



Receiver Motion Correction Test

NZ 3D Processing

28 October 2020

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
10. Shot & channel scaling
11. Receiver motion correction (RMC)

- **Objective:**

To remove the time difference caused by receiver movement during data acquisition.

- **Procedure:**

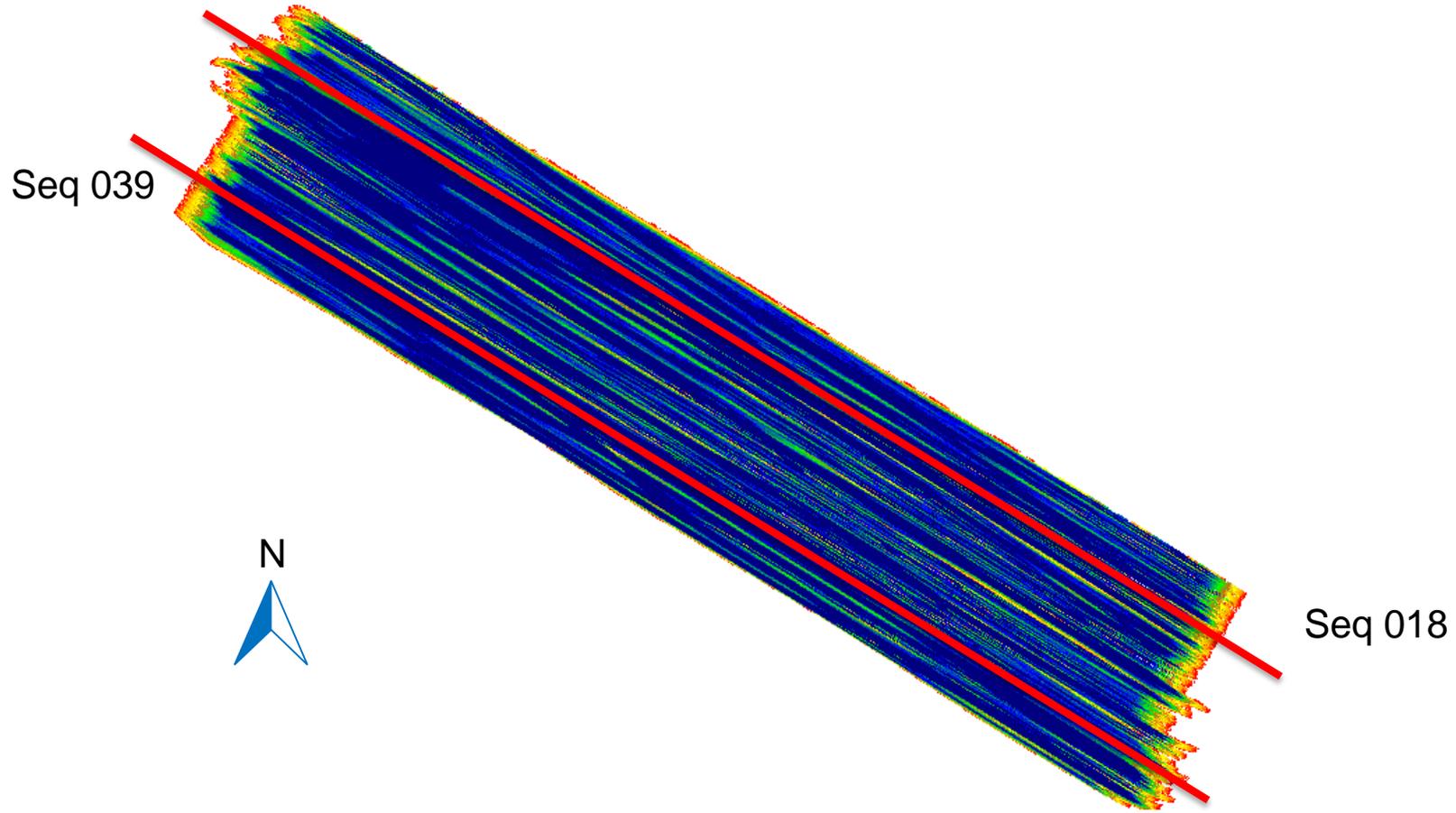
- This is accomplished by applying a time-variant spatial shift related to the boat speed in Tau-P domain.
- The correction is a lateral shift in offset towards smaller offset.

- **Display:**

Selected shot gathers (zoom in shallow), wiggle traces display and stack.

- **Observation and Recommendation:**

The traces were repositioned to compensate the effect of receiver motion. Hence, it is recommended for production.



Shot gathers wiggle traces display

– zoom in shallow

Seq 018

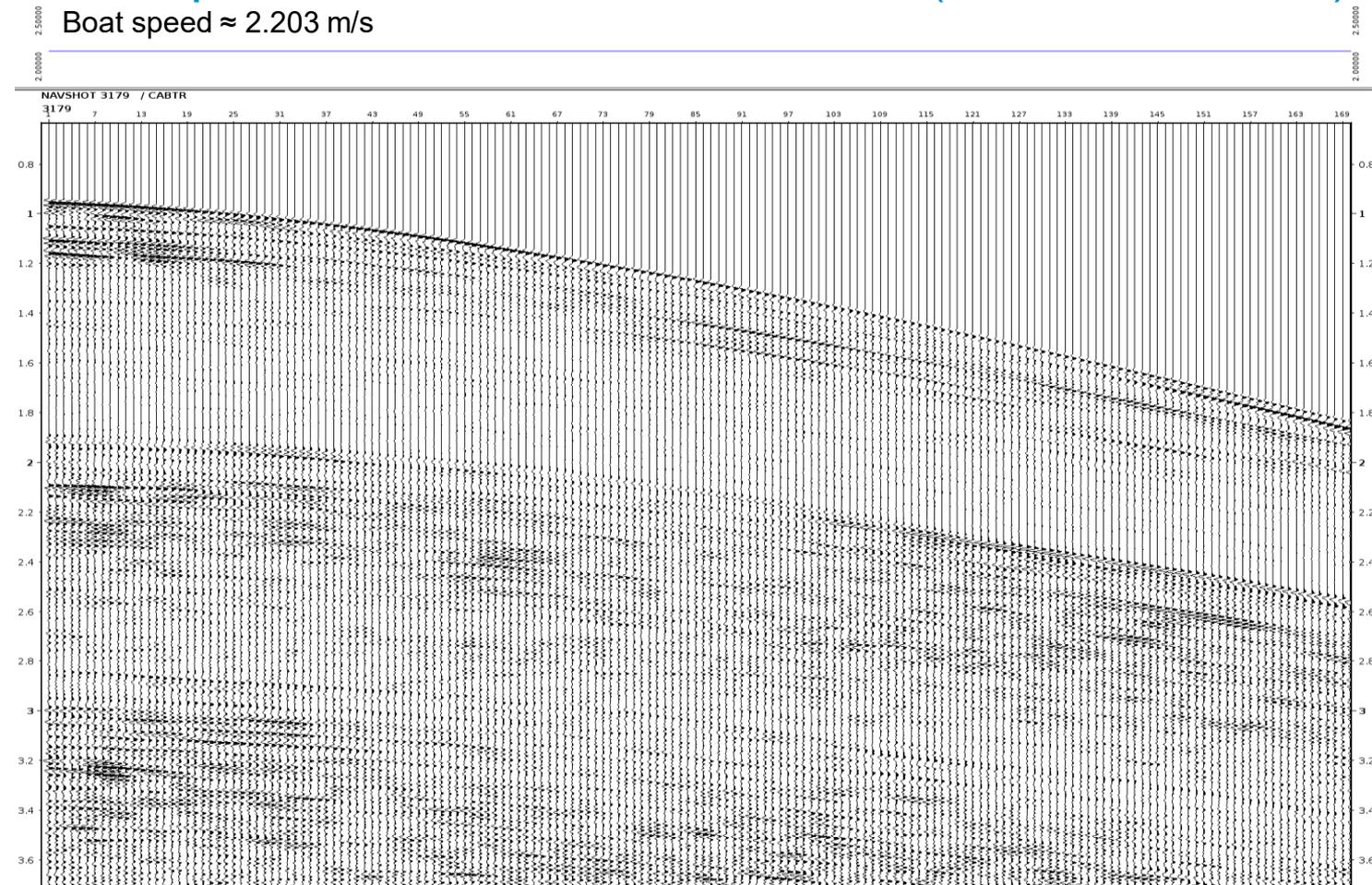
Seq 039



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Seq018 Shot Gather before RMC (zoom in shallow)

