Aerial Surveys, previously known as GeoSmart, is an innovative aerial photography and geospatial mapping service provider. Our services enable customers to make better business decisions with a higher degree of confidence through the exploitation of sophisticated technologies. Our products are used in a wide variety of Geographic Information Systems where spatial mapping using imagery and data is required.

Aerial Surveys operates from two locations in New Zealand, the head office in Auckland and flight operations in Nelson. The flying and photography operations are strategically located in Nelson Airport so as to provide the flexibility to mobilise to any location in New Zealand quickly for optimum utilisation of fine weather periods for aerial photography. This is particularly crucial with New Zealand’s weather patterns. Our flying operation includes two fixed wing aircraft for the core aerial data capture and we utilise other types of aircraft when appropriate. We utilise the latest GPS airborne flight navigation system for accurate imagery capture and all planes carry large format calibrated cameras for precision vertical photography and medium hand held format for oblique photography.

The sales, photogrammetric mapping and administration functions are based in Albany, Auckland. The depth of mapping experience amongst the team exceeds 16 years on average offering a highly experienced technical photographic and mapping service.

This combined with our highly accredited international mapping partner based in India offers substantial capacity to process any size project efficiently.

Our core products and services include digital aerial photography and mapping, LiDAR surveys and remote sensing, and specialised and patented forest inventory management tools. We have a number of strategic partners enabling us to combine expertise, alternative technologies and additional mapping capacity when required to provide a full mapping solution.

In the tradition of the company, Aerial Surveys continues to embark on trials in conjunction with various partners to test and establish new and better technologies and processes such as the new “multi-ray” mapping application from Vexcel Imaging.

Our Vision

With our commitment to outstanding service and technological excellence it is our vision to be New Zealand’s leading and most innovative aerial survey and mapping service provider. We are committed to leading the market in the implementation and use of new technologies where they will deliver additional value to customers and enhance their decision making.
Overview of Core Technologies

- Aerial photography using the latest Vexcel UltraCam mapping camera with forward motion compensation
- Simultaneous capture of colour, colour infrared and panchromatic photography
- Capture of digital oblique photography with geo-reference data
- Airborne Laser Scanner – LiDAR surveys using the Optech ALTM3100EA laser sensor and data processing software
- Intergraph ZI 3D photogrammetric mapping systems
- Aerial Surveys patented software applications for aerial tree counting and tree stem profiling
- Airborne Hyperspectral Scanner (CASi II remote sensor)
- Airborne Thermal Image Scanner
- Terrestrial LiDAR tree stem, 3D laser scanning and profiling using Aerial Surveys patented Tree Attribute Profiler for tree stem quality assessment
- Satellite imagery (GeoEye-1, WorldView 2, Pleiades1A/1B, RapidEye and Quickbird)

Overview of Services – Smart Photos

Flying and Photography

- Aerial photography and photogrammetric mapping services for image ortho rectification
- Vertical and oblique aerial photography
- Aerial photography in colour, black and white, colour infrared with in-house specialised digital image and film processing laboratories
- Digital dodging of imagery for enhanced image quality
- Aerial photography to customer scale requirements
- Piloted flying services for aerial surveys
- Photographic library and reprint services

Photogrammetry and Mapping

- Digital ortho imagery (high accuracy and GIS ready) with full colour balancing and feather mosaicking for seamless imagery tile production
- True ortho production (no lean in above ground features)
- Digital Terrain Modelling (digital elevation models, high accuracy for precision planning and monitoring purposes)
- Quality Contour production with detailed break-line capture for higher accuracy
- Topographic/feature mapping from digital imagery (vegetation polygons, buildings, hydrology, roads etc.)
- Corridor mapping
- 3D mapping, slope and aspect mapping
- Land use/change mapping/time series mapping
- Resale of LINZ 1:50,000 and 1:250,000 digital Topographic raster maps
- 3D visualisations and simulation
- Clutter data mapping for microwave networks
Remote Sensing Services

- **Airborne Laser Scanning (LiDAR) surveys for fast capture high density point data for DTM production, tree and forest canopy measurements**
- **Airborne Hyperspectral surveys for biosecurity, environmental and disease monitoring (using a CASI II sensor)**
- **Airborne thermal imagery surveys for underground heat detection, river temperature monitoring and urban housing insulation efficiencies**
- **Colour Infrared photography (land use, species identification, crop and soil health monitoring and tree counting)**
- **Satellite imagery (Geo-Eye, Ikonos and Quickbird) for higher resolution**

Aerial Surveys offers a variety of forest management tools and solutions to add value to forest owners and managers throughout the lifecycle of a forest

**Overview of Services – Smart Forests**

Our range of technologies are designed to meet recognised needs in the industry and to increase the level of certainty in forest inventory management.

