at the University of Leeds has produced the first complete map of how the ice sheet's submarine edge, or "grounding line", is shifting. The team, led by Dr Hannes Konrad from the University of Leeds, found that grounding line retreat has been extreme at eight of the ice sheet's 65 biggest glaciers. The pace of deglaciation since the last ice age is roughly 25 metres per year. The retreat of the grounding line at these glaciers is more than five times that rate. This retreat has had a huge impact on inland glaciers, because releasing them from the sea bed removes friction, causing them to speed up and contribute to global sea level rise. Grounding lines typically lie a kilometre or more below sea level and are inaccessible even to submersibles, so remote sensing methods for detecting them are extremely valuable.

Geodiversity Map of Sikkim Himalayas to Aid Conservation

In a maiden effort, researchers have mapped the plant diversity of the Sikkim Himalayas on the basis of geography and climate data, to create a 'geodiversity index that can serve as a tool for biodiversity conservation and disaster risk reduction. The 'geodiversity index map' of flora of Sikkim in the eastern Himalayas would also enable resource managers and conservationists to assess the number of species according to altitude, to understand the nature of environmental change in the region and how the plant species are adapting to the change.

NMCAs to Develop New Core Reference Dataset for Europe

EuroGeographics has announced it is developing a new core reference dataset using INSPIRE-compliant geospatial information from official national sources. The international not-for-profit membership organisation for Europe's National Mapping, Cadastral and Land Registration Authorities (NMCAs), has signed an agreement with Germany's Federal Agency for Cartography and Geodesy (BKG) to coordinate technical production and quality management. A prototype, focusing on transportation (road and railway) and hydrography themes, is to be available in Autumn 2018 and will also include basic feature types and attributes. This will be followed by the launch of the first version of the new dataset in Spring 2019.

Sentinel-1 and Sentinel-2 Missions Helping to Map Minerals in Africa

ESA has recently supported a pan-African initiative to collect, interpret and disseminate satellite information on geology and mineral resources such as metallic ores. This ESA-funded effort has paved the way for the German geo-information company GAF to help the African Mineral Geoscience Initiative. The aim of initiative, which is led by the African Union Commission and supported by the World Bank Group, is to catalogue Africa's geology and mineral resources. This task is made somewhat easier thanks to freely available data from the Copernicus Sentinel-1 and Sentinel-2 missions, as well as information from other satellites such as NASA's Shuttle Radar Topography Mission and the US WorldView-3. The idea is to produce geological maps for various climatic zones and different types of geology, especially in areas where data are scarce, not sufficiently detailed or outdated. Initial results show that while arid and semi-arid areas can be mapped accurately, tropical areas are more of a challenge.

India Fastest Growing Market for UAVs; To Touch $886 mn by 2021

India is one of the fastest-growing markets for unmanned aerial vehicles (UAVs), and one of the top UAV importers for military purposes worldwide. According to global market intelligence and advisory firm BIS Research, by 2021, the Indian UAV market will reach USD 885.7 million, while the global market size will touch USD 21.47 billion. A special report noted that customer-focused innovation in UAV technology and the rise in demand for UAVs for surveillance, civil, and commercial applications from global markets will drive this growth.

MDA to Provide RADARSAT-2 Information to Meet Critical and Complex Challenges for Land and Maritime Monitoring

Maxar Technologies company (formerly MacDonald, Dettwiler and Associates Ltd.), has announced recently that it has signed multiple geospatial-related contracts based on RADARSAT-2 satellite information. RADARSAT-2 Synthetic Aperture Radar (SAR) imagery provides users with a unique method of accurately monitoring very large areas to locate, track, measure, and monitor objects. A rich source for analytics, SAR imagery reveals important details about our changing planet and the impact of human activity across the globe.