Boat speed ≈ 2.203 m/s



- Boat speed for this shot is around 2.203 m/s

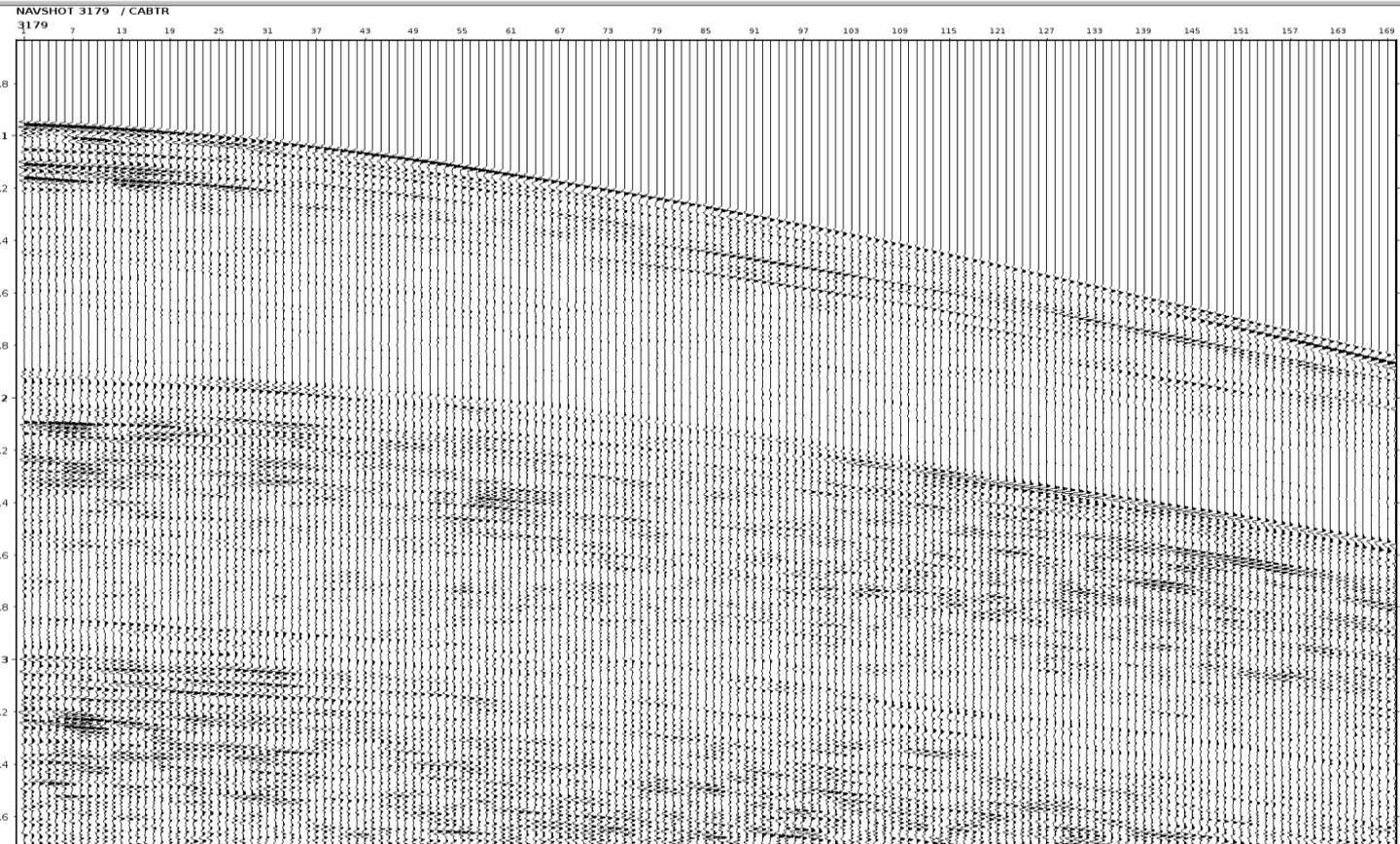
- After correction, traces are horizontally shifted towards near offsets.

- The receiver motion effects is more visible in deeper part.



Seq018 Shot Gather after RMC (zoom in shallow)

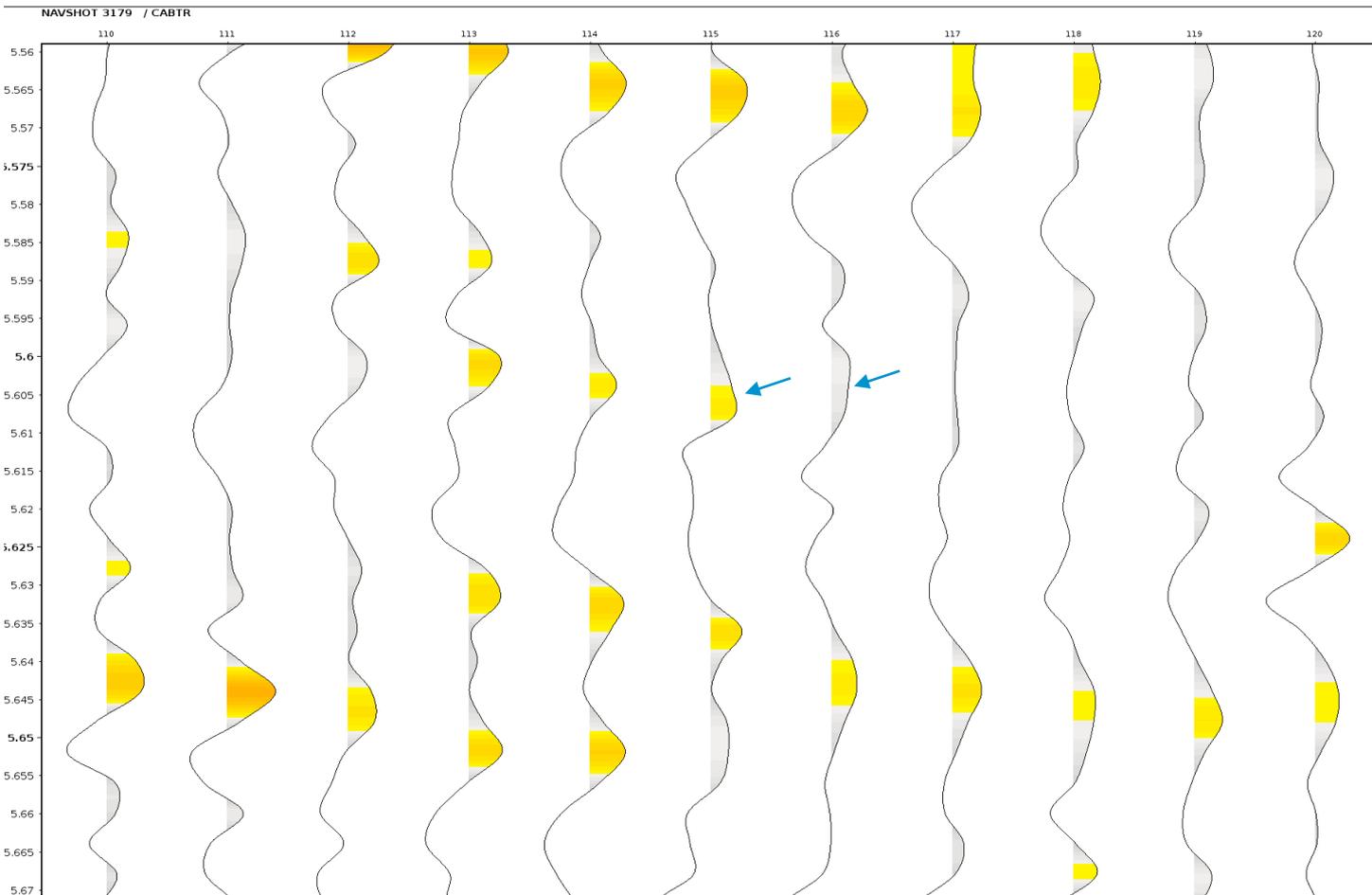
Boat speed ≈ 2.203 m/s



- Boat speed for this shot is around 2.203 m/s
- After correction, traces are horizontally shifted towards near offsets.
- The receiver motion effects is more visible in deeper part.



