





2018 Submissions



Potential application
in mining industry



University / Research Institute
Submission

Company	Industry (sector)	Description
 Centre for Geographical Information, Stellenbosch University	Geoscience / Conservation	CGA has developed an Earth observation method for monitoring how much water is being used by irrigation. The team aims to automate the methodology so that the procedure is operationalized. The intention is to develop a geospatial online platform and/or app through which authorities can view which areas are actively being irrigated and how much water is used.
  Council for Geoscience	Data analytics / Meteorology	The Council for Geoscience aims to establish a national integrated Environmental Prediction System. This will be achieved by developing several innovative predictive algorithms, which integrate all time-stamped satellite data with other terrestrial geoscientific datasets, including geological, geophysical and drilling information.
 Digitech	Data analytics / Farming	Digitech uses machine learning to analyse patterns related to weather that affect farming capabilities, water availability, and to track historical analysis and data to help farmers understand their environment for the improvement of commercial and subsistence farming.
Independent	Engineering	The submission proposes to create a navigating system to be used directly by humans, similarly to what currently used for cars. This will include an ear piece that can be used to navigate many areas, or other functions depending on what the needs of the user is. For example, it can be used to assist the physically disabled.
Visual Matrix	Geoscience / Education	Visual Matrix have developed an innovative, three-phase approach to the training and development of GIS and remote sensing professionals. Phase 1 entails training, tutoring and mentoring provision through various faculties and institutions; phase 2 consists of post-graduation entrepreneurship or partnership support through consulting services. Phase 3 consists of partnering with local government for service delivery.







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Company	Industry (sector)	Description
  University of Johannesburg	Geoscience	The use of optical and RADAR satellite remote sensing for routine water quantity and quality assessments. As an alternative to the inherent inefficiencies of traditional water quantity assessments, they aim to use Synthetic Aperture Radar for dam water level assessments.
 University of the Witwatersrand (WITS)	GIS/Remote Sensing	This WITS student proposed to design a spatially explicit and quantitative technique to enhance detection of small-scale forest disturbances in an Afromontane tropical forest system, by merging optical and SAR time series, and characterizing such disturbances using ancillary data.
Geofarm	Data analytics / Farming	Geofarm is a start-up company focused on providing farmers that are moving towards precision farming techniques with a user-friendly platform to collect, analyse and interpret data in the most cost-effective way possible. The platform integrates and analyses data from remote sensors on the ground, as well as high resolution satellite imagery for holistic, precise and real-time information on crops.
 University of the Witwatersrand	Data analytics / Farming	This research study on crop epidemiology aims to examine the utility of integrating Sentinel-1A SAR and Sentinel-2B MSI data to map more accurately and effectively the spatial-temporal changes of intercropping, in this case study, potato crops, in the South African environment, which has never been done before.
  University of Fort Hare	GIS / Remote Sensing	This proposal aims to design an app to monitor the influx and evapotranspiration of rainfall, and water usage in regions with high water usage, in order to have early indications of potential water stress situations. This app will give an indication of methods and quantities of irrigation needed. The app will automatically geolocate the user to provide real-time, geographically-accurate data.



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Company	Industry (sector)	Description
BKM Data Analytics	Data analytics	BKM Data Analytics proposes to use big data and analytics to gain insights on geospatial data and provide meaningful recommendations. The information gathered is not limited for public use only but can be used for commercial purposes.
Department of Public Works	Geoscience	This project aims to monitor the loss of agricultural land associated with urbanization by using an analytic approach that can be on a municipality level. The goal of this project is to maintain and preserve agricultural land that is being lost through urbanization.
Shuri	Data analytics	In order to improve the accuracy of current forecasting methods, Shuri will integrate weather data, prediction models and a machine learning algorithm.
 Samaita	Development	Team Samaita aims to design multi-year economic, social development and human rights programme ecosystems linked to all sectors and at all levels of government, political/inter-governmental/ civil society organisations at local, national, regional and continental levels (Duty Bearers (DBs)). Such ecosystems are aimed at benefiting persons with disabilities, other vulnerable groups and the general population (all referred to Rights Holders or RHs).
 RSANL	Geoscience	This research study aims to explore and uncover new possibilities of GIS, RS and drone technologies for monitoring climate change impacts on water resources in South Africa.

