



# Tidal & Water Column Statics Correction Test

## NZ 3D Processing

14 October 2020

[cgg.com](http://cgg.com)



INSTITUTE FOR GEOPHYSICS



Passion for Geoscience

1. Convert to CGG internal format
2. Nav merge / trace edit
3. Low cut filter
4. Time Variant Scaling (TVS) & Resample to 4ms
5. Swell noise attenuation (SNA)
6. Debubble
7. Linear noise attenuation (LNA)
8. Tidal statics correction
9. Water column statics correction

- **Objective:**

To correct statics shift caused by tide and water column statics, which is caused by changes in water velocity due to temperature and salinity variation.

- **Procedure:**

- The statics shifts in time are computed based on formula:  $\text{Tidal shift} = (\text{tide height} * 2) / \text{water velocity}$   
The statics was corrected with calculated tidal shift to individual shots.
- Water column statics are derived by the relative static shift between adjacent sail lines and be corrected along sail lines.
- A near trace bin (offset 200m~offset 500m) was generated after linear noise removal with NMO applied for improvement display and water column statics picking.

- **Display:**

Tidal & water column statics map, time slice from near trace cube and crossline (geometry 6.25x37.5).

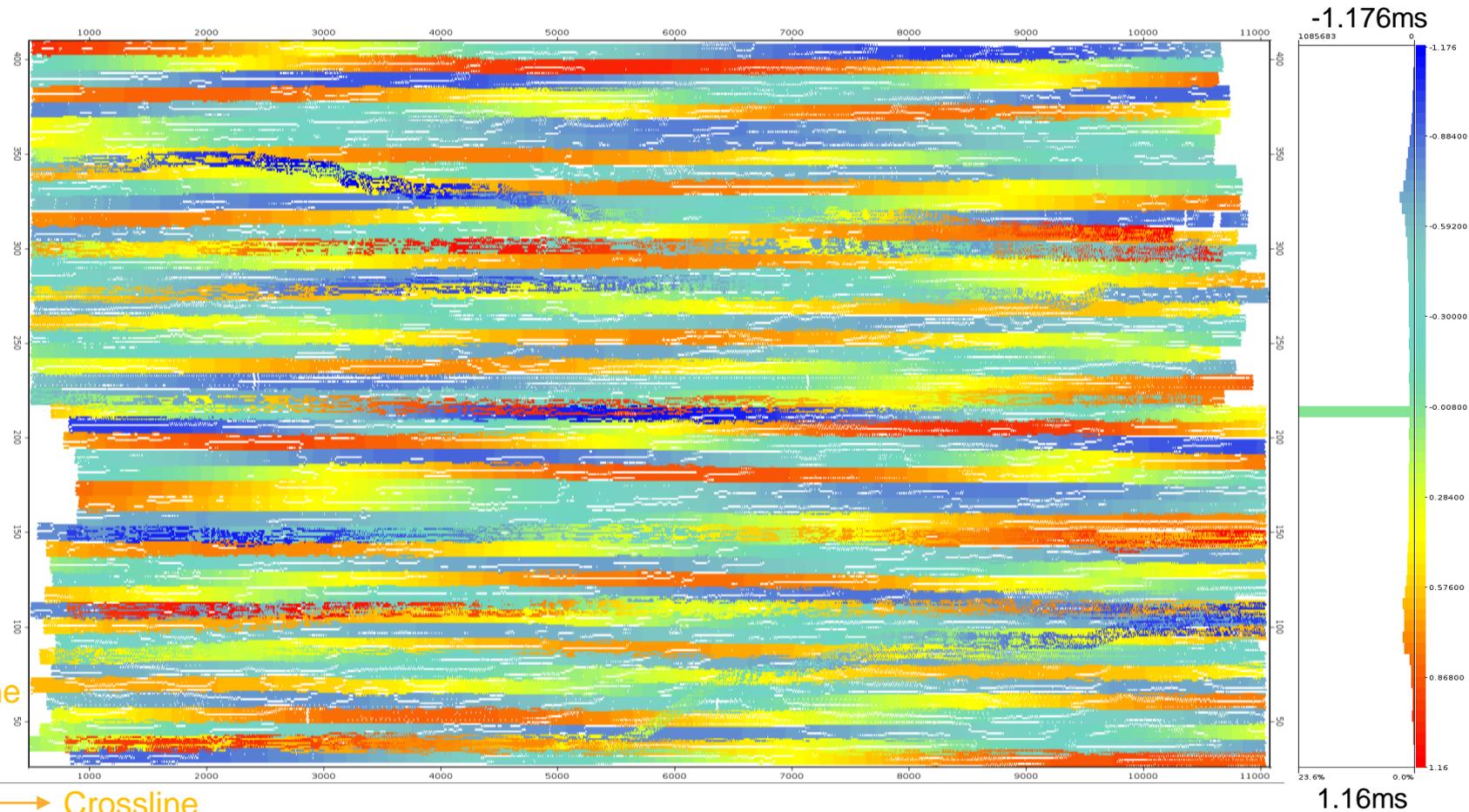
- **Observation and Recommendation:**

Tidal & water column statics correction can improve event continuity.

Recommend to apply in production.