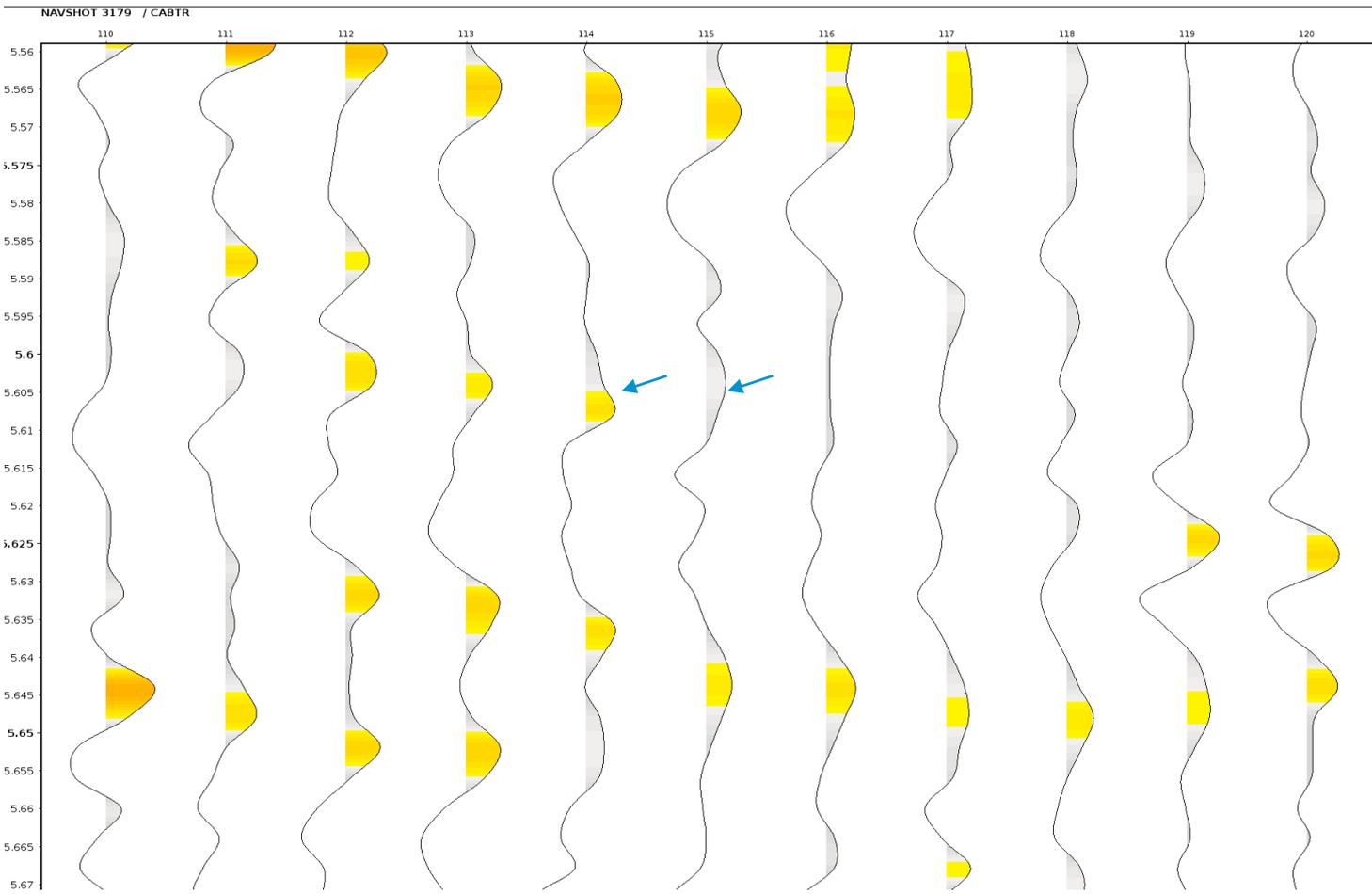
Seq018 Shot Gather before RMC (zoom in @ 5.6ms)



- At time $t \approx 5.6$ seconds = 12.5 meter (channel interval) / 2.203 meter per second (boat speed), the wavelet signal will shift 1 trace toward the shot location.



Seq018 Shot Gather after RMC (zoom in @ 5.6ms)



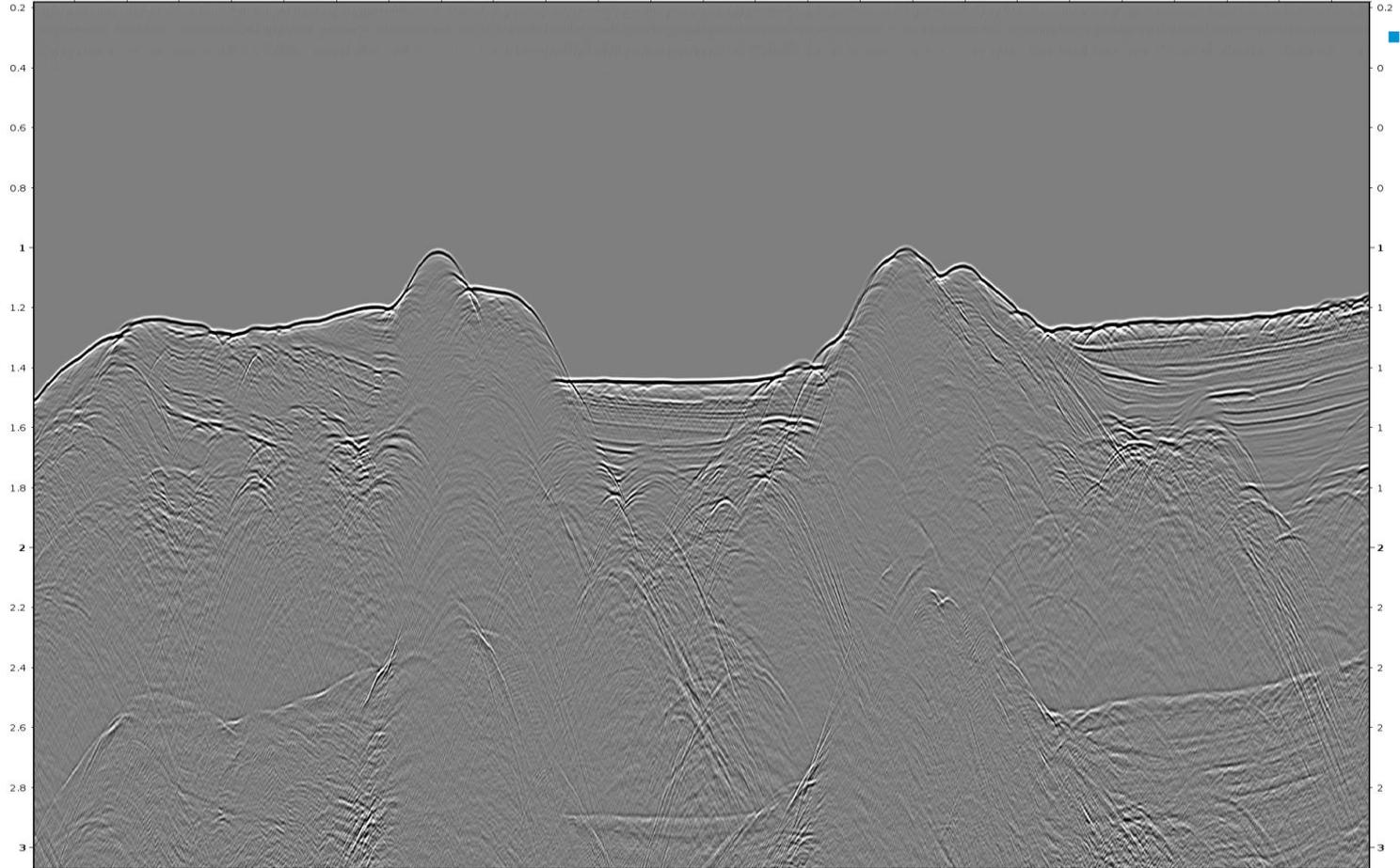
■ At time $t \approx 5.6$ seconds = 12.5 meter (channel interval) / 2.203 meter per second (boat speed), the wavelet signal will shift 1 trace toward the shot location.



