



Isotropic FWI – Migration QC

NZ 3D Processing

11 November 2020

cgg.com



INSTITUTE FOR GEOPHYSICS



Passion for Geoscience

- **Objective:**

To QC isotropic (ISO) FWI result via depth migration.

- **Procedure:**

The VMB migration input is prepared from the production data after linear noise attenuation. Several key steps were applied to reasonably clean the data. These processes include WCS, RMC, 2D deghost, 3D demultiple, and some simple denoise.

Kirchhoff depth migrations were done with 5 km aperture and down to 15 km. A time variant scale was applied to balance the amplitude for QC purpose.

- **Display:**

Velocity and migrated depth full stack & gathers.

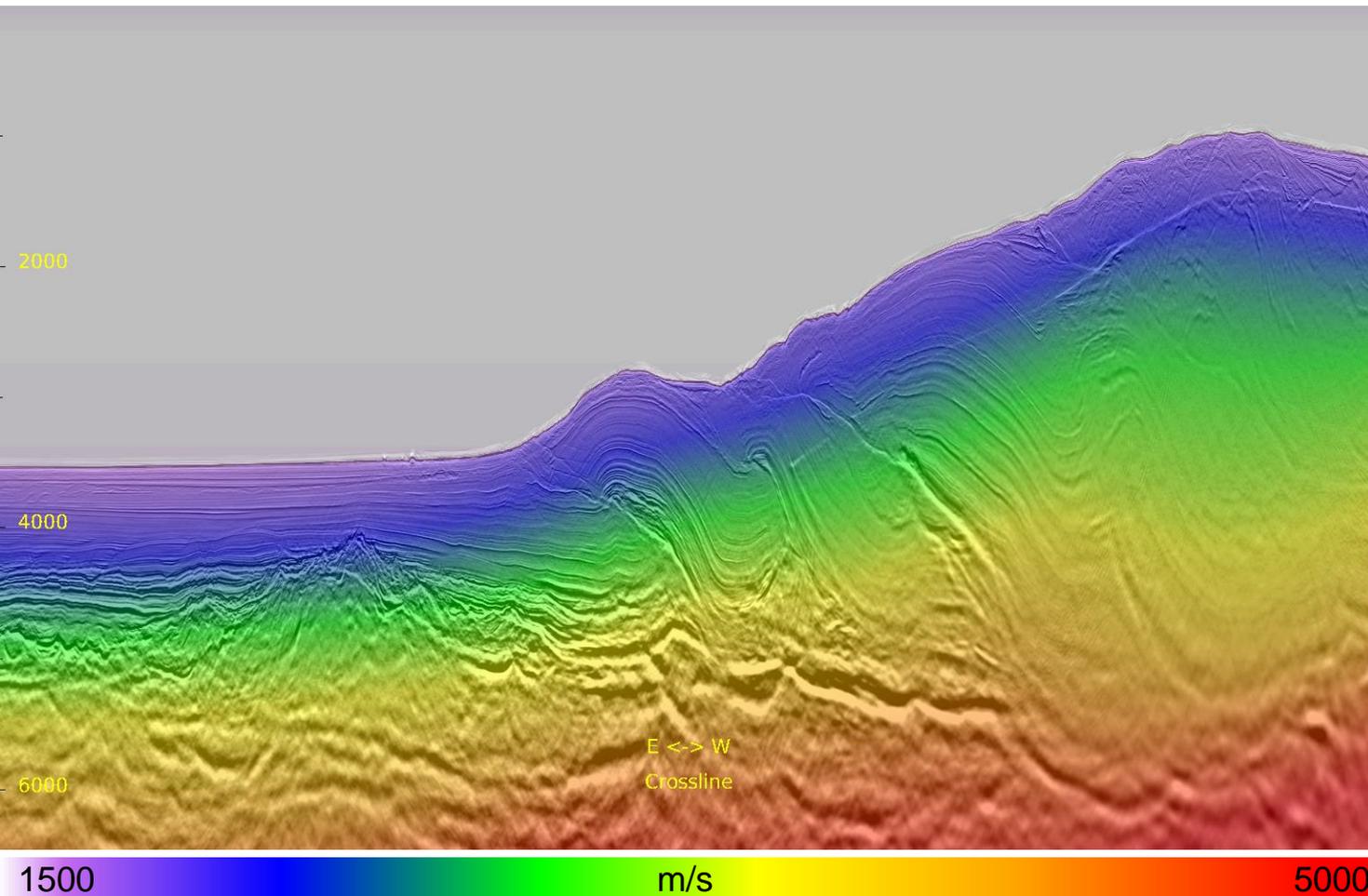
- **Observation and Recommendation:**

ISO FWI velocity gives overall flatter gathers and improvements on migrated stack, compared to initial velocity. We recommend to move on to ISO tomography.

Velocity Model

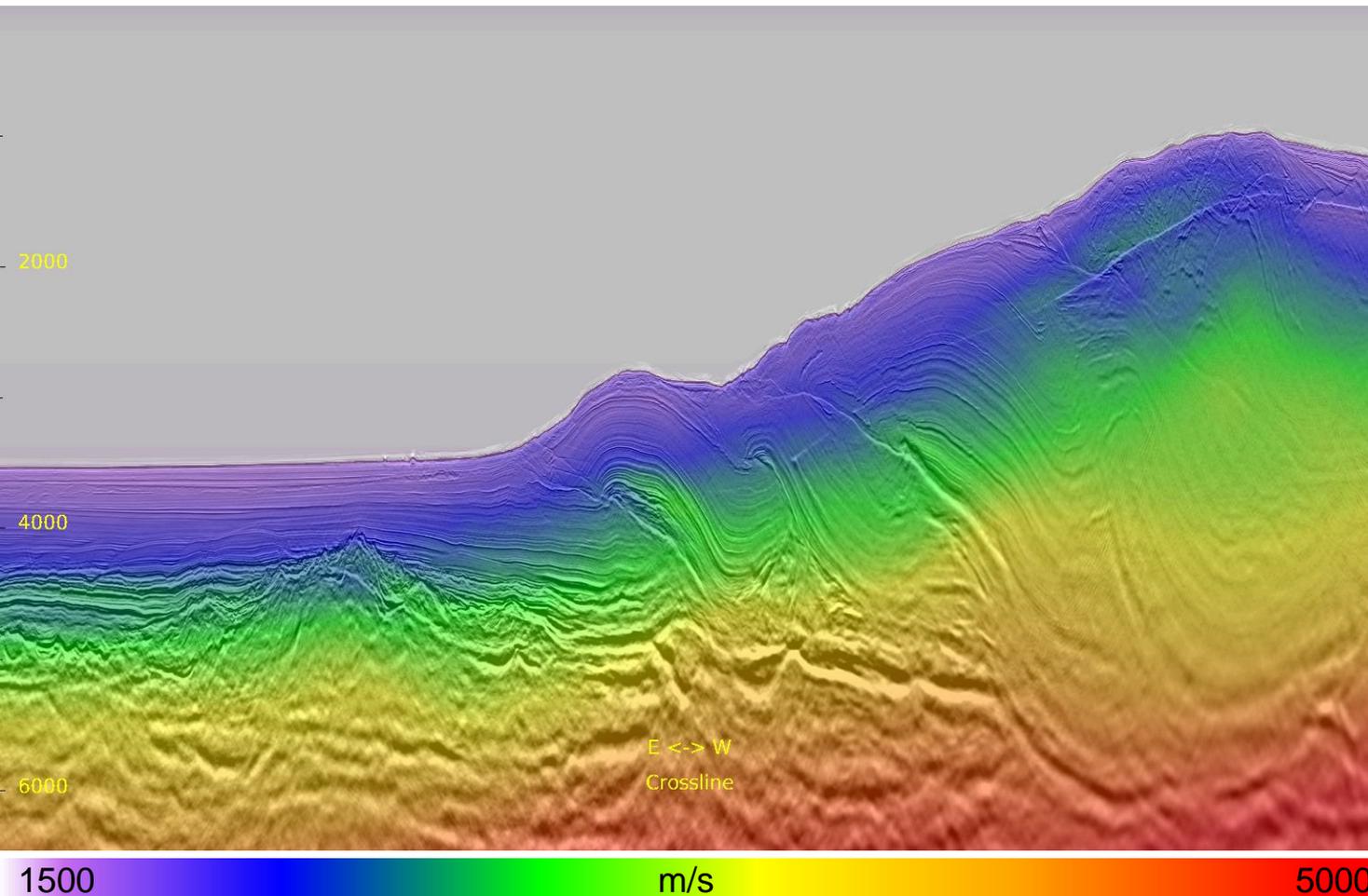


Inline 436 East: Initial Velocity

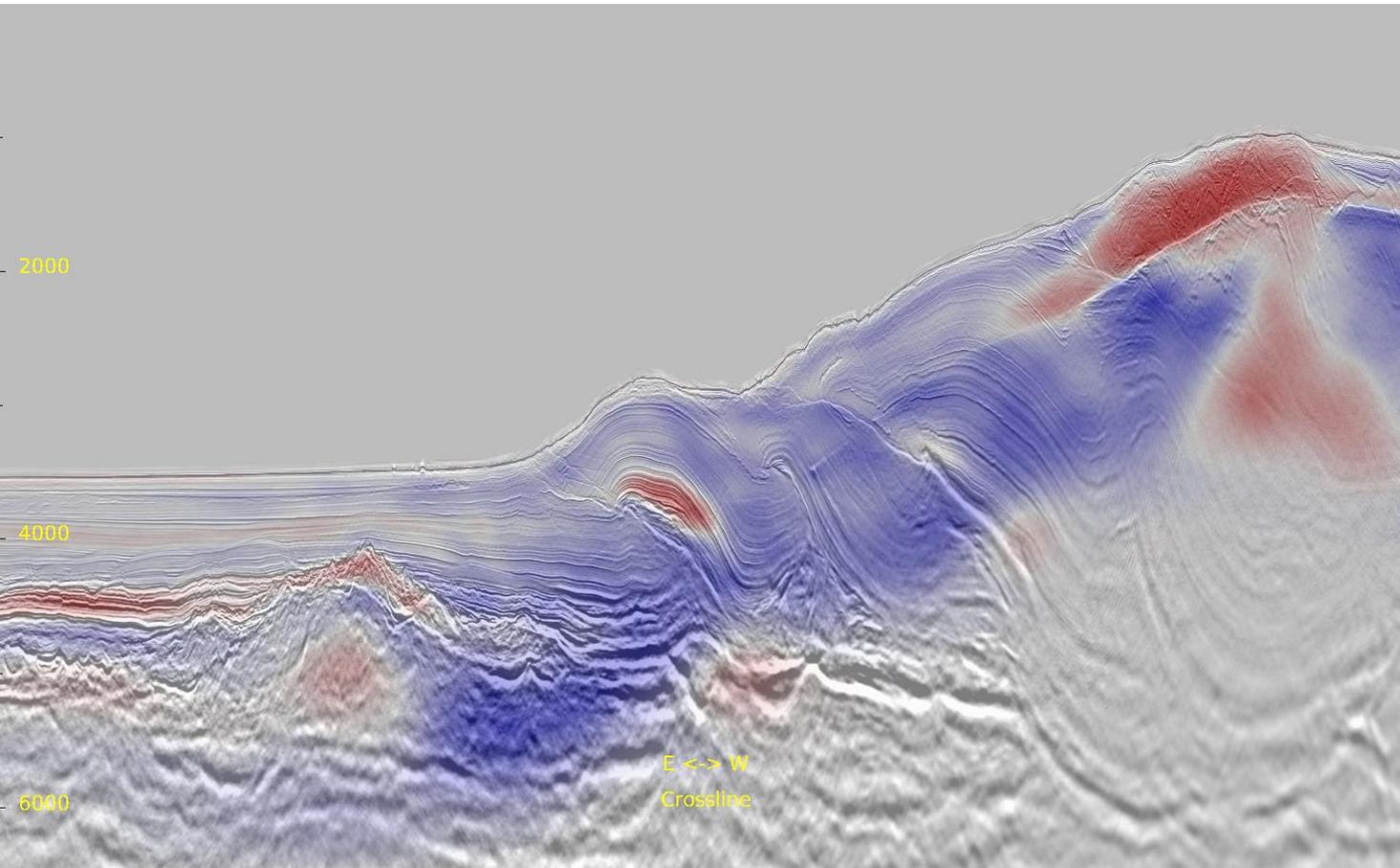


- Initial velocity is smooth.

