

3D-NAV DRAPE FLYING

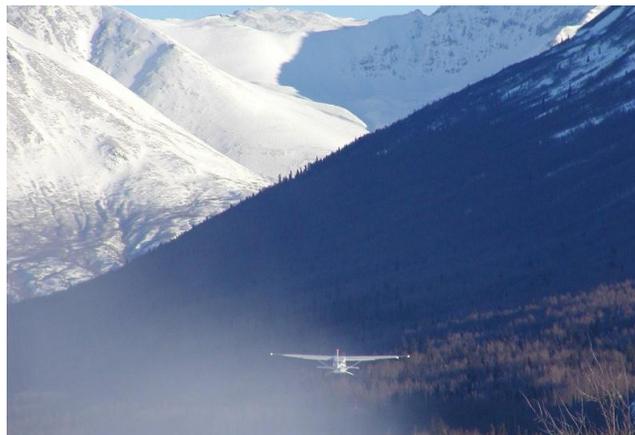
To obtain high resolution geophysical data, survey aircraft need to be flown at a consistent height above the ground, maintaining a consistent and safe altitude (the drape surface) on the two orthogonal survey line directions. McPHAR operates a computer-assisted system, 3DNAV, to enable our flight crews to maintain an optimal flight altitude (drape surface) during surveying while at the same time ensuring that primary and control lines intersect at the same altitude. The result is a vast improvement in the quality of the high resolution data acquired, particularly in hilly or mountainous terrain.

The critical elements in the design of the drape surface are the safety of the data

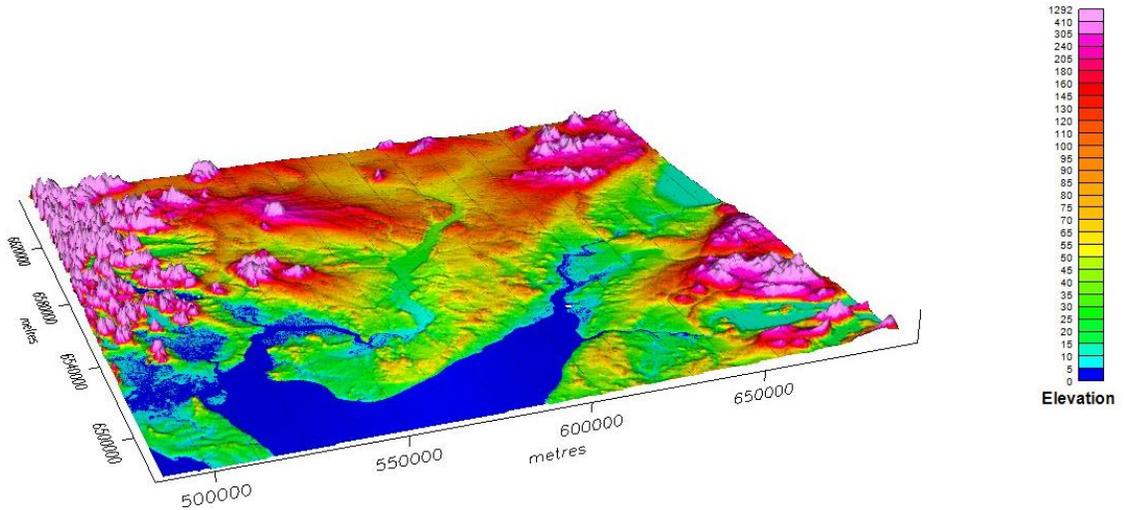
acquisition operation, the (median) performance parameters of the survey aircraft for climb/descent rates and the desire to drape as closely as possible to the specified survey altitude. To create a drape surface, a digital terrain model of the survey area is modified using proprietary McPHAR software to reduce all slopes to within the capabilities of the survey aircraft to safely climb and descend. The preplot survey design is stored as the on-board navigation information for the pilot to fly with, using a precision radar altimeter and, where possible, real-time differentially corrected GPS height for vertical and horizontal control.

