



Figure 1. Location of regions within northern and southern Naples Bay where side-scan sonar tracks was completed.

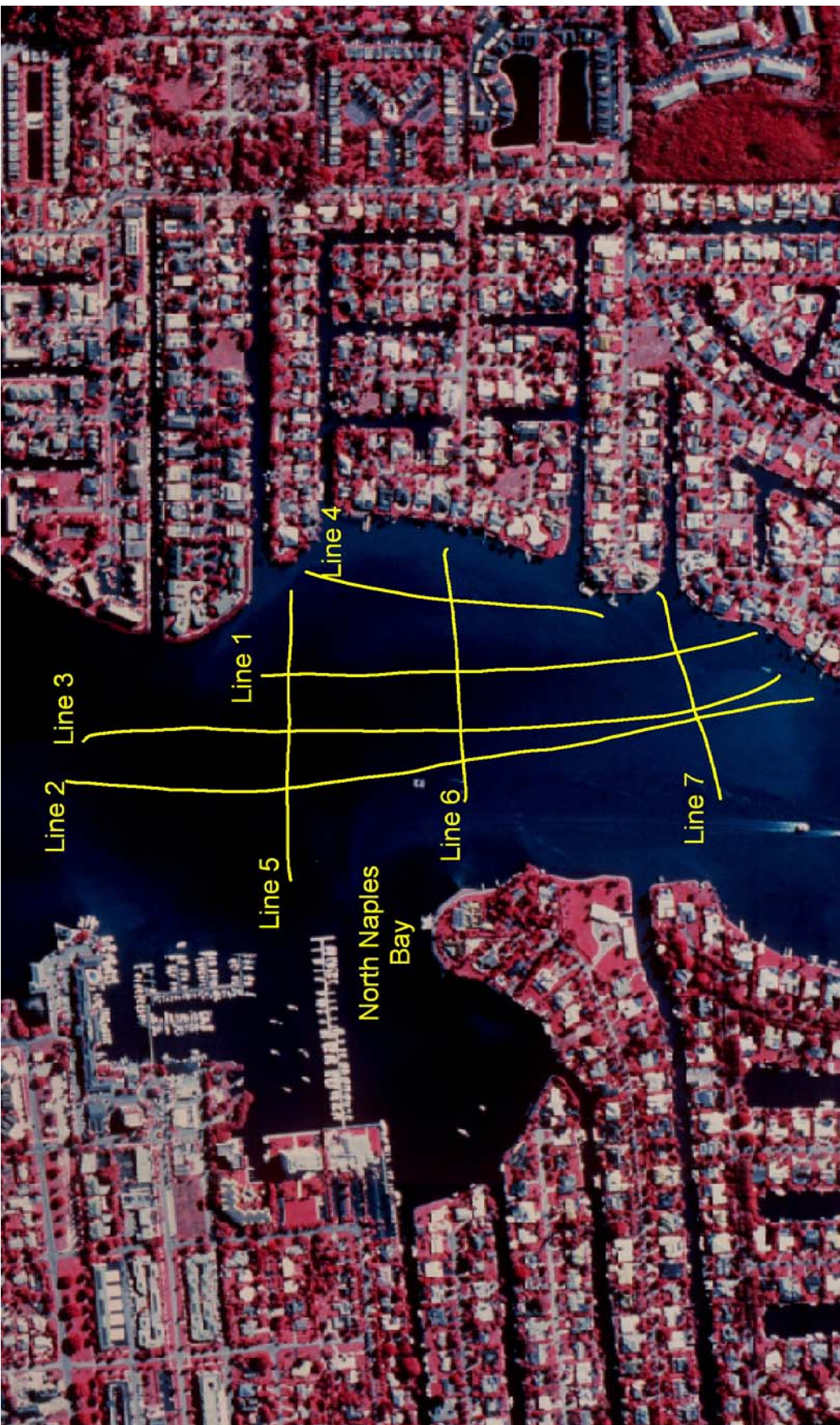


Figure 2. Location of 7 CHIRP profiles lines within northern Naples Bay. These profiles overlap with the region covered by the side-scan sonar survey.

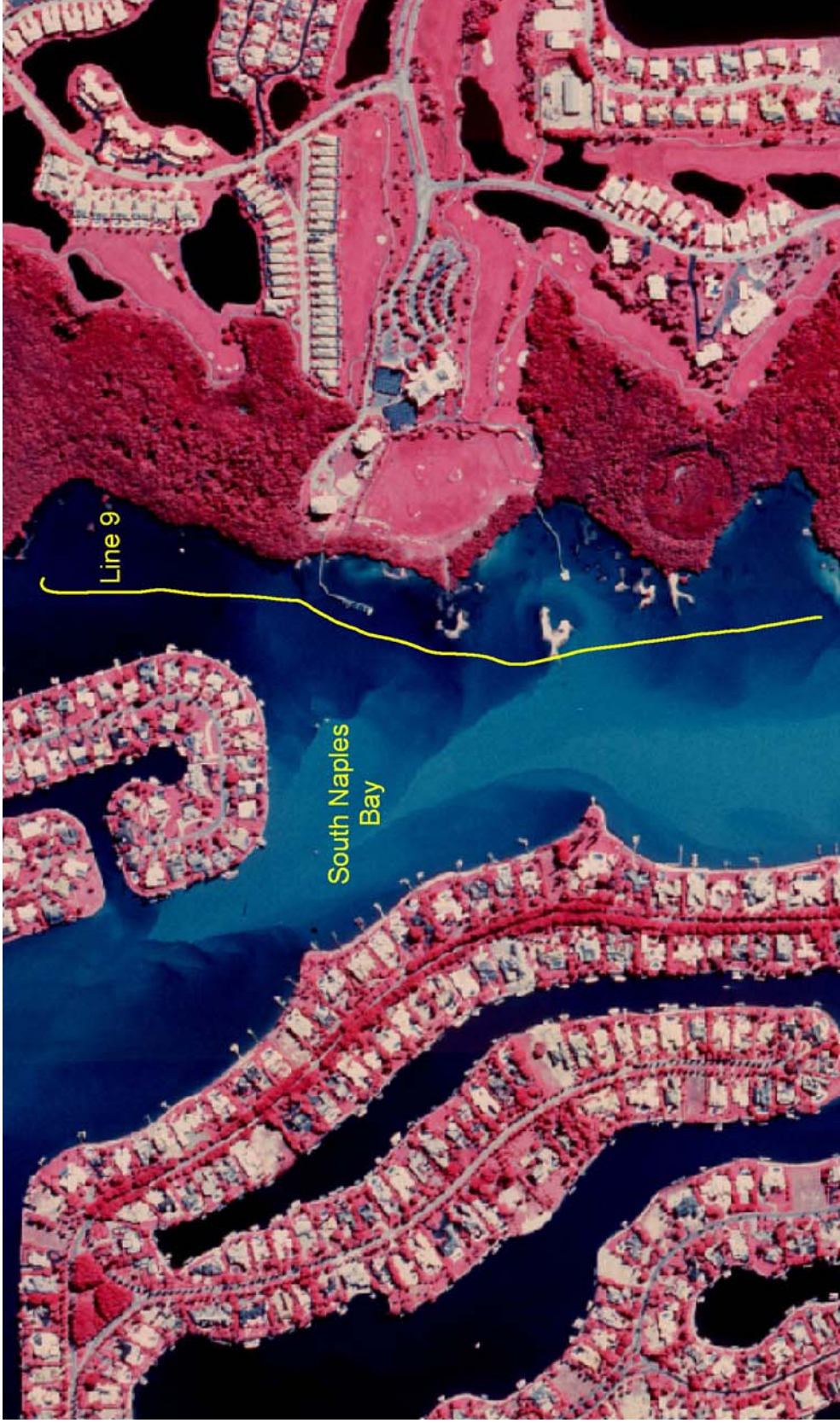


Figure 3. One long CHIRP profile (line 9) was completed in southern Naples Bay and runs down the center of the side-scan sonar swath.