Inline 436 East: Modified ISO FWI Velocity

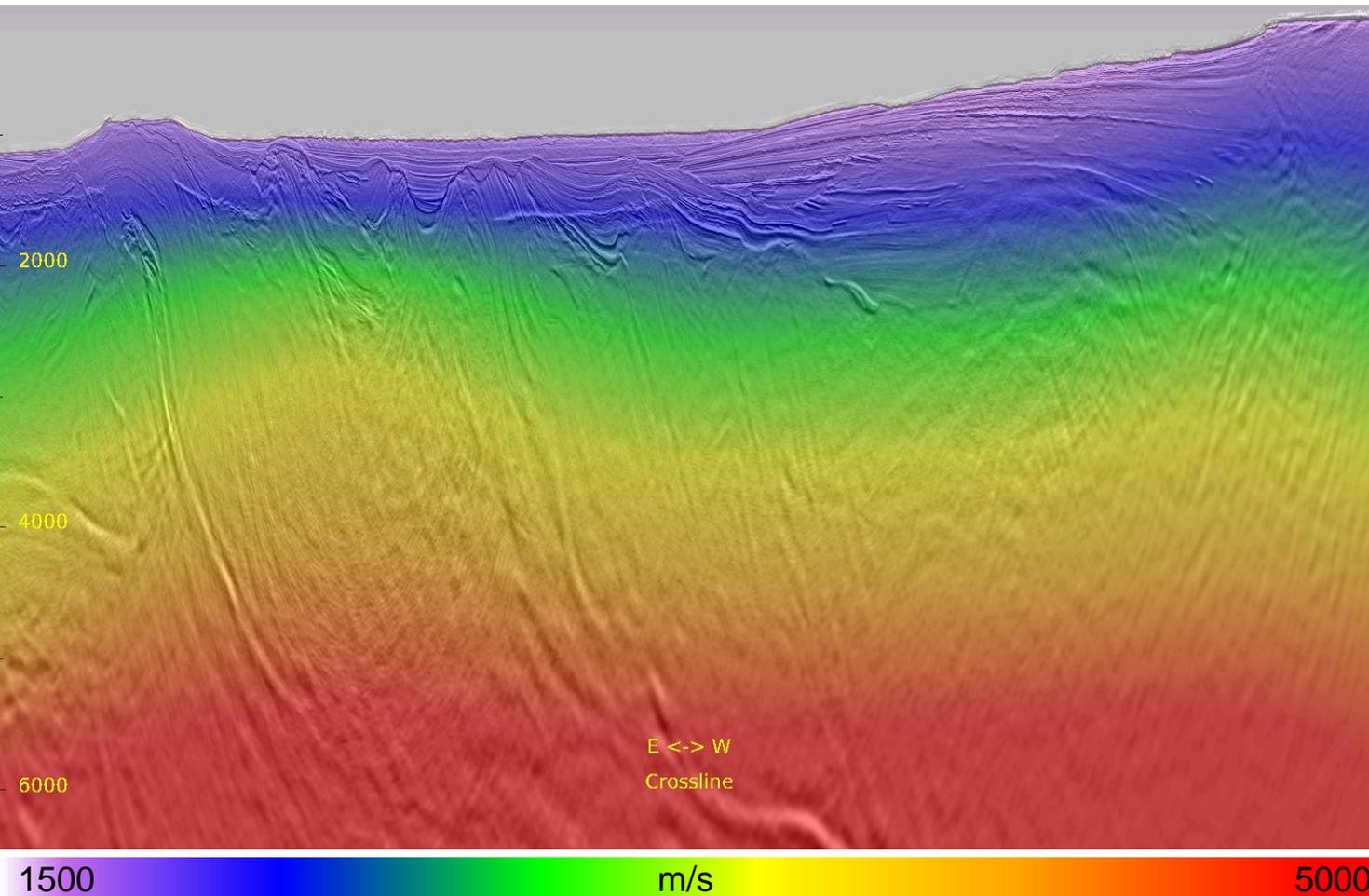


- ISO FWI gives reasonable update that follows geology, down to 2km beneath water bottom.



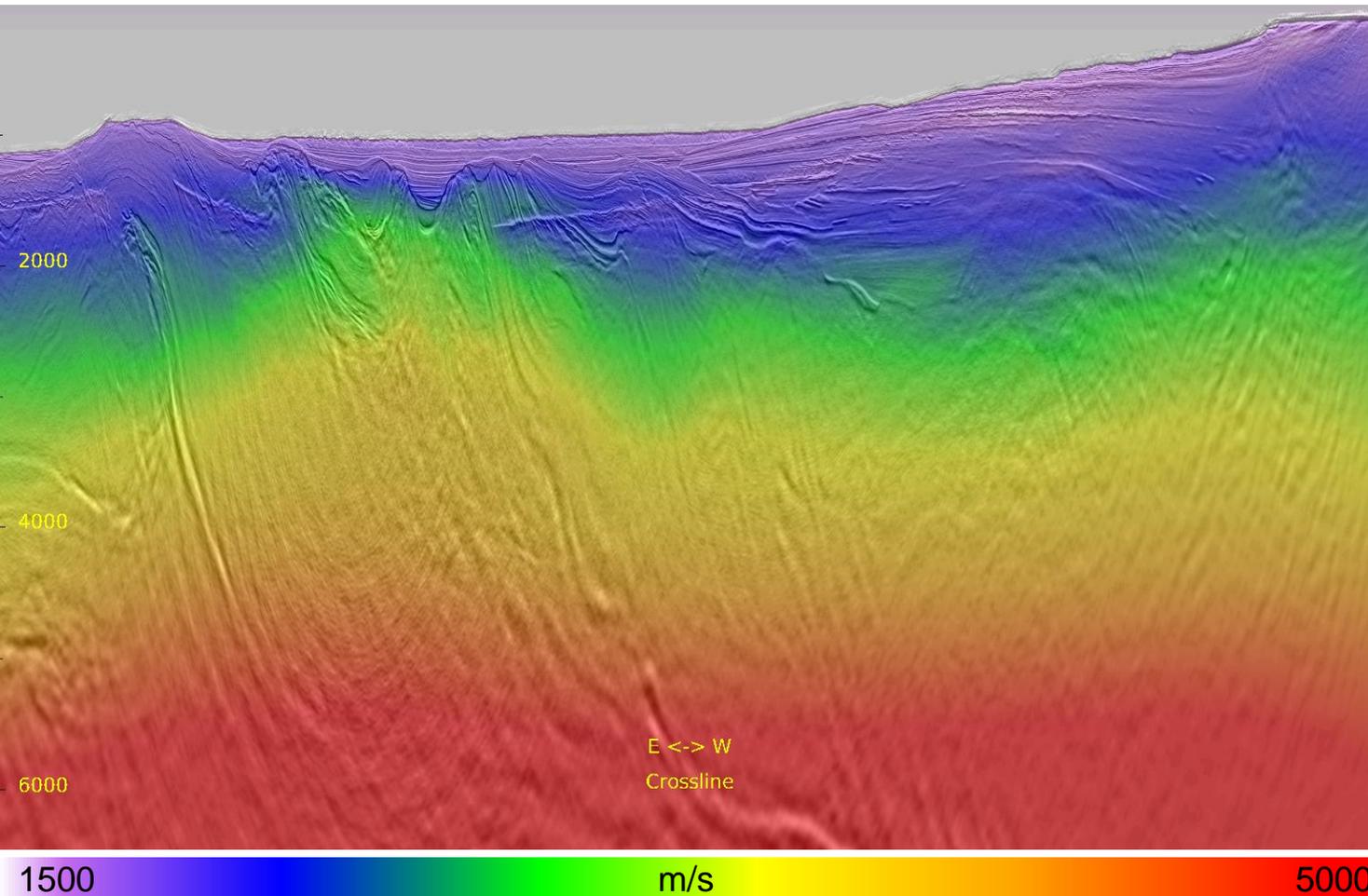
- ISO FWI gives reasonable update that follows geology, down to 2km beneath water bottom.
- The perturbation deeper than 2km beneath water bottom is removed with taper.

Inline 436 West: Initial Velocity

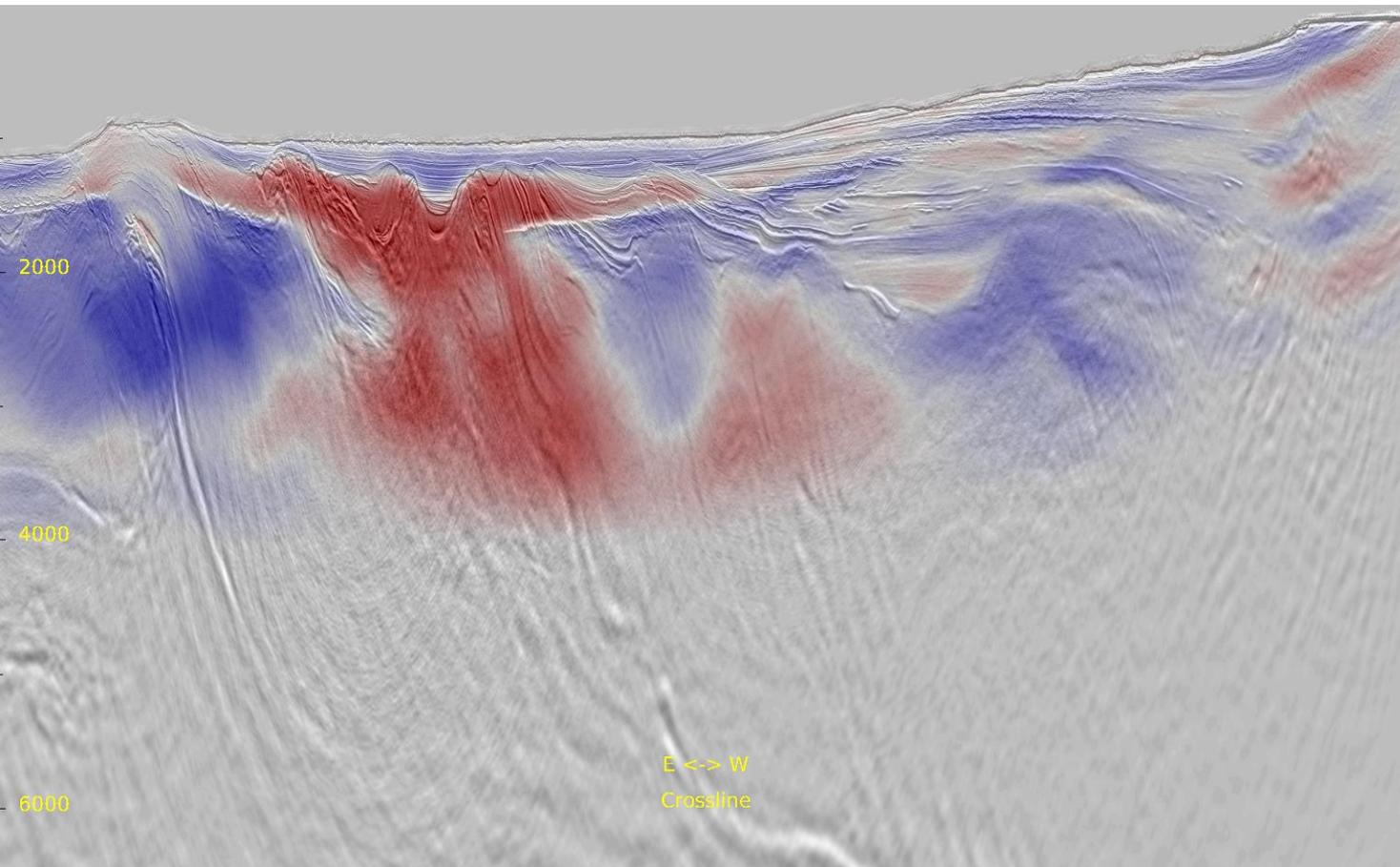


- Initial velocity is smooth.

