



IT3 - TTI FWI 7Hz

NZ 3D Processing

06 January 2021

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INSTITUTE FOR GEOPHYSICS



Passion for Geoscience

- **Objective:**

To QC intermediate 7Hz TTI FWI result.

- **Procedure:**

TTI FWI was run with both streamer and OBS data from 2.5 Hz to 7Hz. Refraction energy is used in both data sets and reflection energy of streamer data is also included in the inversion. 7Hz TTI FWI velocity was used to generate the synthetic shots.

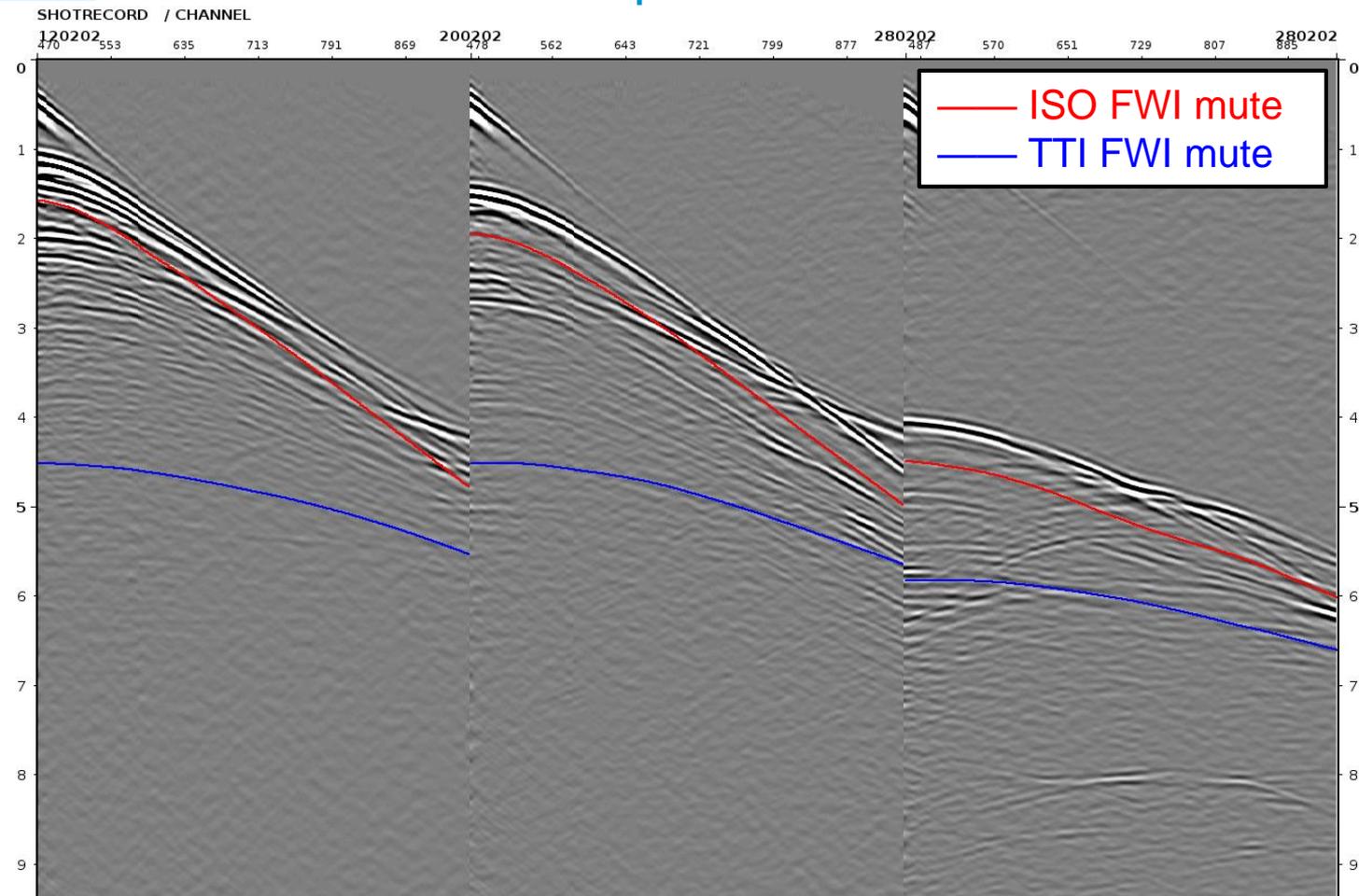
- **Display:**

Velocity and FWI synthetic.

- **Observation and Recommendation:**

Current TTI FWI gives more detailed velocity that aligns more with geology, compared with IT2 TTI tomographic velocity. Synthetic shots have better match with the real data indicating a reasonable update. We'll continue the TTI FWI update to 12 Hz according to our contract.