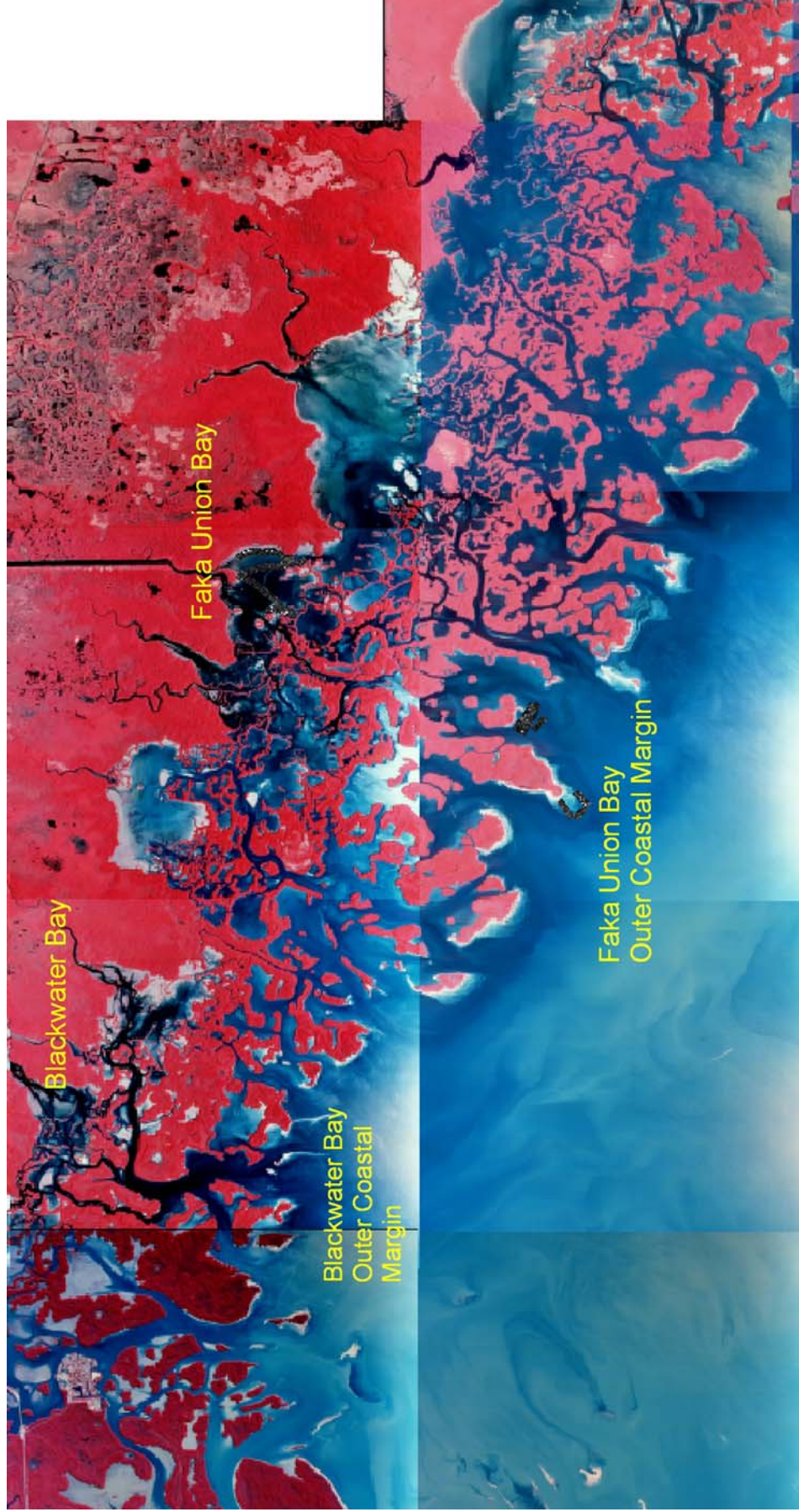
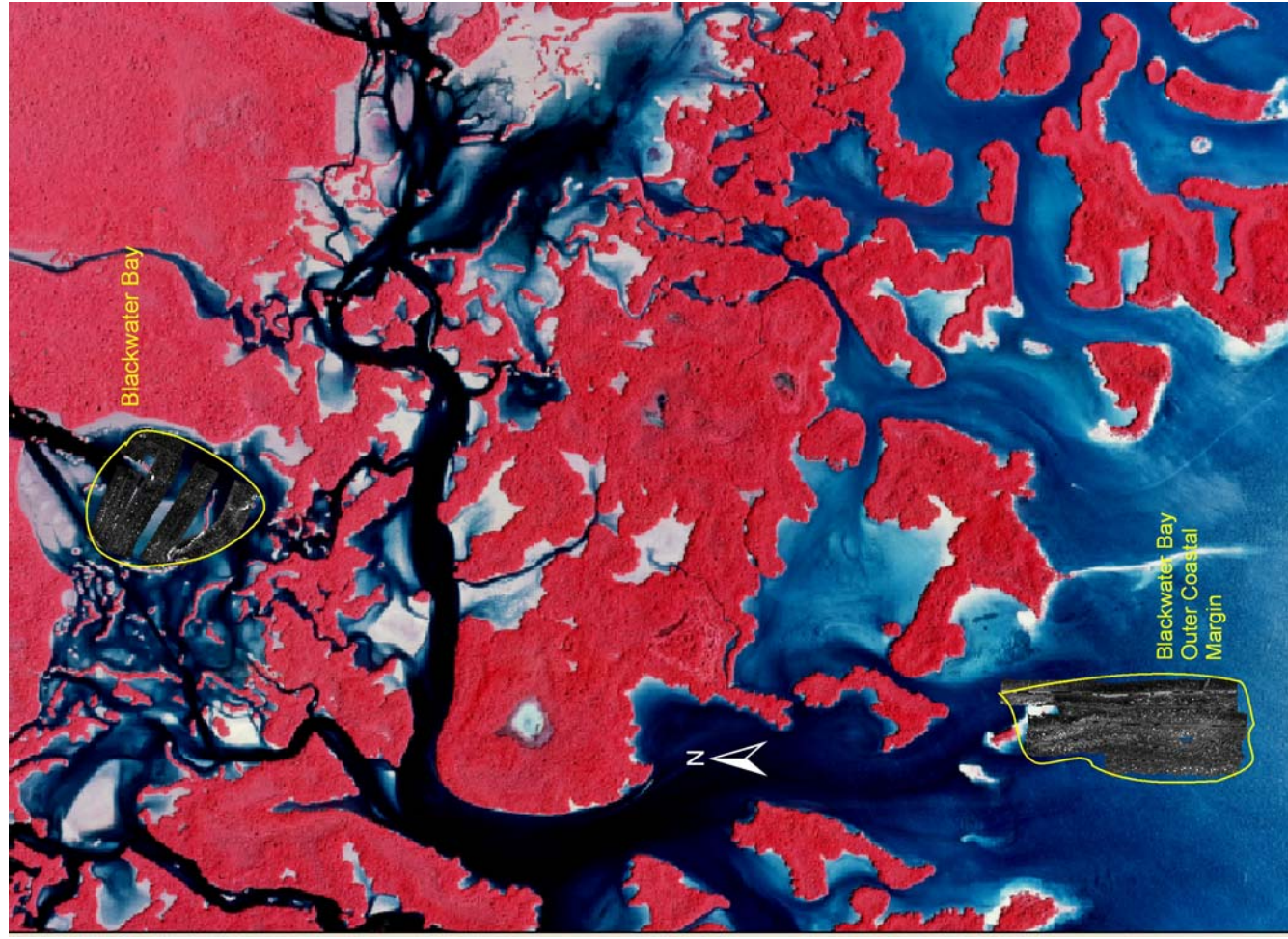


Figure 4. Aerial view of the Ten Thousand Islands showing the 4 subregions included in this study: Blackwater Bay, Faka Union Bay, the outer coastal margin of Blackwater estuary, and the outer coastal margin of Faka Union estuary.

Figure 5. Locations of side-scan sonar surveyed regions in the Blackwater estuary of the Ten Thousand Islands: the inner region of Blackwater Bay, where oyster reef development predominates, and the outer coastal margin, where vermetiform gastropod reefs occur. The long shallow structure running parallel and east of the outer coastal side-scan sonar swath (which covers a reefs) is a second gastropod reef.