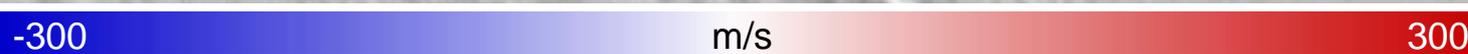
Inline 436 West: Modified ISO FWI Velocity



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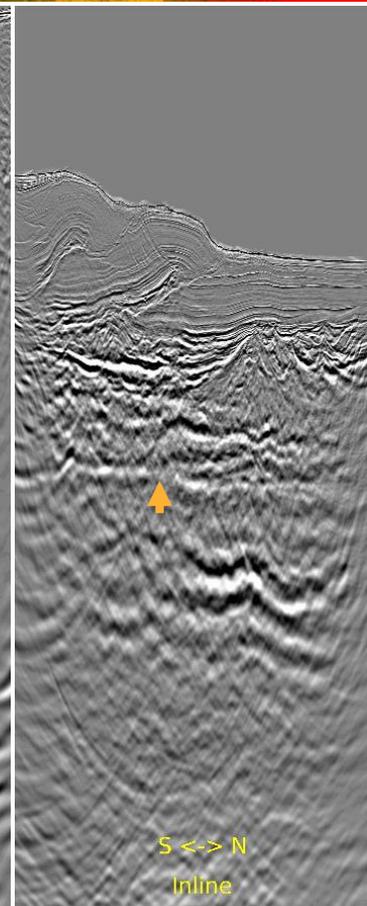
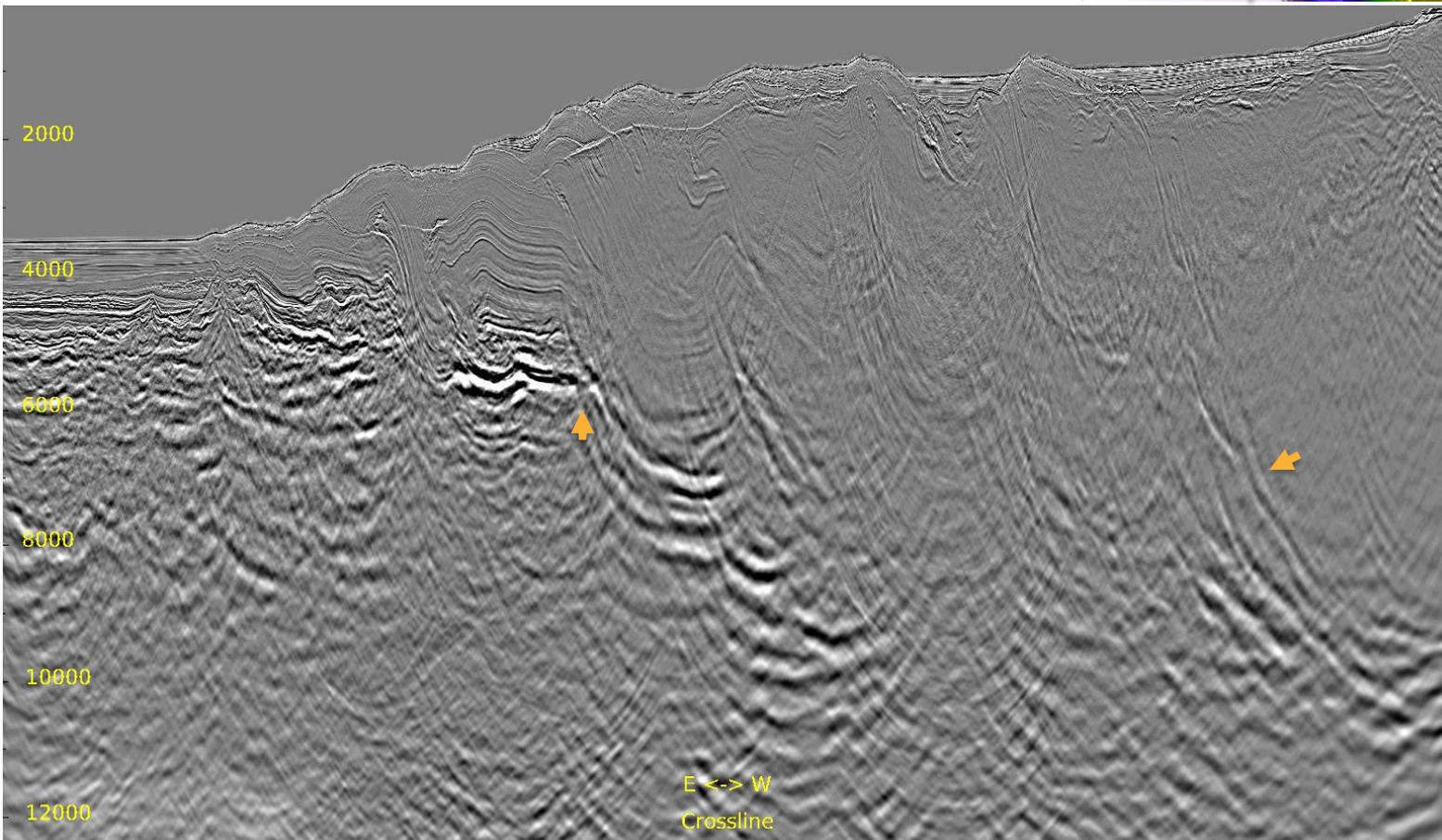
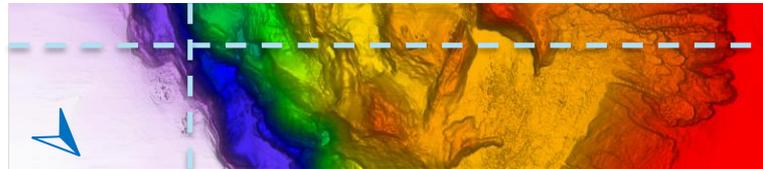


Kirchhoff Depth Migration



Full Stack: Initial

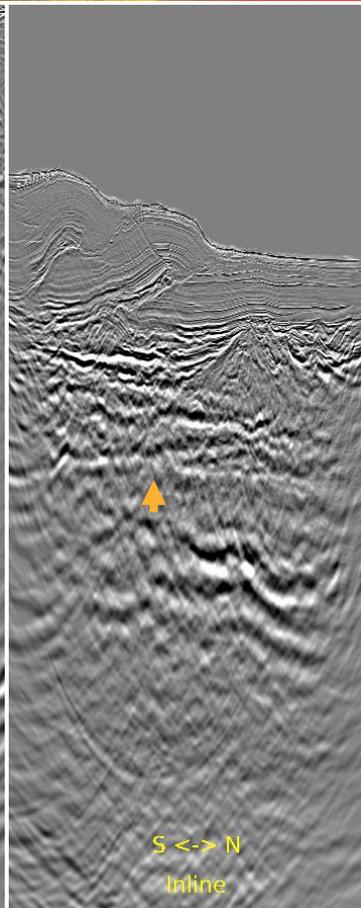
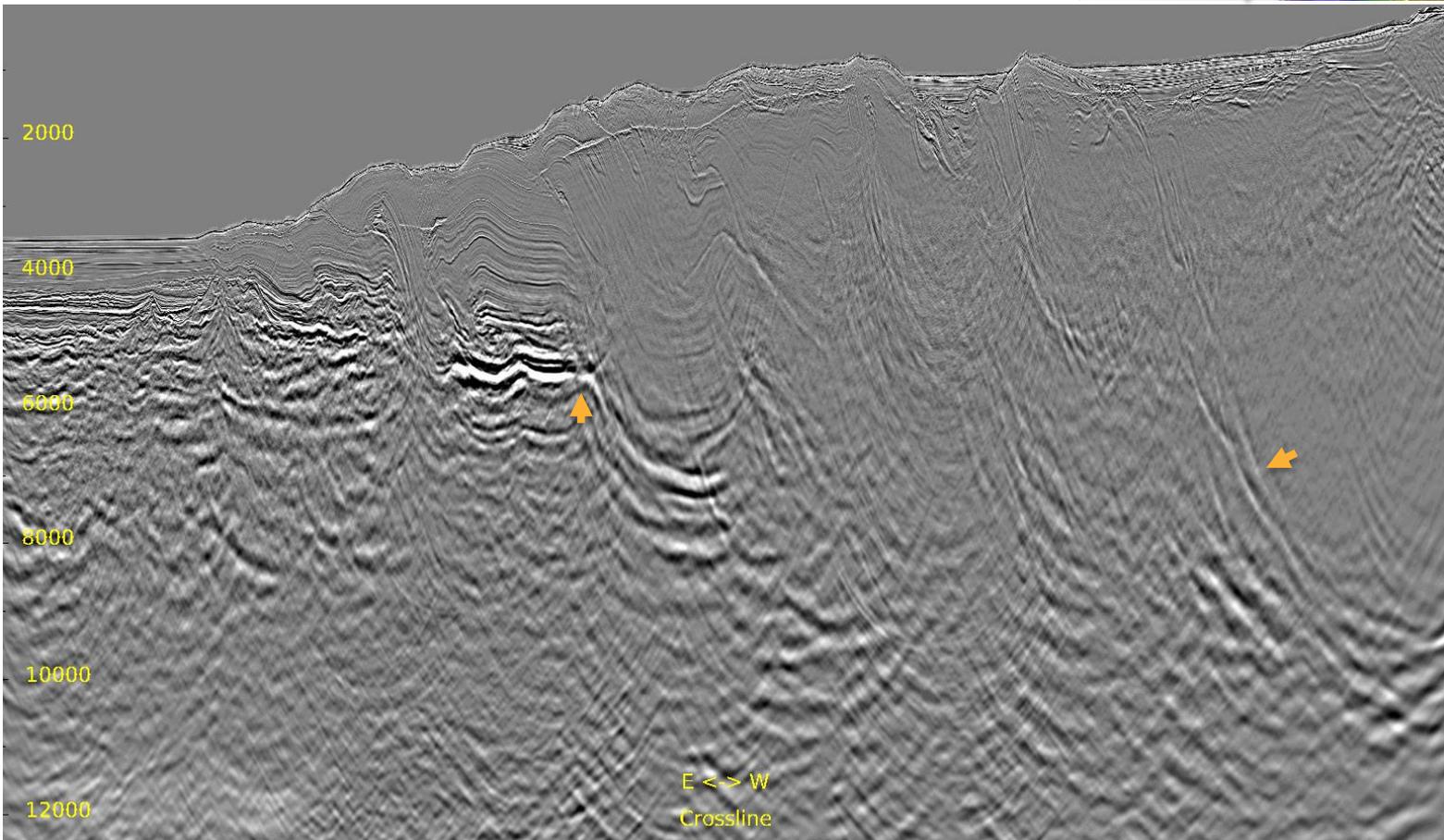
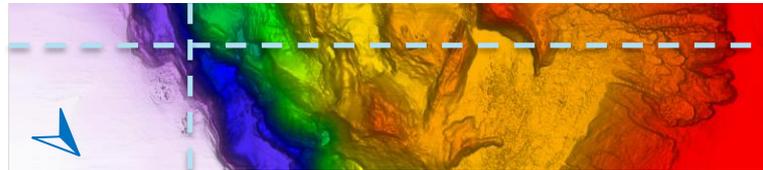
Inline 236 & Crossline 1540





