**SGL** | SCANPOINT GEOMATICS LIMITED

Government of Rajasthan Office of the CEO, RBAAS & Settlement Commissioner (SC) Rajasthan, Jaipur.

Client
Government of Rajasthan Office of the CEO, RBAAS & Settlement Commissioner (SC) Rajasthan

Location
Jaipur, Rajasthan

Industry
Government

Rajasthan Districts
- Sri Ganganagar
- Hanumangarh
- Churu
- Barmer
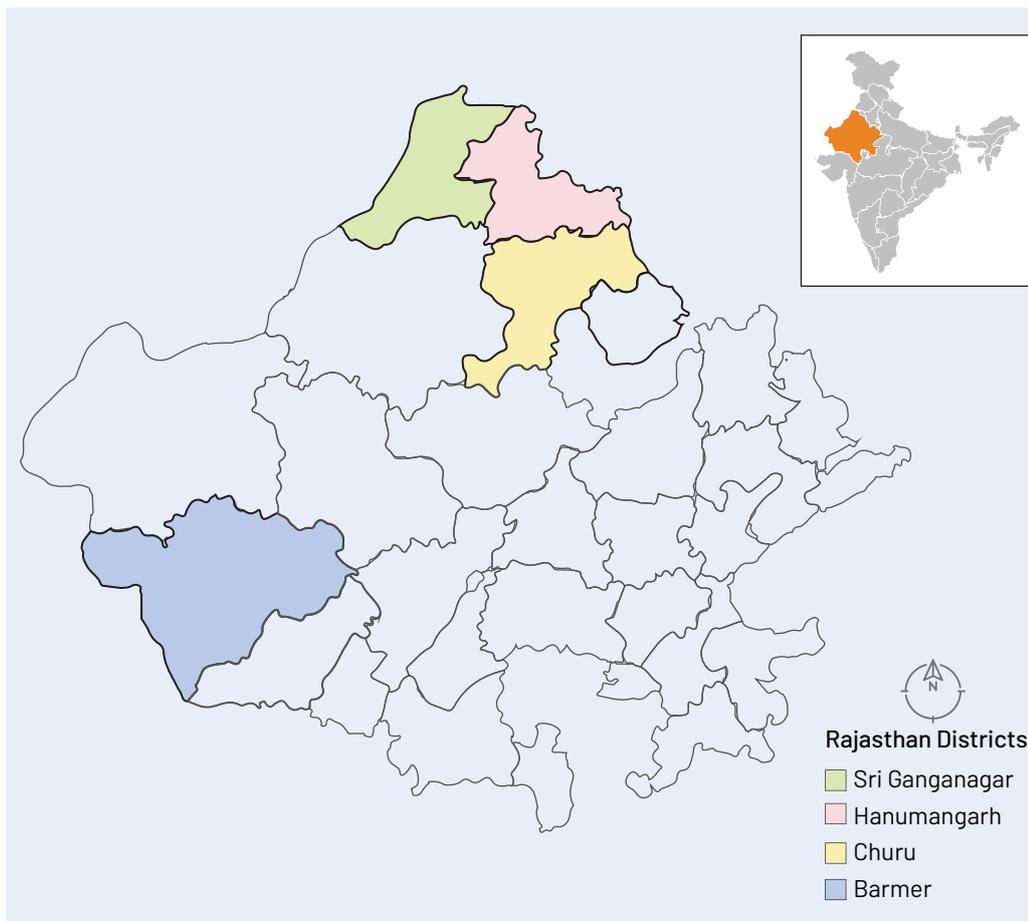
Project

Implementation of DiLRMP using IGiS Photogrammetry Suite in the District of Sri Ganganagar, Hanumangarh, Churu and Barmer

Objective

The main motive of the DiLRMP project was to develop a modern, comprehensive, and transparent land records management system in the state. Also, it aimed to implement the conclusive land-titling system with a title guarantee, which will be based on the DiLRMP basic principles and guidelines.

IGiS Photogrammetry Suite was used on HRSI Stereo Pair to generate orthorectified image to match the old cadastral maps and measurement books of the land owners.

Solution

The project was executed by Scanpoint Geomatics Ltd. (SGL) using its indigenously developed IGiS platform including IGiS Photogrammetry Suite and covered a total of 73,571 Sq Km of area of the four districts.

High-Resolution Satellite Image (HRSI) Worldview II Stereo Pair provided by the office of CEO, RBAAS & Settlement Commissioner (SC) Rajasthan, Jaipur was used for image processing activities for the project implementation.

