

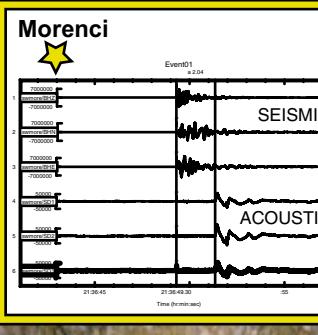
STUDY GOALS

- * Establish regional seismic-acoustic network.
- * Develop in-mine seismic and acoustic instrumentation.
- * Construct ground truth data base of hard rock blasts.
- * Quantify coupling and source characterization (seismic mic & infrasound).
- * Quantify seismic mic and infrasound propagation path effects.

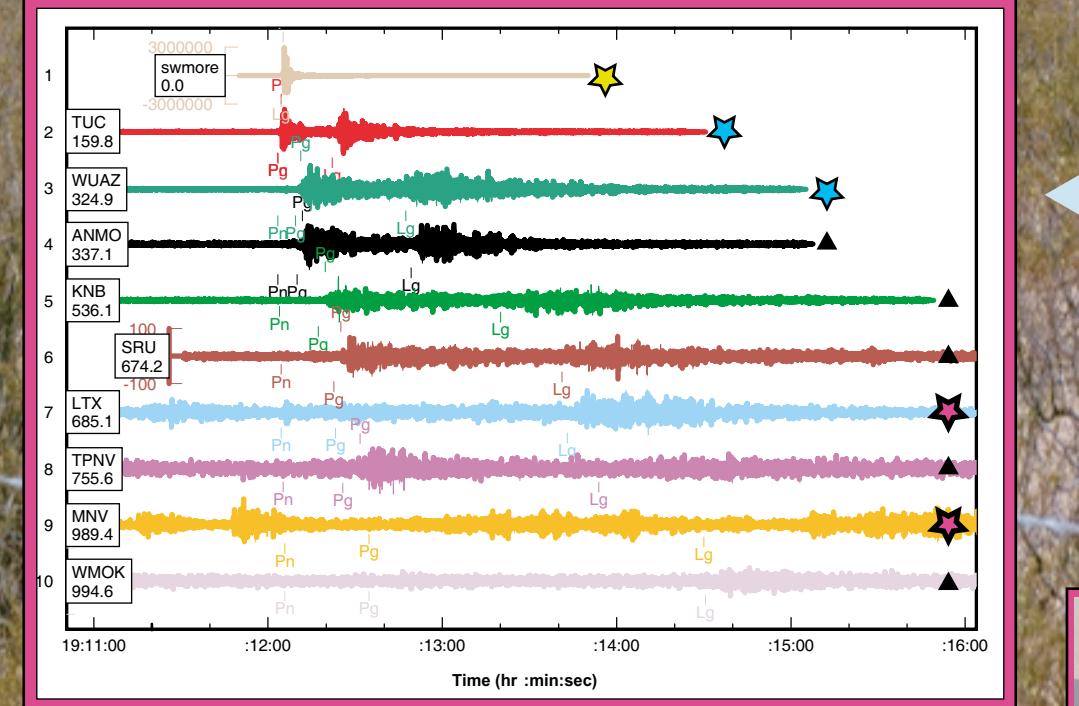
RESULTS

- * Hard rock mines detonate multiple patterns over short time periods (0-60 s) resulting in complex regional signals.
- * Some hard rock explosions are detonated with no delays.
- * Close-in and regional seismic amplitudes do not scale with total amount of explosives.
- * Close-in acoustic amplitudes do appear to scale with explosive size.