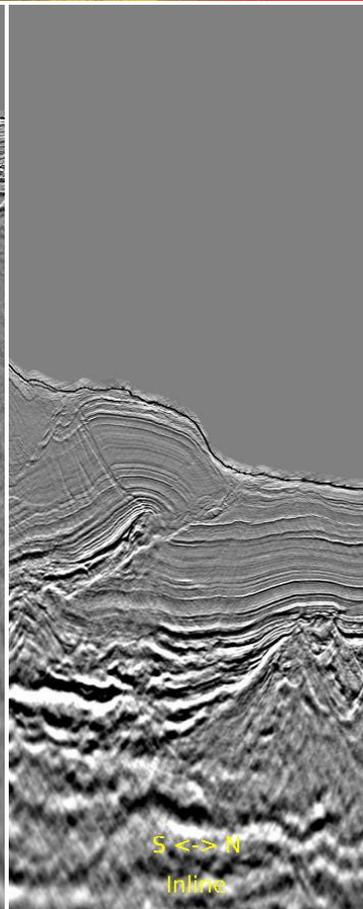
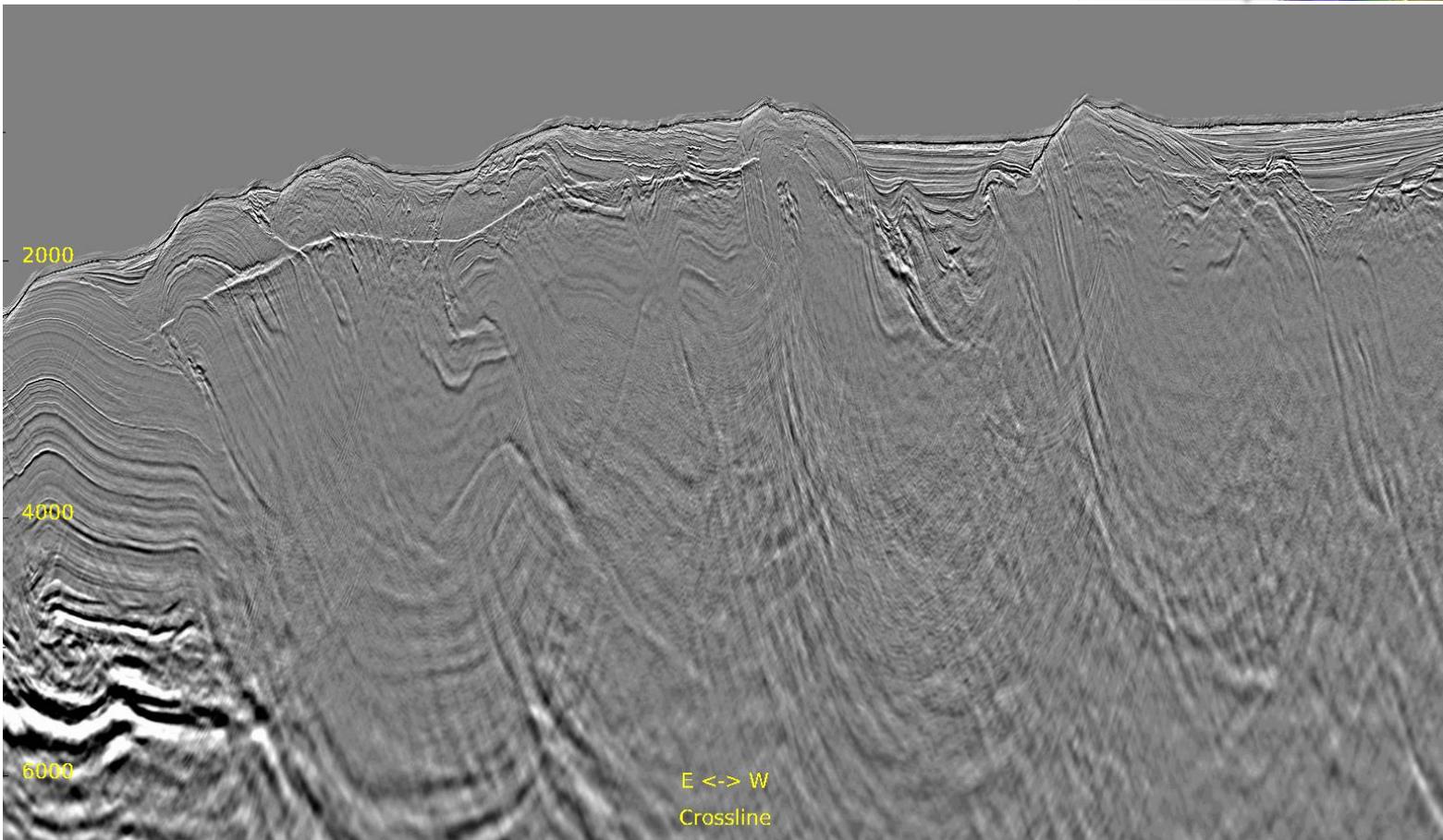
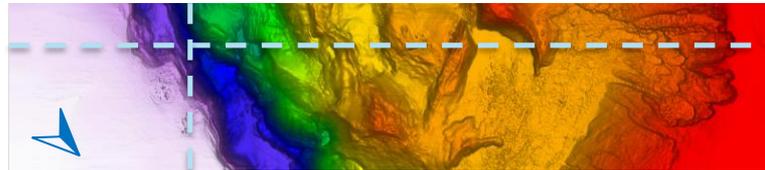
Full Stack: ISO FWI

Inline 236 & Crossline 1540



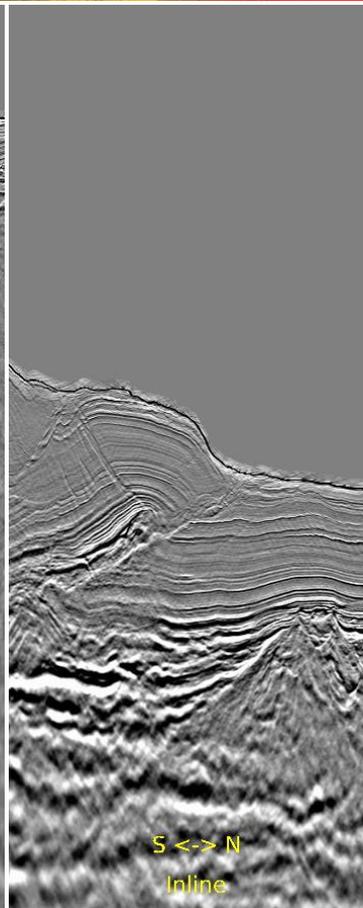
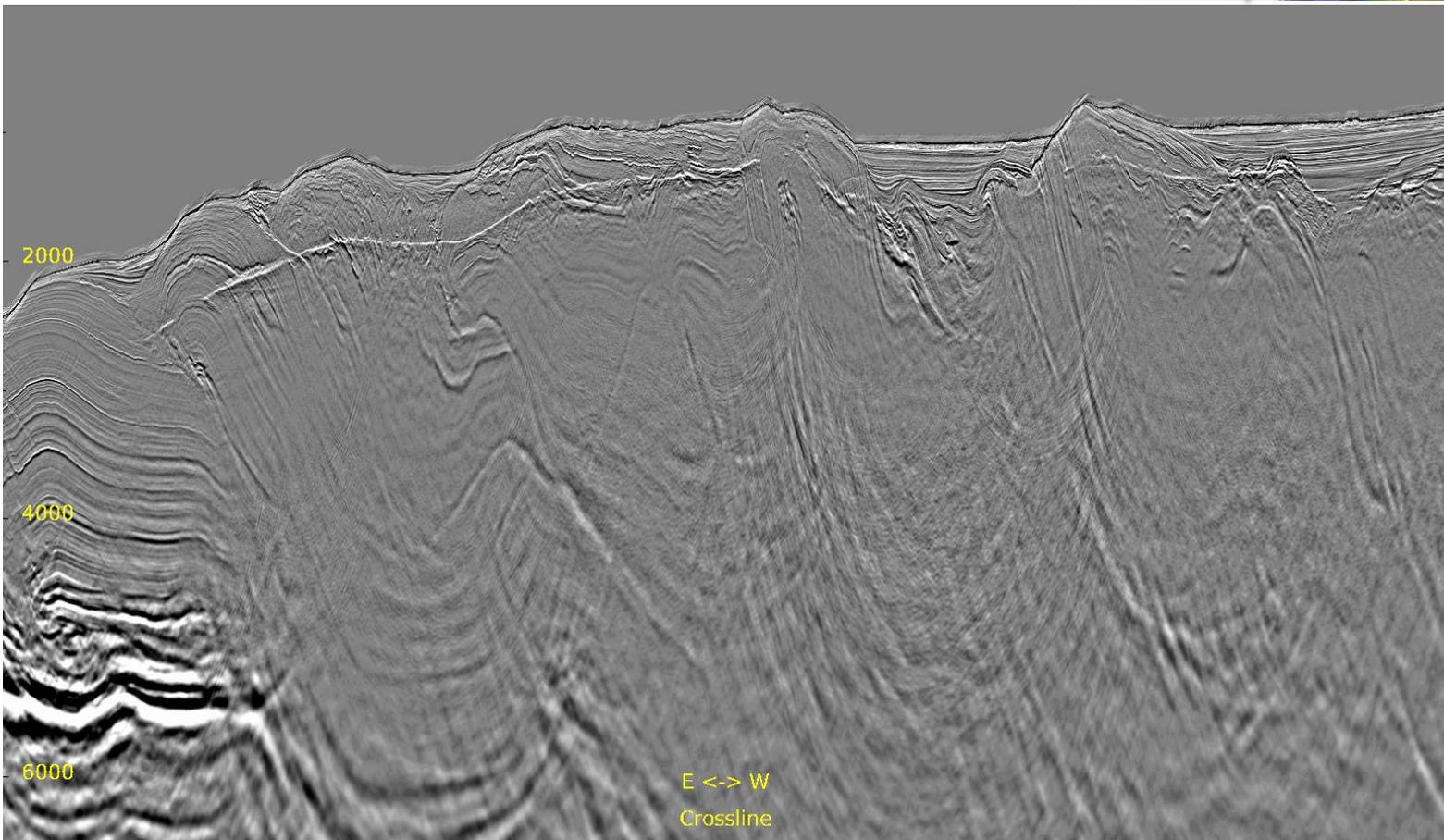
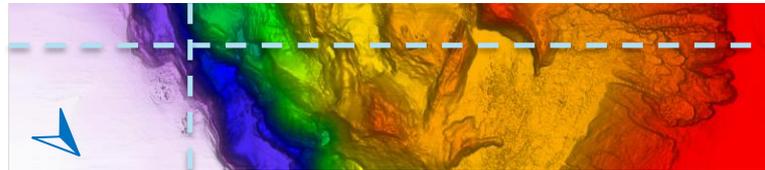
Zoomed Full Stack: Initial