Some of the benefits of drape flying are:

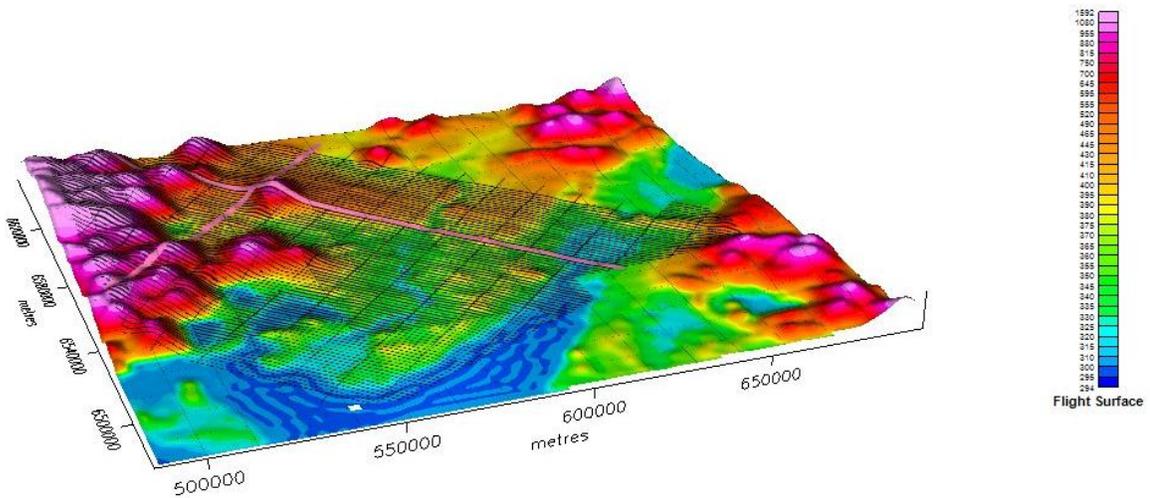
- Clients can review the drape surface prior to the survey commencing and can see what altitude the sensors will be at any point in survey area.
- Control and traverse lines intersect at more or less the same altitude, greatly facilitating the leveling of the acquired data.
- A preplanned drape survey enables the flight crew to fly a better, safer survey. McPHAR's 3D-NAV system, to a large degree, removes the guess work out of maintaining a safe and consistent survey altitude.
- Optimization of the survey line direction results in a more efficient use of exploration dollars.



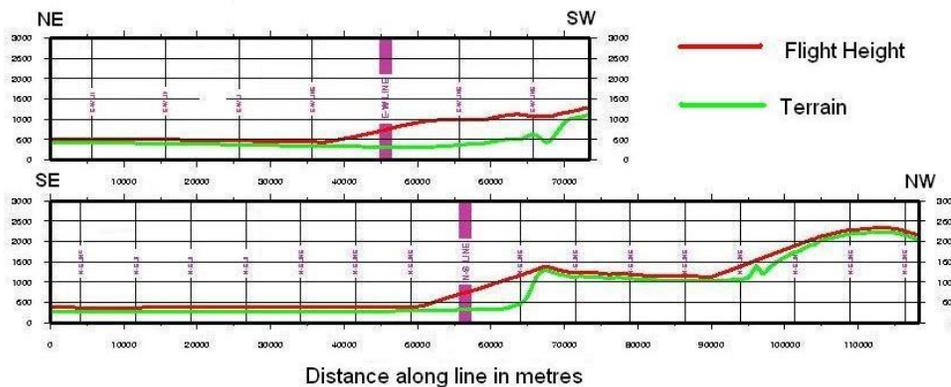
Survey Aircraft flying a 3D-NAV survey in Taylor Mountains, Alaska



3D presentation of the Digital Terrain of a proposed survey area



3D-NAV Drape Surface for a nominal 300 m survey height, showing flight lines superimposed



These two profiles are of the two flight lines drawn in pink on the drape surface image above, and are derived from the 3D-NAV program. They demonstrate how the two lines flow perpendicular to each other intersect at the same flight height