Streamer 001: FWI Input



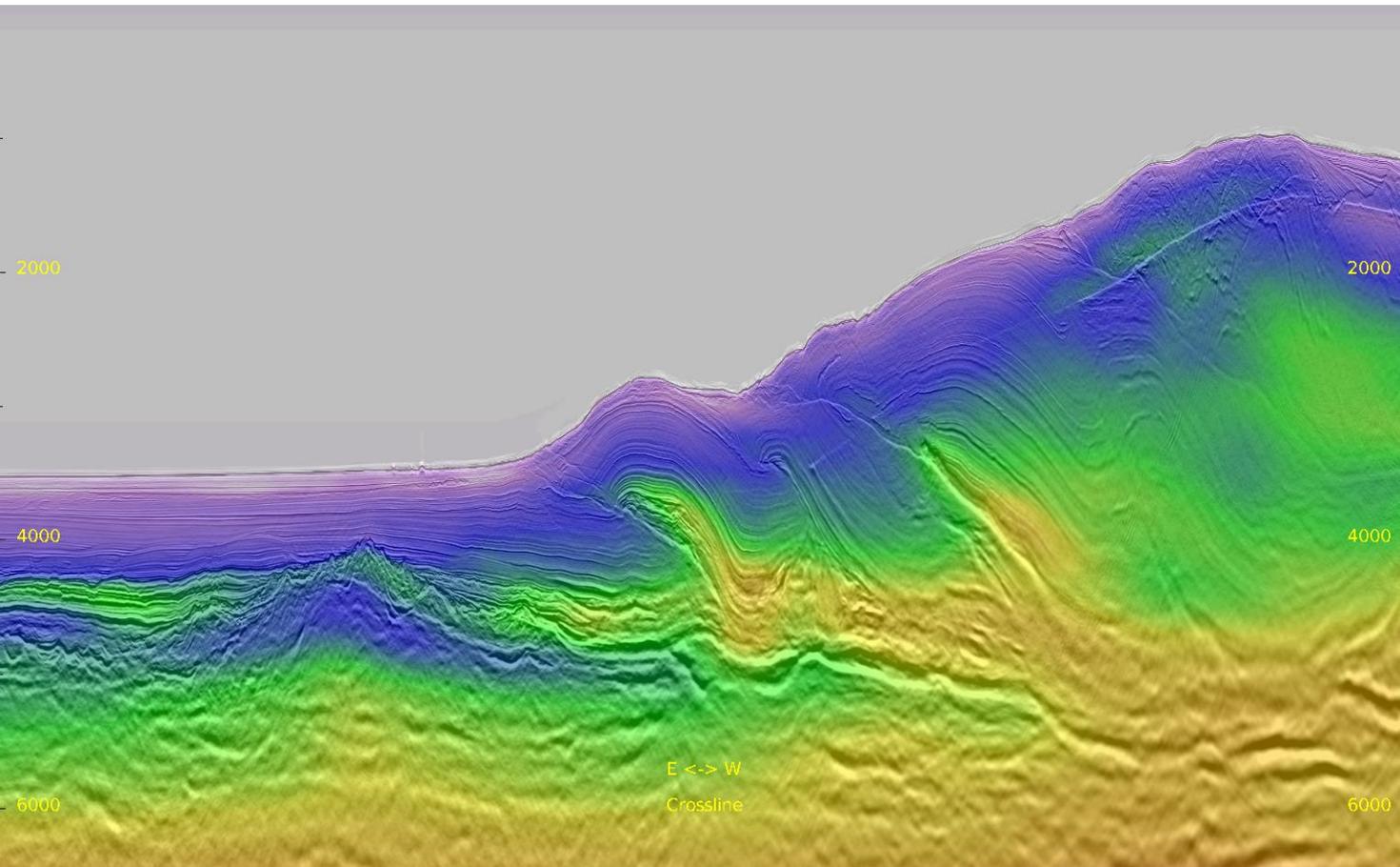
- The reflection energy below the blue line is mute.
- Compared to ISO FWI, part of the reflection energy is included in the inversion to get more resolution in the velocity.
- OBN input data is not changed (refraction only), due to the low quality of it's reflection zone.