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Company	Industry (sector)	Description
N and M Technologies	Environmental science	N and M Technologies has a unique, patented water harvesting technology which is the first of its kind on the African continent, which can produce water from the atmosphere without the presence of rainfall, or fog or mist.
Gemini GIS & Environmental Services	Geoscience	Gemini aims to develop an interactive application that will be a decision-making tool that will show variations and project crop yields. This project is a cross-cutting tool that will inform decision-making in Agricultural and Infrastructural sector among others.
 University of KwaZulu-Natal	Geo-spatial Analysis	This proposal aims to monitor water quality in the Inanda Dam, particularly chlorophyll-a and total suspended solids, using remote sensing.
 Independent	Geospatial Data science	The proposal aims to develop a standardised approach for identifying, mapping (informal settlement and building footprint boundaries) and addressing informal settlements to support National Support Upgrading Programme (NUSP) projects.
 Tokafatsa	Electrical Engineering	Tokofatsa proposes the use of satellite data to identify residential properties, and use the X-Y coordinates to register the properties without the need of surveyors. Furthermore, it suggests the novel use of an online interactive map for property owners to verify their properties.



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Company	Industry (sector)	Description
Have no plastic	Cleantech	Modelling the movement and density of ocean plastics for eventual reclamation or recycling.
  Mintek	Cleantech / Mining	Mapping and monitoring mine waste in South Africa.
Thiinknobs	Digital agriculture	Digital agriculture management and education platform allowing farmers to obtain better yields of Bambara nuts.
WGS Aerial Surveys	Agriculture	Prediction of sugarcane yield with EO data and Machine Learning.
Initio Earth Sciences	Agriculture	Combination of camera-, 3D scanning and EO data to track fruit crop yield for orchards.


2017 Submissions

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Company	Industry (sector)	Description
Aerobotics	Agriculture	Estimating crop moisture content using remote sensing.
Umvoto Africa (pty)LTD	Environmental conservation	Solving problems of environmental degradation threatening water and food security in a major costal cities.
Digitalk (Pty) LTD	Agriculture	Invasive plant species eradication management.
 Mangosuthu University of technology	Agriculture	Measuring the types of crops grown for compensation to small holder farms.
 North-West University and geospacer international	Agriculture	Creating crop estimates that are real time and less labour intensive.

2017 Submissions

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Company	Industry (sector)	Description
 Cape peninsula university of technology	Land reform	An incremental approach to land reformation through fit-for-purpose mapping.
 Africascope SA	Data analytics	Using EO data and object recognition algorithms to identify individual dwellings in communities, assisting in census data.
Smart solar	Cleantech / Tracking	An integrated system that uses dual axis solar tracking by using EO data.
Labserve analytical service and digital Earth	Agriculture	Asses sample data to improve productivity in the agricultural sector.
 Ontolligent Software services	Urban planning	A Smart sustainable information resource that monitors urban trends.

2016 Submissions

Company	Description
<p>Drone Clouds</p>	<p>Drone Clouds is a mobile application using up-to-date imagery and analysis from satellite & drones to assist farmers to:</p> <ul style="list-style-type: none"> • Identify where plants are stressed • Save time and money caring for their plants • Have better and more predictable yields • Seeing & understanding plant stress helps the farmer understand how to efficiently use water, fertilizer and pesticides • Better farming ensures food security and conserves our resources
<p>Mobbisurance</p>	<p>Mobbisurance focuses on providing access to affordable crop insurance to emerging farmers.</p> <ul style="list-style-type: none"> • Utilising satellite data extensively to create a technological platform enabling insurers to insure against specific weather related risks • Service will be fully accessible from mobile devices. • Everything from applying for cover to having a pay-out issued will be done via a mobile app on the client's mobile phone.
<p>MySmartFarm</p>	<p>MySmartFarm is a data management and services company that helps farmers frustrated with the collection and interpretation of information from multiple sources.</p> <ul style="list-style-type: none"> • Various kinds of data are collected and aggregated in order to present usable information for each field on easy to use mobile dashboards.
<p>GISCAPETOWN</p>	<p>GISCAPETOWN uses satellite image applications to address artisanal mining challenges in Africa</p> <ul style="list-style-type: none"> • Uses a multi-disciplinary, network-based approach to examine artisanal mining at a global and regional level. • Satellite imagery and processing methods are developed according to challenged-based constraints • The satellite imagery within a GIS serves as a dialogue interface and strategic planning tool.