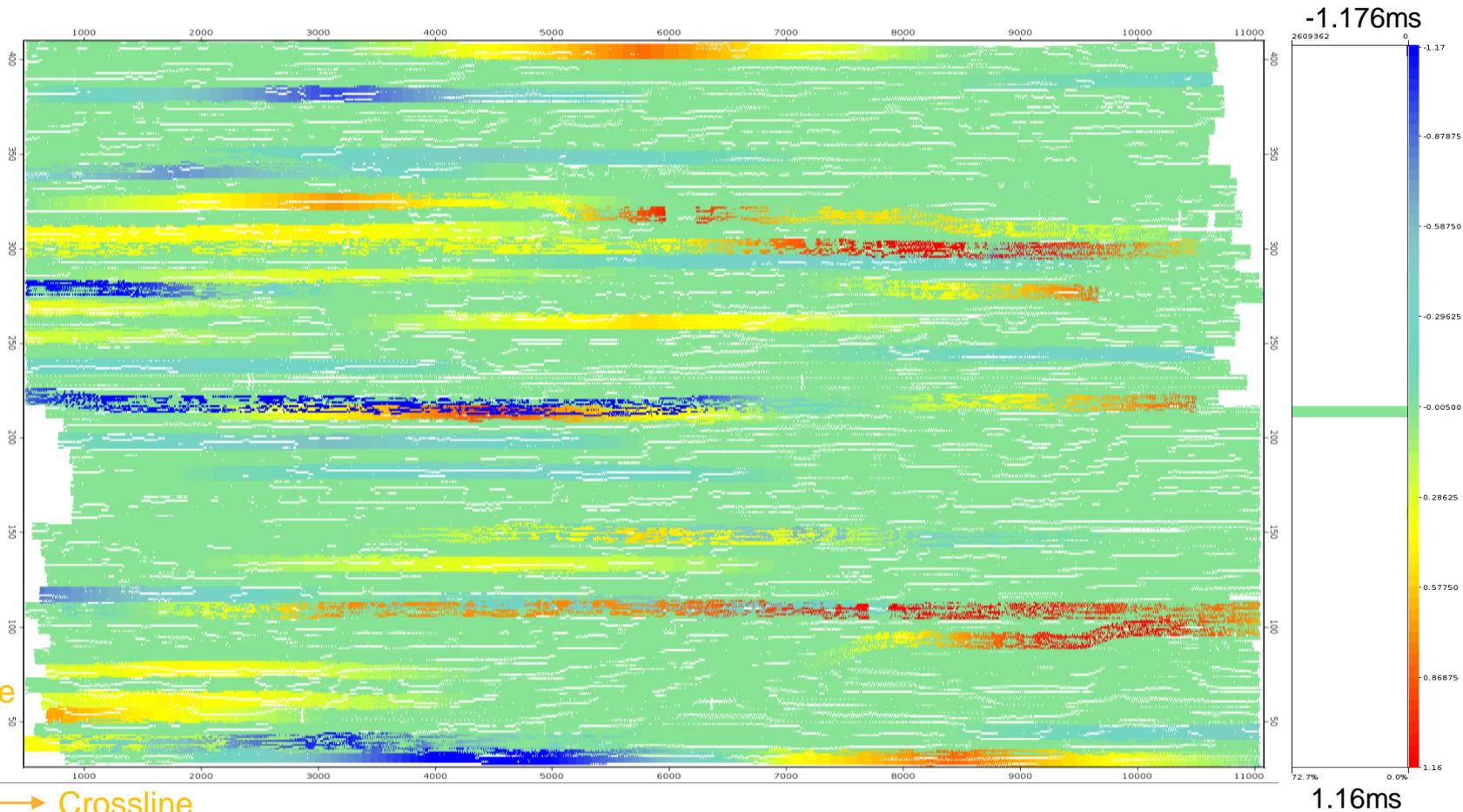


# Tidal Static Map





# Water Column Static Map



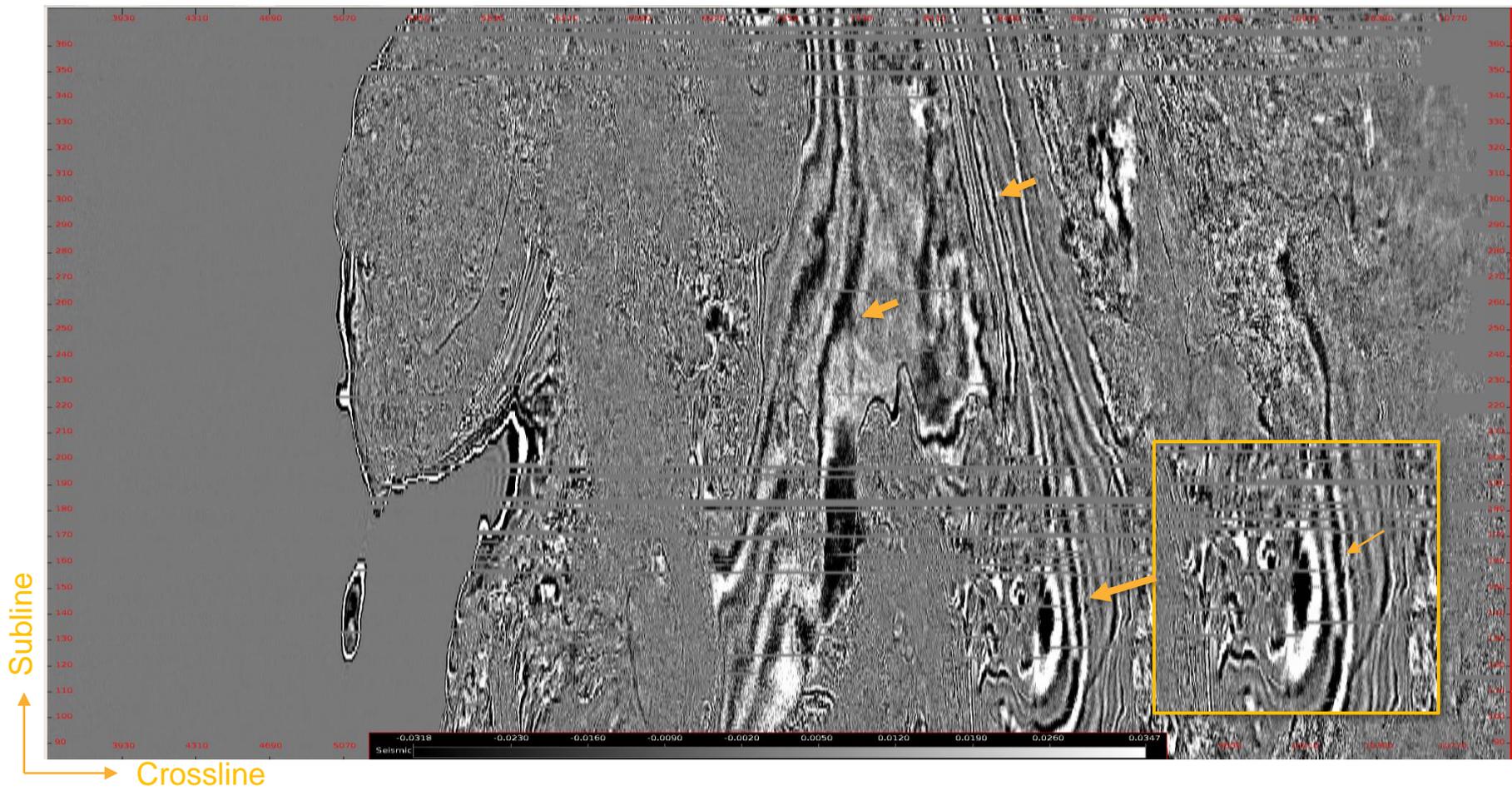
Subline  
Crossline

# Near trace cube: time slice

1550ms

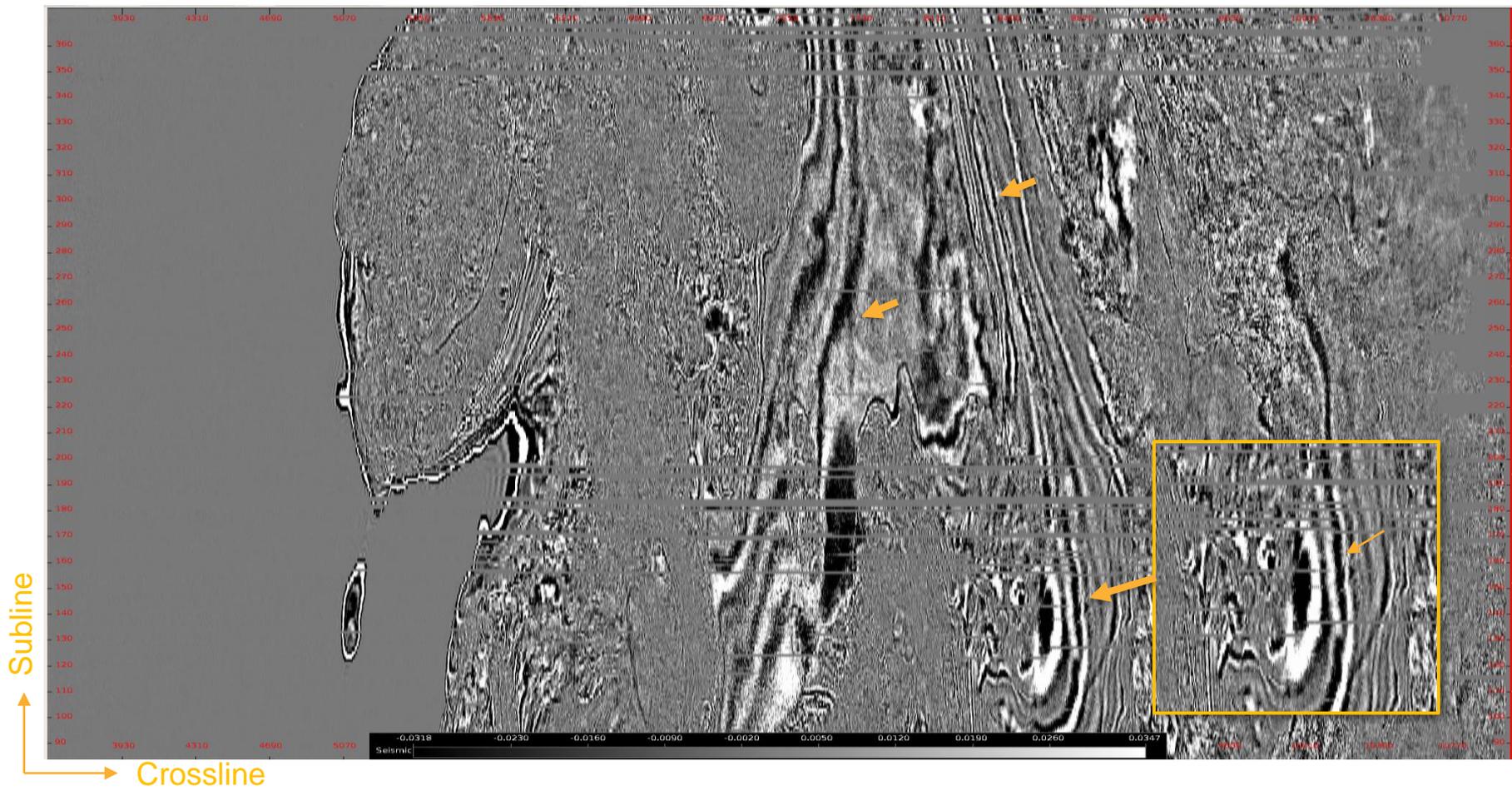


# Time Slice: 1550ms before Tidal Correction



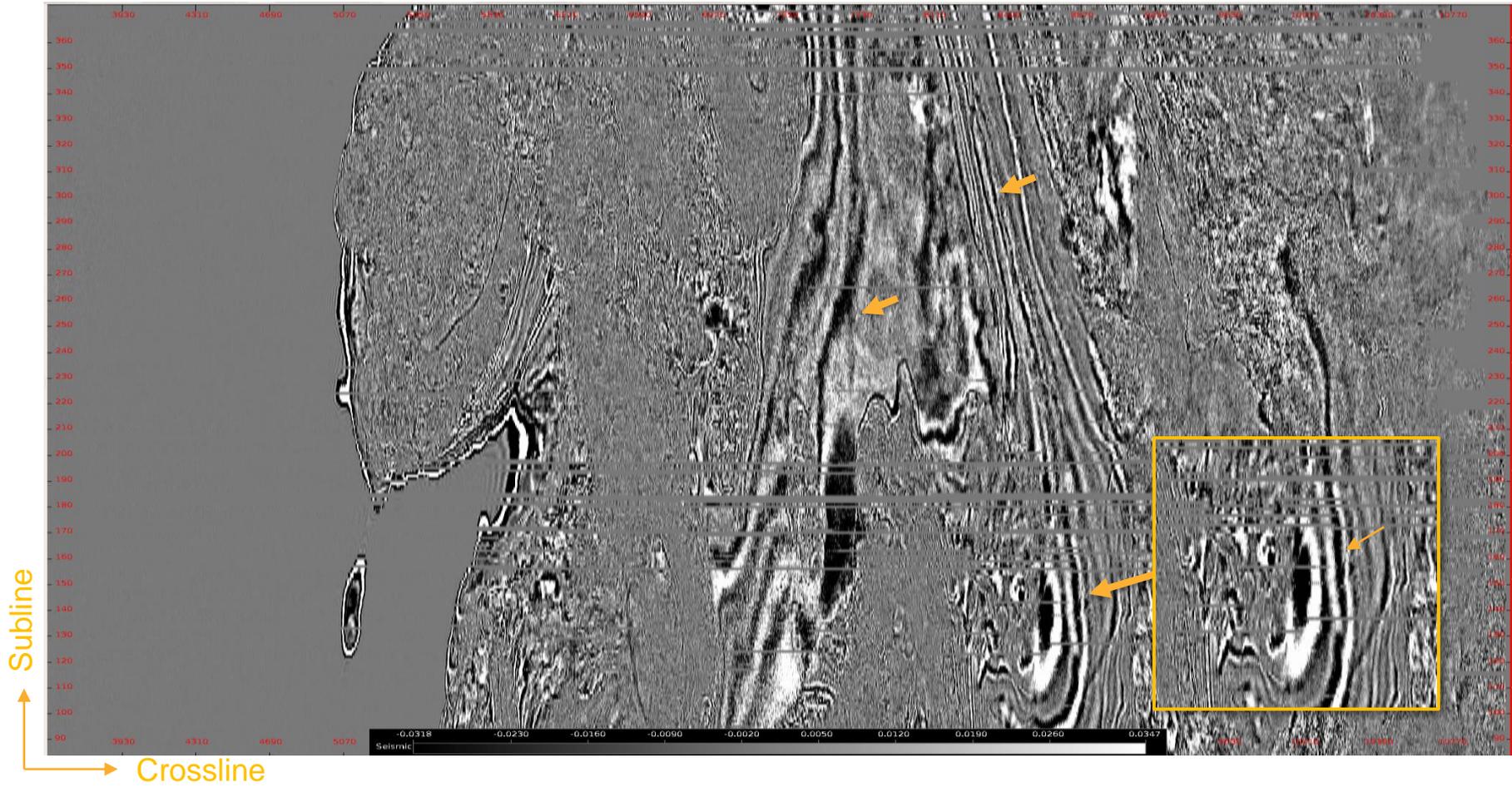