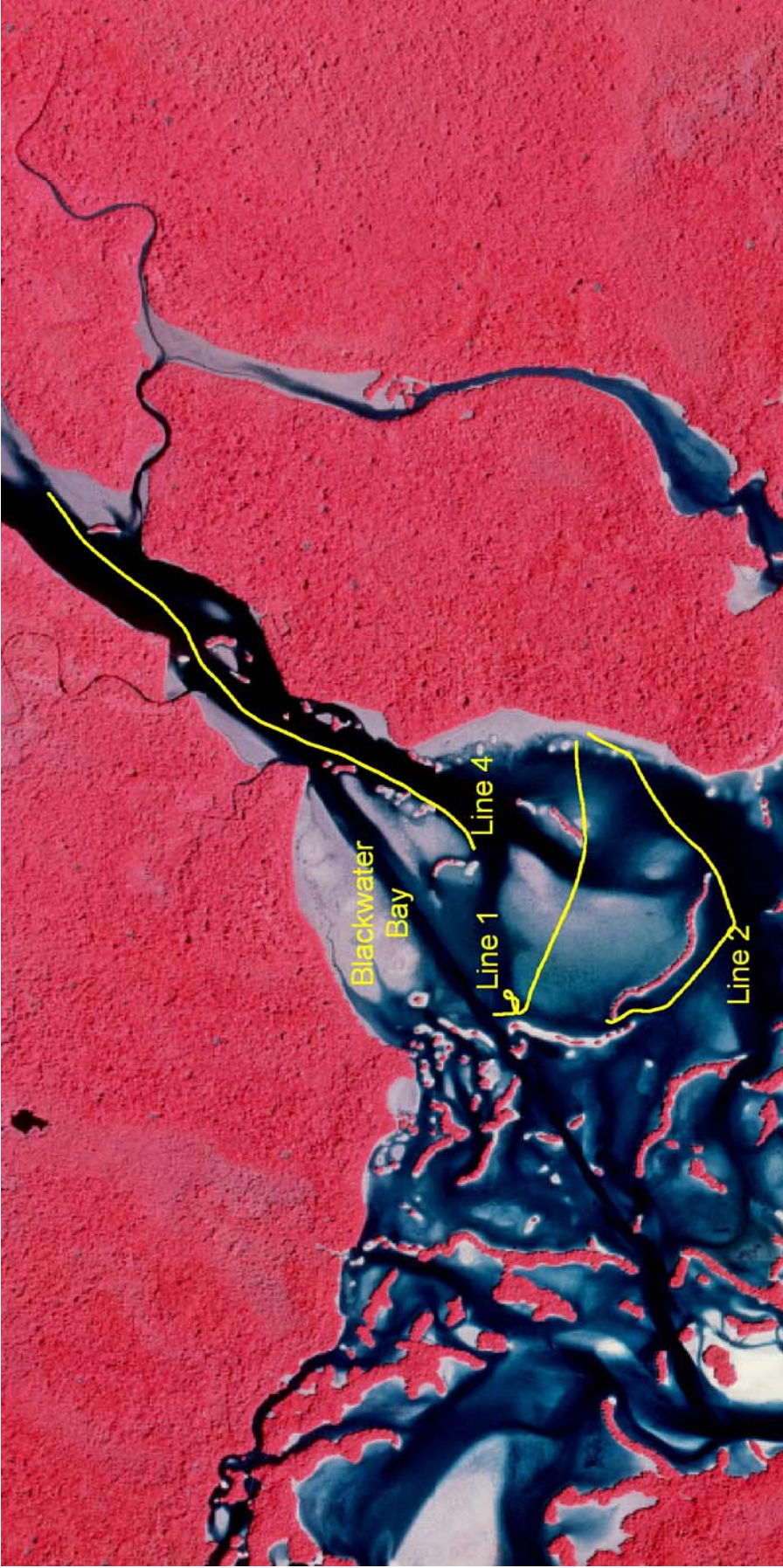
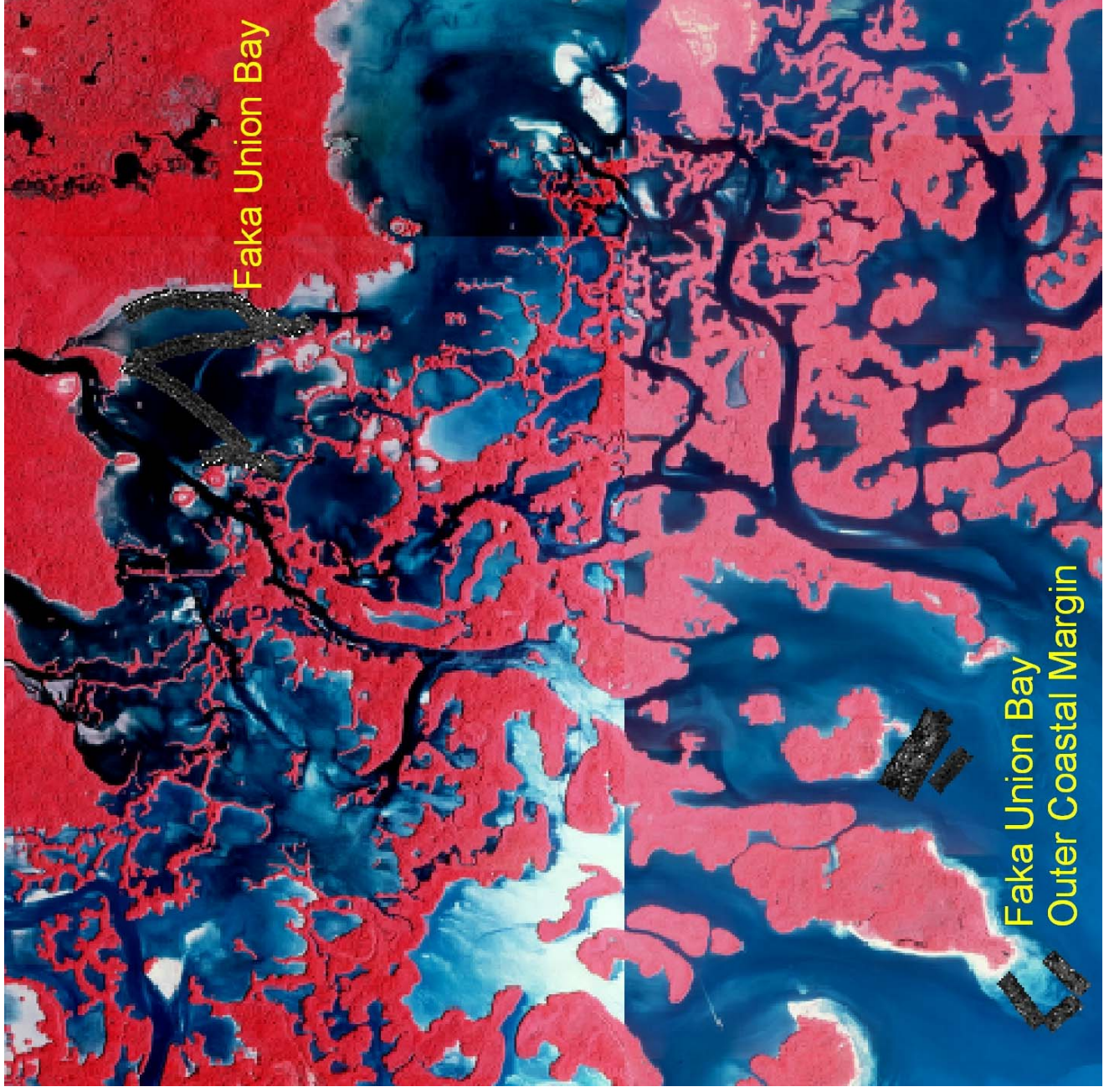


Figure 6. Three CHIRP lines profiled in Blackwater Bay.

Figure 7. Locations of side-scan sonar surveyed regions in the Faka Union estuary of the Ten Thousand Islands: the inner region of Faka Union Bay, where oyster reef development predominates around its perimeter, and the outer coastal margin, where vermetiform gastropod reefs occur.



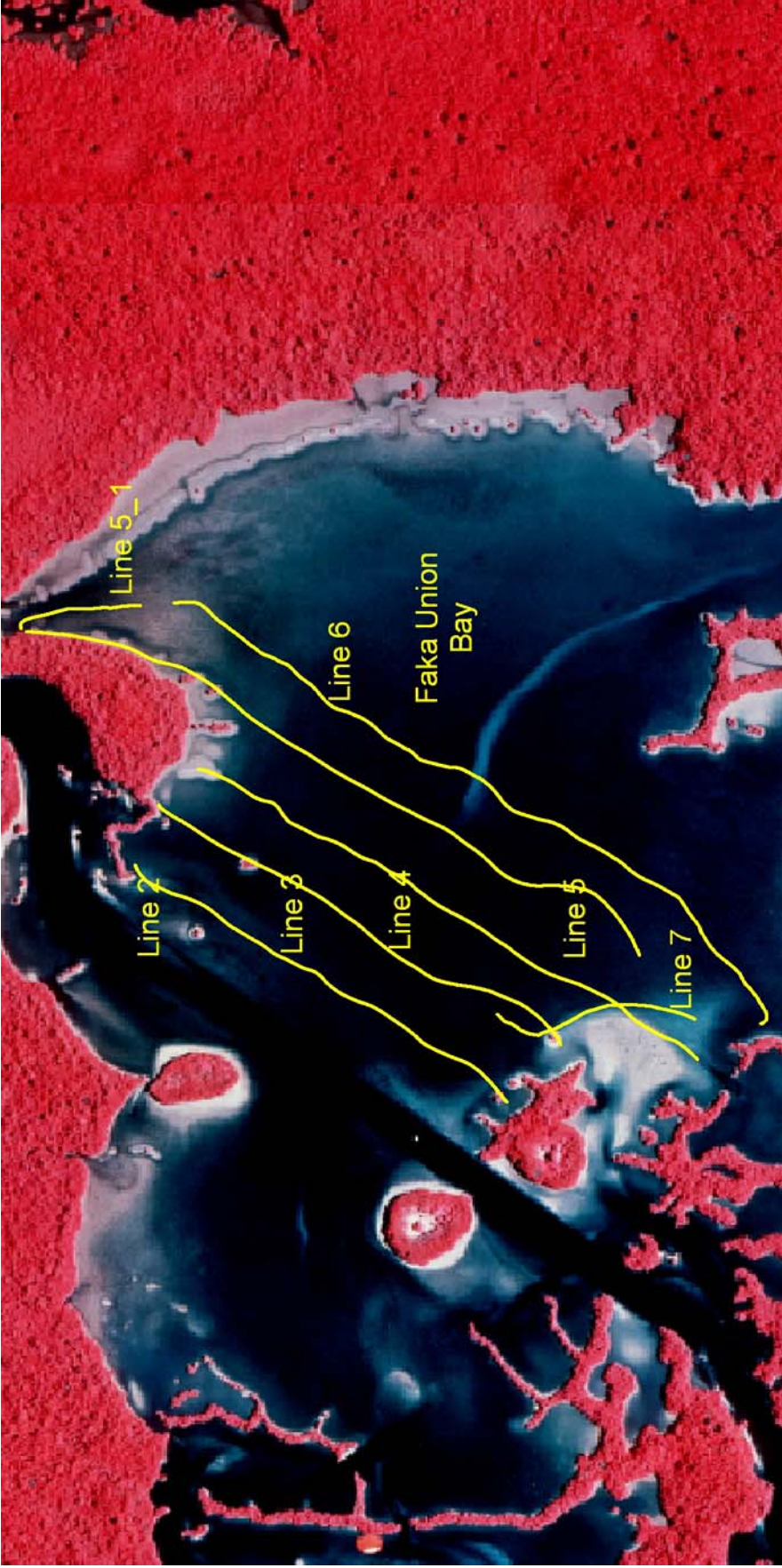


Figure 8. Six CHIRP lines profiled across Faka Union Bay.