Ground Control Network (GCN) was created with a primary grid of 16X16 sq.km, a secondary grid of 4x4 sq.km and tertiary grid of 2x2 sq.km. GCPs (Primary, Secondary & Tertiary) were marked on the raw Stereo Pair HRSI for further preprocessing. IGiS Photogrammetry Suite was used for the below process.
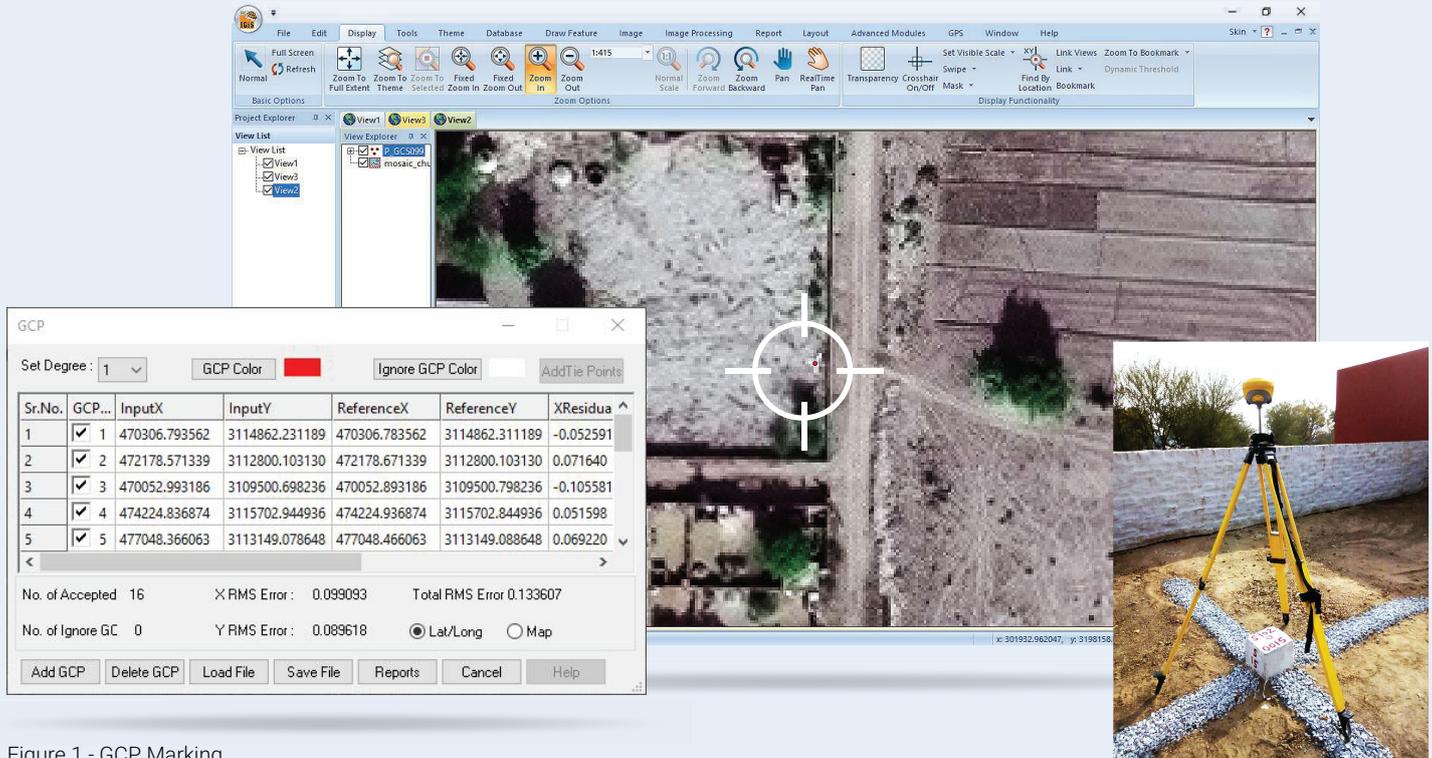

Figure 1 - GCP Marking

- Creation of Bundle Block Adjustment file using GCPs and the preprocessed HRSI.

- Generation of the 3D point cloud using the preprocessed HRSI, GCPs, and the Bundle Block Adjustment file.

- Generation of Digital Surface Model (DSM) from 3D point cloud.

- Conversion of DSM into the Digital Terrain Model (DTM) also known as the Digital Elevation Model (DEM).

- Orthorectification of HRSI using the DEM, RPC (Rational Polynomial Coefficient,) and the Bundle Block Adjustment File.

- Natural Color Image generation from orthorectified image using the image bands viz. Red, Green, and Near Infrared.

- HRSI were mosaicked using various enhancement techniques for entire districts.

- Creation of image tiles of 4x4 or 9x9 Sq.Km as per the project requirement.

  Finally, the orthorectified image is being used for the digitization of land parcel maps in reference to the old cadastral map as well as for the use of survey/ resurvey activities using ground truthing by ETS and DGPS as per DiLRMP guidelines in the State of Rajasthan.