# Time Slice: 1550ms after Tidal Correction



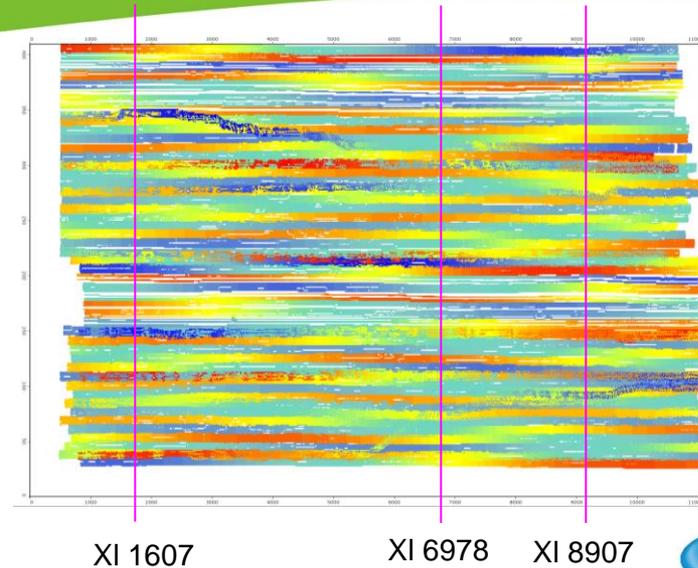


# Time Slice: 1550ms after Tidal + Water Column Correction

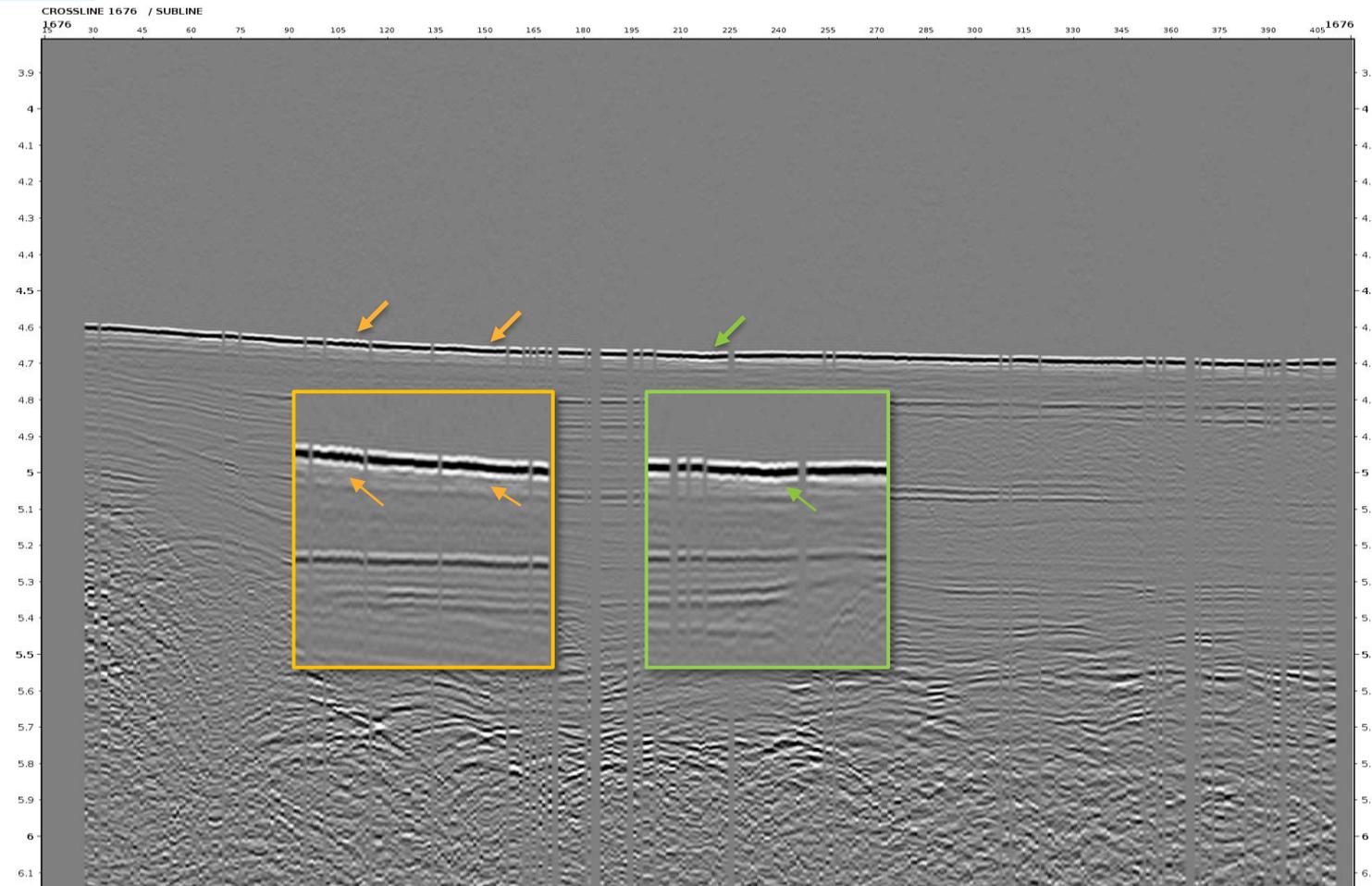


# Crosslines

1676 6978 8907

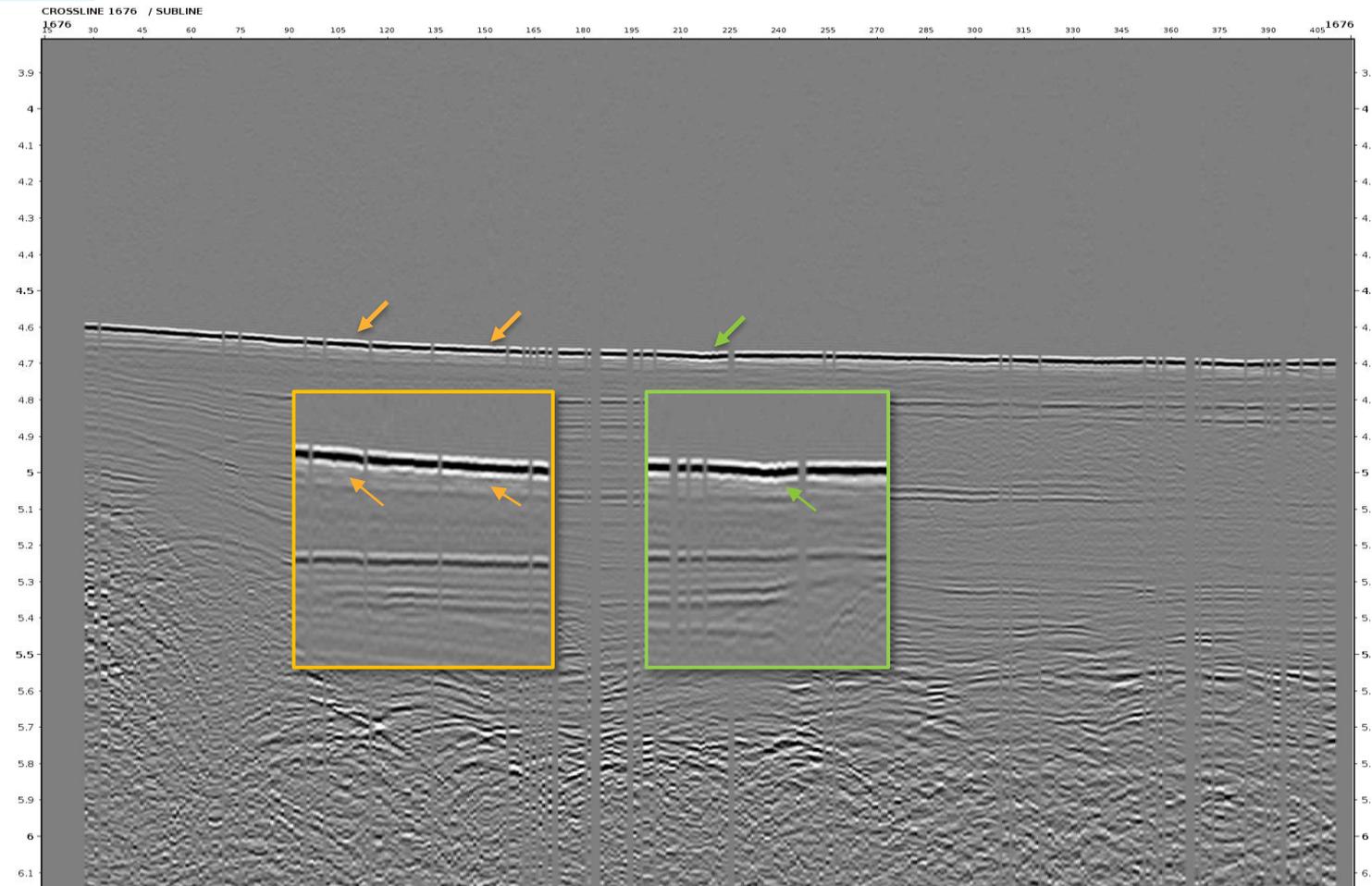


# Crossline 1676 before Tidal Correction



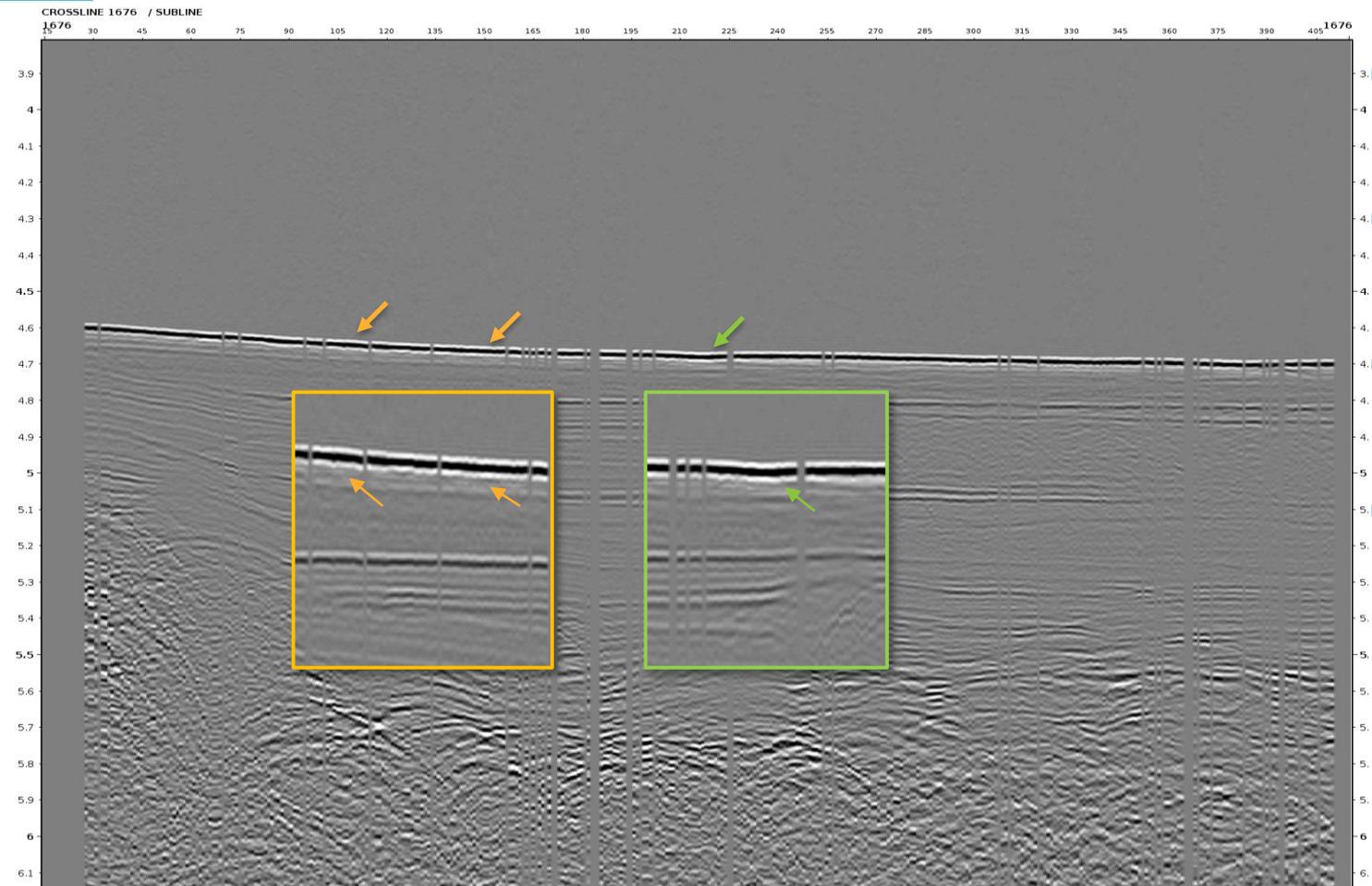
