

Compress Terabyte-Sized Imagery into a Single Source of Truth

Single, 50-cm-Resolution ECW File of South Africa Streams Daily to Thousands of Users

GeoSpace International is a leading digital aerial photography and GIS/GPS/remote sensing solution provider in Southern Africa. The Company operates the leading edge large format Leica DMC III Digital Mapping Camera, giving them unrivalled quality and production capability on the African continent.

GeoSpace is a Hexagon Geospatial Premium Partner in Africa and their services include aerial photography, census mapping, socio-demographic field surveys, GIS software development, and census consultancy services.





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Bernhard Jacobs,

Director of GeoSpace International

The Chief Directorate: National Geo-spatial Information (CD:NGI) is mandated to supply geospatial information for the Republic of South Africa.

- Provide survey services
- Collect and maintain earth imagery and geospatial data
- Provide mapping services
- Provide geospatial information and professional support services
- Establish, maintain and provide a national spatial data infrastructure
- Provide management support services to the chief directorate
- Provide national geospatial information services at provincial level

One Nation, One Basemap, Multiple Uses

GeoSpace flies the entire country of South Africa every three years. They create aerial photographs of the country for its customer, Chief Directorate: National Geo-spatial Information, the National Mapping Agency of South Africa. Mosaics of this imagery provide the basemap for the entire country used not only by CD: NGI, but also by other customers and, ultimately, by local governments.

GeoSpace's customers – such as CD: NGI, the South African National Roads Agency, and Statistics South Africa – provide census, transportation, and employment data for the populace of South Africa.

Naturally, this data requires an accurate, current imagery basemap of the region. Not only does this provide the best backdrop, but the context provided by this imagery can be vital in understanding and drawing conclusions from the data.

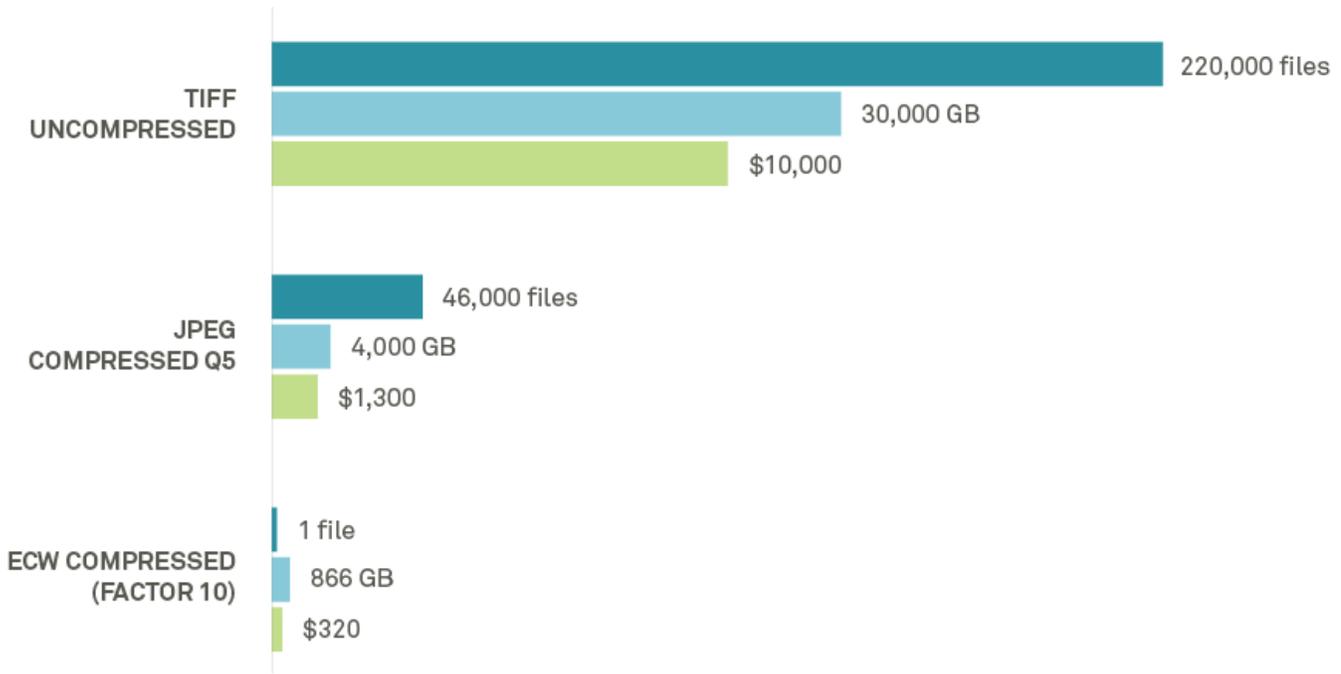
Too Many to Search, Manage, or Store

When your job is to cover a country the area of 1.22 million square km at 50cm GSD resolution, the amount of data that you generate can be staggering. Each of their approximately 440 flight missions captured 500 individual images and covered areas of about 2700-3000 square km each. After orthorectifying and mosaicking the images to a 1:10,000 scale, GeoSpace was left managing nearly 46,000 files.