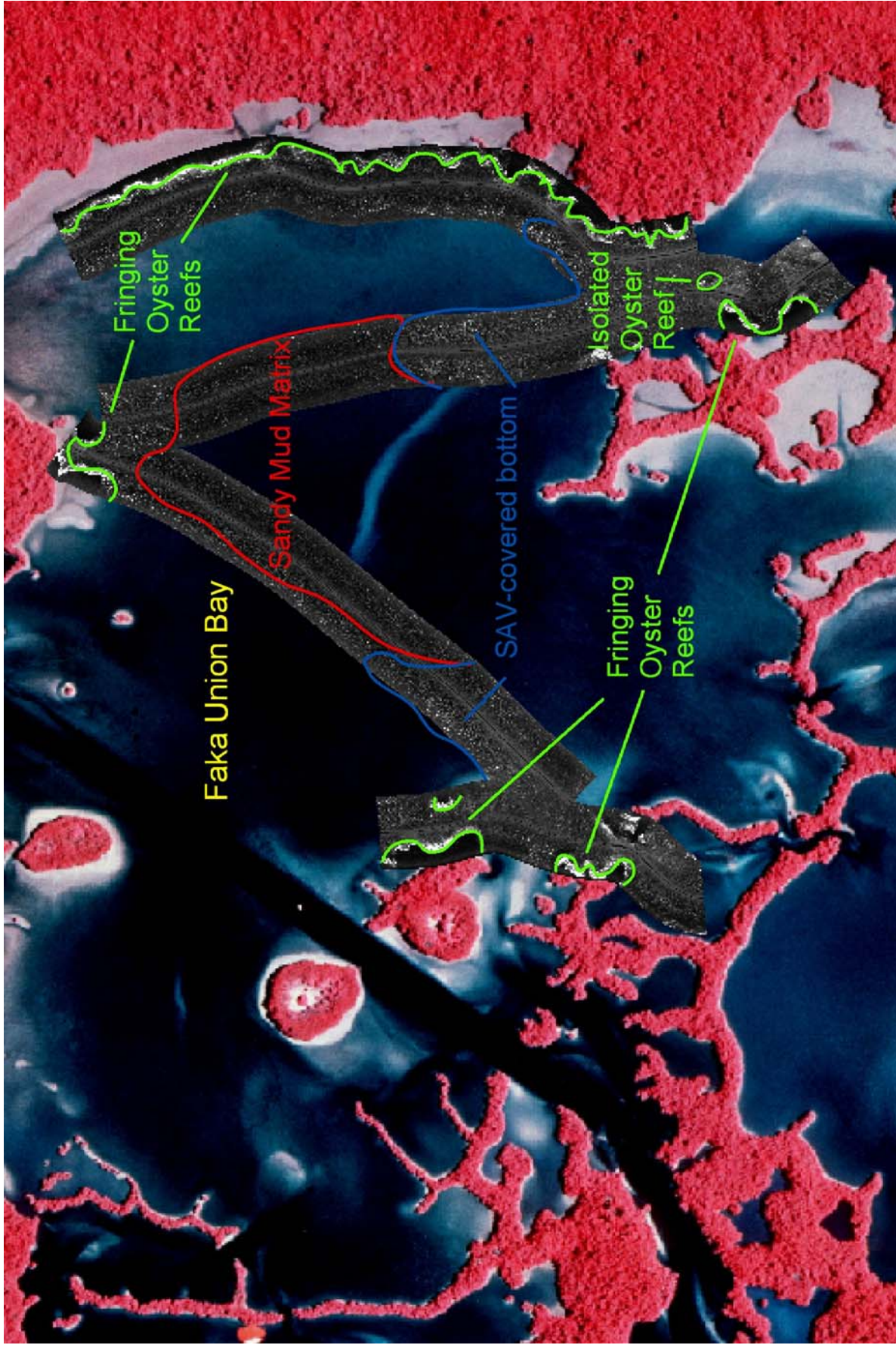


Figure 9. Side-scan sonar results for Faka Union Bay showing 4 substrate types: sandy mud matrix, SAV-covered bottom, isolated oyster reefs, and fringing oyster reefs.

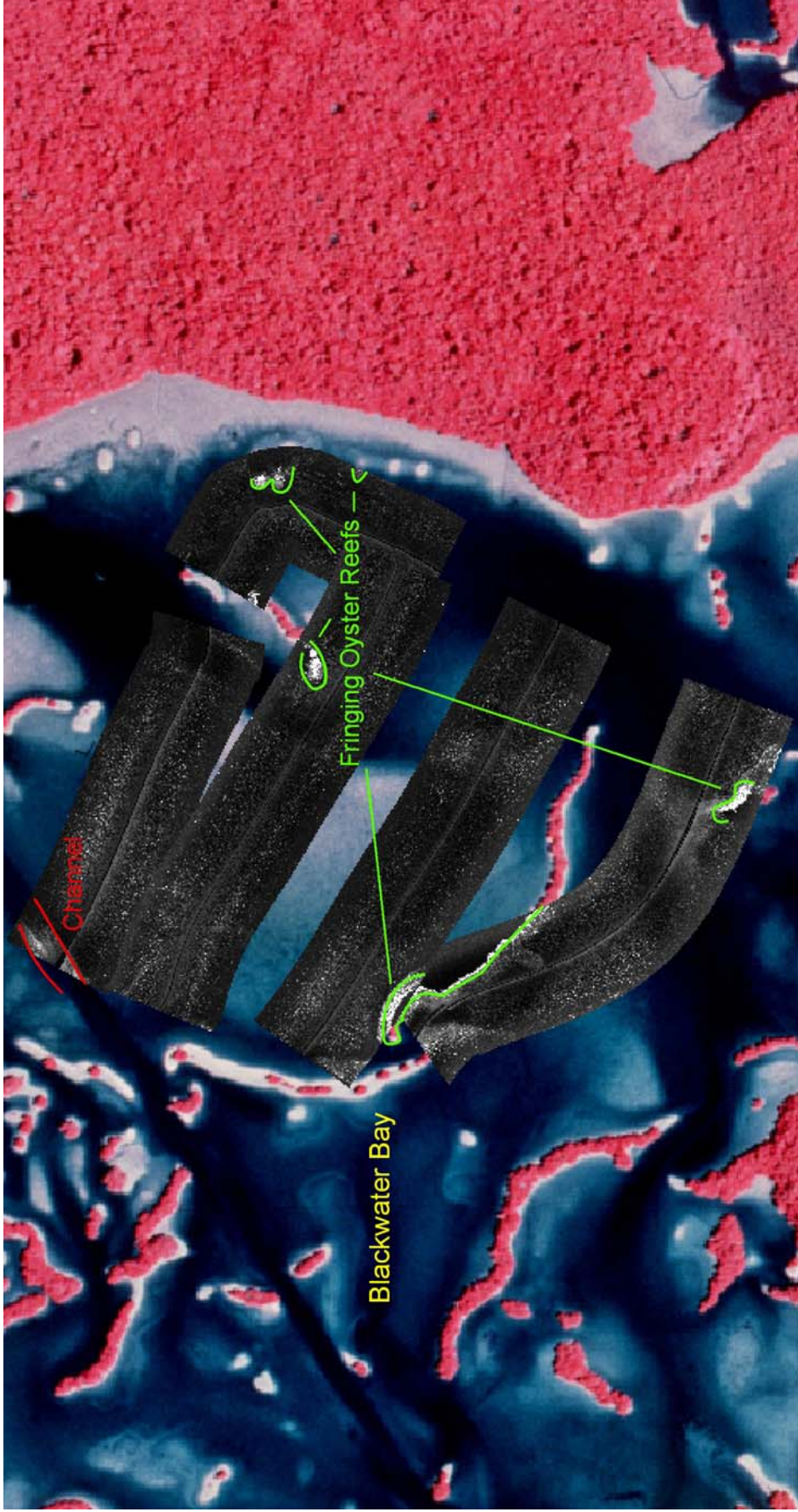


Figure 10. Side-scan sonar results for Blackwater Bay showing 2 substrate types: fringing oyster reefs and sandy mud bottoms (portions of swaths not highlighted in green).