Velocity Model





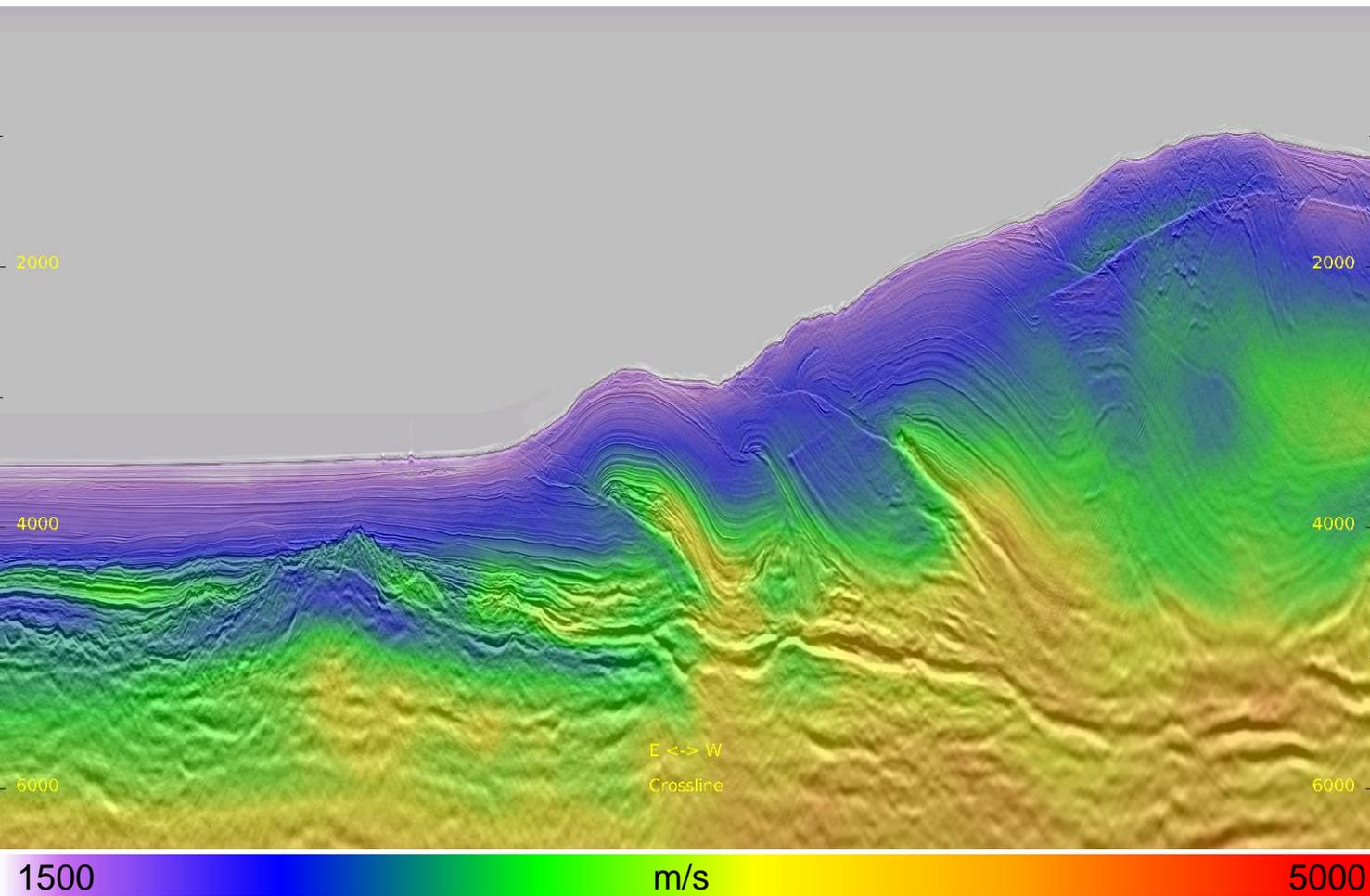
Inline 436 East: IT2 Velocity



- Starting velocity is from IT2 TTI tomography.