Seq018 Stack before RMC (zoom in shallow)

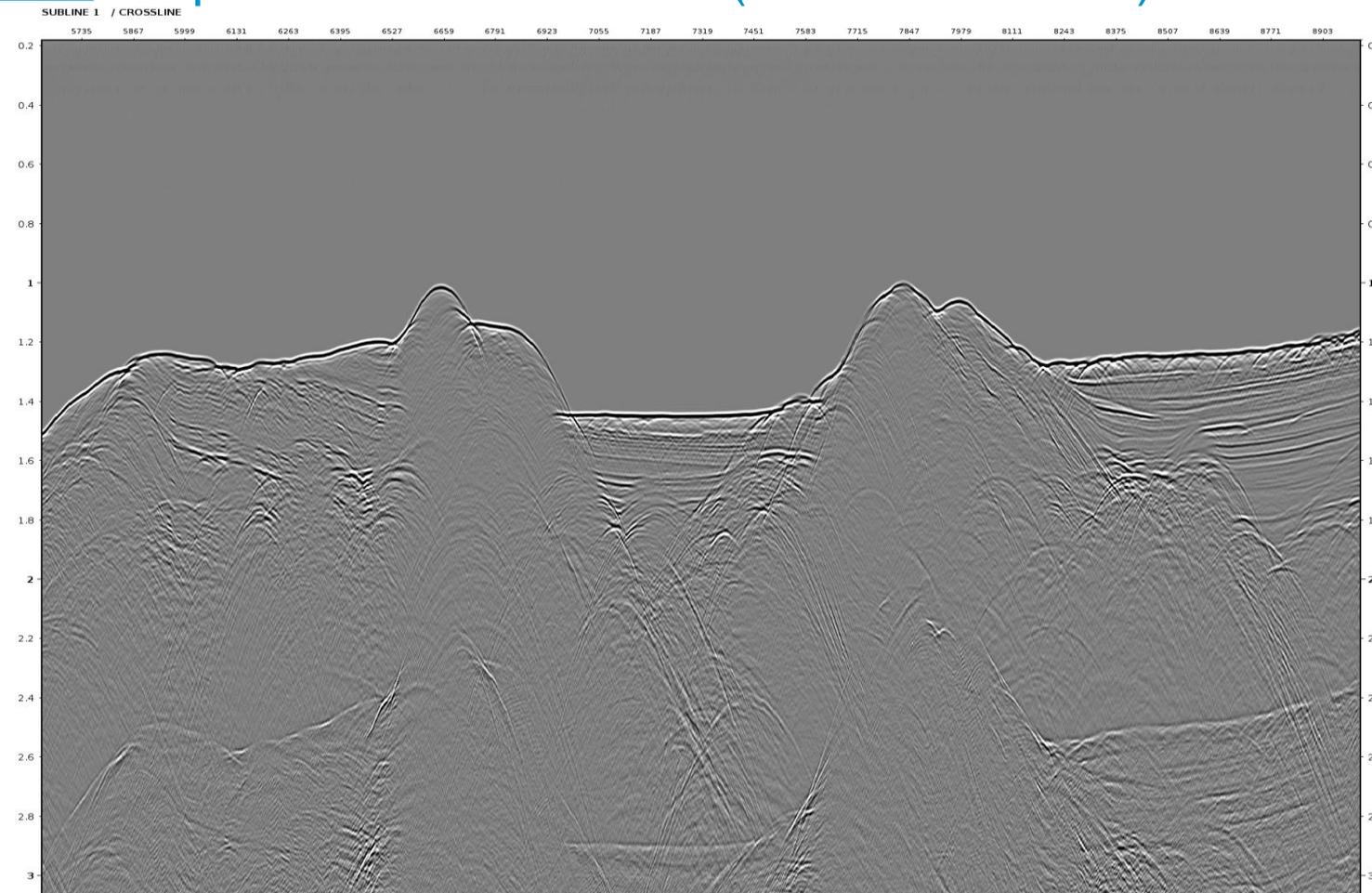
SUBLINE 1 / CROSSLINE

5735 5867 5999 6131 6263 6395 6527 6659 6791 6923 7055 7187 7319 7451 7583 7715 7847 7979 8111 8243 8375 8507 8639 8771 8903



- Shallow zoom in stack keep consistent

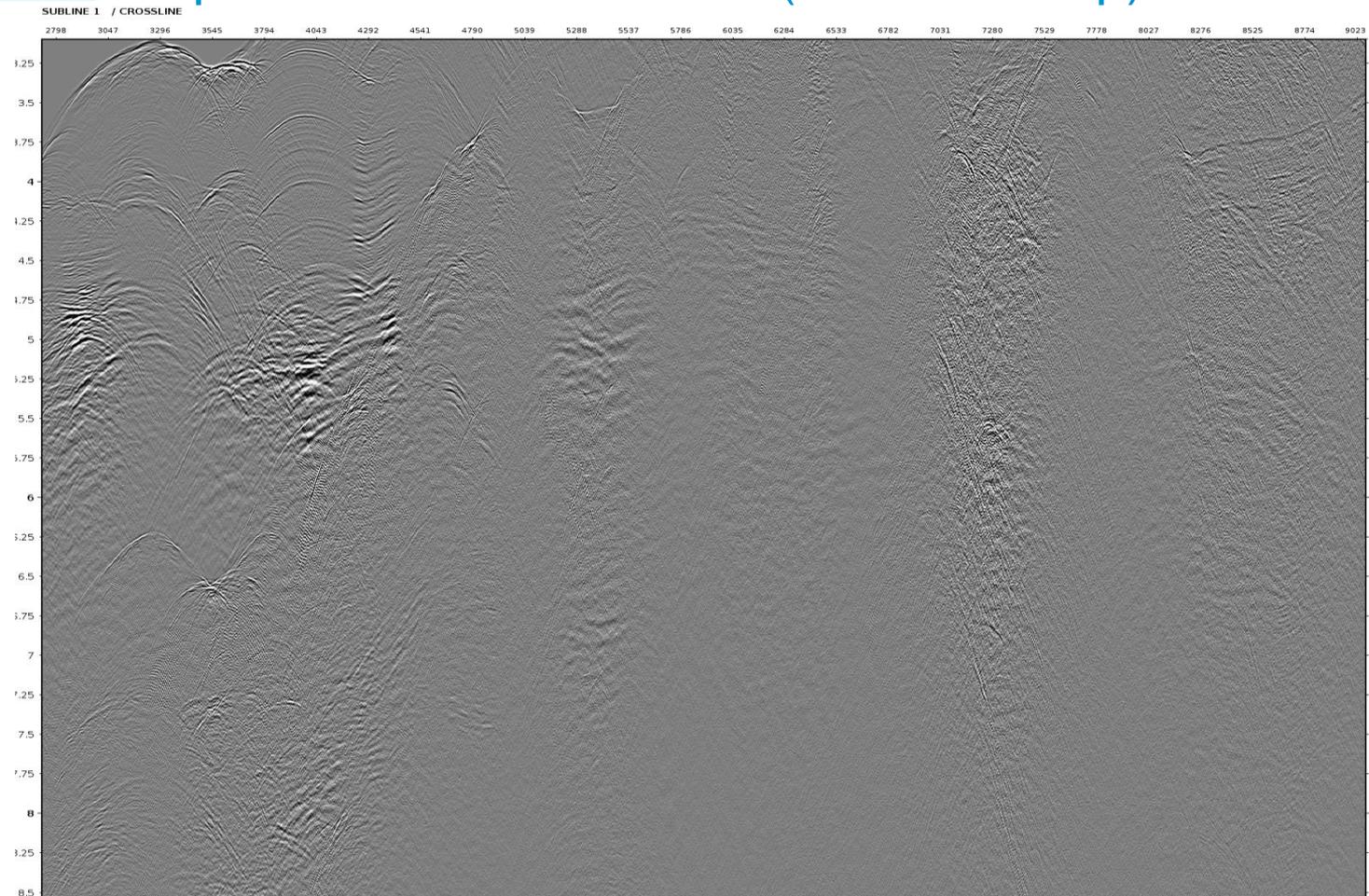
Seq018 Stack after RMC (zoom in shallow)