IGiS Photogrammetry Exhibits:
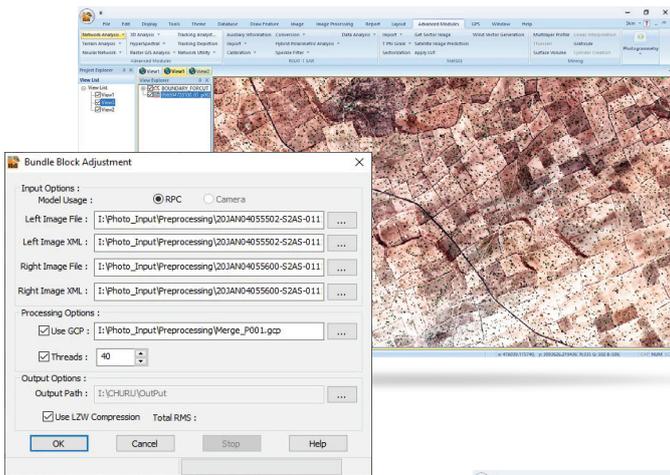
Figure 2 - Bundle Block Adjustment
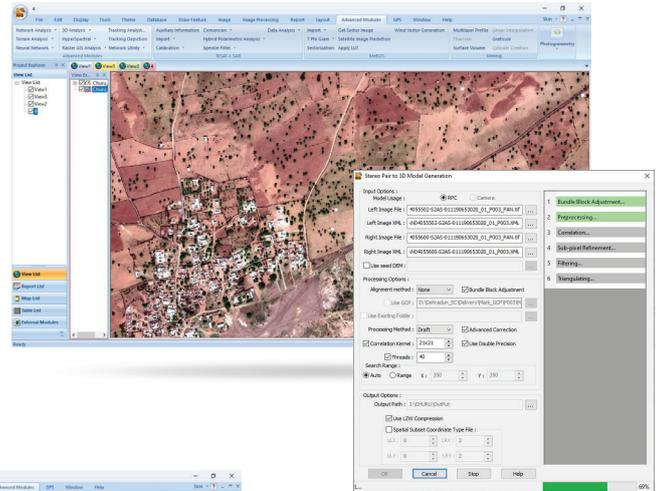
Figure 3 - 3D Model Generation
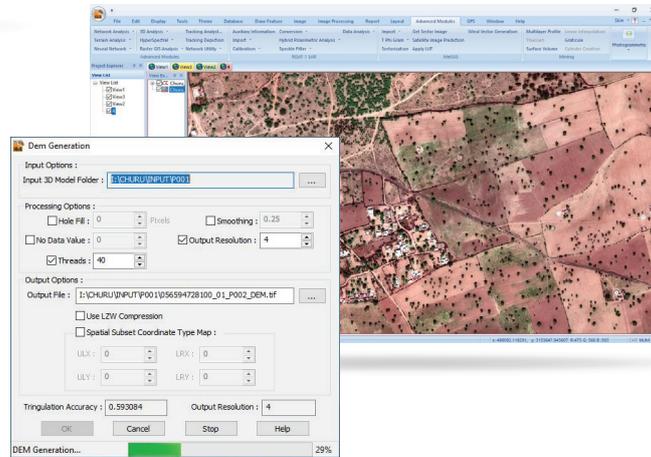
Figure 4 - DEM Generation
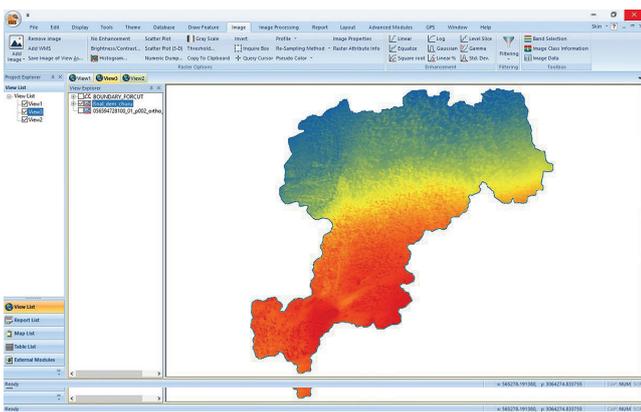