2016 Submissions

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<p>Umvoto</p>	<p>Umvoto uses GIS and Remote Sensing to provide practical solutions to challenges e.g. groundwater exploration, geo-hazard assessment, environmental planning, town planning and development and mineral exploration</p> <ul style="list-style-type: none"> • The aim through this project was to utilise EO data and technologies to mobilise, monitor, model and manage groundwater resources in extending the footprint of Concentrating Solar Power (CSP) Generation within Semi-arid Regions
<p>Africa Geo-Data</p>	<p>Africa Geo-Data proposes the use use satellite imagery, Digital Elevation Models (DEMS) and Video Game theory to create innovative and amazing visual and interactive products to support the video game industry</p> <ul style="list-style-type: none"> • Secondary markets include education and tourism industries • Virtual Reality (VR) games will help to improve and rejuvenate the understanding of geography, appreciation of architecture, built environments, awesome landscapes, diversity of cultures, historical events, discoveries, explorations, and expeditions that embrace our common humanity
<p>Netbrain Integrated Solutions</p>	<p>Netbrain offers a solution that can be used in the safety and security sector and for urban development tracking</p> <ul style="list-style-type: none"> • The approach includes a middleware stack implementation solution, serving as a gateway for requests from satellite data and consumers of information to route the requests to the appropriate information source
<p>Quartex</p>	<p>Quartex proposed a mechanism for continuous data collection, providing working data set for planners and policy makers allowing them to make decisions as to where to best expend resources for the provision of services (sanitation, water, health and education) to the vast underserviced population in South Africa</p> <ul style="list-style-type: none"> • Comprehensive, time based data sets will facilitate the processes for the whole of South Africa and alleviate the requirement for new analysis at every local and district municipality and at provincial level. • This dataset will form the basis to determine where the data is not sufficient and allow for the local community to collect field data through the use of mobile survey applications.

2016 Submissions

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<p>Metagrated</p>	<p>Metagrated proposed the creation of technological solutions designed to support operational workflow in the public safety environment</p> <ul style="list-style-type: none"> • Dissemination of seemingly disparate data into actionable intelligence, through the ‘intelligence life-cycle’ of planning, direction, collection, processing/exploitation, analysis/production, supported by geospatial and temporal correlation
<p>TATA</p>	<p>Remote sensing has been successfully used for identifying crop types, monitoring crop health, and for forecasting yield</p> <ul style="list-style-type: none"> • TATA’s first proposal envisages an end-to-end solution for analysing remote sensing data in order to provide timely advice to the farmers • The core of the project delivers the required analytics platform coupled with integration of ground based sensor for crop monitoring and yield forecasting • A second proposal suggests a novel solution for monitoring urban quality of life and automation of land record maintenance, delivering an analytics platform for urban pollution monitoring and verification of urban land records
<p>North-West University</p>	<p>Vulnerability assessments are approached differently by different sectors, e.g., environmental, developmental and disaster risk management and research highlights the need for geospatial data derived from Earth Observation platforms in an integrated geospatial data model</p> <ul style="list-style-type: none"> • The African Centre for Disaster Studies (ACDS) undertook a study aiming to further research and develop methodologies to create user-defined data in the shortest possible time, focusing on recurrence and continued use of EO data • The respondent wishes to further research and to improve methodologies developed so far, in order to create large scale datasets that may have commercial value