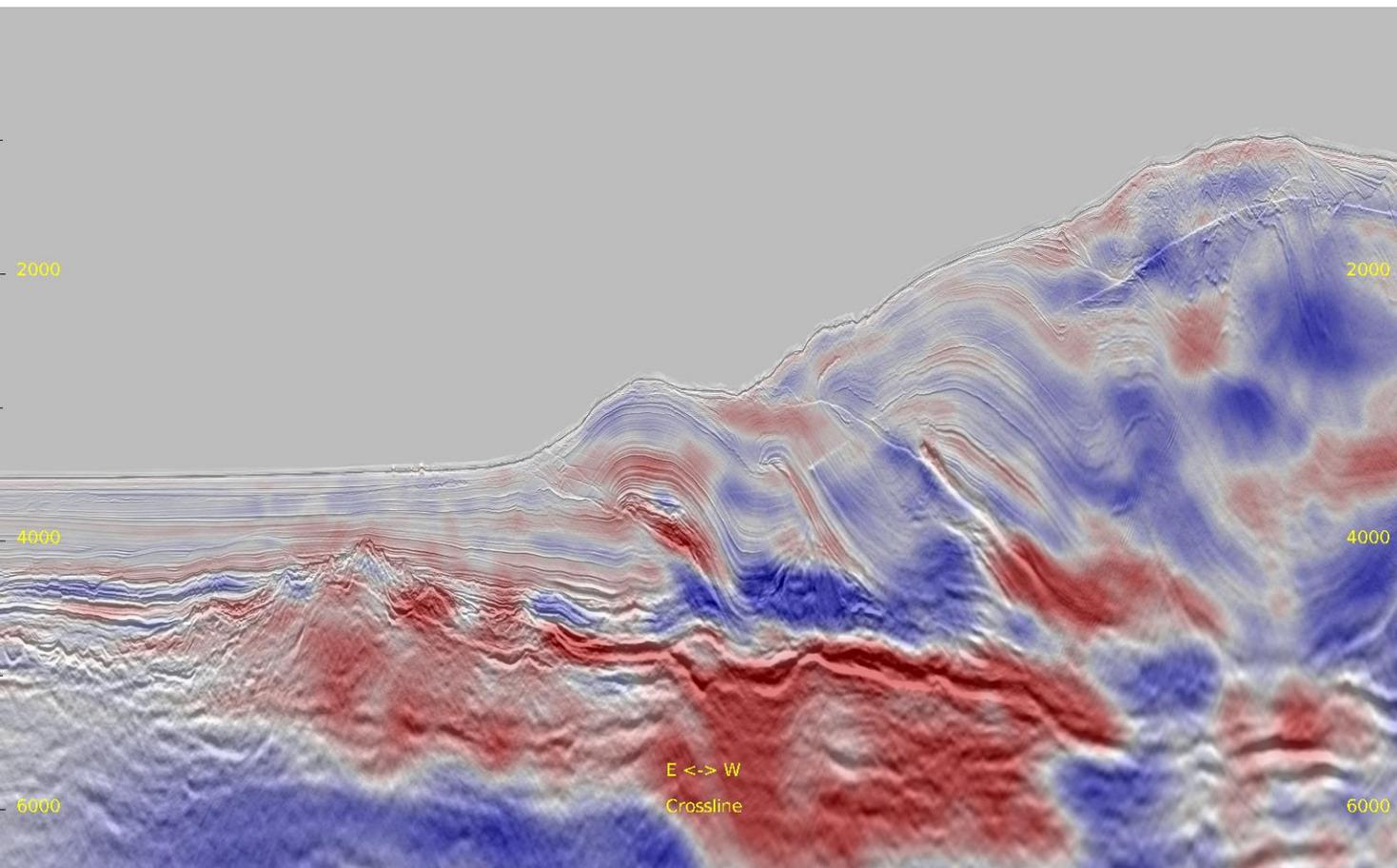


Inline 436 East: 7Hz TTI FWI Velocity

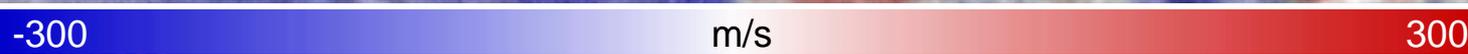


- TT FWI velocity aligns more with geology.

Inline 436 East: Velocity Perturbation

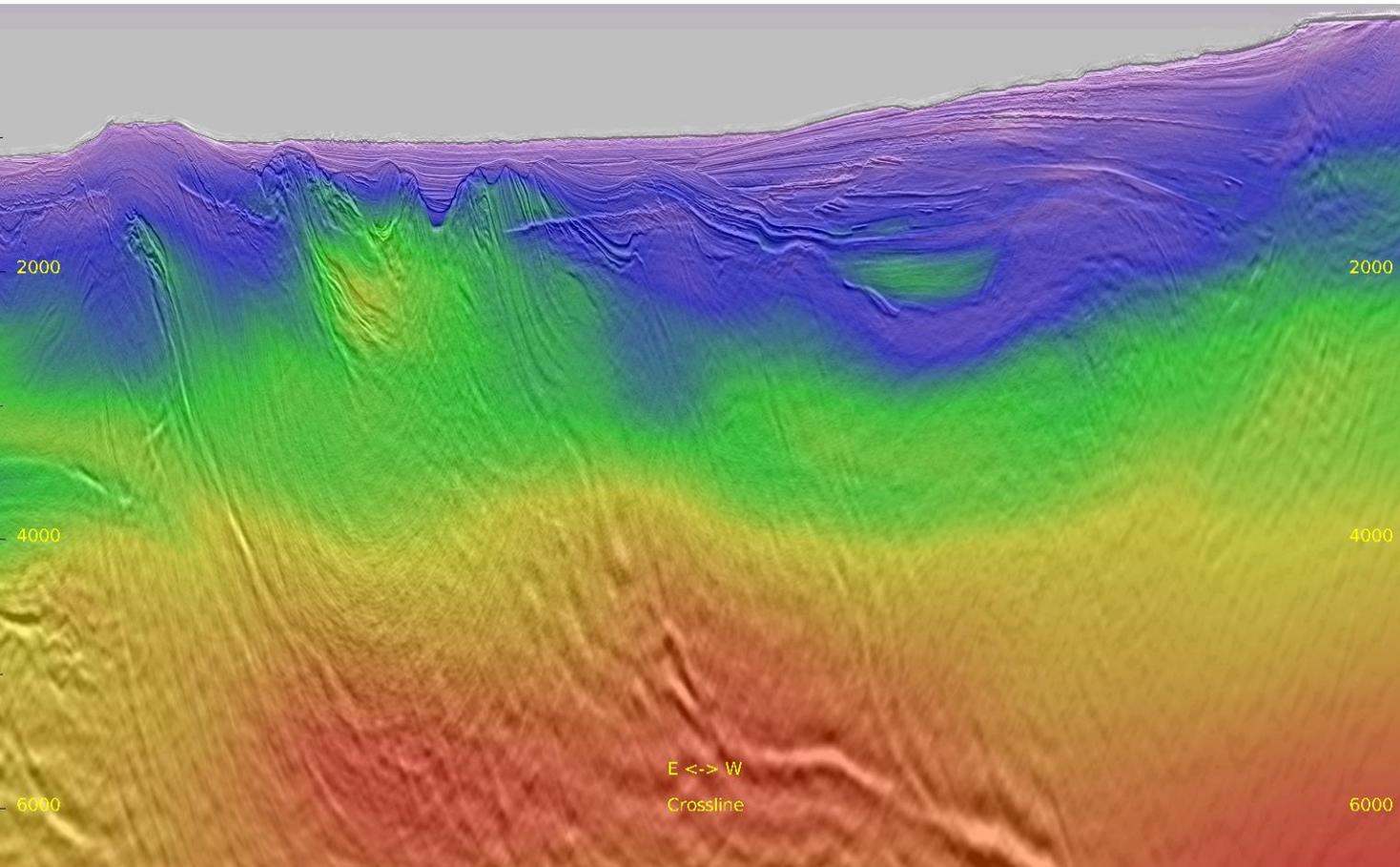


- TTI FWI give detailed velocity perturbation.