- Shallow zoom in stack keep consistent



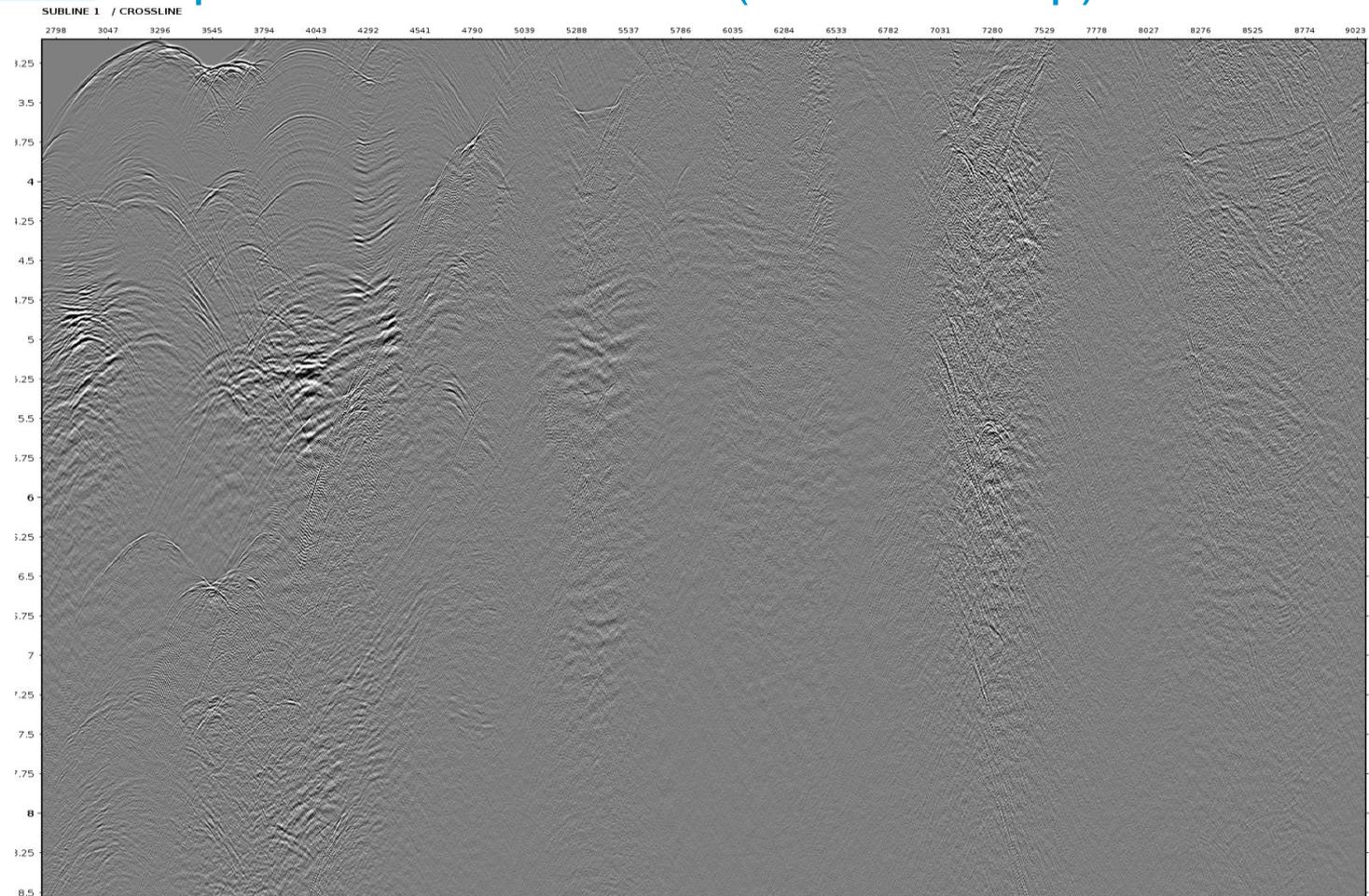
Seq018 Stack before RMC (zoom in deep)



- Primary keep consistent in deep zoom in stack



Seq018 Stack after RMC (zoom in deep)

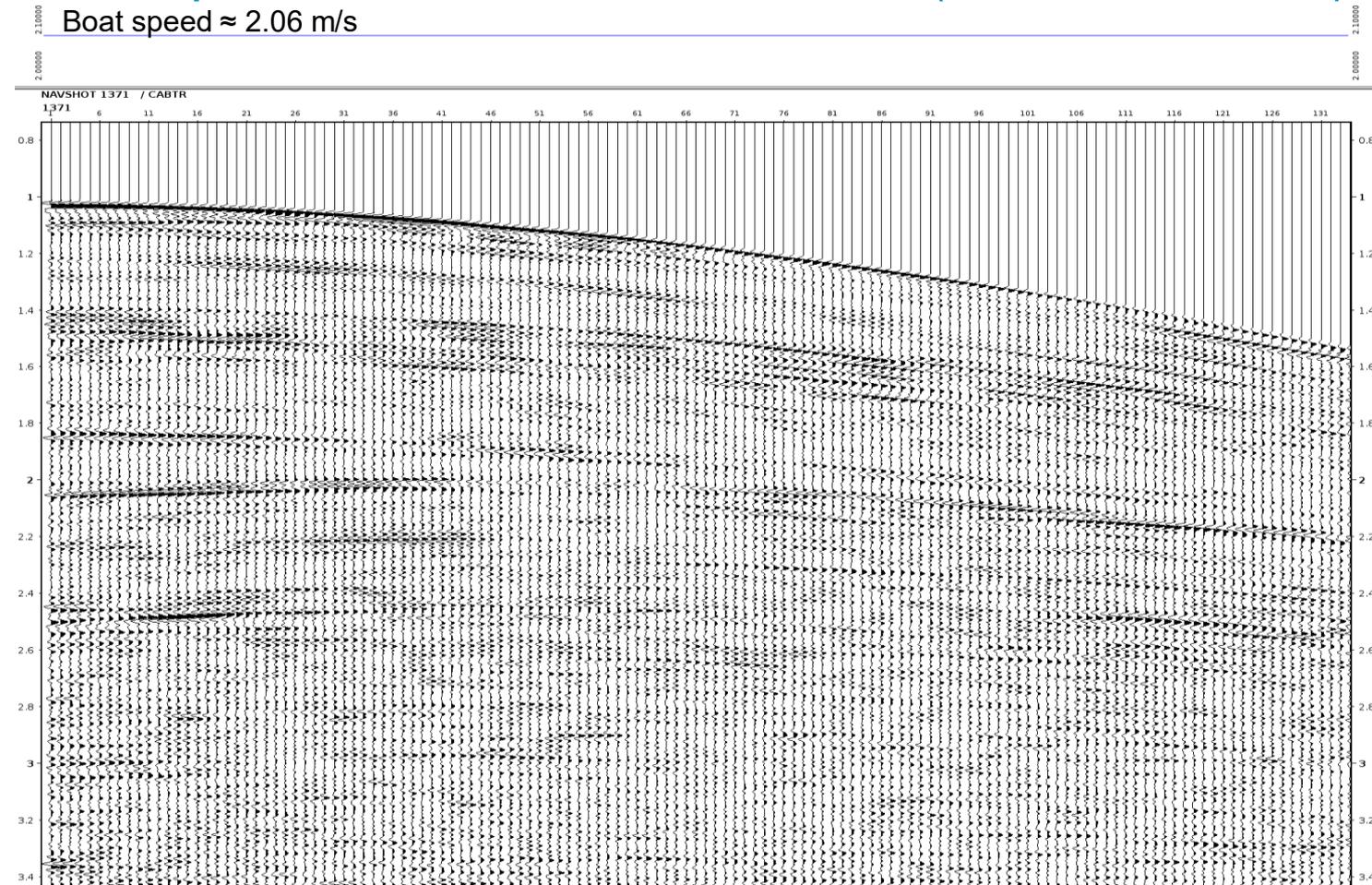


- Primary keep consistent in deep zoom in stack



Seq039 Shot Gather before RMC (zoom in shallow)