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Company	Description
<p>University of KwaZulu-Natal</p>	<p>Realistic observations and measurements of local precipitation effects from ground equipment require space bourn tropospheric observations from satellite data, in form of radar images over South Africa and other parts of Africa.</p> <ul style="list-style-type: none"> • Satellite data to be acquired will serve as useful resource to validate, synchronise and calibrate the effects of rainfall on communication systems through the assessment of cloud dynamics and droplet scattering mechanism. • This will help in the improvement of terrestrial and earth-space communication systems operating at microwave and millimetre-wave bands, leading to improved wireless services for high-end end customers in the telecommunication, space and aerospace industry.
<p>Cognitive Systems</p>	<p>Cognitive Systems proposed an AME- Artificial Mind Engine, suited for analysing real-time complex data streams</p> <ul style="list-style-type: none"> • Its unique feature is “instream cognition & harvesting perishable insights from multiple sensors” • It consists of software agents that collect, integrate, sort, learn & adapt to changes in the environment • It is massively scalable yet deployed on affordable hardware & is independent of platform & communication protocols • Applications specific to earth observation data include: Marine ecosystems and water observations Water quality in ports Monitoring of Climate Change
<p>Mosaic Analytics</p>	<p>The company focuses on the application of spatial systems and technology across a wide range of sectors, with a strong emphasis in the environmental management and conservation sectors</p> <ul style="list-style-type: none"> • Particular focus on providing novel spatial, analytical approaches which provide clients with new insights from their existing datasets • Mosaic Analytics integrate client datasets with a range of data from other sources to extract greater value from these datasets, and thus provide clients with information which gives them a competitive edge • Existing tools (developed by ESRI) can be used in conjunction with earth observation data in order to develop insights associated with various applications including environmental monitoring and management; disaster management; agriculture; health; safety and security, general research, nature conservation and for commercial use, urban development;

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Company	Description
National Institute for Communicable Diseases	<p>Remote sensing, geographical information systems, and spatial analysis have been used elsewhere in Africa to map the distribution of schistosomiasis, but generally at fairly low resolution (country or regional scale).</p> <ul style="list-style-type: none"> NICD proposes to use the modern earth observation data that is now available to study the epidemiology and ecology of schistosomiasis at much higher resolution (district, municipality and community levels), and provide data that will allow the national health service to make rational decisions about controlling the disease, and allow the country to catch up with its African peers in the field of schistosomiasis mapping
Protek Advanced Systems	<p>They proposed examining the movement and the migration of animals within all 22 National Parks with over 4 decades of data obtained from the SANSA archives, using advanced Unmanned Aerial Vehicles (UAVs) to illustrate the locations to which the animal herds migrate to in different seasons</p> <ul style="list-style-type: none"> This geospatial data will be compared to the existing data received on a daily basis which will indicate whether or not the patterns may be recursive. The data will allow for security observations of poaching activities in the areas herds of animal Data collected will also be interpreted by an application with telemetric capabilities to capture heat (infrared) and perform advanced mathematical calculations at specified times allocated by game rangers to allow concurrent data to be processed which can be analysed
South African Geomatics Institute	<p>SAGI proposed a “Geo-Compliance” portal in which various predetermined layers (temporal) are visible to the consumer</p> <ul style="list-style-type: none"> The Portal will bring complex data to the consumer in a meaningful way, and will also allow access to data at a reasonable cost, assisting society, consumers, banks, municipalities, supporting the implementation and enforcement of legislation amongst other aspects, Additionally banks can assess risk in a better manner prior to granting development loans and mortgages

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Company	Description
<p>Spatial Management Consulting</p>	<p>SMC Synergy CC is working with the Department of Environmental Affairs to assist with the area-wide-planning (AWP) and the development of a monitoring and evaluation frameworks for the Ntabelanga site on the Tsitsa River, identified as the site for domestic and irrigation water supply, and regional development potential.</p> <ul style="list-style-type: none"> • High resolution remote sensing and digital elevation models will be crucial in the AWP process which will include -land use/cover mapping, erosion modelling, prioritization of rehabilitation sites as well as planning of structures and other interventions. • SMC Synergy proposes the use of Airbus spatial data to form part of standard operating procedures within the NRM programmes as well as other branches within DEA e.g. SANBI in the future.
<p>SRK Consulting</p>	<p>SRK proposed an investigation into the potential for using high resolution satellites to monitor the daily fluxes in water distribution and evaporation from tailings dam, which will allow for a better understanding of water availability on mines and the stability of these structures</p> <ul style="list-style-type: none"> • This has the potential to increase mine water use efficiency and increase the confidence in tailings stability, reducing the cost of construction and footprint while simultaneously reducing the chances of a devastating failure • SRK wants to explore the potential of high resolution satellite data for ongoing monitoring of moisture and evaporation from tailing facilities (TSF's) • This would include exploring the potential for coupling high resolution data from Pléiades1 and 2 and from Spot 6 and &7, where tailings deposition and surface water area could be monitored and compared to evaporation calculated at a courses scale using Landsat 8 • This information will also be fed into water balance and design criteria to provide more accurate calculations of evaporation and better inform the design and estimated life span of the TSFs, allowing for better management of TSFs on mines and better management of water resources on the mines with the potential to improve the use of water on mines