Inline 236 & Crossline 1540

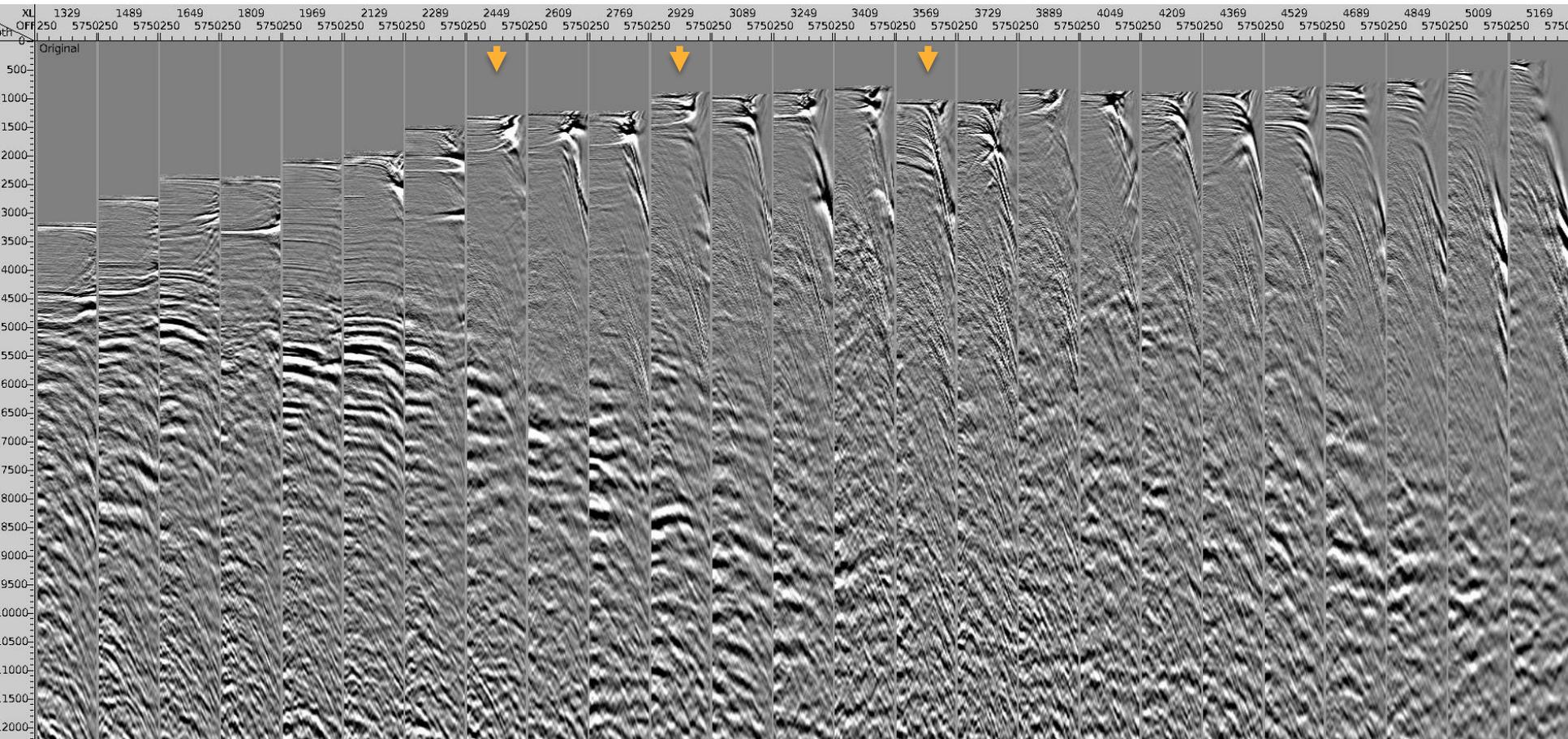


Zoomed Full Stack: ISO FWI

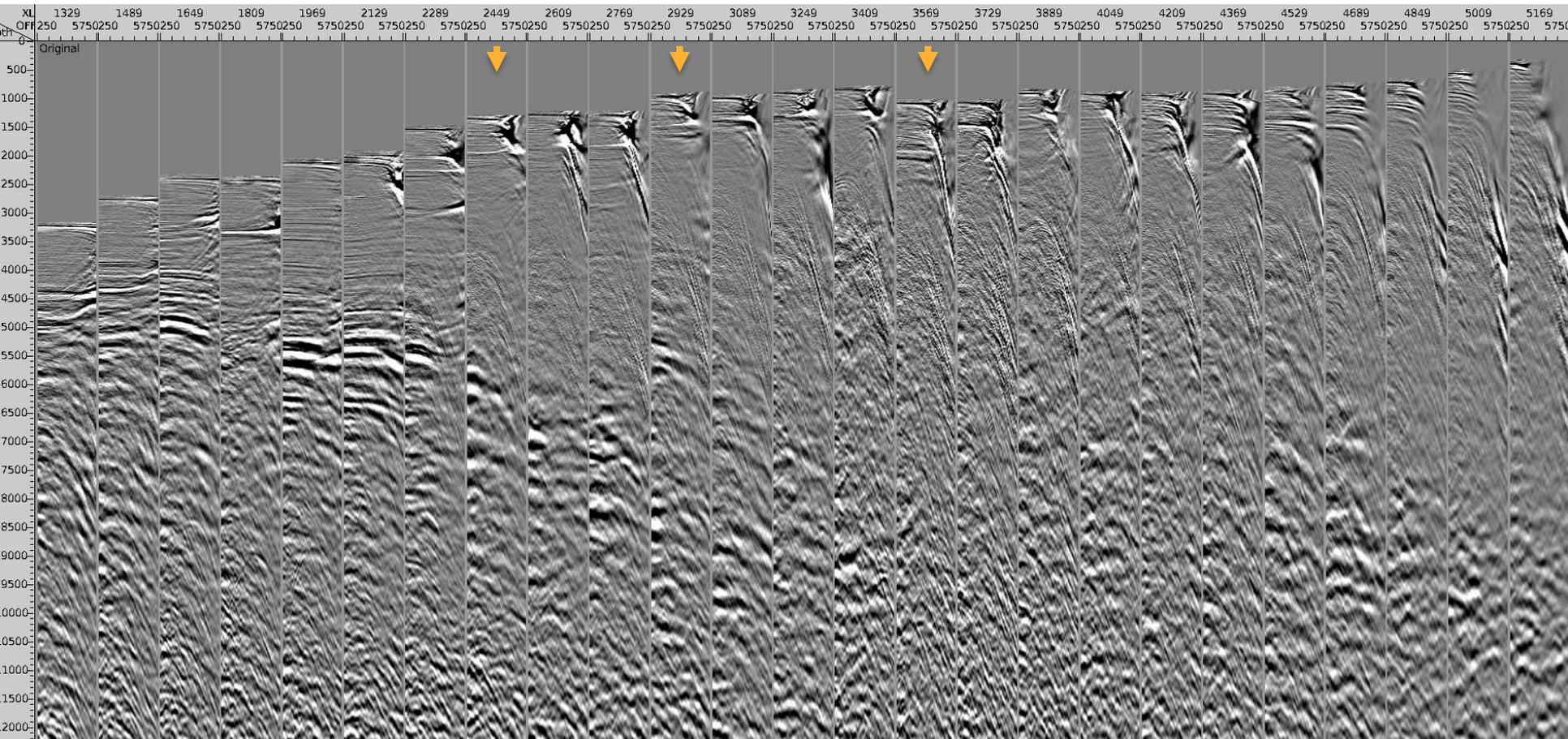
Inline 236 & Crossline 1540



Inline 236 CDP Gathers: Initial

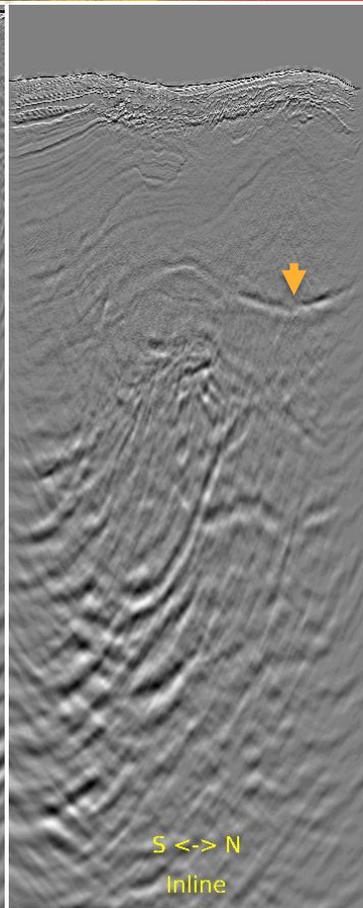
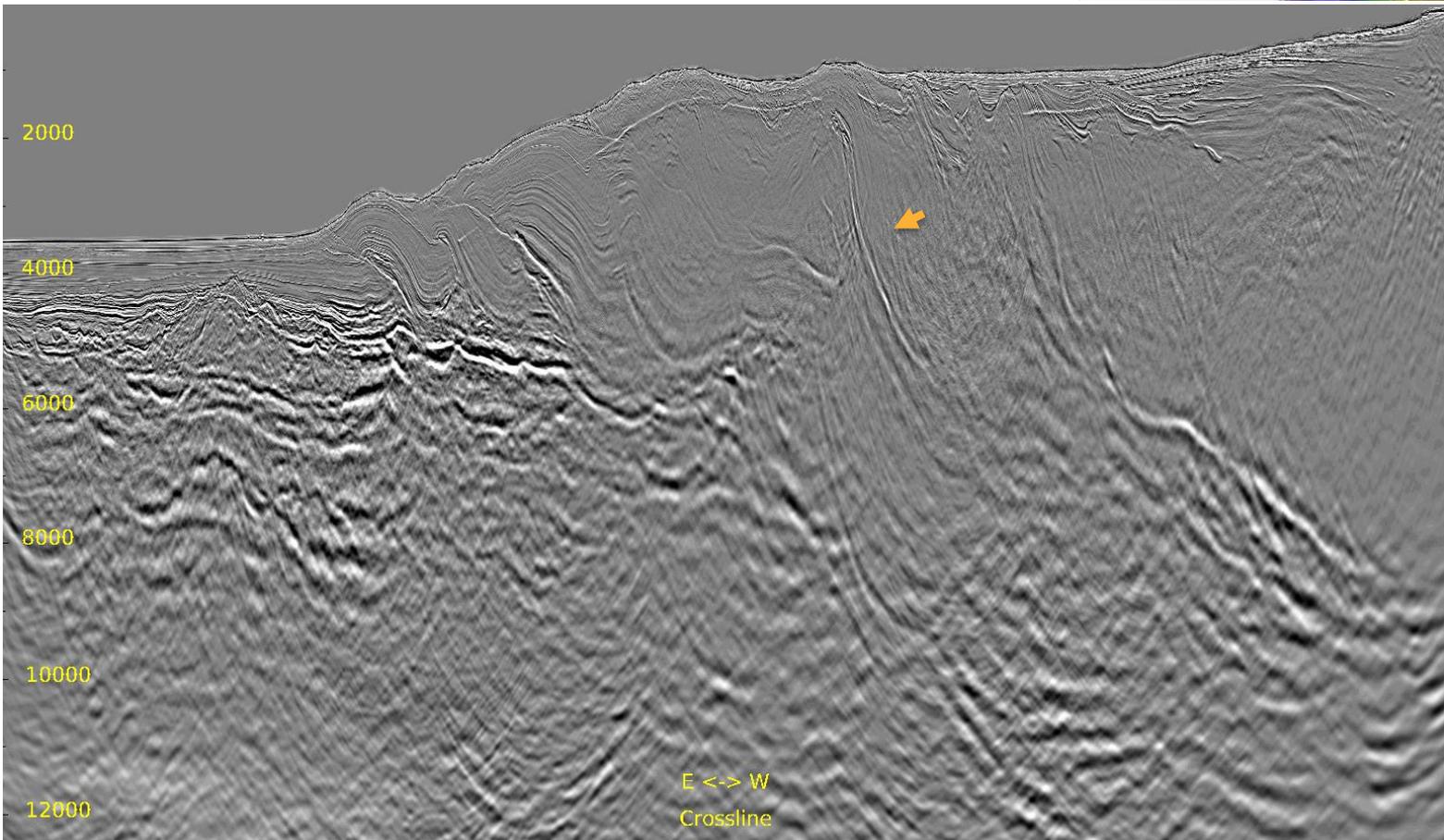
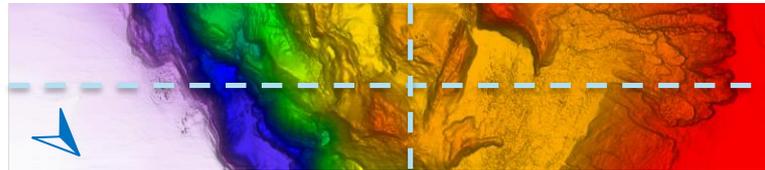


Inline 236 CDP Gathers: ISO FWI



Full Stack: Initial

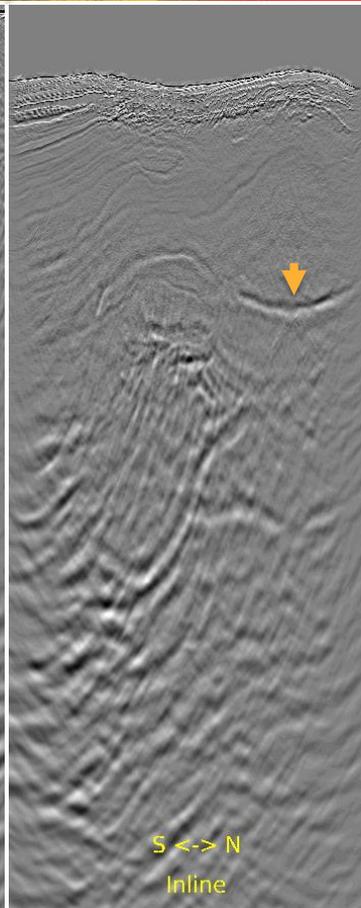
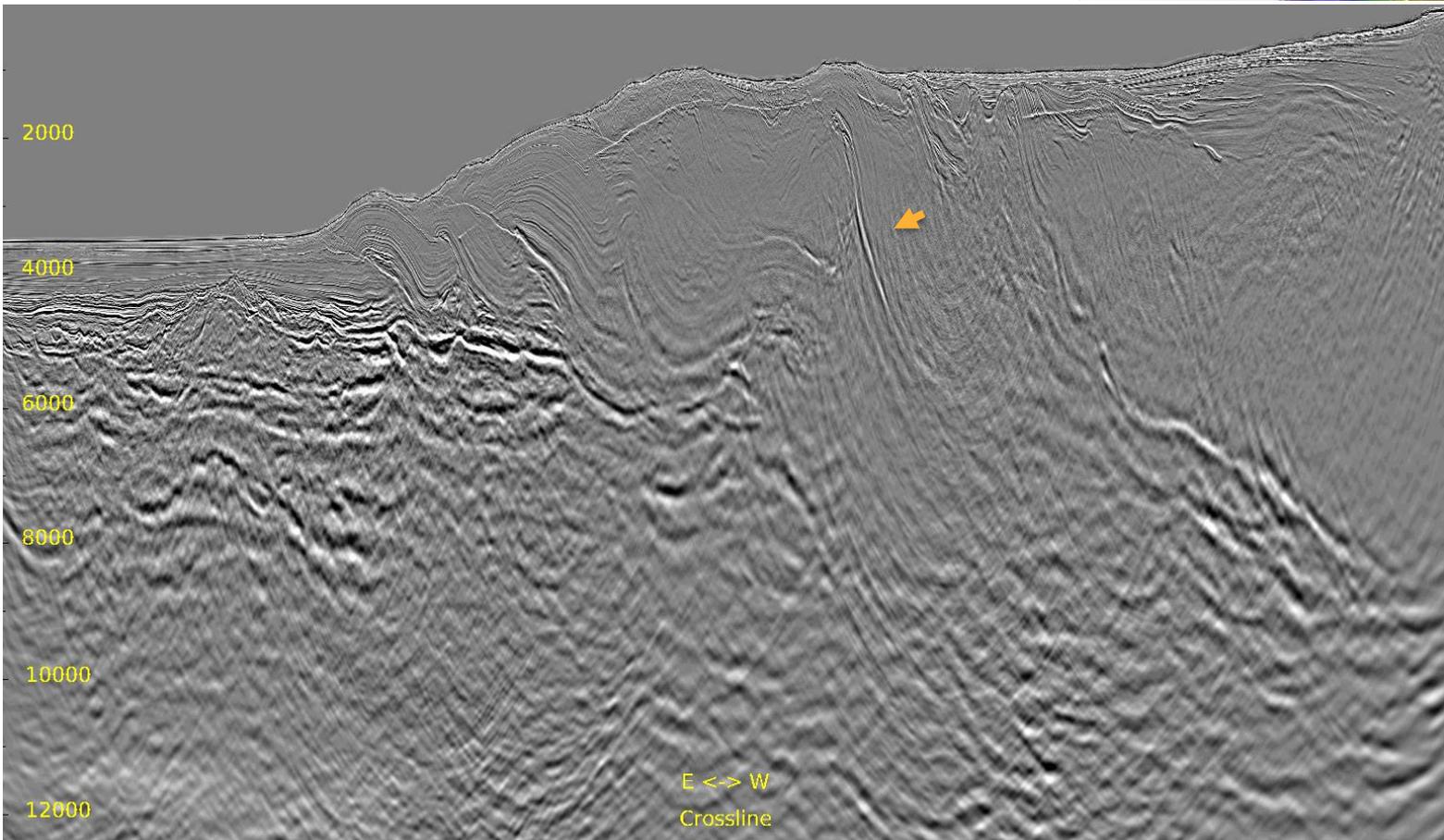
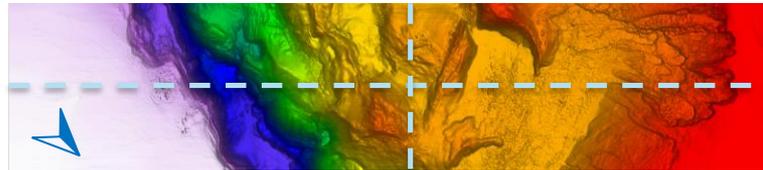
Inline 436 & Crossline 3040