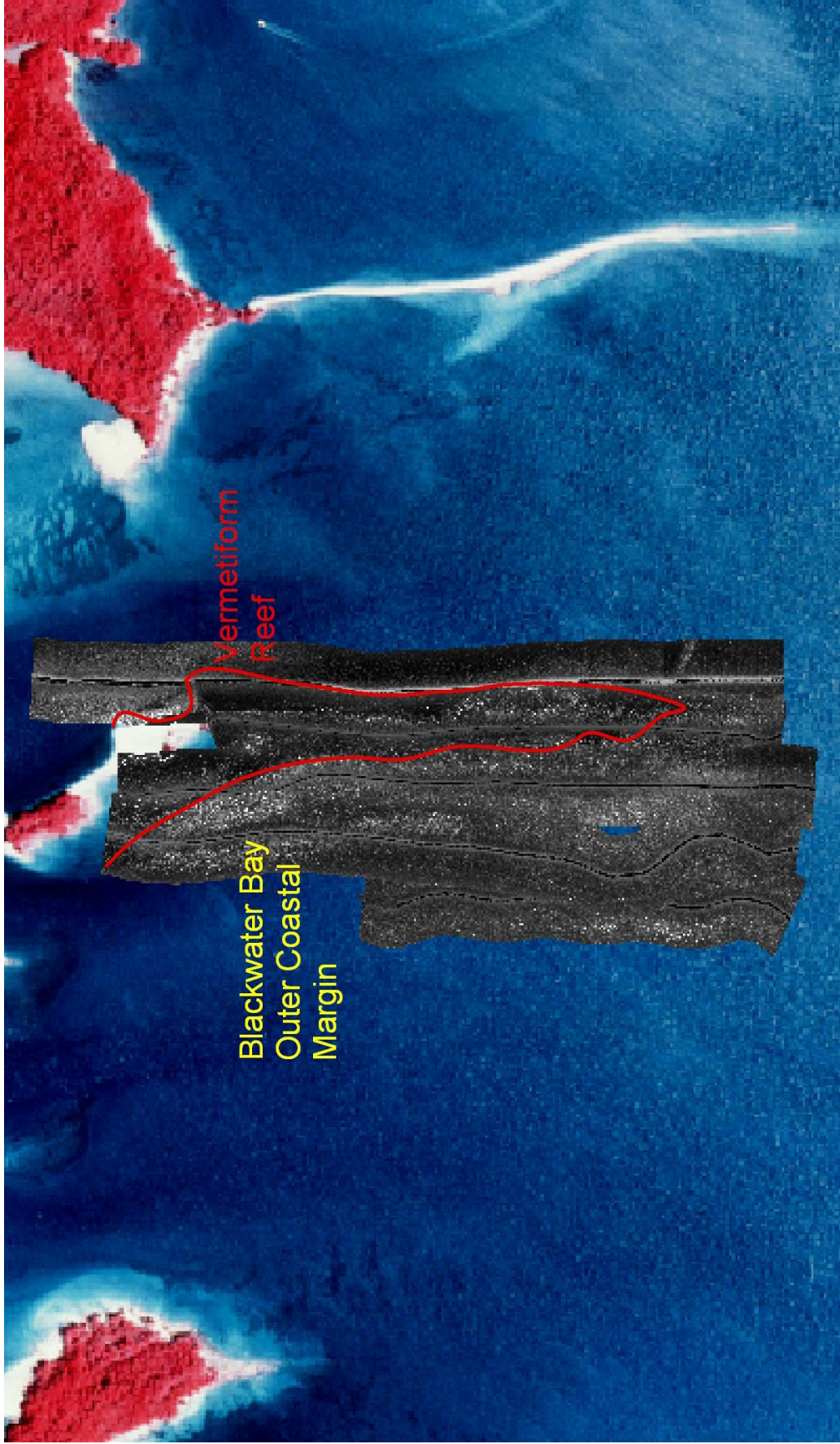


Figure 11. Side-scan sonar results for the outer coastal margin of the Blackwater estuary of vermetiform gastropod reef substrate. The reef surface is composed of patches of high substrate with shallow relief, interspersed with sand- and gravel-rich areas. This creates the patchy appearance of the acoustic reflectors.

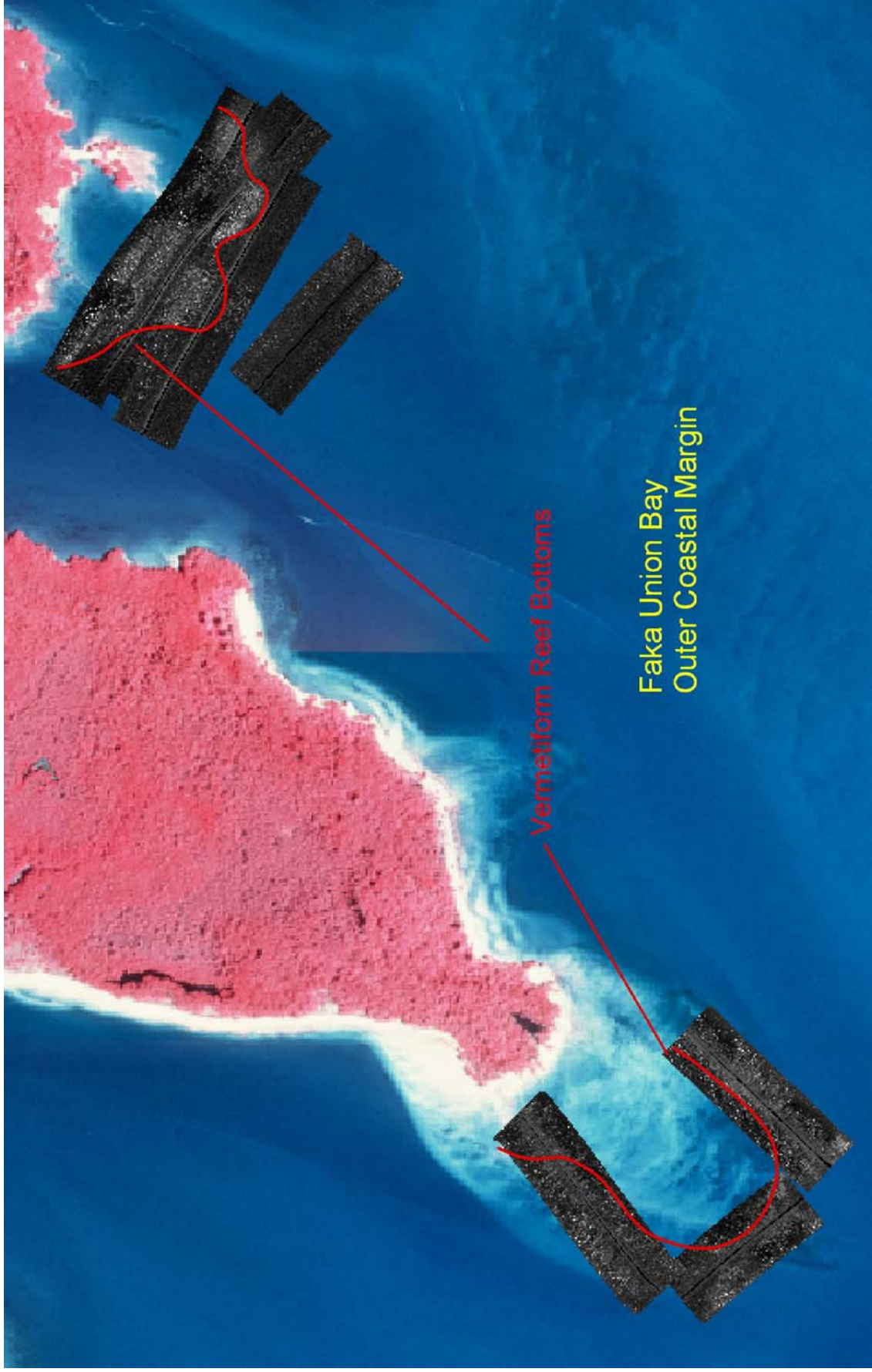


Figure 12. Same vermetiform gastropod reef substrate but from outer coast of Faka Union estuary.

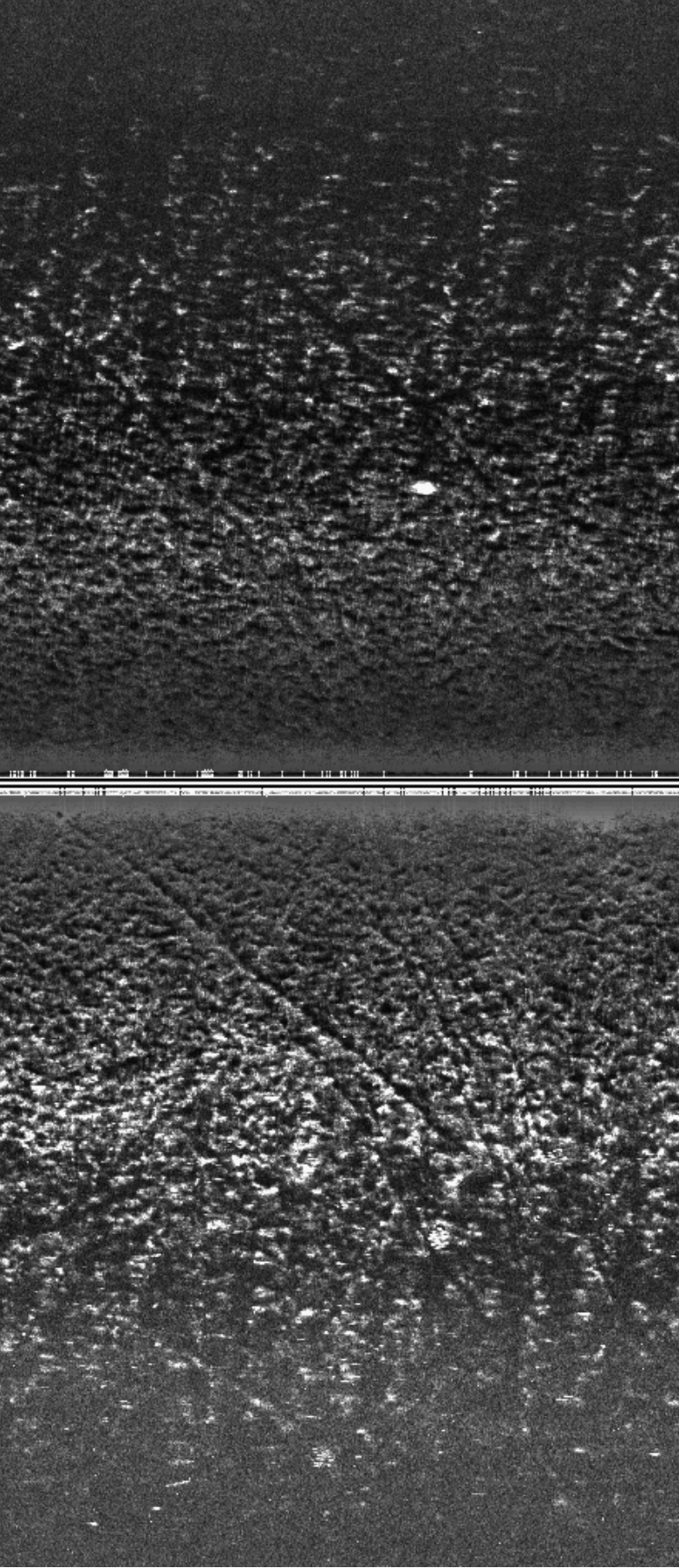


Figure 13. Mottled pattern seen within the side-scan sonar signal indicative of submerged aquatic vegetation (SAV) that could be generated by sea grasses or benthic algae. Also present are boat propeller scars across this habitat. Image mid-line represents the towed sonar; the left and right halves of the image represent the port and starboard sides, respectively, of the sonar swath.