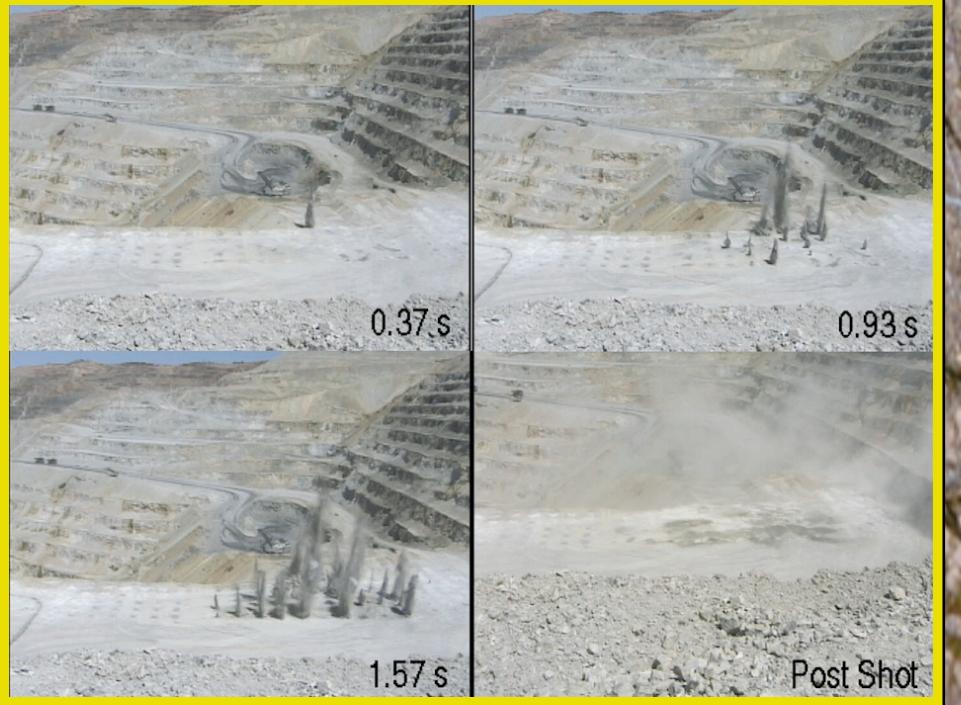
IN-MINE SEISMIC & ACOUSTIC



REGIONAL OBSERVATIONS

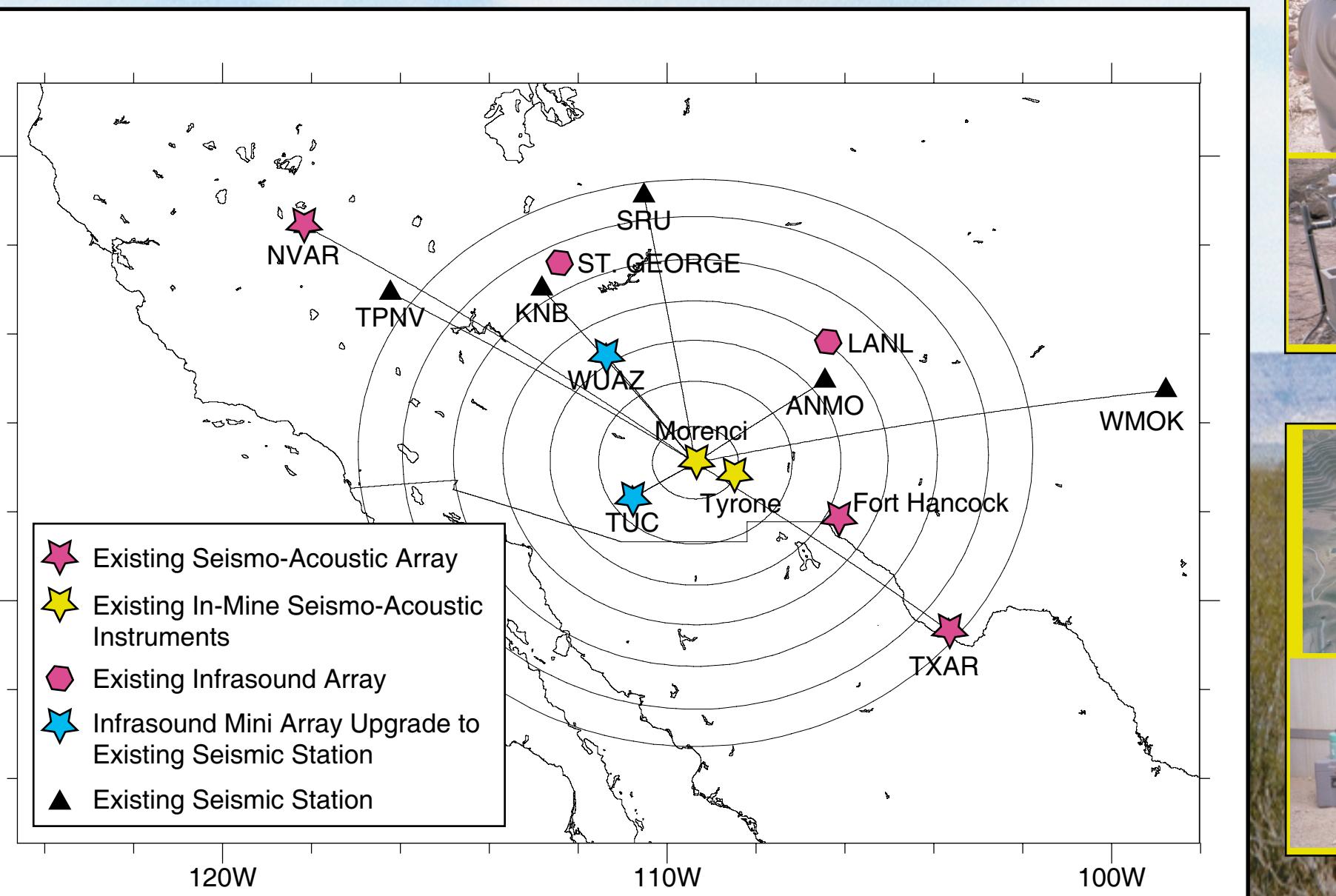


GROUND TRUTH



WESTERN US SEISMO-AcouSTIC NETWORK

WESTERN US SEISMO-ACOUSTIC NETWORK



NVAR

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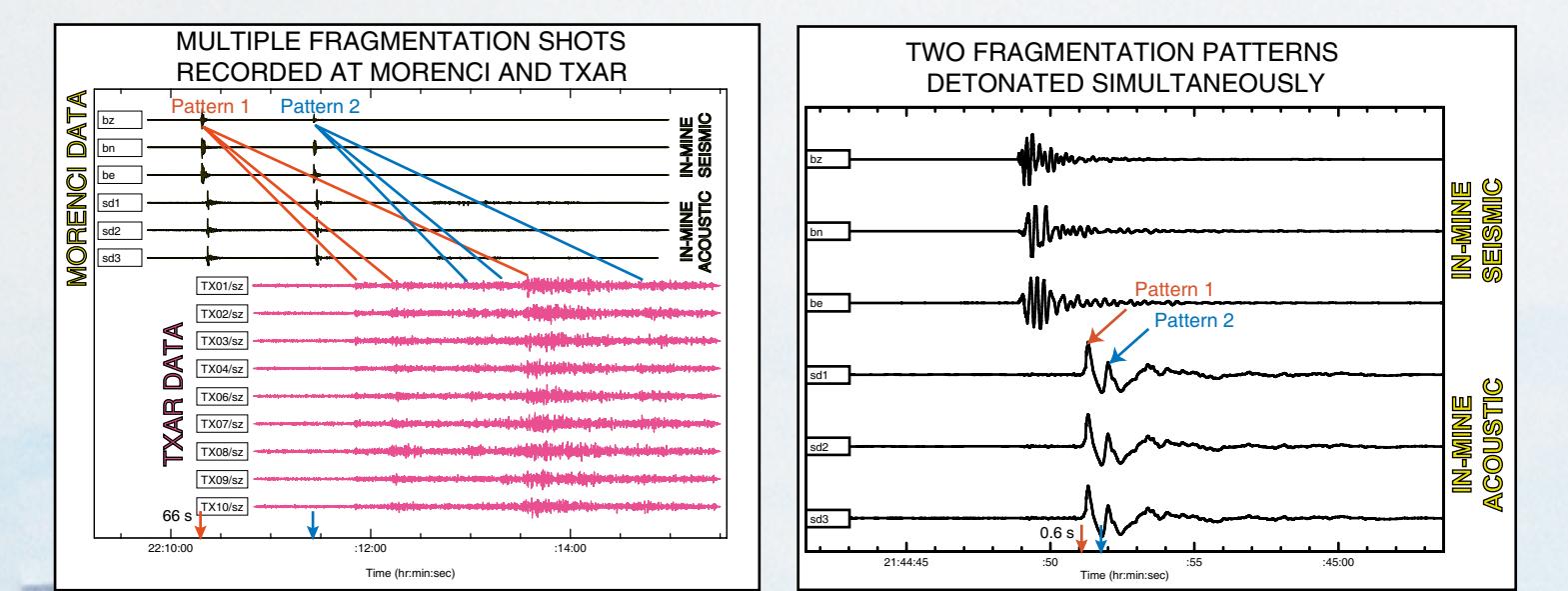