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Core Industries and Typical Applications

Aerial Surveys has a wide range of industry experience including the following:

- Territorial Local Authorities
- Regional Councils
- Government
- Town Planners
- Property Developers, Engineering Consultants and Landscapers
- Mining and Quarry Operations
- Farming and Agriculture
- Telecommunications
- Energy and Utilities
- Forestry
- Transport and Roading
- Sea Ports

- Land use management
- Resource management consents
- Coastal and foreshore management
- Flood modelling
- Environmental management and disease control
- Change mapping
- Environment impact reporting and compliance
- Forest pre- and post-harvest management
- Forest inventory management
- Road network management
- Topographic mapping
- Engineering design

Company History

The company was originally established in 1977 to provide aerial photography and mapping under the name of Air Logistics and was re-branded in 2003 as GeoSmart Ltd. This better represented the wider range of geospatial services that had been in development in recent years and were coming on stream.

Over the last six years the business grew its digital and spatial mapping operations under the brand SmartMaps incorporating cartography, car navigation mapsets, web mapping services and fleet management services. Having achieved market leadership in these markets the company recently sold the SmartMaps division to the New Zealand Automobile Association. The company now remains totally focused on the SmartPhotos and SmartForests operations.

Since inception the company has purchased a number of companies.

<table>
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<th>Company</th>
<th>Started</th>
<th>Purchased</th>
<th>Business</th>
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<tr>
<td>Whites Aviation</td>
<td>1946</td>
<td>1988</td>
<td>Oblique photography of New Zealand</td>
</tr>
<tr>
<td>Air Photos Ltd</td>
<td>1950s</td>
<td>1966</td>
<td>Vertical &amp; Oblique</td>
</tr>
<tr>
<td>Aero Surveys</td>
<td>1963</td>
<td>1976</td>
<td>Vertical &amp; Oblique</td>
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<td>Air Logistics</td>
<td>1978</td>
<td>N/A</td>
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<td>2003</td>
<td>N/A</td>
<td>Colour printing services</td>
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<td>Renamed Aerial Surveys Ltd</td>
<td>2007</td>
<td>N/A</td>
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</table>
A strong national client base has evolved covering local authorities, regional councils, government departments, utility companies and specialist areas such as transport, forestry, engineering, horticulture, water care, pollution, civil defence and resource surveys.

Aerial Surveys has continued to be a pioneer in its fields to bring new technologies and solutions to the market place.

The following is a list of our main achievements:

<table>
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<tr>
<th>Year</th>
<th>Achievement</th>
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<tr>
<td>1993</td>
<td>The first company in Australasia (excluding the Australian Army) to commit to digital 3D photogrammetry and lead the market in higher performance digital production with the Intergraph ImageStations</td>
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<tr>
<td>1994</td>
<td>The first company to bring into New Zealand a Forward Motion Compensating (FMC) camera for higher quality aerial photography</td>
</tr>
<tr>
<td>2001</td>
<td>Developed the Automatic Tree Counting process from an airborne platform – a world first technology – patented</td>
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<tr>
<td>2001</td>
<td>Developed the Tree Attribute Profiler (TAP) technology for precisely measuring stem profiles of standing trees for forest inventory by using 3D laser technology – patented</td>
</tr>
<tr>
<td>2003</td>
<td>First Airborne Hyperspectral programme to be undertaken in New Zealand to demonstrate the viability of the technology to monitor plant disease, pests for bio-security and predict horticultural yields</td>
</tr>
<tr>
<td>2003-2007</td>
<td>Development of a highly accurate drivable map set and launch of car navigation mapping in New Zealand Launch of a new web mapping service and routing engine for fleet management</td>
</tr>
<tr>
<td>2009</td>
<td>Implementation of the new Vexcel UltraCam digital camera</td>
</tr>
<tr>
<td>2009</td>
<td>First urban thermal mapping program undertaken for the identification and assessment of urban housing energy emissions and insulation efficiency</td>
</tr>
<tr>
<td>2010</td>
<td>First commercial use of multi-ray photogrammetry to produce “true ortho” imagery over the Auckland CBD</td>
</tr>
<tr>
<td>2011</td>
<td>Implementation of an Optech ALTM3100EA LiDAR system</td>
</tr>
</tbody>
</table>

**Strategic Partners**

Aerial Surveys has selected strategic partners where necessary with a similar wealth of experience and complementary technologies to enable a comprehensive aerial survey solution.

Our strategic partners include:

- **Cyient (India)** for mapping services and LiDAR classification
- **Geospatial Research Centre** for urban thermal surveys and mapping
- **Landcare Research** for hyperspectral survey solution design, survey analysis and reporting
- **GeoEye** for high resolution satellite imagery
- **GeoComp International** for offshore project mobilisation and coordination as well as technical assistance