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<p>ZARON Business Solutions</p>	<p>The project aims to develop a footprint of solar power potential maps of rooftops in each municipality, district and province in South Africa</p> <ul style="list-style-type: none"> • The methodology proposed is to perform a digital analysis to identify high potential solar areas • Rooftop data can be collected using satellite imagery while ArcGIS desktop tools will be necessary to determine the solar potential of all roof areas • It is envisaged that Pléiades and TerraSAR-X Radar Satellite Imagery will be used to capture rooftop footprint data. • This dataset will be used to clip solar radiation/irradiation from a solar GIS dataset, forming the foundation for the development of a web application/interactive map where users can search their address to identify what the solar potential of their rooftops • ZARON also proposed the mapping of installations of solar water heaters in South Africa done between 2009 and 2012 to develop a footprint via GPS Coordinates and interactive maps, supporting a maintenance programme for repairing and replacements of dysfunctional systems installed • A second concept idea proposed by ZARON is to use SPOT, Pléiades and TerraSAR-X Radar Satellite Imagery to calculate the movement of people, monitoring settlement changes over time and thus providing mid-year estimates for Statistics South Africa
<p>UNISA</p>	<p>The research work done by UNISA proposes an application aiming to establish environmental responses of water and soil with the quantification thereof in the event of land cover change</p> <ul style="list-style-type: none"> • The quantification of these responses will in turn enable the prediction thereof to establish and/ or, improve integrated management of these resources for future sustainability of a catchment, water management area, region etc. • The project proposes the use of participatory monitoring which will enable the collection of current data and in turn make communities more environmentally aware and hopefully empower them to form their own forums to promote sustainability within their region • It will therefore firstly enable researchers to quantify and predict water and soil resources of a specific area, secondly enable participatory monitoring which could potentially lead to public empowerment and promote more integrated sustainable management of these important environmental resources with the possible development of a science policy interface

2016 Submissions

Company	Description
Department: Water and Sanitation Republic of South Africa	<p>Water Monitoring is a requirement of the National Water Act (act 36 of 1998)</p> <ul style="list-style-type: none">• The Department of Water and Sanitation is involved in the monitoring of different aspects of water resources. For example, water quality, water quantity (flow), surface and groundwater, water use, etc.• Remote sensing and satellite data can play an important role of supplementing the water monitoring network (in-situ measurements) that is available across the country• DWS's proposed uses of earth observation data includes: Hydrological Services (surface and groundwater monitoring); compliance monitoring (monitoring of irrigation); stream flow reduction; strategic asset management; water monitoring & information (land use and land cover change detection around the water resources, backdrop for cartographic services or mapping, onscreen capturing of the water features); macro planning & information systems; water regulation (water use validation and verification); water use monitoring and mapping of small water bodies



2015 Submissions



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Company	Industry (sector)	Description
 Netbrain	Data science	Netbrain offers a solution that can be used in the safety and security sector and for urban development tracking. The approach includes a middleware stack implementation solution, serving as a gateway for requests from satellite data and consumers of information to route the requests to the appropriate information source
IntegriSense	Geoscience	Cloud-based GIS marketplace for propagation of EO data.
Mobbisurance	Agri/Fintech	Mobbisurance focuses on providing access to affordable crop insurance to emerging farmers. Utilising satellite data extensively to create a technological platform enabling insurers to insure against specific weather-related risks
 Africa Geo Data	Geoscience	Africa Geo-Data proposes the use of satellite imagery, Digital Elevation Models (DEMS) and Video Game theory to create innovative and amazing visual and interactive products to support the video game industry
Protek Advanced Sys.	Animal conservation	examining the movement and the migration of animals within all 22 National Parks with over 4 decades of data obtained from the SANSA archives, using advanced Unmanned Aerial Vehicles (UAVs) to illustrate the locations to which the animal herds migrate to in different seasons. This will be used in anti-poaching.