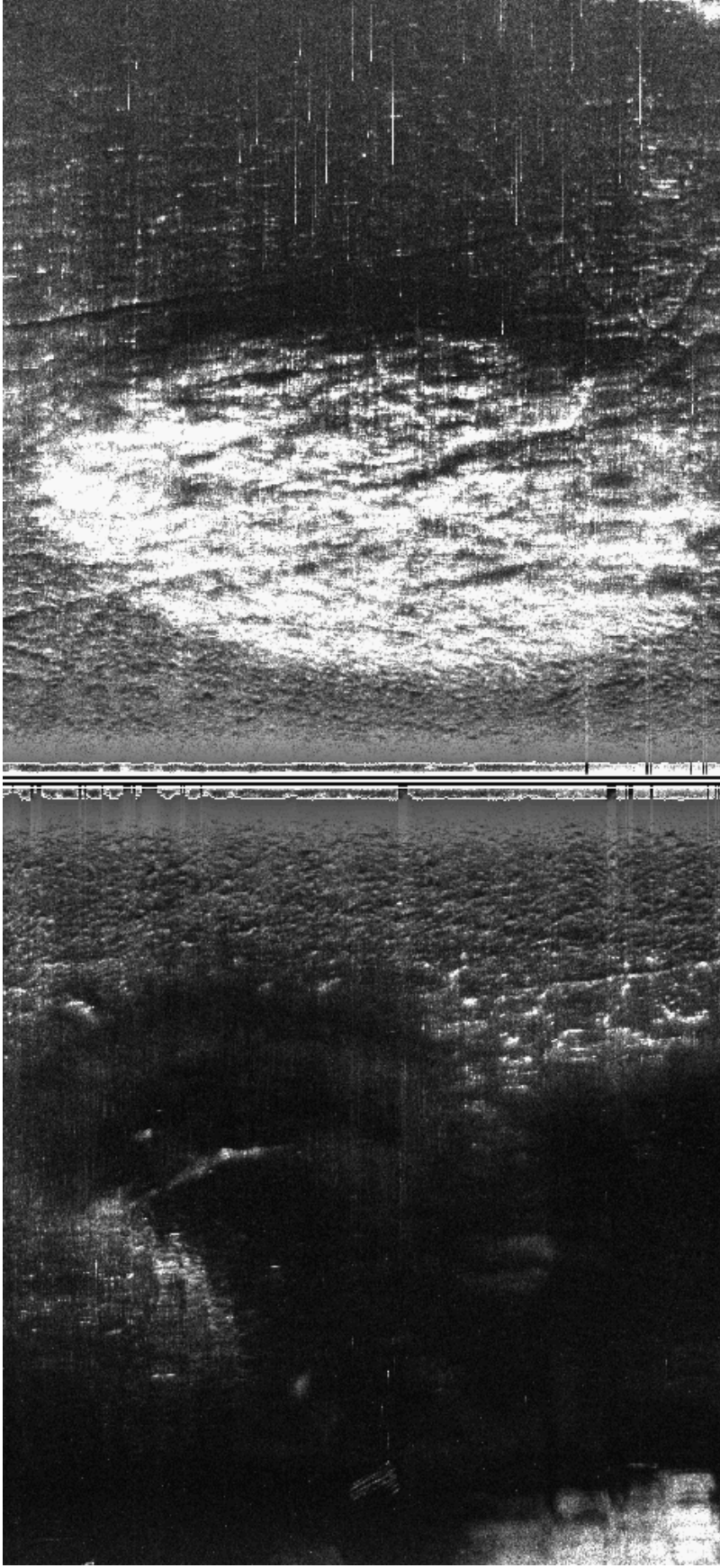
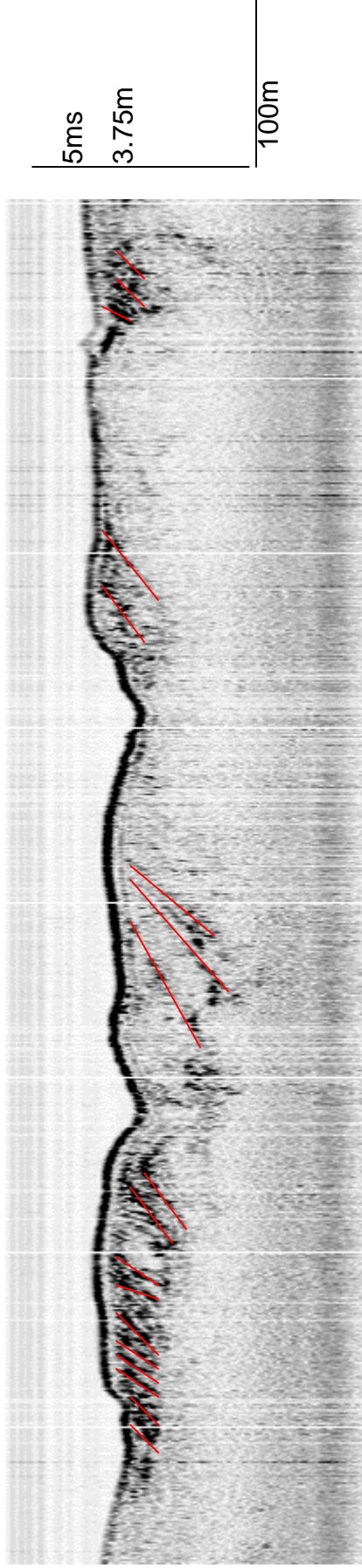


Figure 14. Similarly formatted image as seen in Figure 13. Starboard panel shows side-scan sonar image of a subtidal oyster reef from northern Naples Bay.



Figure 15. CHIRP line 4 running parallel to and through Blackwater River's mouth. Length highlighted in green traverses modern foreset beds of the river's delta.

Blackwater Line 4



Recent River Mouth Delta with Foreset Beds in Northern Blackwater Bay and mouth of Blackwater River

Figure 16. CHIRP profile view of the subsurface under line 4 in Blackwater Bay through the delta's foreset beds. Red lines highlight the structural dip of those foreset beds. Note that foreset dip angle is vertically exaggerated.



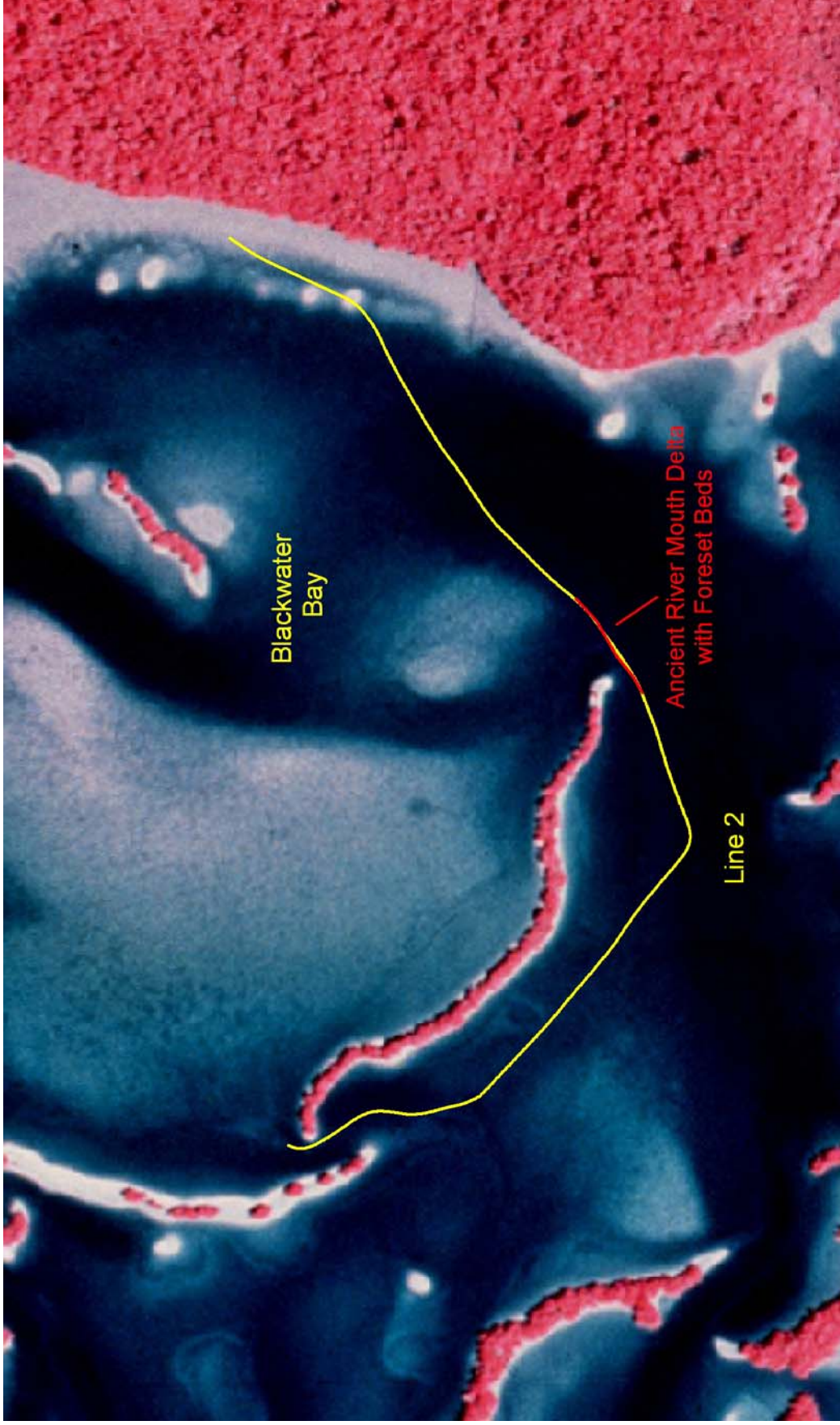
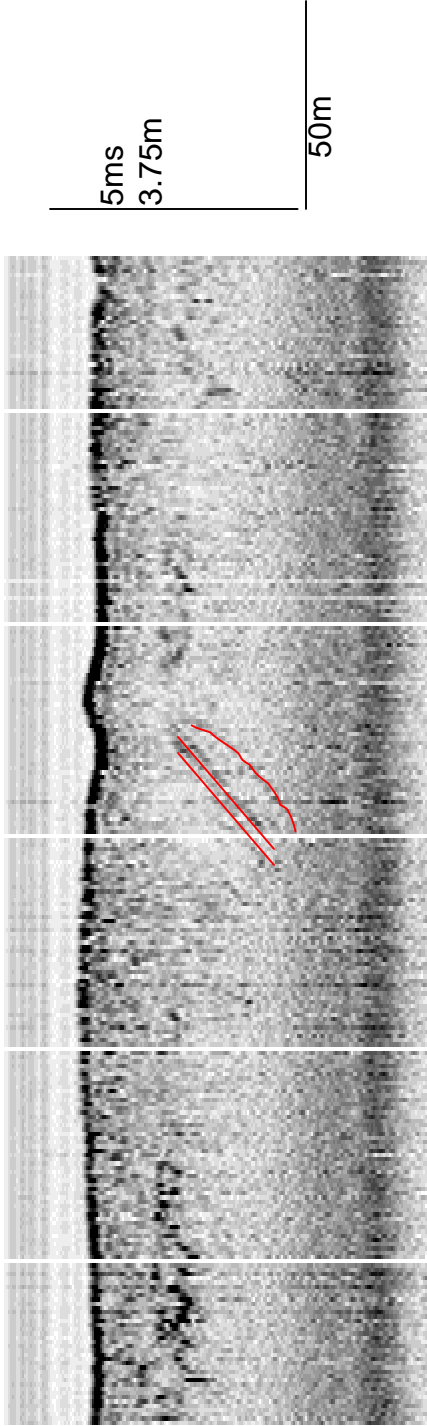


