GEOSOFT
Oasis montaj

Gravity and Terrain Correction

montaj Extension developed by Geosoft

The montaj™ Gravity and Terrain Correction extension provides a complete system for processing and reducing gravity data from conventional ground surveys.
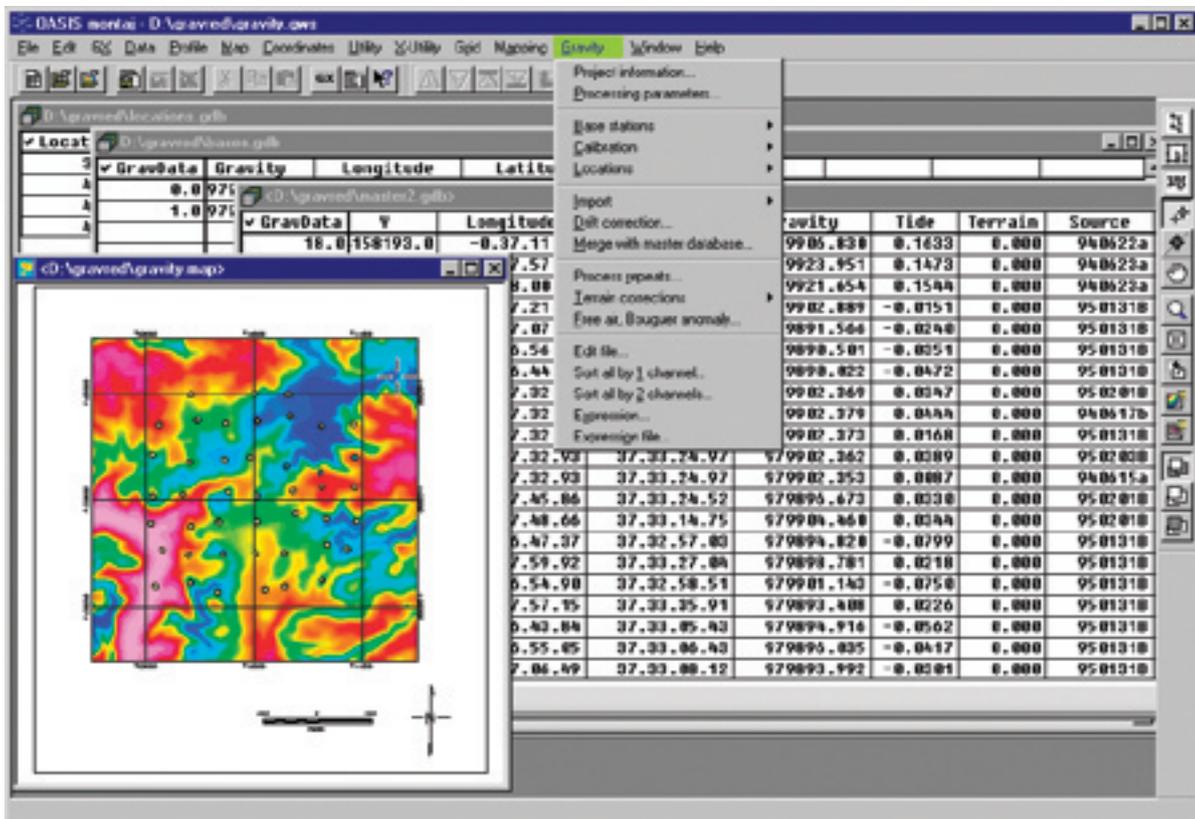
Apply terrain corrections from digital elevation models (DEMs) or gridded elevation data. With the streamlined menu system, perform all the standard gravity processing steps quickly and easily.

In addition, the uniquely optimized terrain reduction algorithm delivers accurate corrections quickly, even for very large data sets.

Geosoft's terrain correction algorithm combines methods described by Kane[†] and Nagy[†] with advanced grid-mesh interpolation, zoning and de-sampling techniques.

Use Gravity and Terrain Correction to:

- Correct base station data,
- Manipulate calibration data,
- Merge X and Y location data with survey data,
- Apply drift and atmospheric tide corrections,
- Compute free air and bouguer anomaly values, and computing terrain corrections.

Gravity Processing and Reduction

Gravity Processing and Reduction functionality reduces and processes your gravity data without performing terrain corrections. Gravity reduction functions include: Latitude correction, Free Air anomaly calculation and Bouguer anomaly calculation.

Users can:

- Access data manipulation utilities,
- Process data in UTM coordinates and many other cartographic projections,
- Reduce data from local grid surveys, and regional longitude, latitude based surveys,
- Handle Base Station loop and Calibration surveys,
- Create statistical reports to evaluate repeat readings,
- Apply water and ice corrections to the Bouguer anomaly,
- Apply Terrain correction able to Regional and residual DEM grids of any size,
- Export for modeling,
- Integrate mapping via Oasis montaj.

Terrain Algorithm and Corrections

Geosoft's terrain correction algorithm combines methods described by Kane† and Nagy† with advanced grid-mesh interpolation, zoning and desampling techniques.

A proprietary optimization method combines accuracy with performance for even very large data sets. For 1000 x 1000 cell grids, performance increases two to three times with results accurate to within two to three per cent. For larger data sets, tests on 2000 x 2000 cells grids show 14 X performance enhancement while maintaining two to three per cent accuracy.

Traditionally, the most computationally expensive part is the regional correction (beyond 1000m). This extension first calculates the regional terrain correction from a coarse regional Digital Elevation Model (DEM) over a more finely sampled local DEM model covering the survey area. The method produces a "regional correction grid" that represents terrain corrections beyond a local correction distance. This result is re-used to calculate detailed corrections at each observed gravity location.

Key Functionality

- Gravity processing and reduction functions,
- Terrain Algorithm and Corrections.

*The montaj Gravity and Terrain Correction extension requires Geosoft's Oasis montaj.

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