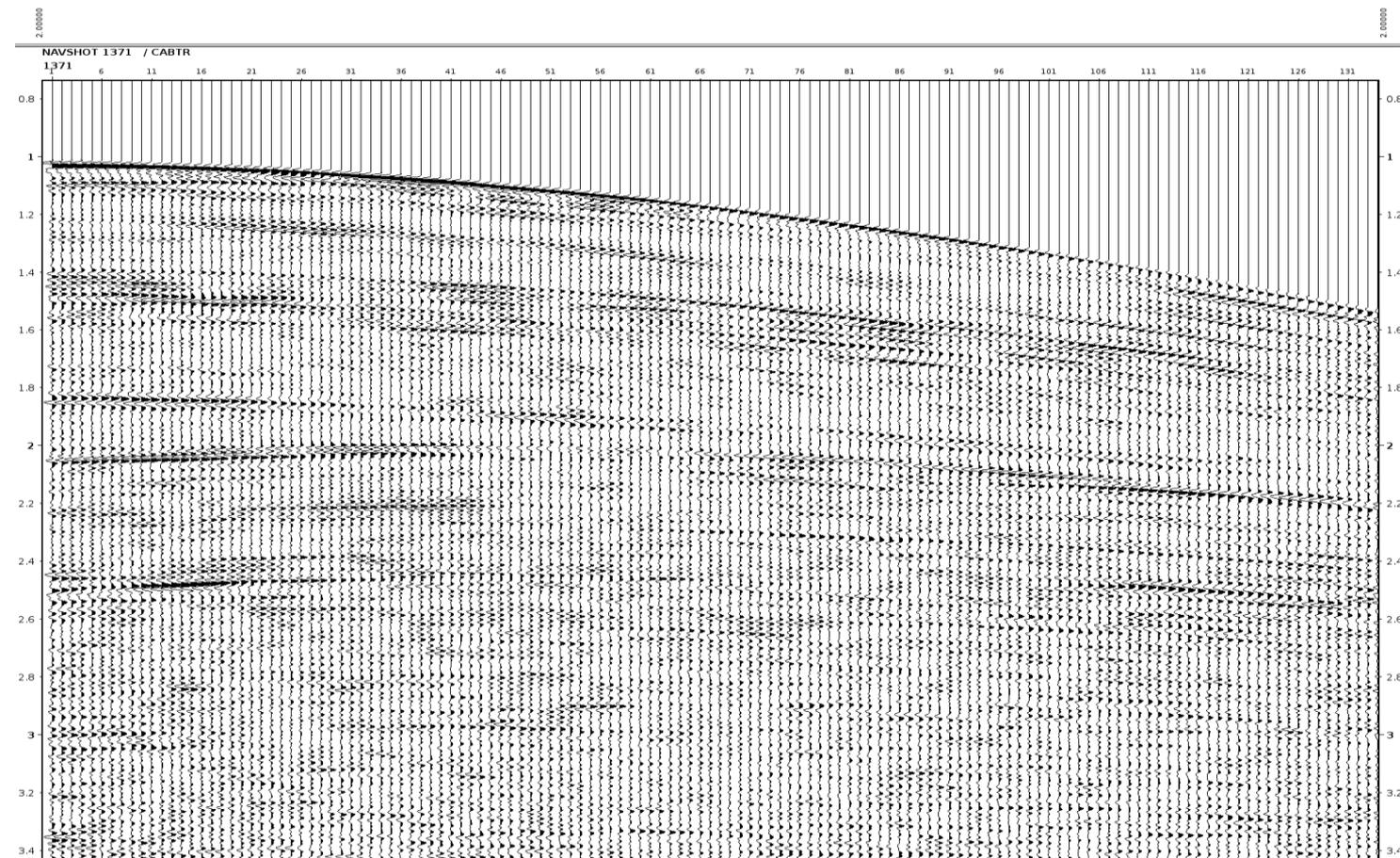
Boat speed ≈ 2.06 m/s



- Boat speed for this shot is around 2.06 m/s
- After correction, traces are horizontally shifted towards near offsets.
- The receiver motion effects is more visible in deeper part.

Seq039 Shot Gather after RMC (zoom in shallow)

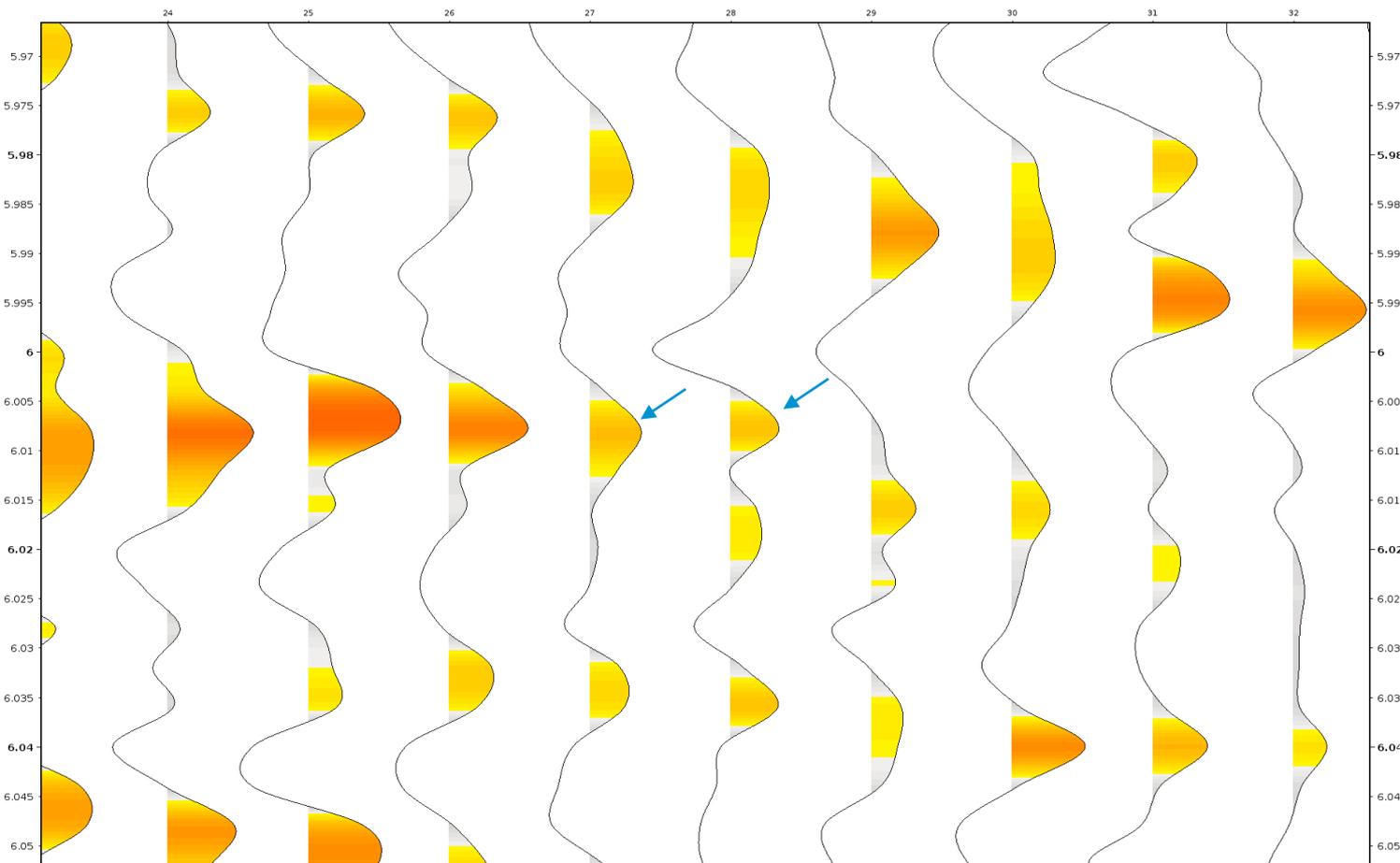
Boat speed ≈ 2.06 m/s



- Boat speed for this shot is around 2.06 m/s
- After correction, traces are horizontally shifted towards near offsets.
- The receiver motion effects is more visible in deeper part.



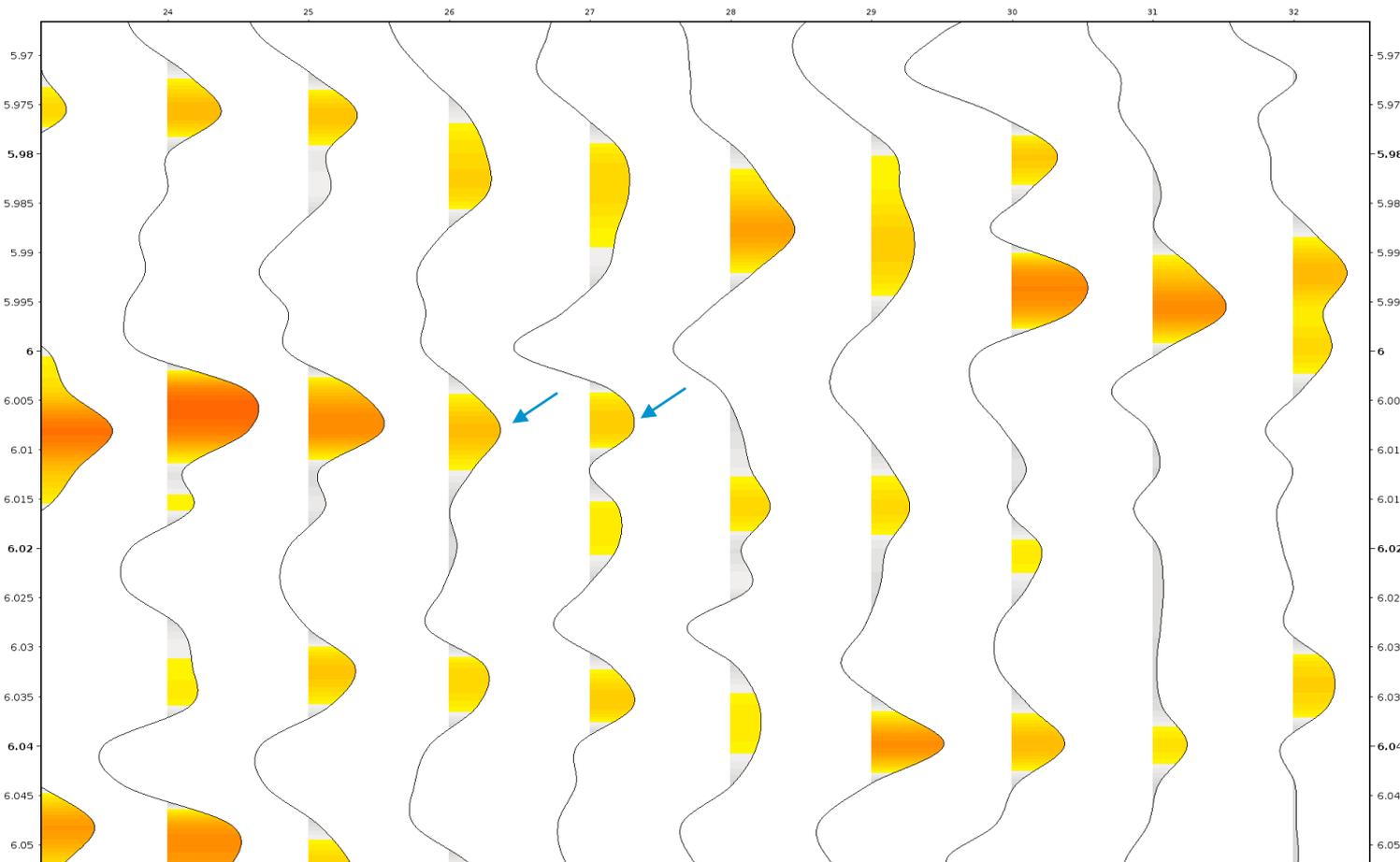
NAVSHOT 1371 / CABTR



At time $t \approx 6.06$ seconds
= 12.5 meter (channel interval) / 2.06 meter per second (boat speed), the wavelet signal will shift 1 trace toward the shot location.