RADARSAT-2 information can be used for asset monitoring in mining, energy, and other civil markets. MDA has developed a suite of powerful off-the-shelf solutions that exploit SAR imagery and associated information, to support maritime, forestry, infrastructure development, and surveillance applications with high levels of accuracy, and reliability. The contracts have a combined value of approximately CA$16 million

LiDAR

March 16 - June 15, 2018

Headwall Integrates Hyperspectral and LiDAR Aboard UAV Platforms

Headwall has introduced advanced sensor payloads consisting of hyperspectral sensors and LIDAR for deployment on Unmanned Aerial Vehicle (UAV) platforms. Through the fusion of spectral imaging data and 3D LIDAR output, Headwall continues to provide new industry-leading capabilities for addressing critical remote sensing applications ranging from civil and military infrastructure inspection to crop science applications requiring discrete solutions for crop monitoring. The Headwall payload consists of a Hyperspec® spectral imager, a LIDAR unit, a UAV, a high-performance GPS/IMU, and the associated software for data acquisition and workflow processing for exploitation. The combination of hyperspectral and LiDAR is especially powerful because the entire data set can be acquired on inexpensive UAV platforms with both sensor instruments operating simultaneously. Headwall's software will allow for the control of both instruments, utilize the Digital Elevation Map for image creation, and allow for the merging of spectral datasets with the 3D point cloud.

New Indoor Mobile Mapping System from NavVis Marks Breakthrough in Data Quality

NavVis, a global leader in mobile indoor mapping, visualization, and navigation, announces the launch of M6, a next-generation indoor mobile mapping system that overcomes the scalability and data quality constraints of today's reality capture technology. Surveyors and AEC professionals can now use reality capture technology for demanding applications, such as large-scale indoor mapping projects, factory planning, creating and updating as-built BIM models and construction monitoring. The NavVis M6 is an all-in-one system that captures 360 degree immersive imagery, photorealistic point clouds, Bluetooth beacons, WIFI signals and magnetic field data. The NavVis M6 features a mobile LiDAR system that lets it scan up to 30 times faster than stationary devices, letting users capture up to 30,000 square meters in a day. What truly sets M6 apart is the cutting-edge 6D simultaneous localization and mapping (SLAM) technology, which significantly improves the quality of data captured.

New Zealand Major Funding Boost for LiDAR Survey

Gisborne District Council will receive over $1 million in funding to fly LiDAR across the entire district, a project that will bring major economic and infrastructural benefits for the region. Ministry for Primary Industries and Land Information New Zealand have provided the funds that will cover the entire cost of the project. LiDAR – which stands for light detection and ranging – is a remote sensing tool that uses laser pulses to generate large amounts of highly accurate geographical terrain data. Once completed, the LiDAR survey data will be free for the public and commercial businesses to use in a range of areas, including infrastructure design, urban planning and flood plan mapping. The data will assist in road design and planning, as well as management of erosion and flooding in rivers in the district. It is likely the LiDAR flying will take place in early summer.

GNSS & SURVEYING

March 16 - June 15, 2018

PSLV-C41 Successfully Launches IRNSS-1I Navigation Satellite

India's Polar Satellite Launch Vehicle, in its forty-third flight (PSLV-C41) in XL configuration launched IRNSS-1I Satellite from First Launch Pad (FLP) of SDSC SHAR, Sriharikota. The 'XL' configuration of PSLV is used for the twentieth time. The IRNSS-1I is the eighth satellite to join the NavIC navigation satellite constellation. IRNSS-1I is the latest member of the 'Navigation with Indian Constellation (NavIC)' system. NavIC, also known as Indian Regional Navigation Satellite System (IRNSS).

HERE SuppBrexit May Exclude UK from the EU's Galileo Satellite Program

According to recent news, British companies may be frozen out of the European space industry after Brexit, the European Commission says, citing security concerns. The UK's involvement in the Galileo project, which aims to build a European rival to the American GPS system, will have to be "readjusted", it added. British firms have already contributed to Galileo and may lose future work. UK ministers oppose the commission's view and want the country to remain involved in "all aspects" of the work.

IAI And Honeywell Propose a Jointly Developed Turn Key GPS Anti-Jam Navigation System

Israel Aerospace Industries (IAI), and Honeywell, have signed a Teaming Agreement (TA) to introduce the market of airborne avionics with a jointly developed turnkey GPS Anti-Jam navigation system. The joint product integrates IAI's GPS Anti-Jam system with Honeywell's navigation products, as a subsystem or as an embedded solution. Upon successful development, IAI's GPS anti jamming system the ADA, an advanced system that protects avionic systems from GPS jamming, will be embedded into Honeywell's Global Positioning System/Inertial Navigation System (EGI).