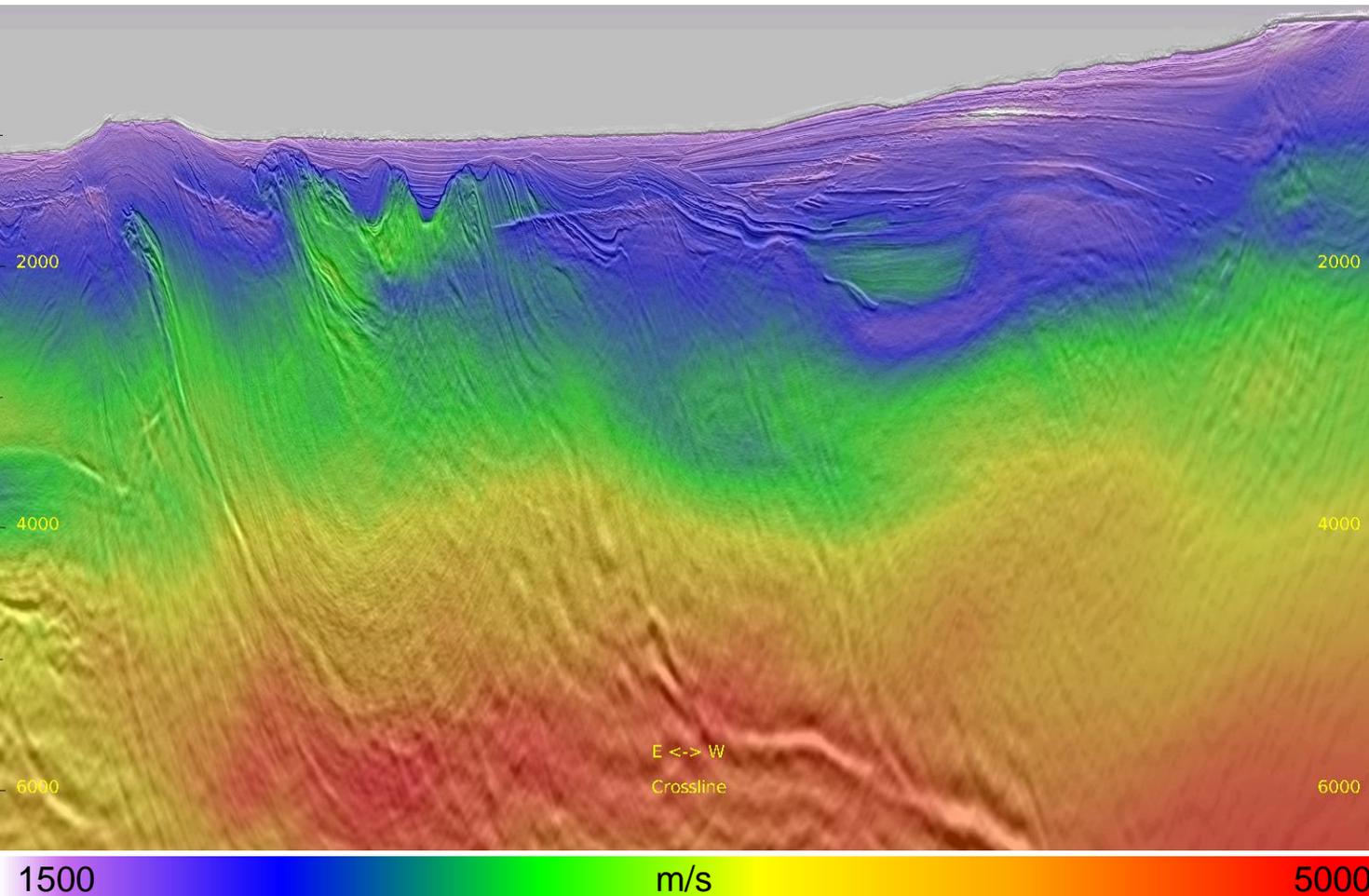
Inline 436 West: IT2 Velocity



- Starting velocity is from IT2 TTI tomography.

