# OVERVIEW OF TYPES OF DATA

DIGITAL SURFACE MODEL – DSM

A DSM models all features of an area including terrain and drainage, vegetation, buildings and other structures. When produced from photogrammetry or LiDAR, only noise and erroneous data is removed from the model. It shows the highest points across the site, in some situations that will be the ground level and in other situation it will be the tops of trees and roofs of buildings. It is the data set that is used to generate a "true orthophoto" to eliminate the lean of buildings and is also used for Line of Site analysis as well as vertical obstruction surveys around airports and helicopter landing sites.
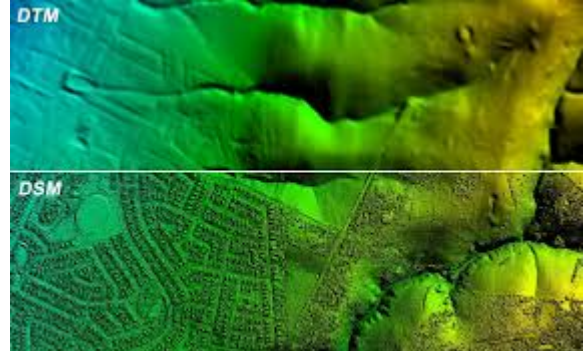

DIGITAL TERRAIN MODEL – DTM

Many applications require a bare-earth model of a site and this is what we refer to as a DTM. The features that represent the ground surface such as natural drainage, roads, kerb and channel culverts are digitised or classified and to provide a model that does not show any vegetation, buildings or other structures (such as bridges, power transmission lines, fences etc). It is most often used for engineering applications such as flood modelling or mine or quarry design. It is also used when undertaking volumetric calculations of stockpile and bulk earthworks. DTMs are most often presented as irregular or regular grids with breaklines. When captured using a LiDAR sensor a DTM is able to model the terrain under dense tree canopies.

ORTHOMOSAIC

An orthomosaic is a photogrammetrically 'orthorectified image', created out of many photos that have been stitched together and geometrically corrected, creating a detailed representation of an area.

ortho

dsm
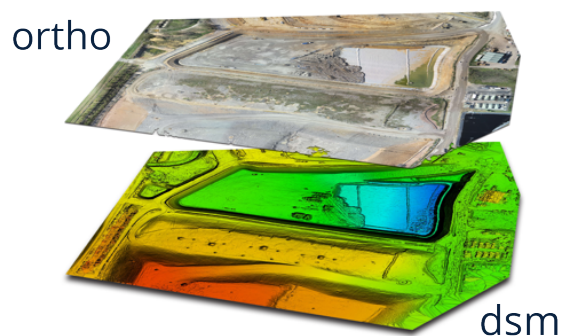
DIGITAL ELEVATION MODEL – DEM

DEM is a term that has different meanings. In some cases, it is used to collectively refer to DTMs and DSMs. In other situations, it is used to refer to a natural surface that is void of any vegetation or man-made features. With this in mind it is a good idea to always clarify what someone means when there is discussion about or a request for a DEM. DEMs are most often used in large area hydrology modelling, town and regional planning and geological studies and may provide national or even global coverage. DEMs are often used as the foundation elevation layer for a GIS. In most cases DEMs are presented as a regular grid in raster format and have often been derived by interpolation from a DTM.


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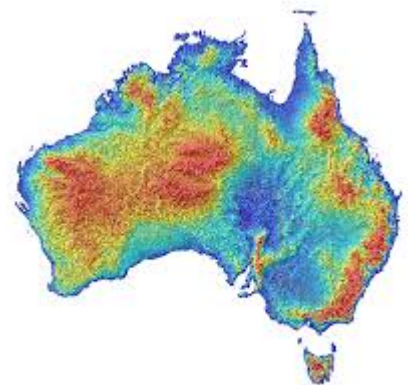
CONTOURS

Contours are lines on a map that join the same height. Contour lines are a familiar way of representing surfaces on maps. A contour line is a line through all contiguous points with equal height (or other) values.

3D MODELS

A 3D model is a mathematical representation of any surface of an object in three dimensions. 3D models are useful in design, analysis activities, construction planning and inspections.
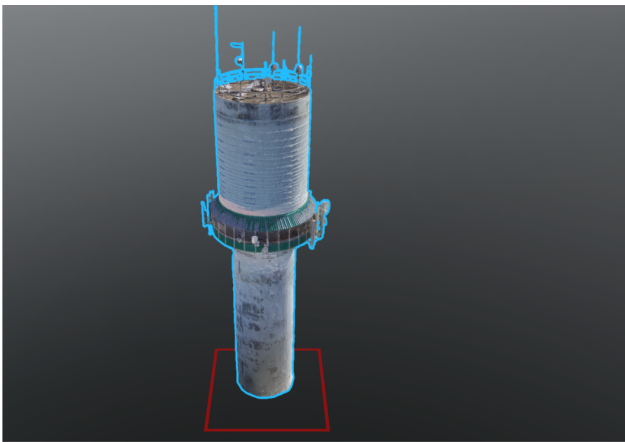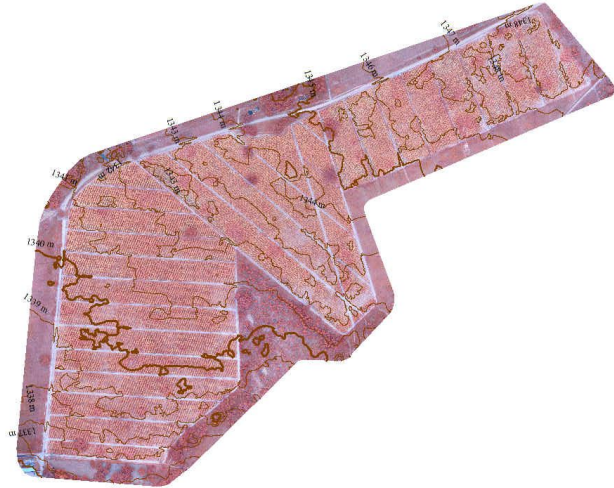
LIDAR

LiDAR, which stands for light detection and ranging, is a remote sensing method that uses light in the form of a pulsed laser to measure variable distances to earth.

LiDAR can be used in situations where the structure and shape of the earth's surface need to be known, for example to penetrate high density vegetation to recreate a model of the surface, and it can even measure some gasses and particles in the atmosphere.

LiDAR is very versatile and its high resolution representations give it applications in archaeology, climate monitoring, city planning, river surveys, agriculture, mining and much more.

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