

Correct preparation of seismic data before it enters the imaging sequence is not only critical, it is the cornerstone on which the remainder of the processing sequence will be based. GX Technology (GXT) understands just how vital it is to the final migrated image; therefore, we have invested a significant portion of our research efforts into developing high-performance, compute-intensive solutions to fundamental seismic problems such as noise attenuation, de-bubble, demultiple, and statics corrections. We developed a comprehensive pre-processing toolkit in which WAZ concepts have been fully integrated throughout development.

The GXT Difference

Our pre-processing modules are custom-written by industry acknowledged experts to solve these problems and then integrated into GXT's efficient data processing architecture. From the basic algorithm through to the final implementation, we implement full wavefield sampling principles (in terms of offsets and azimuths). Whether acquired offshore or on land, 2D or 3D, GXT can solve the following challenges during pre-processing:

- **Noise Removal** - Cleaning up the Data: Noise problems affect the interpretation of the final data images, as they affect imaging algorithms and can mask the real data. We offer custom data processing modules to handle noise, and we make all noise processing decisions within the final imaging context.
- **Signal Processing** - Shaping the Data's Character: The amplitude, frequency, and phase characteristics of the seismic data are critical to both the interpretation and the overall image content. Regardless of the challenge, we have a full suite of tools to shape the seismic wavelet.
- **Multiple Removal** - Removing Unwanted Coherent Energy: Multiples are events that have undergone more than one reflection, leading to false results and difficult-to-interpret seismic sections. We have created several techniques to address multiples, but regardless of the method used, the goal is the same: remove the multiple, and leave the signal.
- **Statics Corrections** - Removing Topography and Near-Surface Effects: Time shifts caused by undulating topography and near-surface velocity anomalies can distort the geometry of reflecting horizons, reducing the signal to noise and making interpretation difficult. ION's GMG Software provides statics solutions for many types of static shifts, including modules to apply a bulk shift for datum corrections and solutions for source/receiver refraction statics, often necessary in data processing.

NAZ, MAZ and WAZ

In addition to the conventional narrow azimuth (NAZ) acquisition configuration, it is now also common to have multi-mono-azimuth survey design (MAZ) and full, rich, or wide azimuth design (WAZ). For MAZ data, the conventional NAZ velocity picking tools are employed per azimuth class, but for WAZ data, we can use offset vector tile (OVT) data sorting to perform both WAZ pre-processing and non-sectored picking of velocity error.