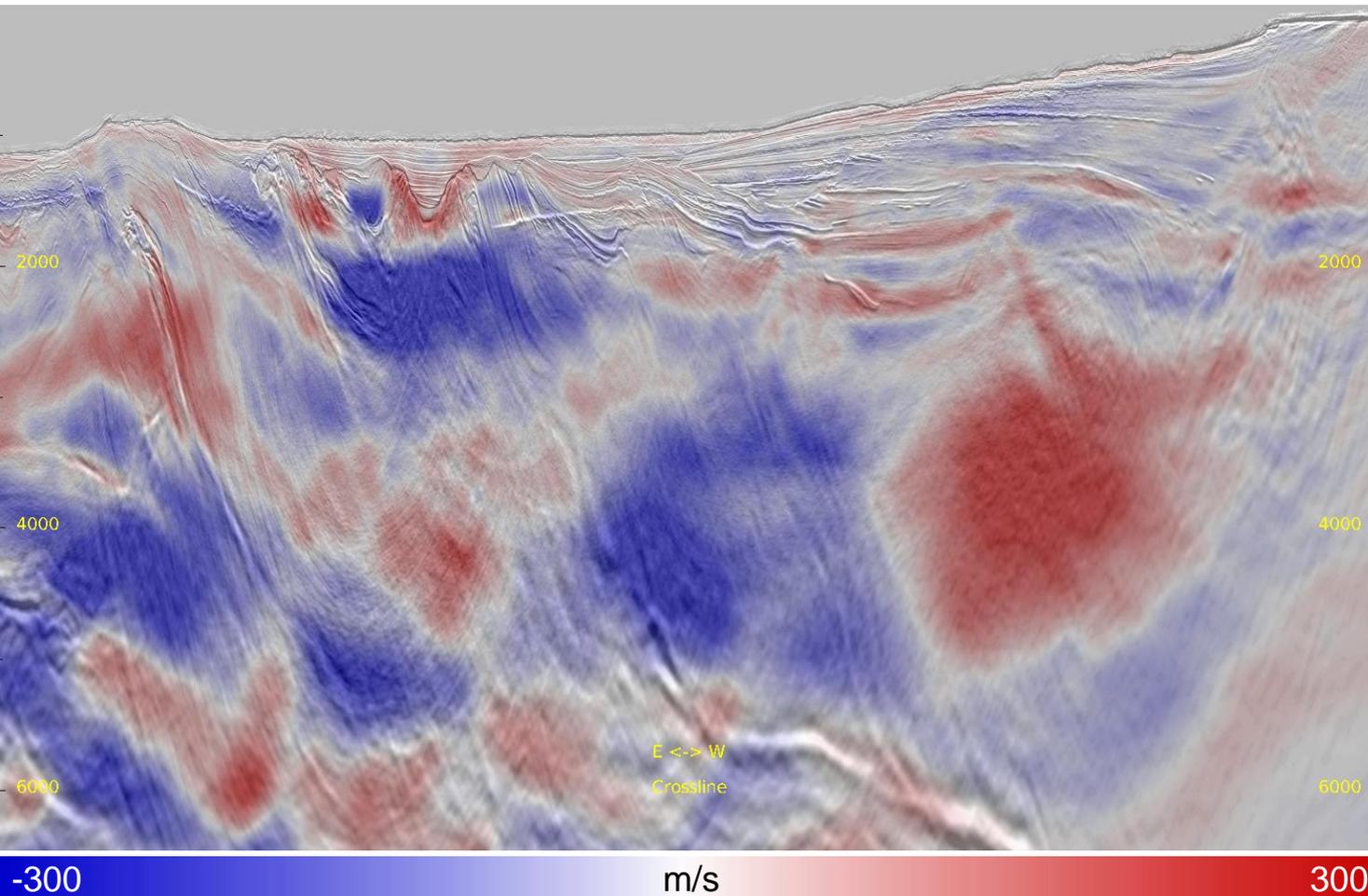


Inline 436 West: 7Hz TTI FWI Velocity



- TT FWI velocity aligns more with geology.