Figure 17. CHIRP line 2 running through Blackwater Bay. Line traverses an ancient river mouth's delta (highlighted in red). (Figure 18 shows the foreset beds of this ancient structure in the subsurface.) Note the position and termination of the old, now inactive, Blackwater channel just north of the red line segment.

Blackwater Line 2



Ancient River Mouth in Southeastern Blackwater Bay

Figure 18. CHIRP profile under the ancient river mouth of line 2. The red lines depict the old foreset beds. Angle is vertically exaggerated.

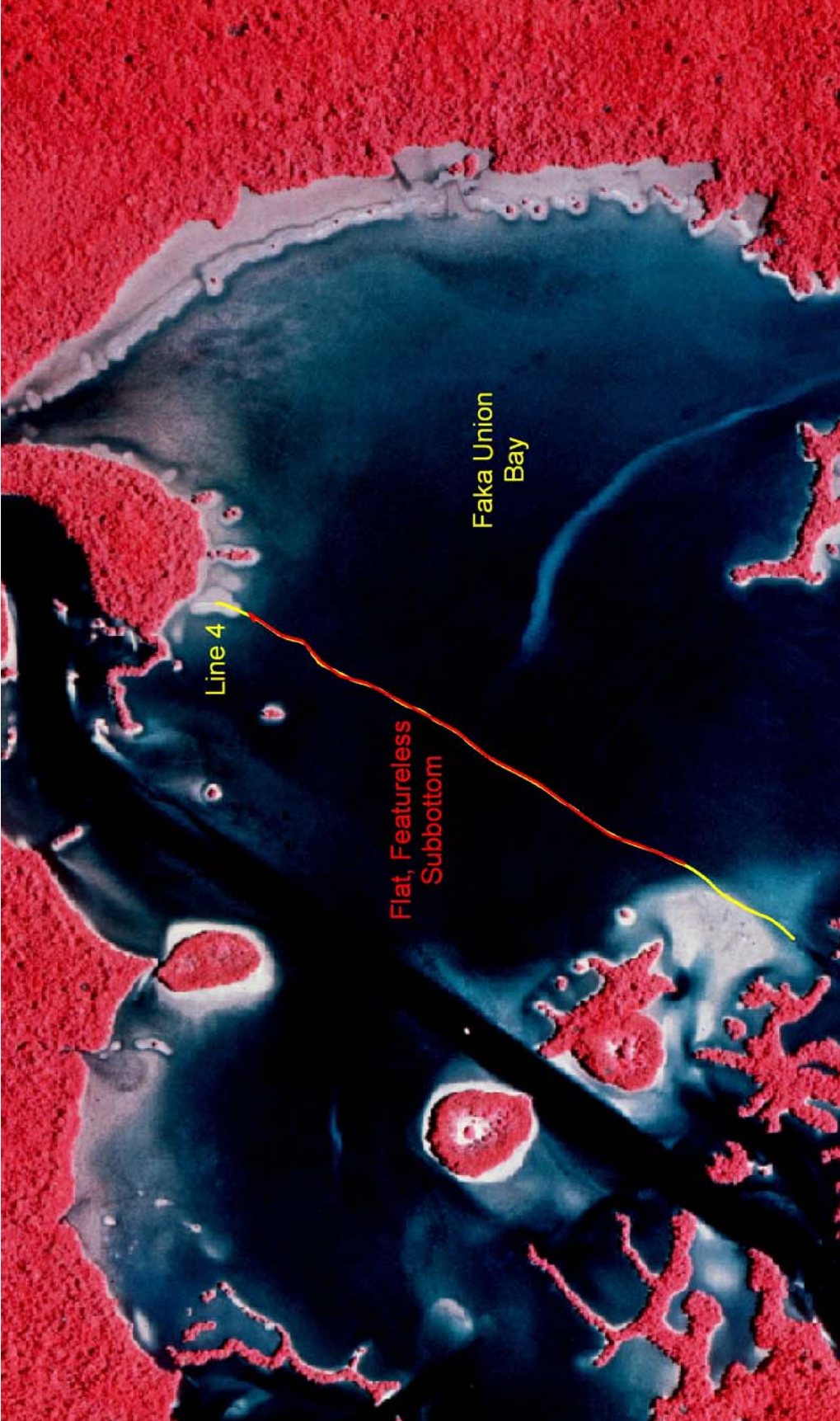
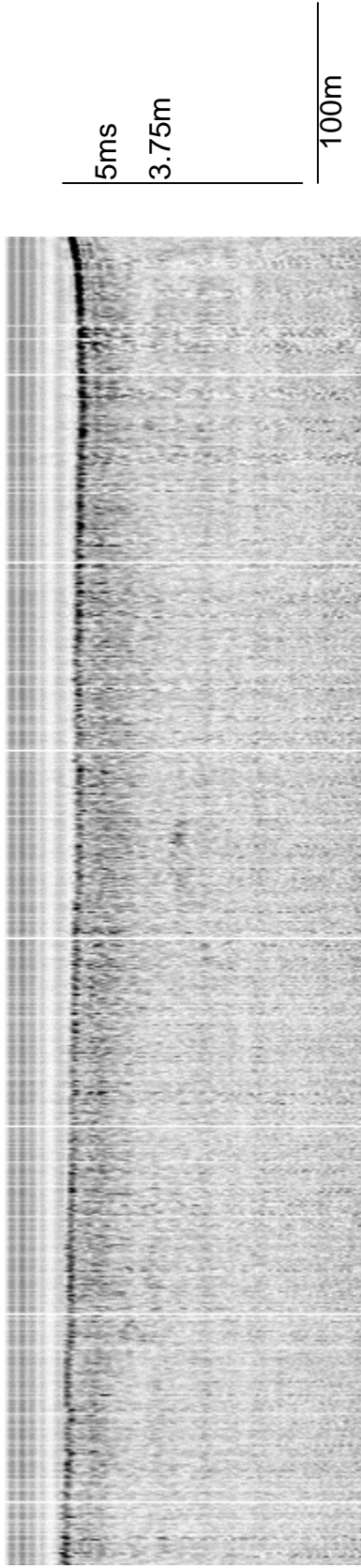


Figure 19. CHIRP line 4 running across Faka Union Bay. The flat substrate of the bay's interior mimics a featureless structure in the subsurface.

Faka Union Bay Line 4



Flat, featureless bottom in central Faka Union Bay

Figure 20. CHIRP profile view under line 4 in Faka Union Bay. Note that the subsurface lacks visible structures, indicating that no shallowly buried oyster reefs exist under this region of the bay's interior.