- Orange arrow shows tidal static correction benefit
- Green arrow shows water column static correction benefit
- Tidal correction can handle majority of seismic un-alignment
- Water column static correction can further align the residual mismatching and improve the event continuity

# Crossline 1676 after Tidal Correction



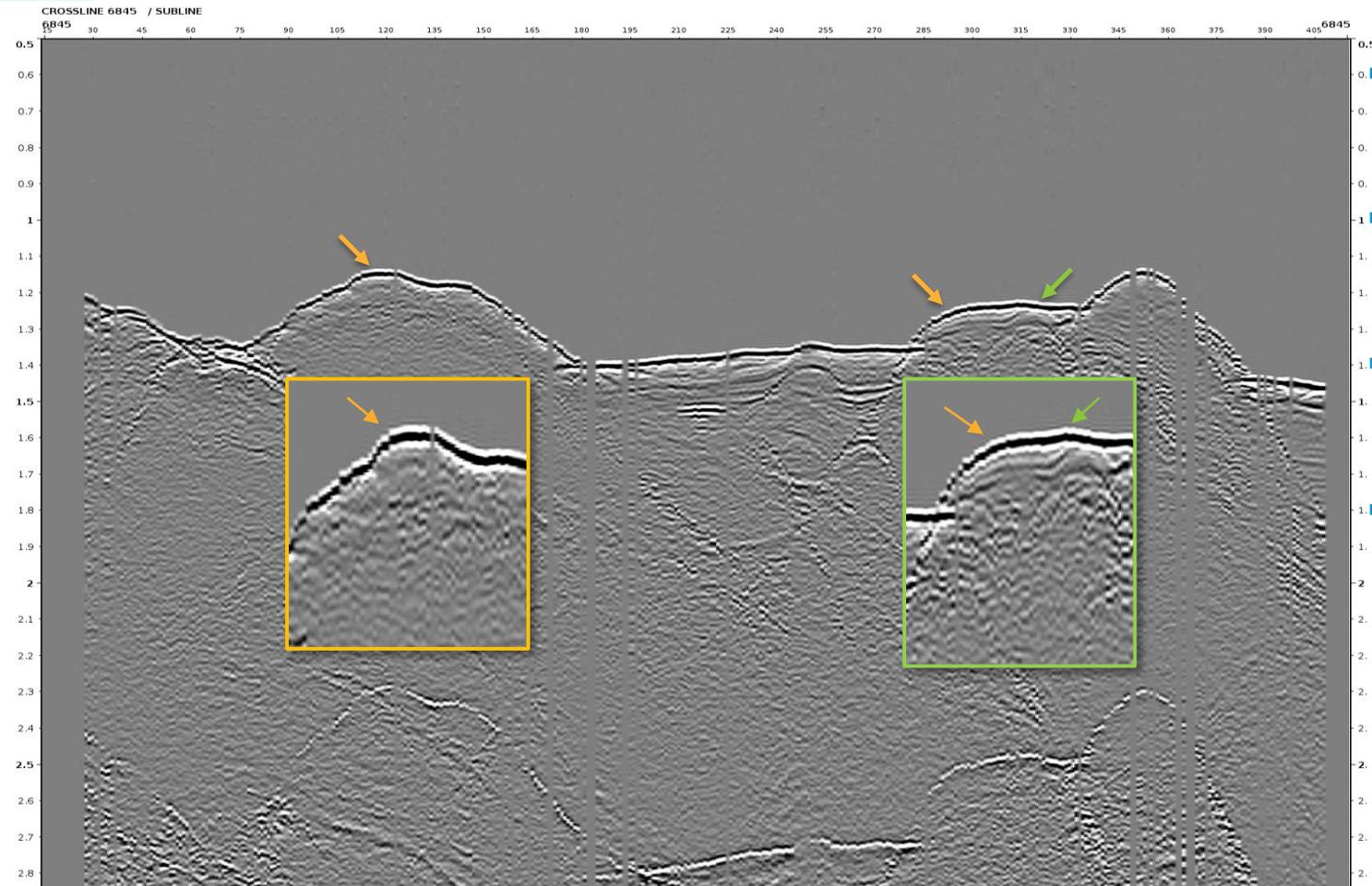
- Orange arrow shows tidal static correction benefit
- Green arrow shows water column static correction benefit
- Tidal correction can handle majority of seismic un-alignment
- Water column static correction can further align the residual mismatching and improve the event continuity