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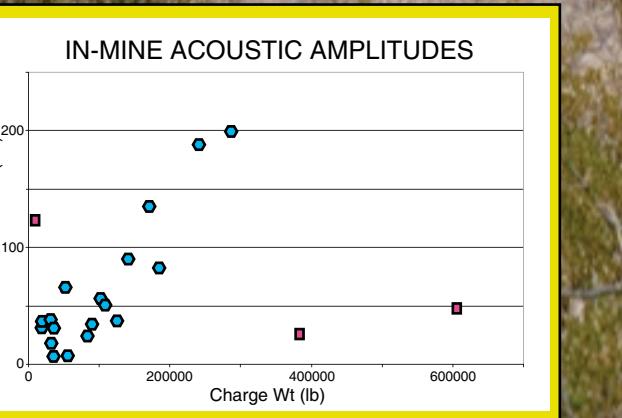
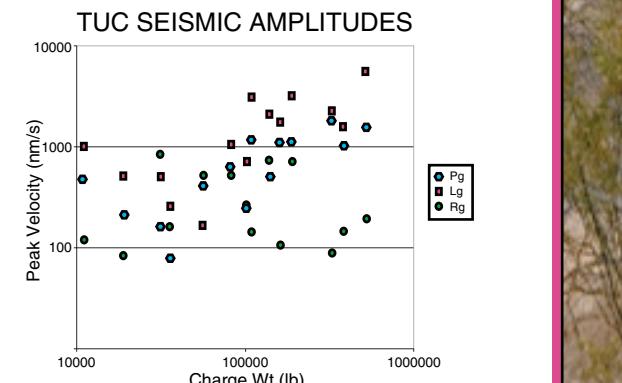
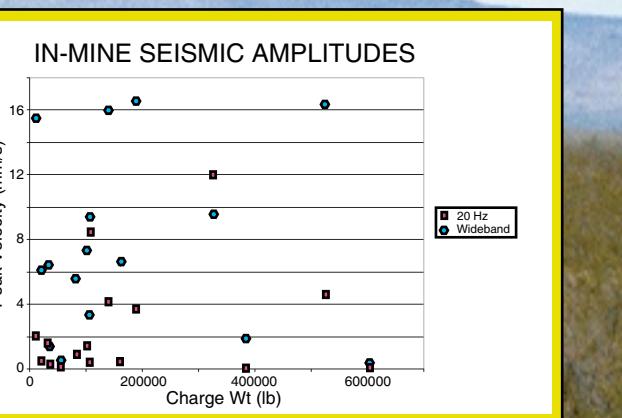
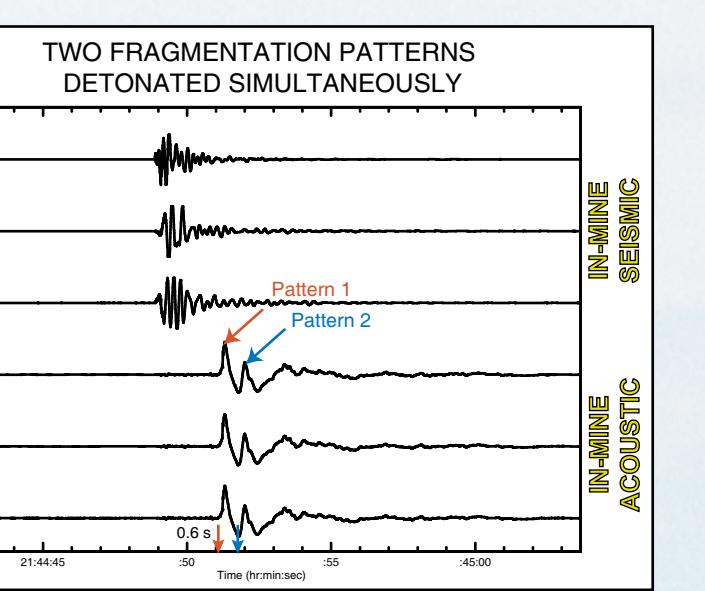
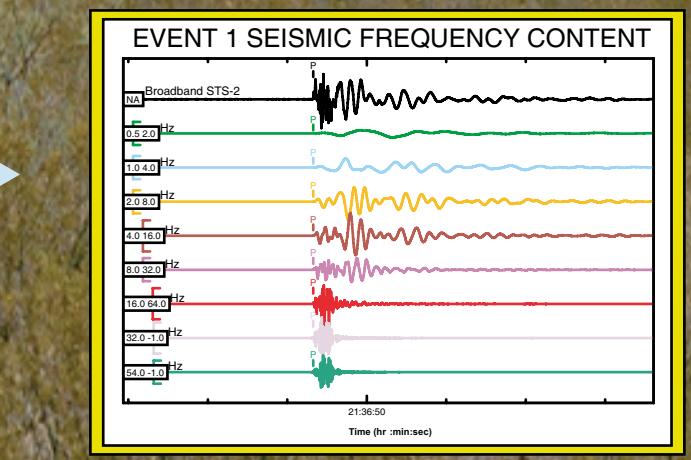
THANKS

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MULTIPLE EXPLOSIVE PATTERNS DETONATED OVER SHORT TIME INTERVALS AS CHARACTERIZED BY GROUND TRUTH AND IN-MINE OBSERVATIONS



SEISMIC IN-MINE & REGIONAL DATA WITH GROUNDTRUTH



ACOUSTIC IN-MINE DATA WITH GROUNDTRUTH