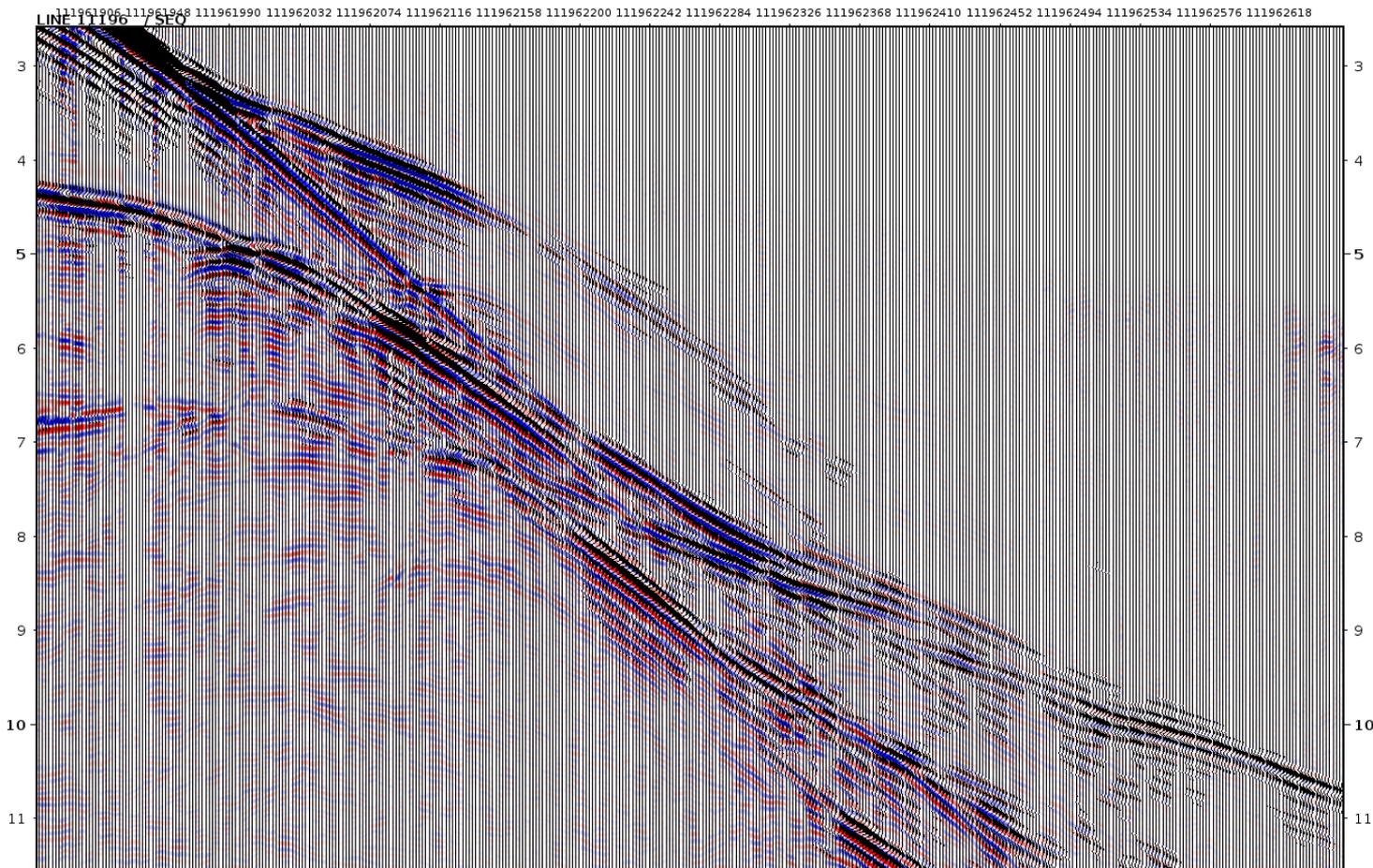
Inline 436 West: Velocity Perturbation



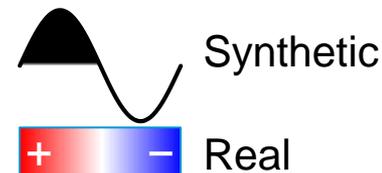
- TTI FWI give detailed velocity perturbation.

FWI Synthetic VS Real Data (< 9 Hz)





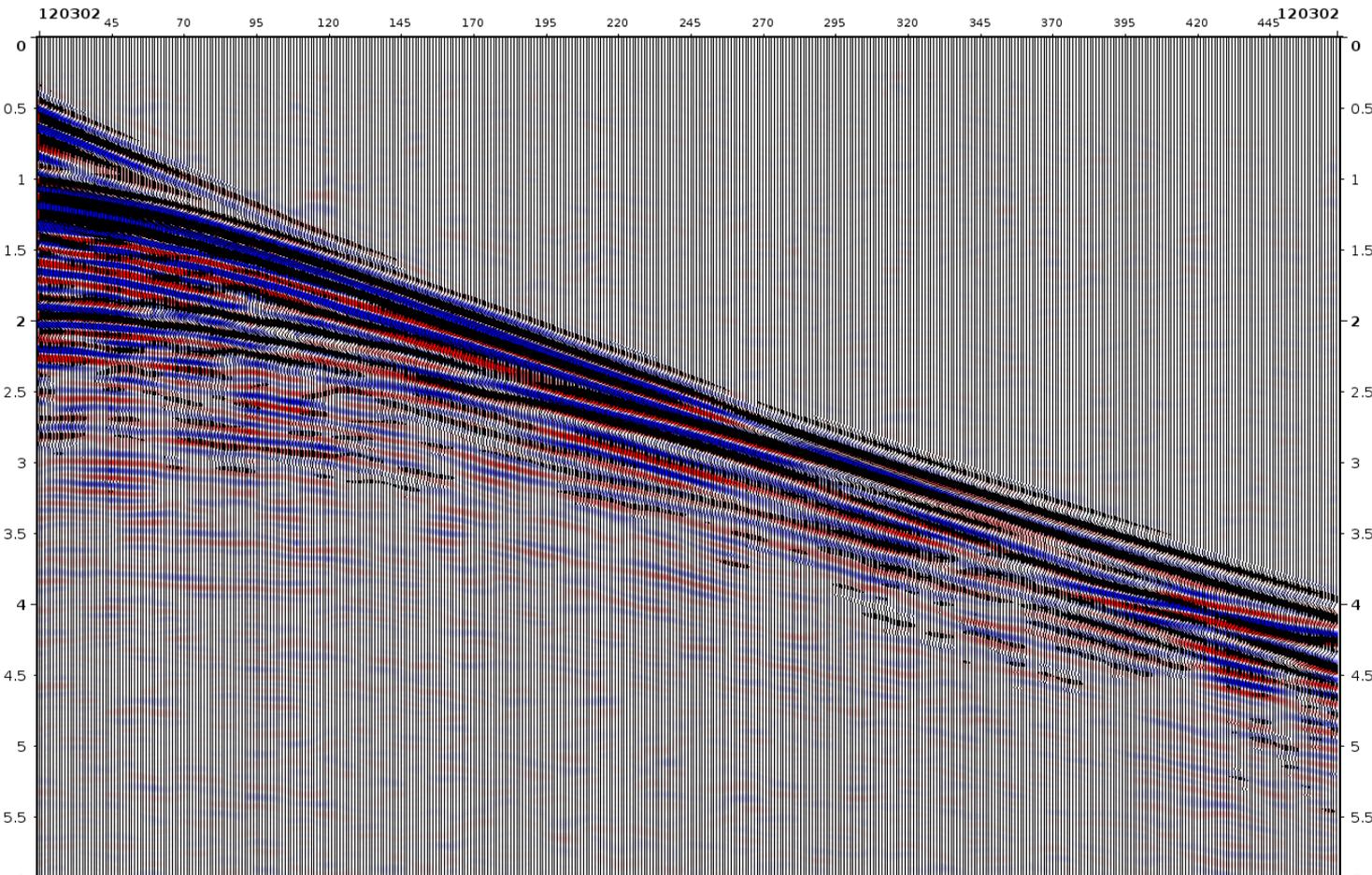
- After TTI FWI date, synthetic shots and real data matches better through out all channels.