European GNSS Agency And Thales Launch EDG²E, A Dual-Frequency Multi-Constellation Receiver

ccording to recent news reported by the GPS World, together the European GNSS Agency (GSA) and Thales has launched a equipment for dual frequency Galileo, GPS and EGNOS project (EDG²E). The four-year-long project intends to develop a dual-frequency multi-constellation receiver, for enhanced navigation capabilities, support standardization and certification preparation, and facilitate the expected increase in air traffic, both in Europe and globally.The prototype EDG²E receiver use GPS and Galileo signals as well as those from the EGNOS. The project aims to achieve a prototype demonstration by 2021. At the end of the EDG²E project, the first SBAS dual-frequency GPS+Galileo receivers for aviation will be ready for final development and use in the aviation sector and in other safety-critical applications.

PRODUCT LAUNCH

March 16 - June 15, 2018

GIS & EO

Esri
- Esri Announces Release of Sentinel-2 Image Services
- Esri Announces Online Data Portal for Africa

Kongsberg Geospatial
- Kongsberg Geospatial Announces Official Release of TerraLens 9 Geospatial SDK

Vricon
- Vricon Precision 3D Registration (P3DR)

FARO
- FARO® Introduces As-Built™ Software Platform For 3D Digital Modeling

TatukGIS
- TatukGIS Desktop Editor/Viewer 5

Boundless
- Boundless Server Enterprise Now Available as Managed Cloud Service
- Boundless Introduces New Lightweight, Portable, Offline Basemap Server

NCTech
- iSTAR Pulsar

LiDAR

Skyline Software Systems
- Photomesh™ 7.4 With LiDAR Integration and Improved Aerial Triangulation Capability

Merrick
- Version 2018 of the Merrick Advanced Remote Sensing (MARS®) software suite.

Voxxlr
- Voxxlr 1.0, a cloud based service to store, analyze and share large 3D point clouds entirely online.

Global Mapper
- Global Mapper and LiDAR Module SDK v19.1 Now Available with New 3D Mesh Generation Capabilities

Orbit GT
- Orbit GT Releases 3D Mapping Feature Extraction Pro V18.0.6

Trimble
- Trimble RealWorks Announces Performance and UI Enhancements

GNSS & SURVEYING

Trimble
- Trimble Business Center Software Adds New Vertical Solutions Support and Streamlines Field-to-Office Productivity
- Trimble Announces New Field Solutions for Land and Construction Surveying
- Trimble's Forensics Solution - SX10 Solution, a hardware and software data collection and processing system for collision and crime scene reconstruction.

Sokkia
- Sokkia Introduces New High-performance Manual Total Station - the iM-50.

Hemisphere GNSS
- All-new UT series of GNSS-capable rugged handheld devices - UT10 6.0" Rugged Phone and UT30 8.0" Rugged Tablet.

DRONE/UAV

senseFly
- eMotion 3.5 - flight and data management software

Sentera
- High-Precision AGX710 Sensor with Dji Matrice 200 Series Industrial Drones

NEW DATA RESOURCES

PlanetObserver
- Release of PlanetSAT Global Imagery Basemap Version #2018

Asian Development Bank and Govt. of Afghanistan
- Launched "Afghan GeoPortal" to Improve Data Access, Sharing

GEO EVENTS

June 25 - 29, 2018
Geomapplica 2018
Syros – Mukonos Islands, Greece
http://2018.geomapplica.eu

July 03 - 06, 2018
GI_Forum Symposium 2018
Salzburg, Austria
http://www.gi-forum.org

July 09 - 13, 2018
Esri User Conference
San Diego, CA, U.S.A.
http://www.esri.com/about/events/uc

August 27 - 31, 2018
FOSS4G 2018
Dar es Salaam
https://2018.foss4g.org

September 02 - 07, 2018
UK Mapping Festival 2018
London, United Kingdom
https://goo.gl/crkBeh

September 05 - 07, 2018
InterDrone 2018
Rio Hotel, Las Vegas, NV, U.S.A.
http://www.interdrone.com/

October 01 - 03, 2018
Commercial UAV Expo
Las Vegas, USA
https://www.expouav.com

November 28 - December 01, 2018
16th World Congress of the International Association of Institutes of Navigation (IAIN)
Makuhari Messe, Japan
https://iain2018.org

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