Figure 5 - Final DEM Output (Churu District)
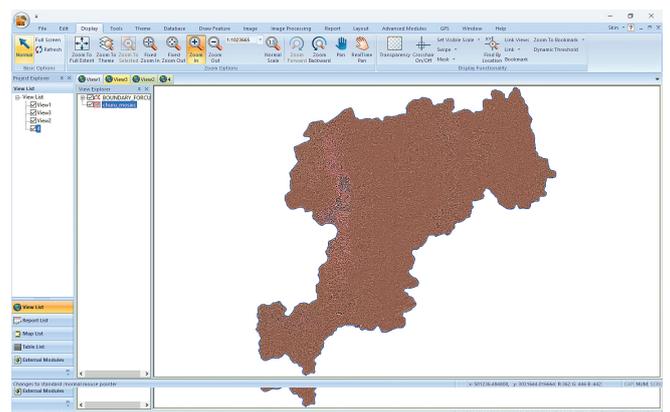
Figure 6 - Final Seamless Mosaic (Churu District)

IGiS Photogrammetry Suite Capabilities

1. IGiS Photogrammetric Suite is a one stop photogrammetric processing software for quick generation of point clouds, DSMs, DTMs and ortho-photo/imagery.

2. IGiS Photogrammetric Suite provides a straightforward and automated workflow along with constantly updated feature sets.
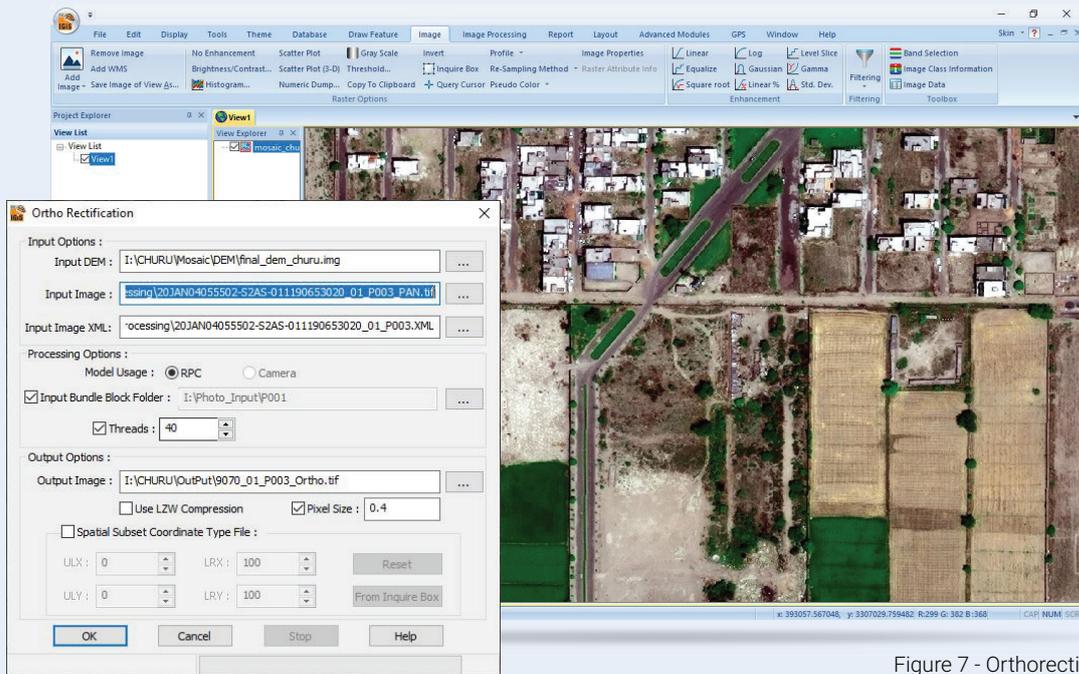
Figure 7 - Orthorectification

3. The suite is designed to handle and process the huge volume of HRSI stereo pair data in the short time with the highest degree of accuracy, supported by guided manual operation, quality control tools, and powerful visualization.

4. It provides quality data processing from the ingestion of raw data to generate point clouds, digital surface models, digital terrain models and ortho-imageries.

5. It also radiometrically corrects and convert raw images into standard file formats to be used for further processing by the IGiS Photogrammetry Suite.

6. The IGiS Photogrammetry Suite creates high density point clouds, DSMs, and DTMs by satellite images by extrapolating exterior and interior orientation data to generate per-pixel height values.

7. This suite generates the final ortho-mosaics from all available inputs such as satellite imagery, triangulation outputs, radiometric settings and height field.

8. Self-explaining, fast in operation and efficient in use, the IGiS Photogrammetry Suite has an intuitive user interface for all modules for consistent user experience.

About SGL

Scanpoint Geomatics Ltd. is the leader in the Indian Geomatics Industry. We pioneer the nation's geospatial domain through IGiS- An indigenous technology that brings GIS, Image Processing, Photogrammetry, and CAD together on the same platform under the Make in India Initiative.

We are proud of our partnership with the Indian Space Research Organisation (ISRO). With an innovative approach and over two decades of rigorous research and development, the duo developed the IGiS Platform. Backed by ISRO's domain expertise, we aim to push forth innovation and uplift the global geospatial domain.