CAPABILITIES STATEMENT 2018

DRONES and GEOGRAPHIC INFORMATION SYSTEMS (GIS)

DRONES & GEOGRAPHIC INFORMATION SYSTEMS (GIS)

Envirosphere Consulting was one of the first consultancies in Queensland to recognise the potential of using drones for management and monitoring. We used the aerial visual capabilities of first generation "prosumer" drones to facilitate assessment of temporal environmental changes – this was prior to the advances of geotagging images within the drone and the recent rapid improvements in drone technology.

Examples of early technology usage have included; safe, rapid assessments of cliffs and escarpment areas for threatened flora species, typically only accessible with ropes and with associated OHS risks, and visually monitoring the impact of sporting events in the Gold Coast Hinterland within high value ecological areas, for regulatory agencies.

Often our experienced pilots have operated drones without physically being directly on the site. This is especially convenient for dangerous or hard to reach areas – with savings in time, reduction in workplace risks, and substantially lower costs.

Envirosphere has evolved with rapidly changing drone technology in a changing legislative and technical environment. Leveraging our expertise in GIS in conjunction with our Unmanned Aerial Vehicle (UAV) knowledge means we can provide clients with solutions that maximise efficiency in design, planning and analysis – providing high quality drone outputs.

Envirosphere can provide mapping solutions for a range of industry sectors including;

- **Geographic Information Systems**
- **Development: Ecotourism Infrastructure, Residential/Commercial, Energy, and Intensive Industries**
- **Sustainable Rural Production: Agricultural Services**
- **Government & Natural Resource Management**

CAPABILITIES STATEMENT 2018

DRONES and GEOGRAPHIC INFORMATION SYSTEMS (GIS)

DEVELOPMENT: Ecotourism, infrastructure, energy, intensive industries

Photogrammetric surveying (combining imagery and reliable spatial information) reduces complex workflows, consistently and easily captures replicated data with updates on an as need basis.

The captured data can create 3D point clouds, digital terrain models, contour maps, or be merged into a 2D or 3D orthomosaic image. Envirosphere can provide in house analysis or provide outputs for cloud sharing and integration into existing mapping and CAD technology such as Building Information Modeling (BIM).

An important consideration when adopting drones and UAV's for use on a project is the selection of the right hardware and software. This includes

- DJI Mavic 2 Pro with 20MP sensor for smaller sites utilising Ground Control Points (GCP) or the Phantom 4 RTK with or without GCP where sub-metre accuracy may be required
- DJI Matrice 200 where different camera sensors may be required

Envirosphere has the capacity and the experience to tailor drone use for the needs of the project.

DRONES AND DEVELOPMENT: Ecotourism, infrastructure, energy, intensive industries

Envirosphere has incorporated drones into a range of projects that were subject to development approval to monitor and manage project outcomes with cost savings. Benefits of adopting drones during civil construction works include:

Design

- Concept building – face, directional or 360^0 views
- Building models for neighborhood context
- Contributing to Building Information Modeling (BIM) – collaboratively approaching building design, workflow and adaptive management for better insight in multi-disciplinary projects.

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DRONES and GEOGRAPHIC INFORMATION SYSTEMS (GIS)

SUSTAINABLE RURAL PRODUCTION: Agriculture

Construction and Jobsites

- Quantify earthwork hauling specifications of cut and fill
- Stockpile volumes for labor and time estimates
- Asset management – materials, equipment, temporary roads, structures
- Egress and on-site logistics for vehicles and heavy machinery
- Quality control – CAD plan vs. actual
- Regulatory compliance and monitoring
- Avoid WHS hazards when monitoring

Infrastructure and Energy

- Collaborative maps and site plans
- Quick and accurate measurements on an as needed basis
- Interactive 3D models of projects
- Surface integrity
- Condition inspection of asset

DRONES AND SUSTAINABLE RURAL PRODUCTION: Agriculture

Drones are being utilised increasingly by agricultural enterprise in Australia. Envirosphere has the capability to assist with the following assessments:

- Soil and field analysis – 3D maps for early soil analysis for planning seed planting patterns
- Crop monitoring – accurately monitor crop development
- Health assessment – NDVI camera to scan crops using visible and near-infrared light. This can contribute to early detection of disease and crop underperformance
- Tracking of livestock

CAPABILITIES STATEMENT 2018

DRONES and GEOGRAPHIC INFORMATION SYSTEMS (GIS)

DRONES FOR GOVERNMENT & NATURAL RESOURCE MANAGERS

DRONES FOR GOVERNMENT & NATURAL RESOURCE MANAGERS

Envirosphere welcomes collaborative opportunities when adopting drones to survey, monitor and manage environmental values effectively.

Our services in this area include:

- Infrastructure assessment for maintenance
- Post natural disaster monitoring for more effective allocation of government resources
- Monitoring progress of bushland restoration
- Monitoring vegetation cover, growth and decline for conservation and compliance purposes
- Monitoring river bank stability to reduce erosion and prioritise restoration works
- Mapping hiking trails and firefighting trails
- Aerial counts of threatened species, e.g. migratory waders and shorebirds

CAPABILITIES STATEMENT 2018

GEOGRAPHIC INFORMATION SYSTEMS

GEOGRAPHIC INFORMATION SYSTEMS

- Create high quality cartographic outputs
- Project specific needs – tailor data outputs and requirements, database enquiry and analysis
- Gather, analyse and integrate spatial data and visualising information
- Prepare, maintain and train staff in mobile device data capture solutions
- Compile geographic data from a variety of sources (censuses, field observation, satellite imagery, aerial photographs, and existing maps)
- Incorporate spatial data to guide and aid documents and reports
- Design, update and maintain spatial geodatabases for clients, applying additional knowledge of spatial feature representations and analysis of geographic relationships among varying types of data; and
- Prepare metadata and other documentation.