2015 Submissions



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Company	Industry (sector)	Description
Hulalup	Geoscience	Middleware solution to deliver GIS data
 Cognitive Systems	Data analytics	Cognitive Systems proposed an Artificial Mind Engine, suited for analysing real-time complex data streams. It consists of software agents that collect, integrate, sort, learn & adapt to changes in the environment and is massively scalable yet deployed on affordable hardware & is independent of platform & communication protocols.
SME Link	Property	Infrastructure auditing for municipalities using EO data.
Anthony Chauke	Tracking	Use of GPS information to locate and track consumer items.
Zaron (I)	Green technology	Web application to determine viability of household Solar PV.





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	Company	Industry (sector)	Description
	Zaron (II)	Cleantech	Use SPOT, Pléiades and TerraSAR-X Radar Satellite Imagery to calculate the movement of people, monitoring settlement changes over time and thus providing mid-year statistical estimates.
	Zaron (III)	Cleantech	The project aims to develop a footprint of solar power potential maps of rooftops in each municipality, district and province in South Africa and performing historical analysis of solar water heater usage in SA
	SMC Synergy	Water conservation / Planning	Using EO data to improve environmental planning, land use/cover mapping, erosion modelling, prioritization of rehabilitation sites as well as planning of structures and other interventions.
	Metagrated	Monitoring / Health and Safety	Metagrated proposed the creation of technological solutions designed to support operational workflow in the public safety environment.
	My Smart Farm	Agriculture	MySmartFarm is a data management and services company that helps farmers frustrated with the collection and interpretation of information from multiple sources.


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Company	Industry (sector)	Description
 Quartex	Urban planning	Quartex proposed a mechanism for continuous data collection, providing working data sets for planners and policy makers allowing them to make decisions as to where to best expend resources for the provision of services (sanitation, water, health and education) to the vast underserved population in South Africa
 GIS Cape Town	Geoscience / Mining	GISCAPETOWN uses satellite image applications to address artisanal mining challenges in Africa. Uses a multi-disciplinary, network-based approach to examine artisanal mining at a global and regional level.
 SRK Consulting	Water conservation	SRK proposed an investigation into the potential for using high resolution satellites to monitor the daily fluxes in water distribution and evaporation from tailings dam, which will allow for a better understanding of water availability on mines and the stability of these structures.
 Tata Consulting (I)	Urban planning	Determination of demographic changes for urban planning
 Tata Consulting (II)	Ecology	Analysis of socio-ecological impact due to urban change


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Company	Industry (sector)	Description
Mosaic Analytics	Geoscience	To provide novel spatial, analytical approaches which provide clients with new insights from their existing datasets. Mosaic focuses on environmental management and conservation.
 Umvoto Africa	Green technology	Umvoto uses GIS and Remote Sensing to provide practical solutions to challenges e.g. groundwater exploration, geo-hazard assessment, environmental planning, town planning and development and mineral exploration
 Oxford Uni. Press	Education	Use of EO data to improve Geography education in SA
 UKZN	Tele-communications	Realistic observations and measurements of local precipitation effects from ground equipment require space bourn tropospheric observations from satellite data, in form of radar images over South Africa and other parts of Africa.
  NICD	Healthcare	Vector mapping of bilharzia risk across South Africa

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Company	Industry (sector)	Description
 UNISA	Climate change	The research work done by UNISA proposes an application aiming to establish environmental responses of water and soil with the quantification thereof in the event of land cover change
 Dept Water & Sanitation	Data analytics / Legislation	DWS's proposed uses of earth observation data includes: Hydrological Services (surface and groundwater monitoring); compliance monitoring (monitoring of irrigation); stream flow reduction; strategic asset management; water monitoring & information (land use and land cover change detection around the water resources, backdrop for cartographic services or mapping, onscreen capturing of the water features); macro planning & information systems; water regulation (water use validation and verification); water use monitoring and mapping of small water bodies.
SAGI	Data analytics / Legislation	SAGI proposed a "Geo-Compliance" portal in which various predetermined layers (temporal) are visible to the consumer.
  African Centre for Disaster Studies & NWU	Predictive disaster management	Vulnerability assessments are approached differently by different sectors, e.g., environmental, developmental and disaster risk management and research highlights the need for geospatial data derived from Earth Observation platforms in an integrated geospatial data model. ACDS undertook a study aiming to further research and develop methodologies to create user-defined data in the shortest possible time, focusing on recurrence and continued use of EO data.