# Crossline 1676 after Tidal + Water Column Correction



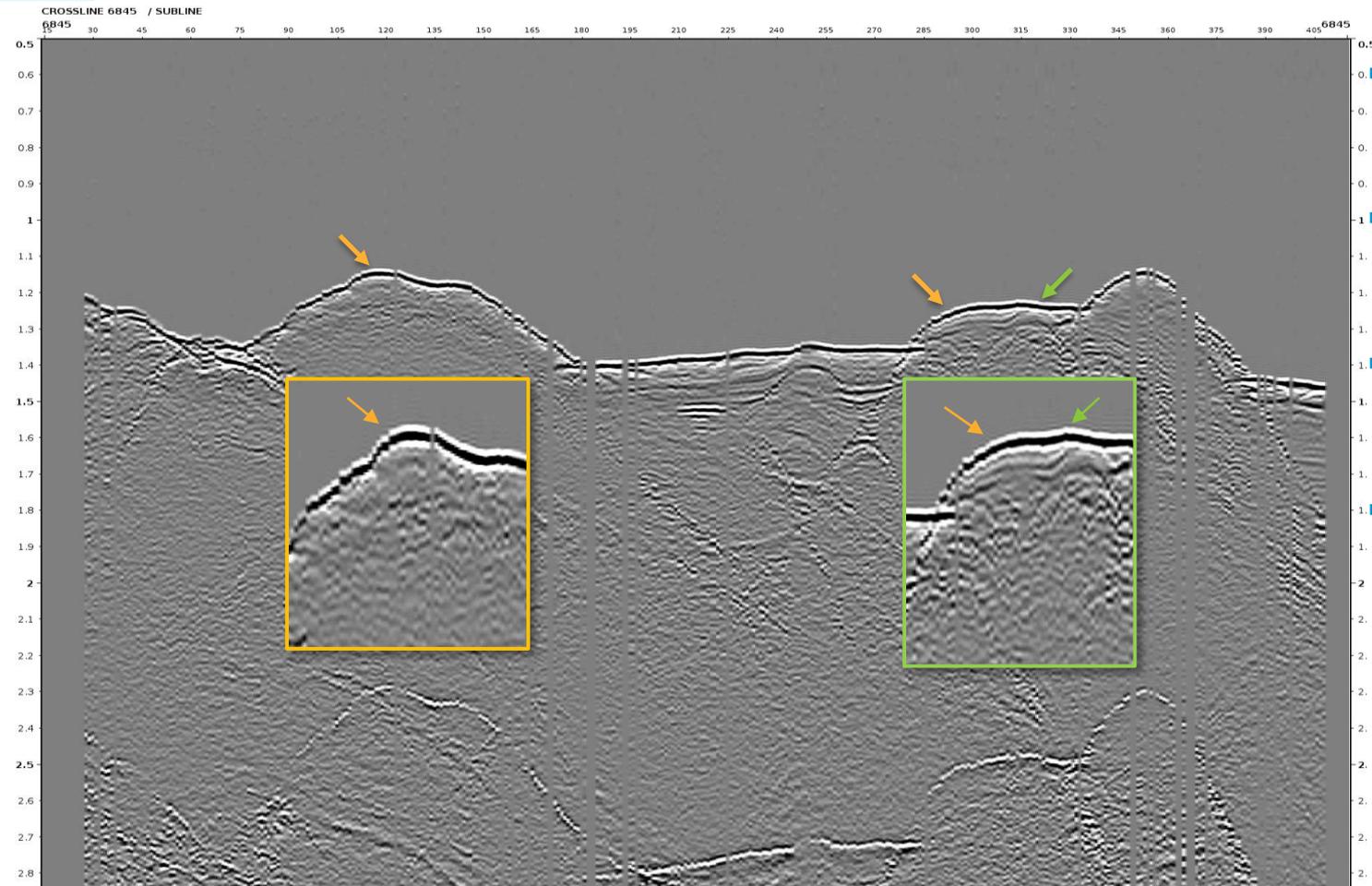
- Orange arrow shows tidal static correction benefit
- Green arrow shows water column static correction benefit
- Tidal correction can handle majority of seismic un-alignment
- Water column static correction can further align the residual mismatching and improve the event continuity

# Crossline 6845 before Tidal Correction



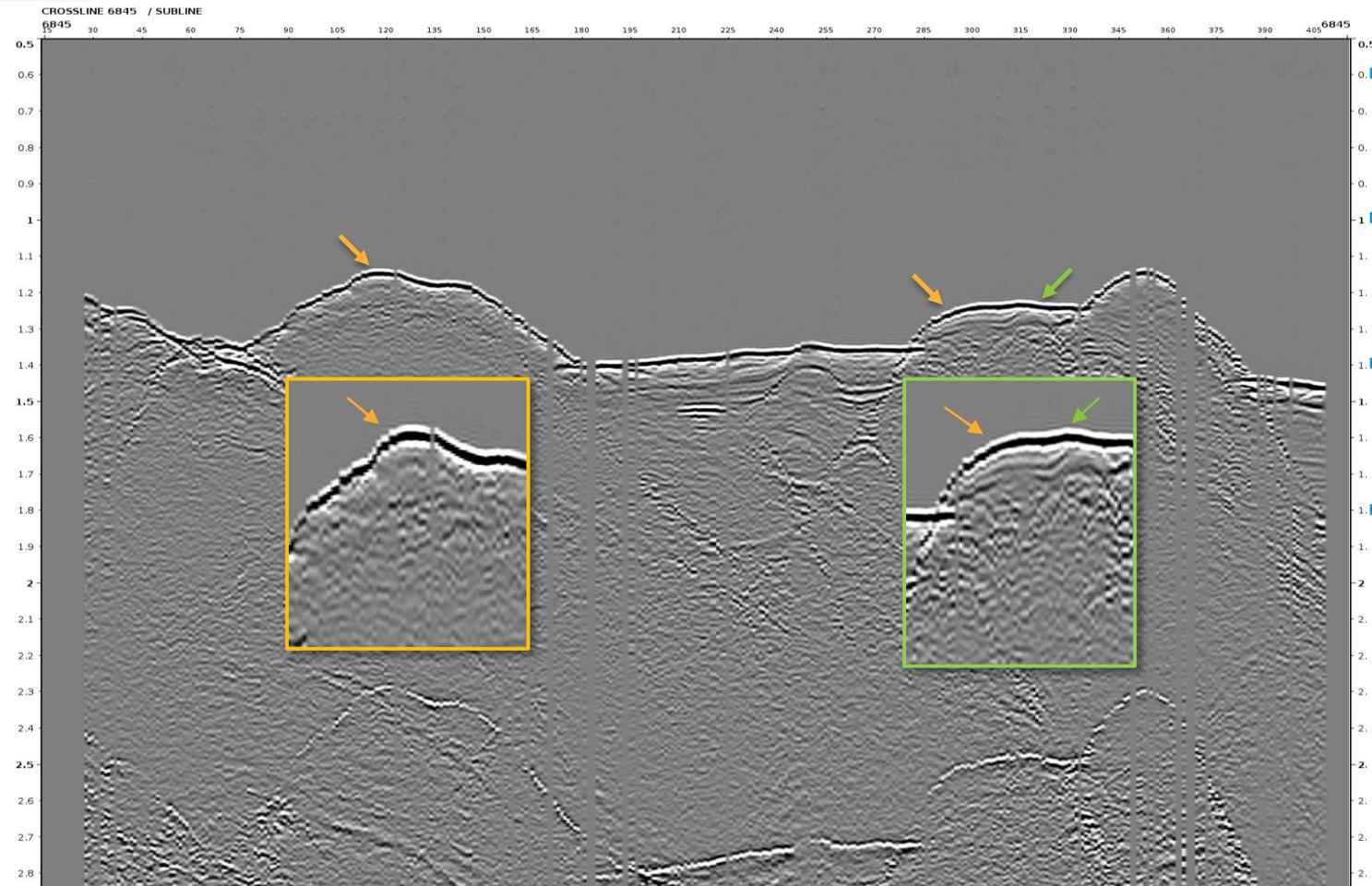
- Orange arrow shows tidal static correction benefit
- Green arrow shows water column static correction benefit
- Tidal correction can handle majority of seismic un-alignment
- Water column static correction can further align the residual mismatching and improve the event continuity