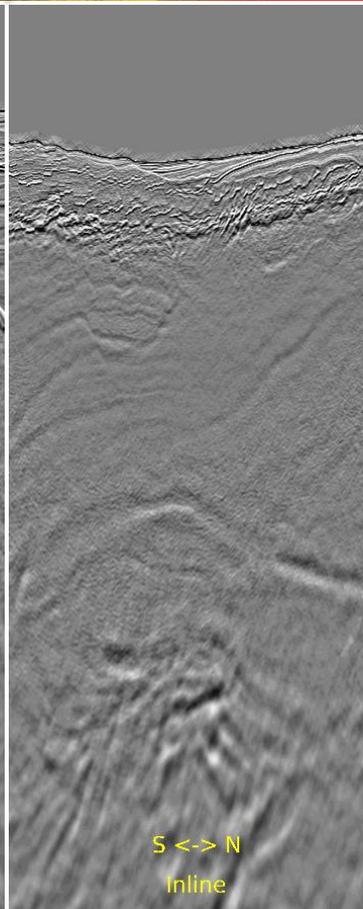
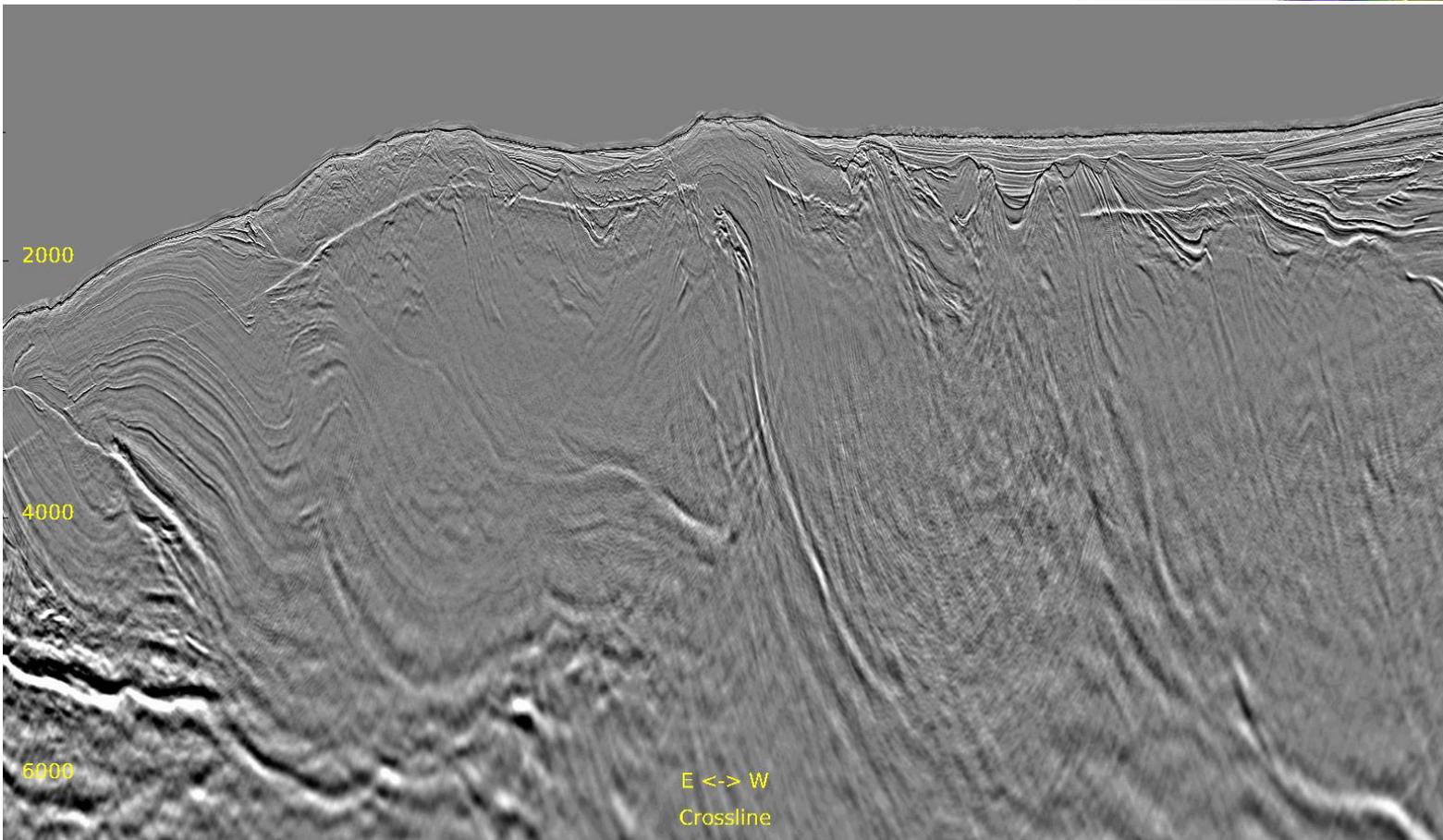
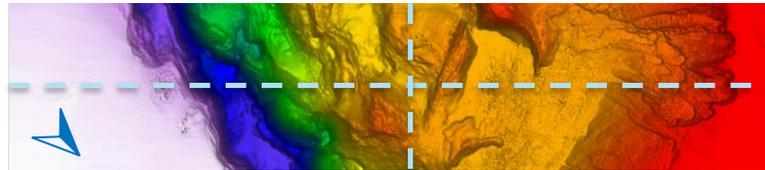
Full Stack: ISO FWI

Inline 436 & Crossline 3040



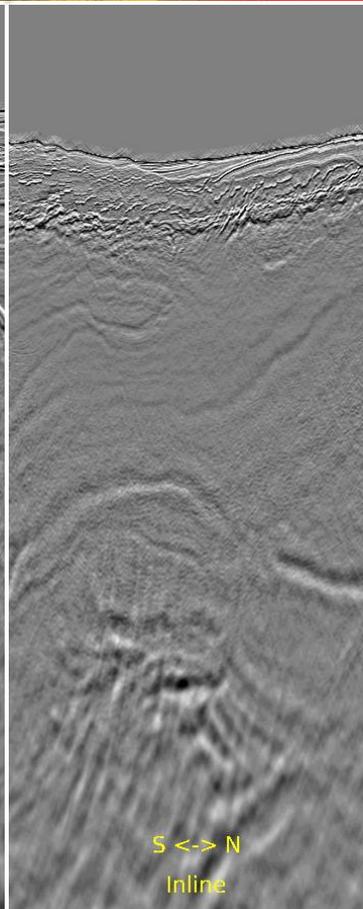
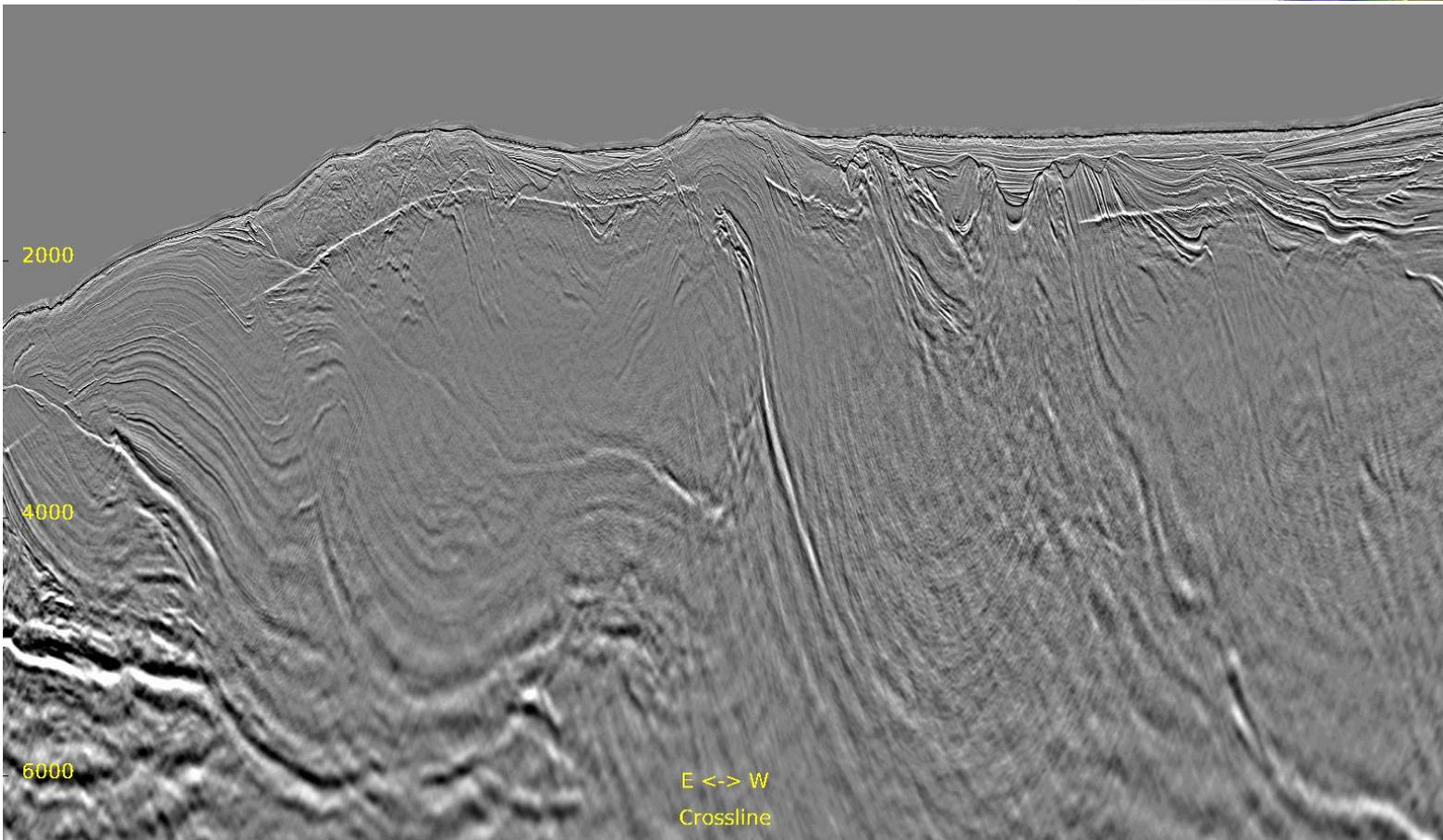
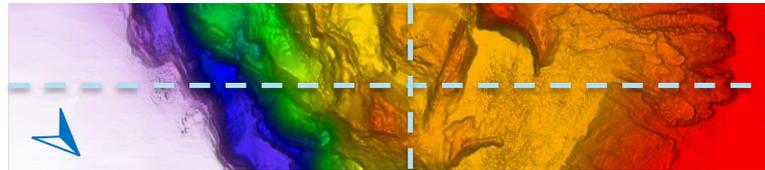
Zoomed Full Stack: Initial

