Oneida Lake Seismic Survey, 2019

Navigation for the data set is set in UTM 18N

The navigation files include CDP number and each CDP's X and Y location.

The segy file headers contain navigation information including X and Y location of CDPs and seismic source.

In July of 2019 ~217 km of 2D multichannel seismic reflection data were collected along 27 profiles. We used a 120 channel Seamux™ solid-towed array marine streamer with a 3.125 m group interval and a maximum offset of ~400 meters. Data were originally recorded in SEG-D format on a NTRS3 recording system. Navigational data and ancillary data (ship speed, depth, etc.) were fed into the external header of each field file. The seismic source was a 4x10 in3 Bolt 2800 LLX airgun array and was towed at ~1 m depth to allow for venting of seismic source air bubbles. Gun pressures varied from 1500 to 2000 PSI. Air guns were fired every 6.25 m distance using two high resolution (Trimble) GPS receivers for navigation. This geometry provided 30-fold seismic coverage with a common midpoint (CMP) interval of 1.56 m. Record length is 2 s and the sample rate is 0.25 ms.

The following processing steps were applied to the dataset using SeisSpace/ProMAX™ Software. Data were initially reviewed in shot mode and noisy traces were edited. Geometry was applied using source and receiver offsets with group and shot intervals, and data were sorted into the CMP domain. Stacking velocities were picked using a combination of velocity semblance plots and constant velocity stacks applied to CMP supergathers. For the constant velocity stacks, supergathers were constructed from 51 CMPs and analyzed in increments of 100 CMPs. Once time-velocity pairs were selected, normal moveout was applied to the full profile data set and the data were stacked.

Nested Ormsby bandpass filters of 110-135-1500-1700 Hz and 40-70-1100-1300 Hz were applied to the stacked datasets. Ormsby filter frequencies were picked by executing a careful parameter test where frequencies were altered incrementally until the ideal filter was produced. A post-stack F-K filter was applied to remove steeply dipping noise, and a careful comparison of F-K filtered profiles and raw profiles was conducted. A post-stack Kirchhoff time migration with a 200 ms bottom taper was applied using the RMS stacking velocities picked for each seismic profile.