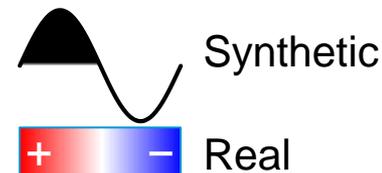


Streamer 001 Synthetic Overlaid on Real: IT2 Velocity

SHOTRECORD 120302 / CABTR
120302



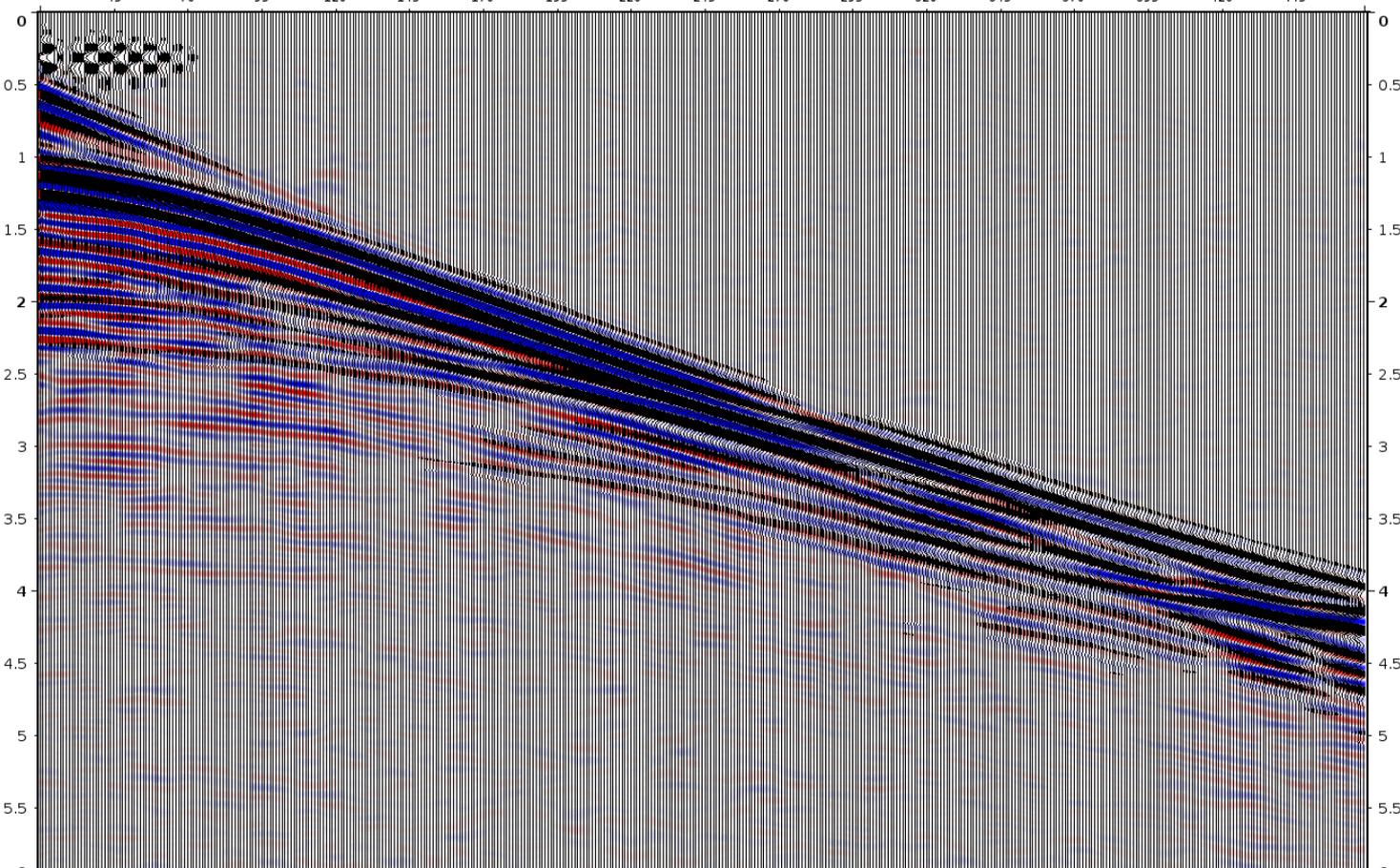
- Before TTI FWI, synthetic shot and real data matches not very well from mid to far channels.





SHOTRECORD 120302 / CABTR

120302 45 70 95 120 145 170 195 220 245 270 295 320 345 370 395 420 445 120302



- After TTI FWI date, synthetic shots and real data matches better through out all channels.