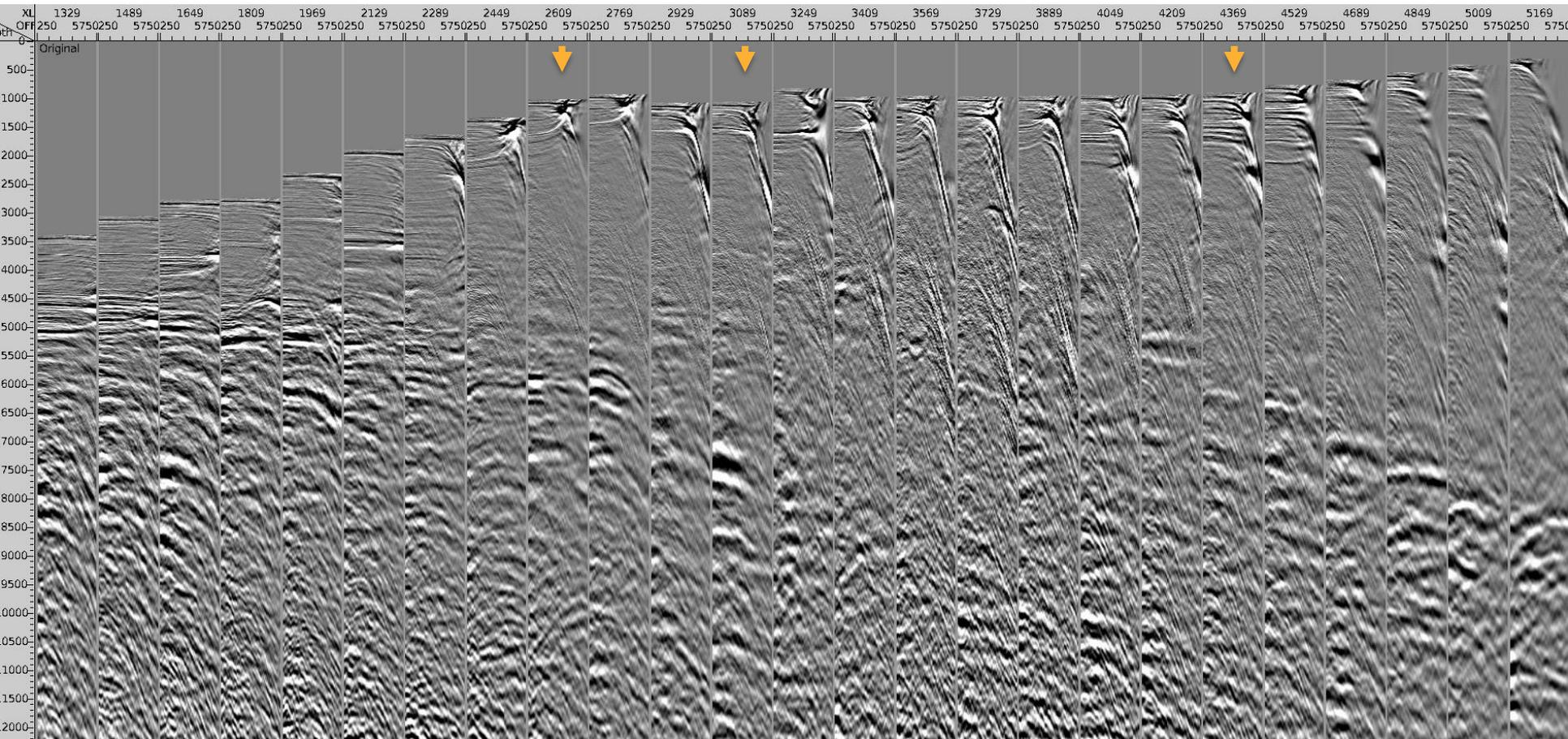
Inline 436 & Crossline 3040

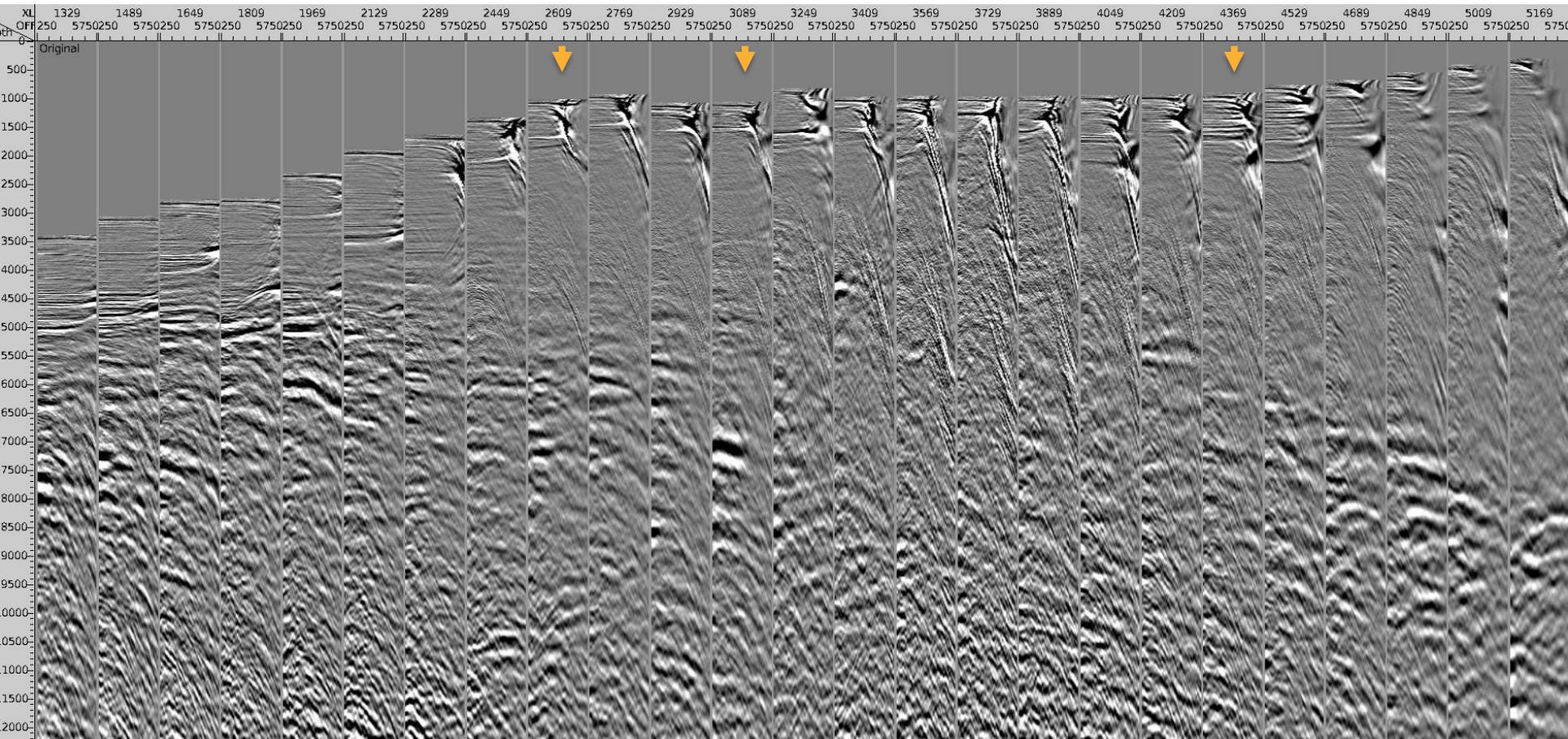


Zoomed Full Stack: ISO FWI

Inline 436 & Crossline 3040

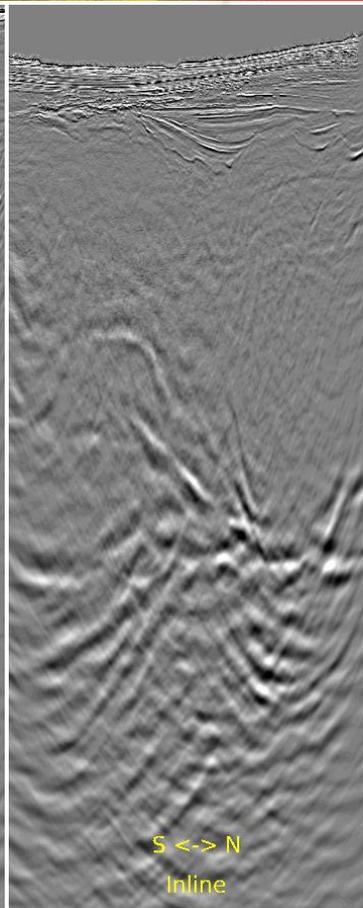
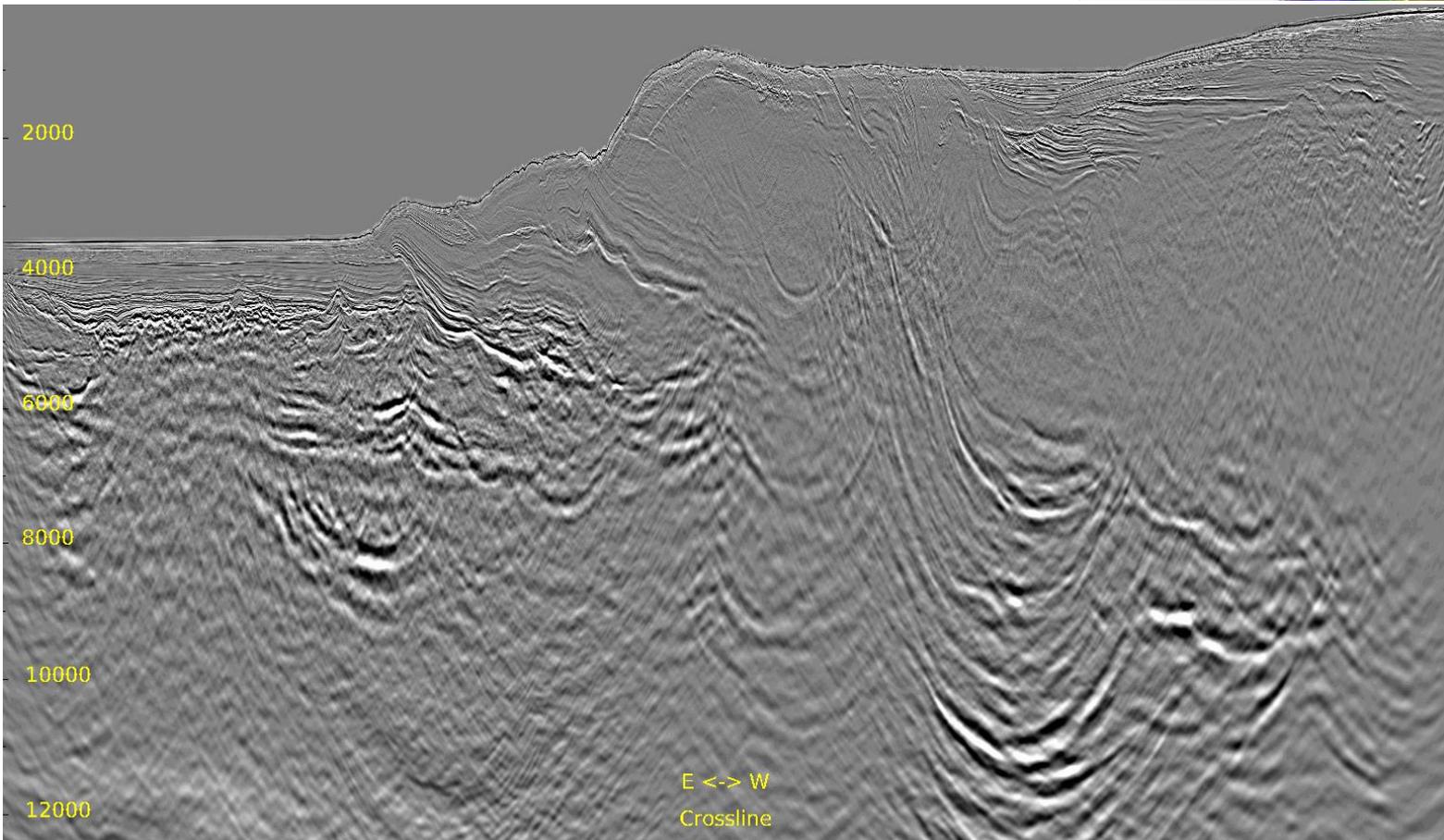
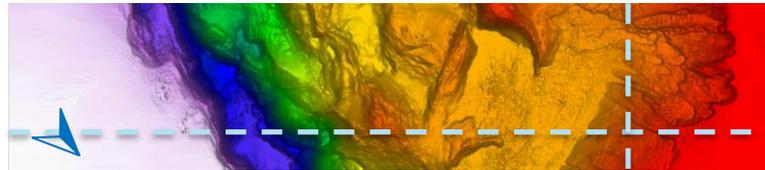