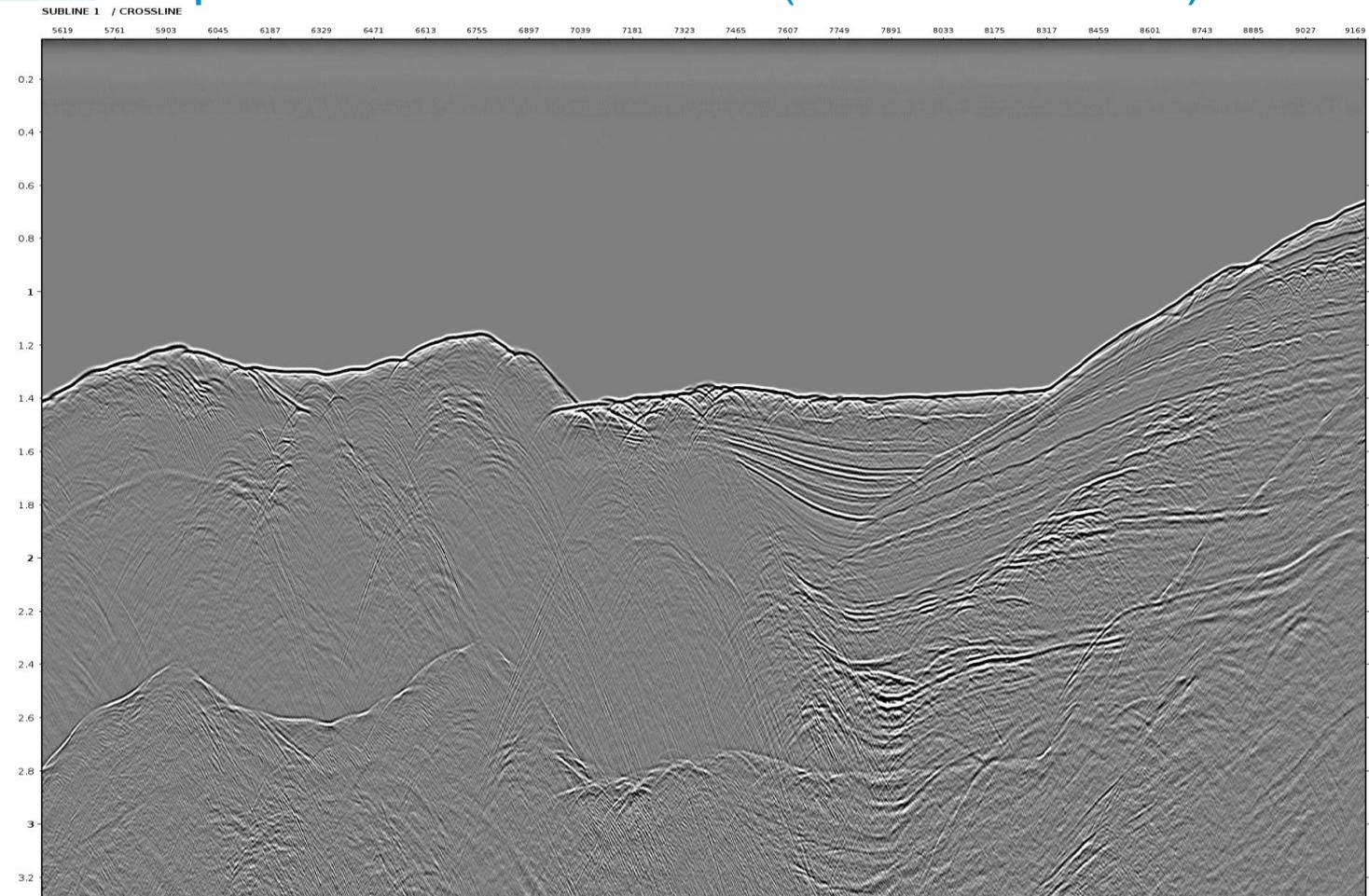


NAVSHOT 1371 / CABTR



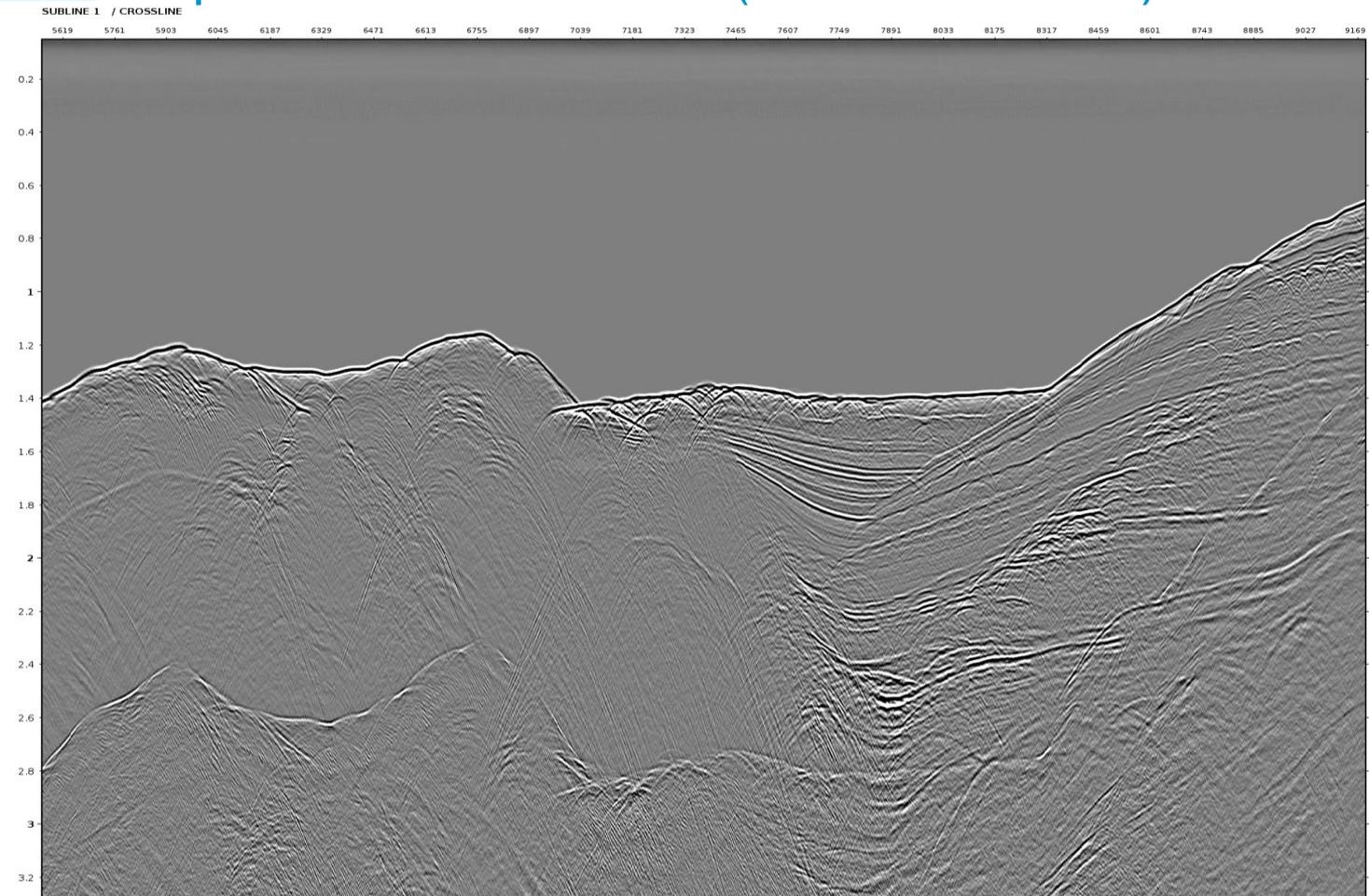
At time $t \approx 6.06$ seconds
= 12.5 meter (channel interval) / 2.06 meter per second (boat speed), the wavelet signal will shift 1 trace toward the shot location.