This much data caused both storage and management problems. Each 1:10,000 mosaic in uncompressed tiff format was approximately 500 MB in size.

Combined, the 46,000 files totalled 30 TB in size, which GeoSpace and their clients found to be nearly impossible to work with.

“Working in this environment, our clients often had hundreds of files that covered their Area of Interest, so it was not only difficult to find the ones they wanted, but also to load and display them all at once,” said Bernhard Jacobs, Director of GeoSpace. “And, there was the problem of the 30 TB of disk space that was required to house all 46,000 files. All in all, it was just way too many files to have to deal with.”



That represents a 97% savings over uncompressed imagery and 71% savings over JPEG-compressed imagery.

One ECW file, one tenth the size

Using GeoCompressor from Hexagon Geospatial, GeoSpace was able to solve the file-size and disk-space problems. GeoCompressor compressed all 46,000 files at 50cm GSD into a single, seamless mosaic in just 10 days, beating their two-week goal. The resulting ECW image was compressed by a factor of 10, maintaining visually-lossless quality.



“Working with a single seamless mosaic saves time, disk space, and of course, money,” continued Jacobs. “To manage one image instead of 46,000 images has already been worth the effort. Our clients are very satisfied with the performance and manageability of the final ECW image.”

Updating the image is easy

The GeoCompressor solution also addressed GeoSpace’s concern that the image needed to be updated as new data is captured. “We fly new areas every month and need to update the currency on a constant basis,” said Jacobs.

Updating the ECW file does not require them to recreate the entire mosaic. In addition to compressing the files into a single mosaic, GeoCompressor provides simple tools to update a particular region within an existing ECW file. This streamlines the workflow, ensuring that the latest data can be rapidly included in the mosaic without a large processing burden.

One single source of truth for multiple Agencies

With so many different agencies making use of the basemap, the final file had to be quickly disseminated to thousands of users at once. At CD: NGI, SANRAL, and Statistics South Africa, the ECW image is streamed by ERDAS APOLLO, a server product from Hexagon Geospatial, to the end users of desktop GIS and Web GIS server technologies.

Serving a file quickly is only effective if everyone who needs it can access the data. For CD: NGI, interoperability is vital. ERDAS APOLLO offers interoperable OGC services like WMS and WMTS. This guarantees that every standard GIS can benefit from the centralized geoservice.

Next Year: New Basemap, Higher Resolution

In 2017, the imagery program began requiring that all new photography be taken at 25cm GSD resolution. This new requirement will result in a total image size of over 100 TB uncompressed once the entire country is covered.

GeoSpace has already covered 200,000 square km in the first four months of the survey and plans to cover the entire country of South Africa by 2019. They will start processing the seamless 25cm mosaics using GeoCompressor for each province until the complete country is covered by 2019, and plan to create another single ECW file for the resulting image.

GeoCompressor was the tool of choice for GeoSpace to create a single, compressed image to be used as the basemap for the entire country of South Africa.

This image can be used as a backdrop for so many different types of GIS data because it can be constantly updated and streamed to thousands of users on a daily basis. This single ECW file therefore provides a basemap of South Africa that is a single source of truth, ready for GIS users to incorporate the latest data and for government decision makers to run analytics against the data to gain a greater understanding of their challenges ahead.

“Using GeoCompressor and ECW as output format has significantly enhanced our productivity and the cost saving on time and disk space is enormous,” said Jacobs. “If you are thinking about solving these problems, I encourage you to ‘Go for it!’”

To learn more about ECW compression, visit hexagongeospatial.com/products/power-portfolio/compression

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Bernhard Jacobs,
Director of GeoSpace International



ECW compression reduced the overall file size by 97% without compromising and visual quality.



The visually-lossless, single-image mosaic of the Republic of South Africa provides a single point of truth that can served online and shared among different government departments.



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Hexagon's Geospatial division creates solutions that visualize location intelligence. From the desktop to the browser to the edge, we bridge the divide between the geospatial and the operational worlds.

Hexagon (Nasdaq OMX Stockholm: HEXA B) has approximately 20,000 employees in 50 countries and net sales of approximately 4.3bn USD. Learn more at [hexagon.com](https://www.hexagon.com).

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