Full Stack: Initial

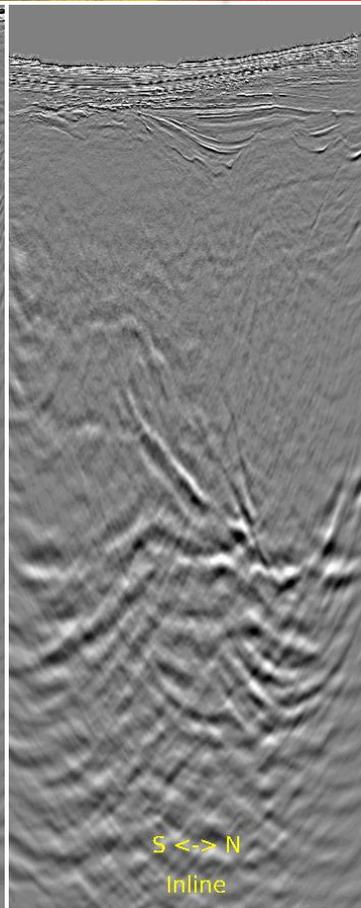
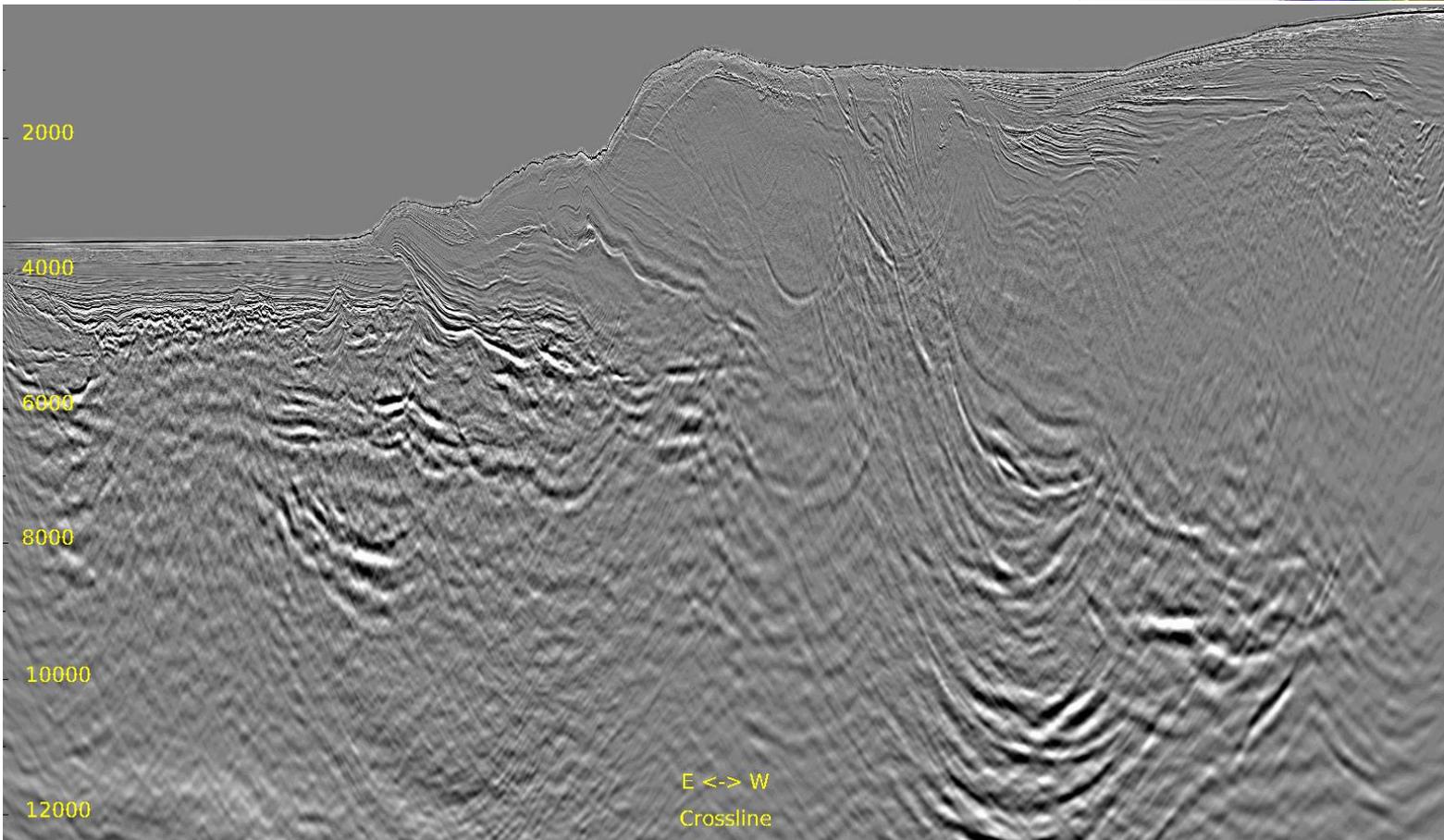
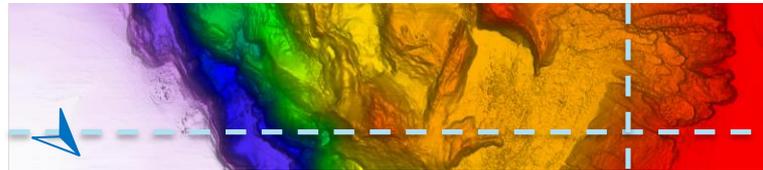
Inline 636 & Crossline 4540





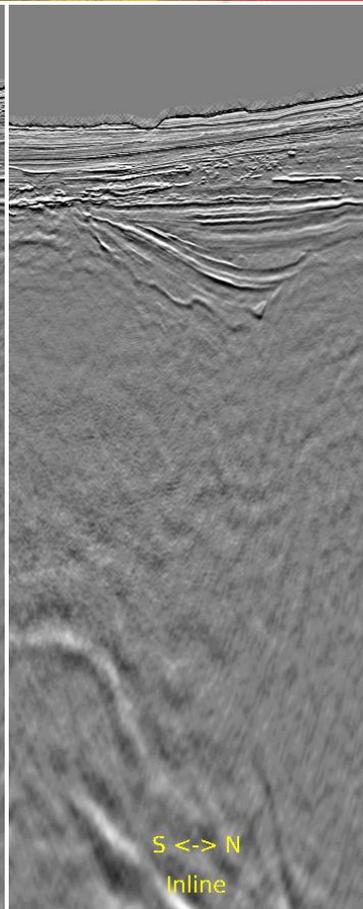
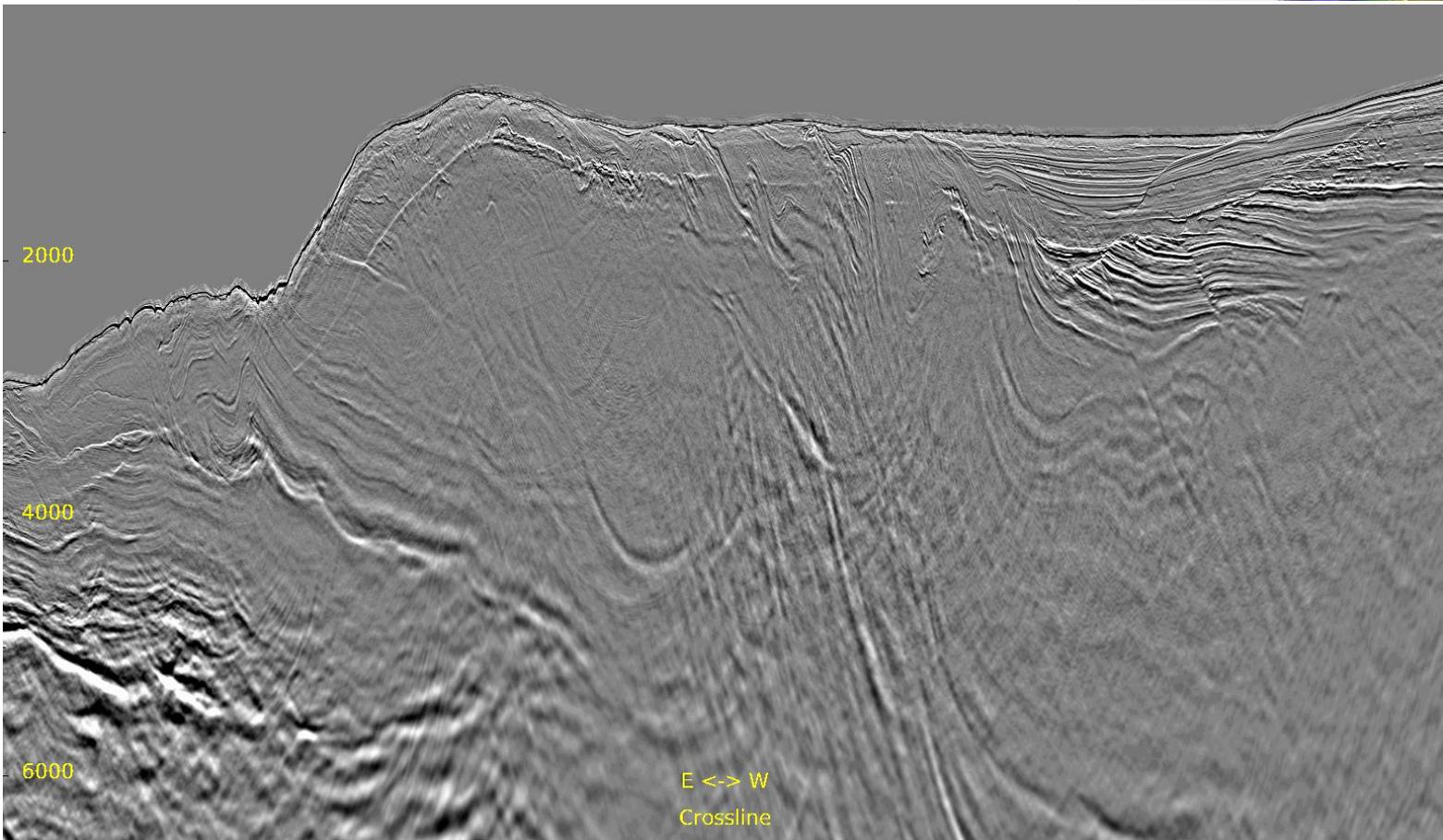
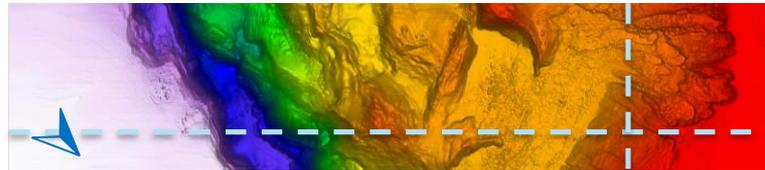
Full Stack: ISO FWI

Inline 636 & Crossline 4540



Zoomed Full Stack: Initial

Inline 636 & Crossline 4540



Zoomed Full Stack: ISO FWI

Inline 636 & Crossline 4540