Seq039 Stack before RMC (zoom in shallow)



- Shallow zoom in stack keep consistent

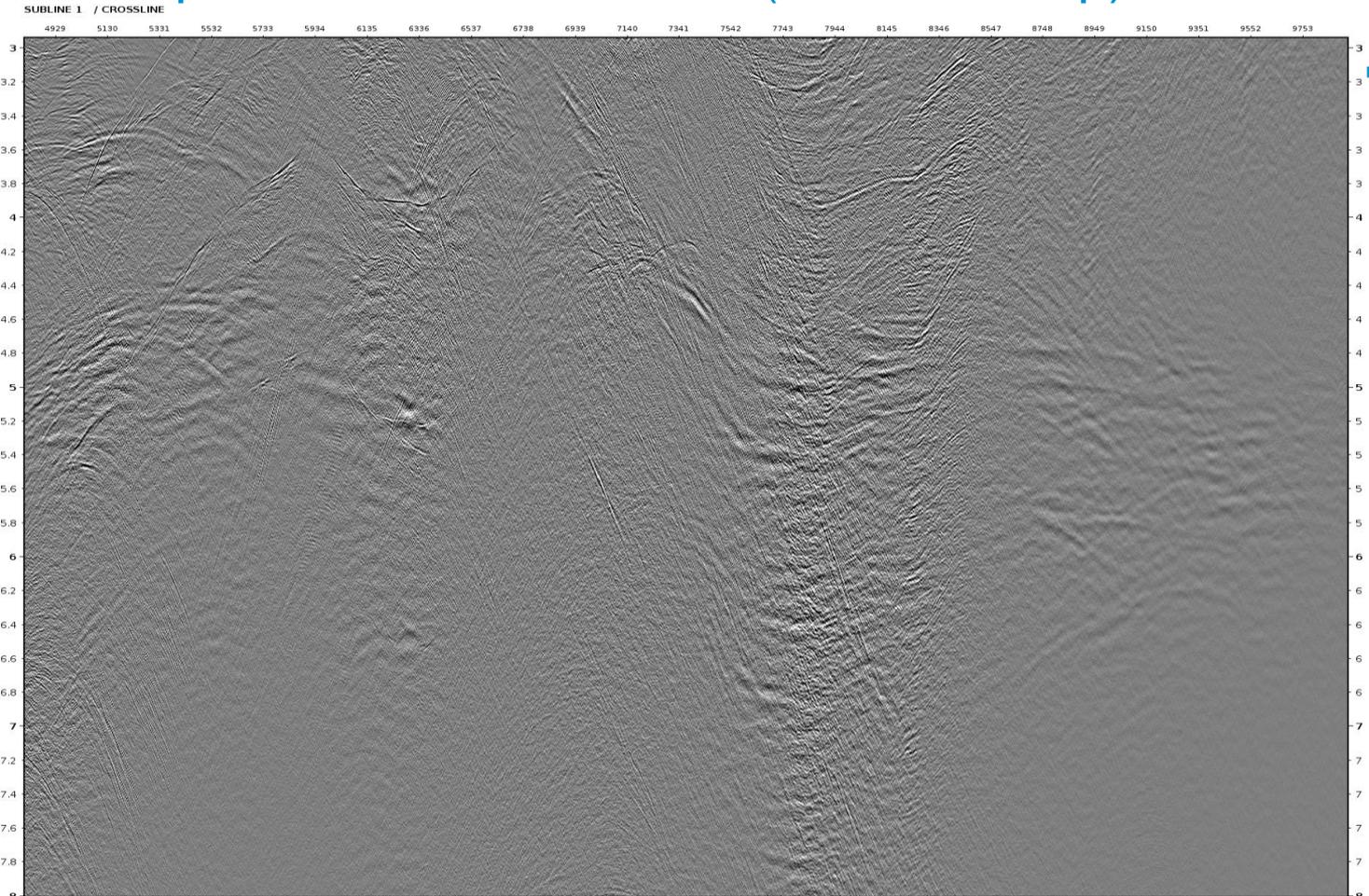
Seq039 Stack after RMC (zoom in shallow)



- Shallow zoom in stack keep consistent



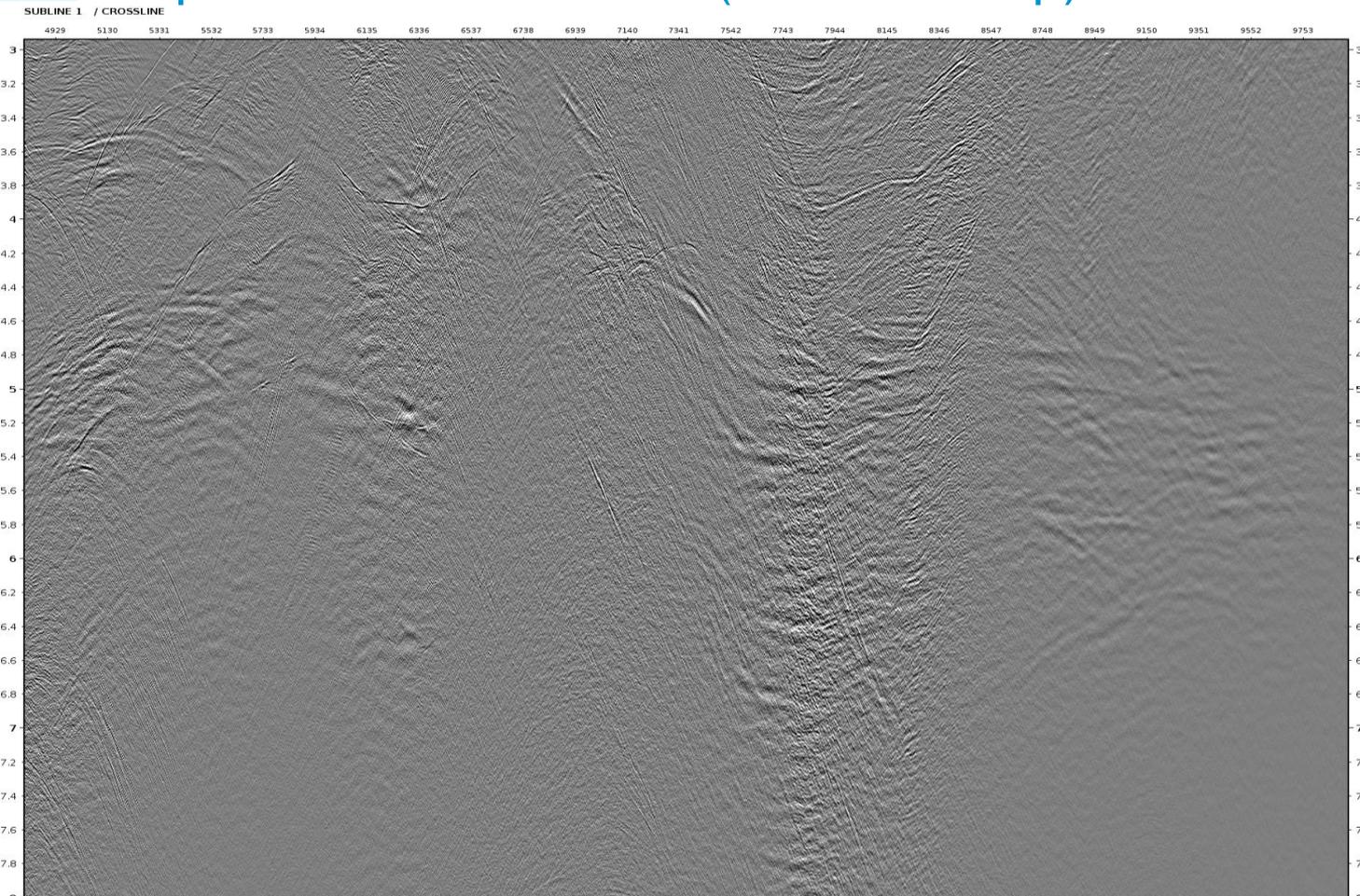
Seq039 Stack before RMC (zoom in deep)



- Primary keep consistent in deep zoom in stack



Seq039 Stack after RMC (zoom in deep)



- Primary keep consistent in deep zoom in stack