# Crossline 6845 after Tidal Correction



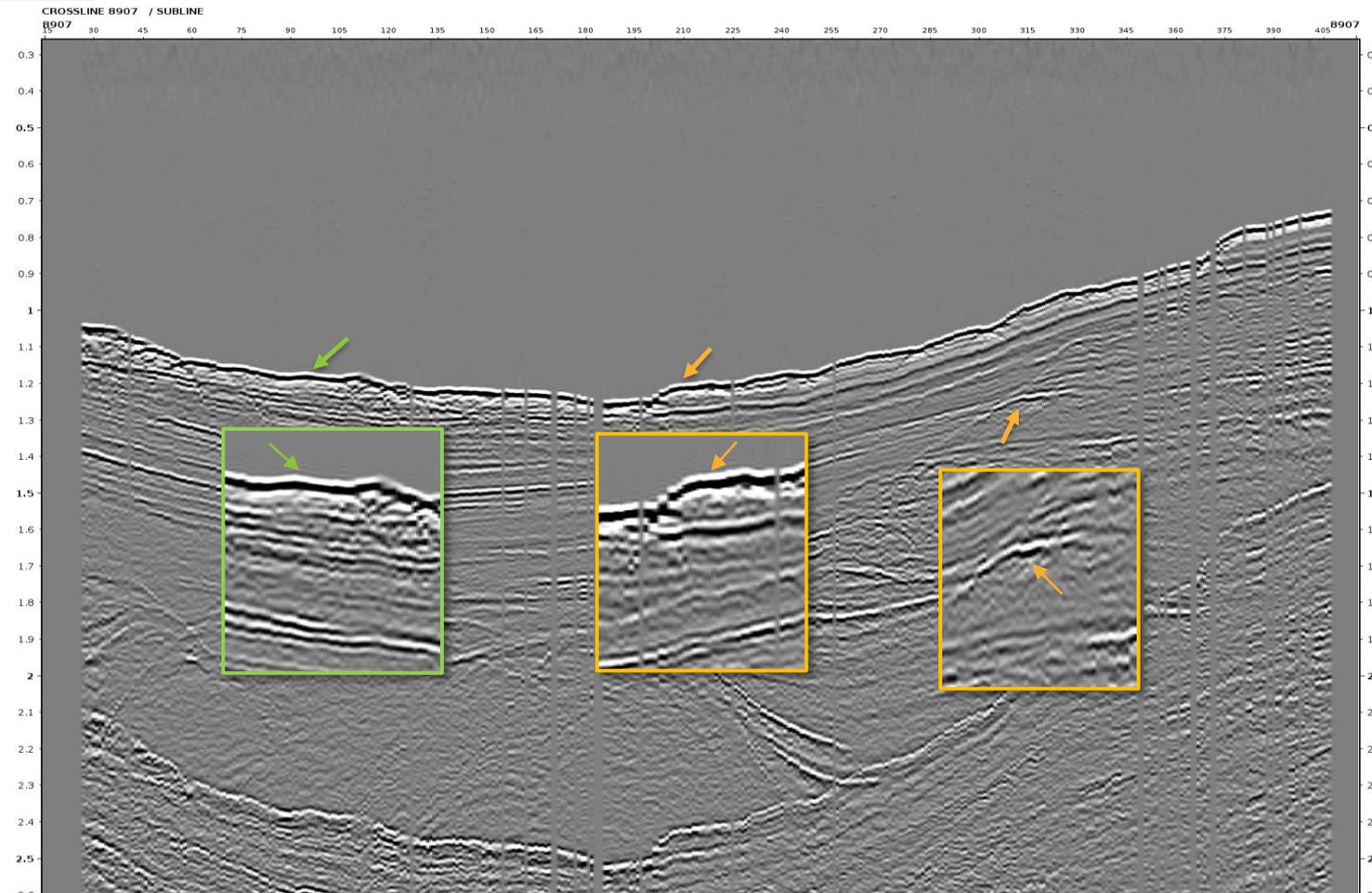
- Orange arrow shows tidal static correction benefit
- Green arrow shows water column static correction benefit
- Tidal correction can handle majority of seismic un-alignment
- Water column static correction can further align the residual mismatching and improve the event continuity

# Crossline 6845 after Tidal + Water Column Correction



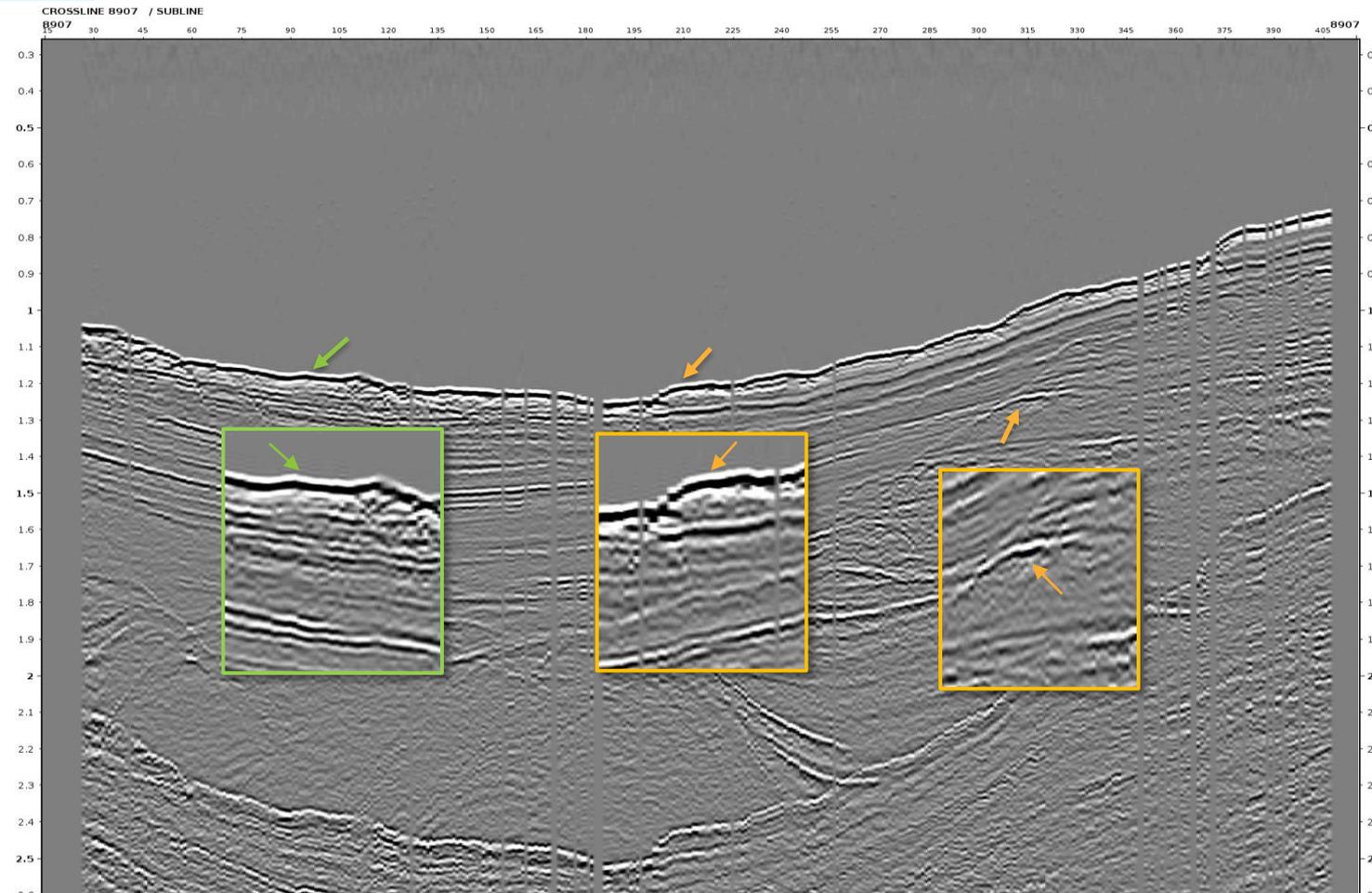
- Orange arrow shows tidal static correction benefit
- Green arrow shows water column static correction benefit
- Tidal correction can handle majority of seismic un-alignment
- Water column static correction can further align the residual mismatching and improve the event continuity

# Crossline 8907 before Tidal Correction



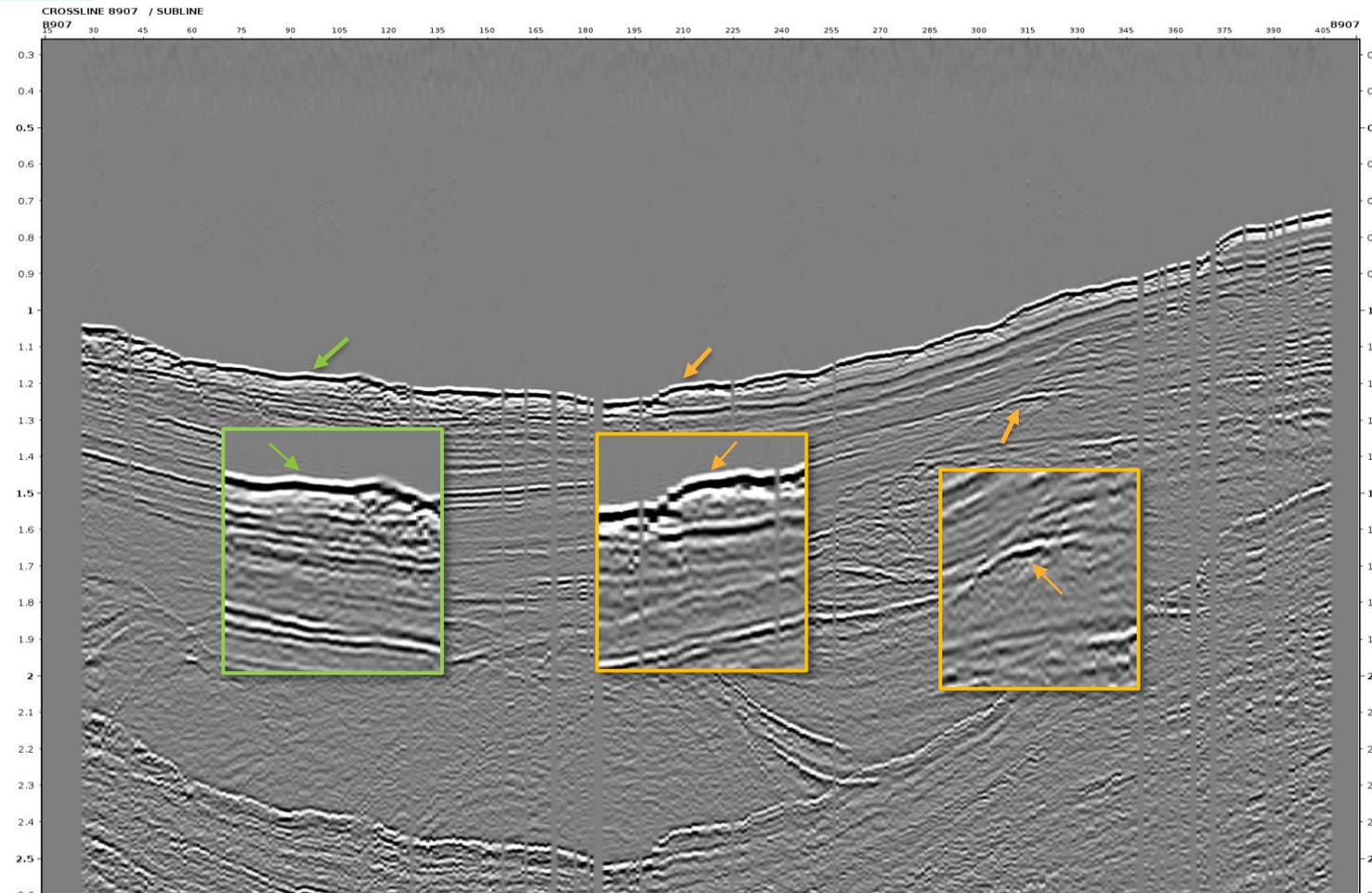
- Orange arrow shows tidal static correction benefit
- Green arrow shows water column static correction benefit
- Tidal correction can handle majority of seismic un-alignment
- Water column static correction can further align the residual mismatching and improve the event continuity

# Crossline 8907 after Tidal Correction



- Orange arrow shows tidal static correction benefit
- Green arrow shows water column static correction benefit
- Tidal correction can handle majority of seismic un-alignment
- Water column static correction can further align the residual mismatching and improve the event continuity

# Crossline 8907 after Tidal + Water Column Correction



- Orange arrow shows tidal static correction benefit
- Green arrow shows water column static correction benefit
- Tidal correction can handle majority of seismic un-alignment
- Water column static correction can further align the residual mismatching and improve the event continuity