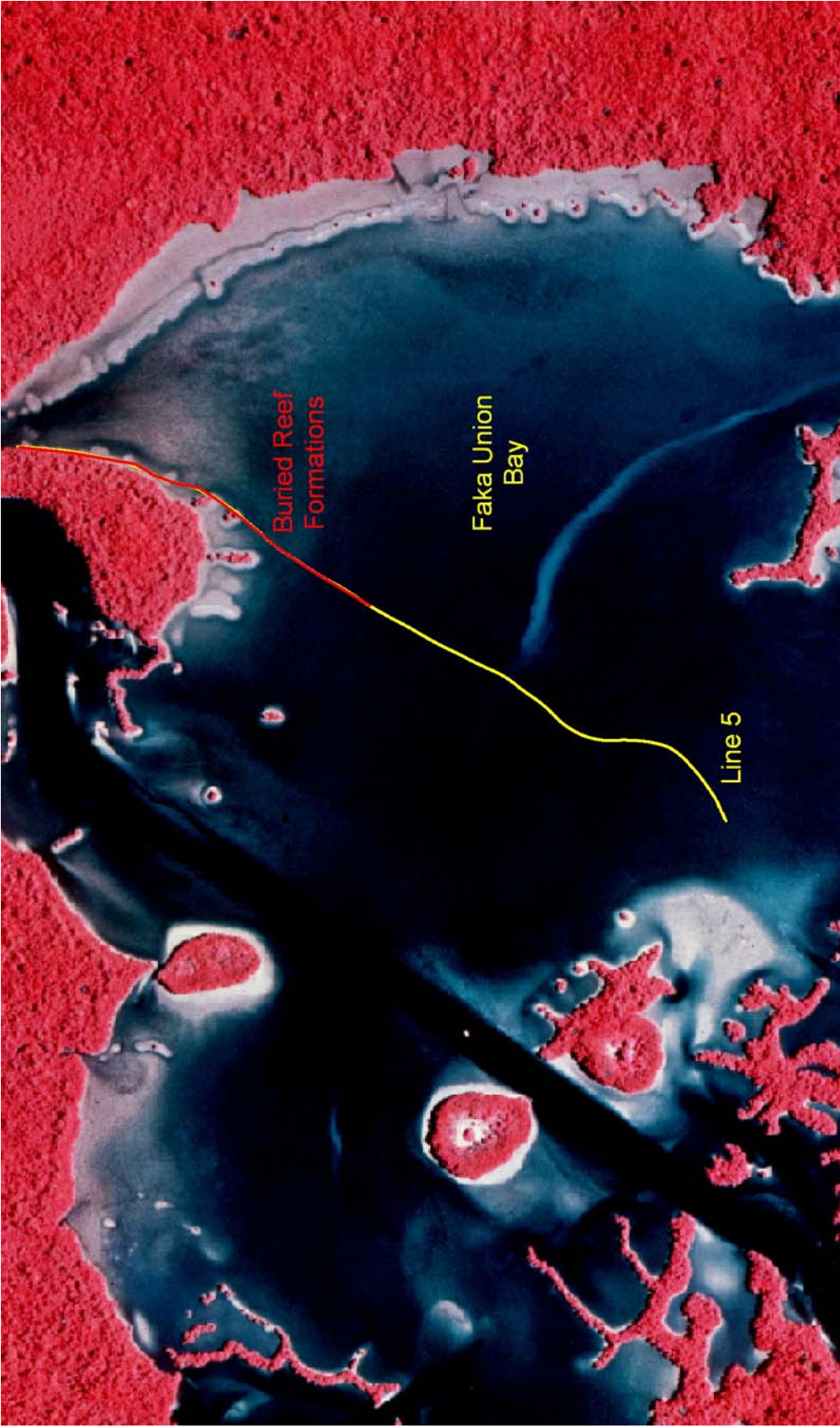
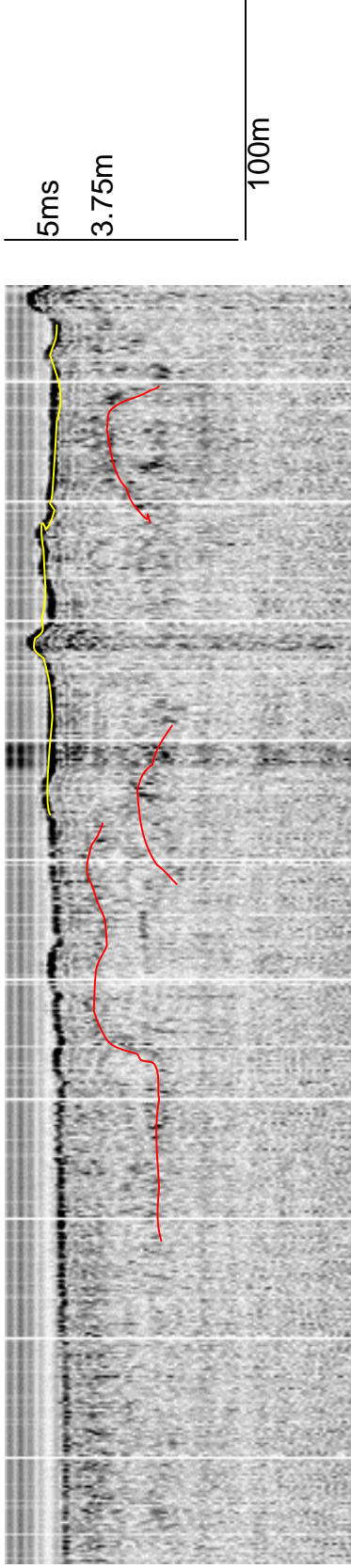


Figure 21. CHIRP line 5 running through Faka Union Bay's interior. As the fringing reefs are approached along the northern terminus of the line, buried oyster reefs are encountered.

Faka Union Bay Line 5



Present Oyster Reefs Overlying Buried Reef in Northern Faka Union Bay

Contrast in Sediment Surface Types is recognized by difference in the reflectance of sediment surface: On left the sediment is probably sandy/mud – muddy/sand, where the right is hard sands, shells, and oyster reefs. Below the hard surface reflectors (on the right) you can see buried reef.

— Present Day oyster reef

— Past Oyster reef

Figure 22. CHIRP profile under line 5 of Faka Union Bay. Yellow outlines present-day oyster reefs; red outlines reefs buried in the subsurface.

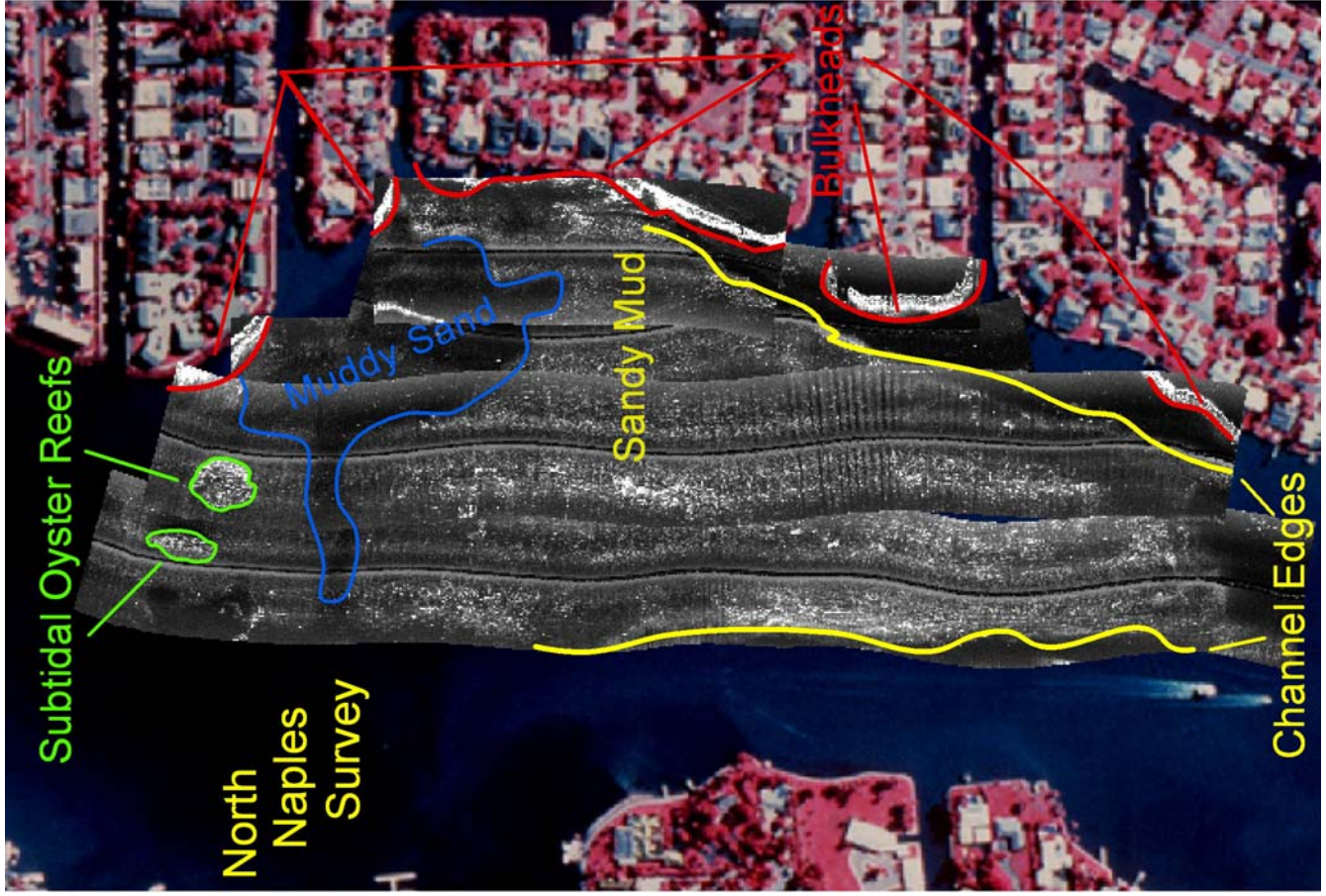


Figure 23. Close-up image of the side-scan sonar results from the northern survey area of Naples Bay. Numerous natural and anthropogenic substrate features are indicated.

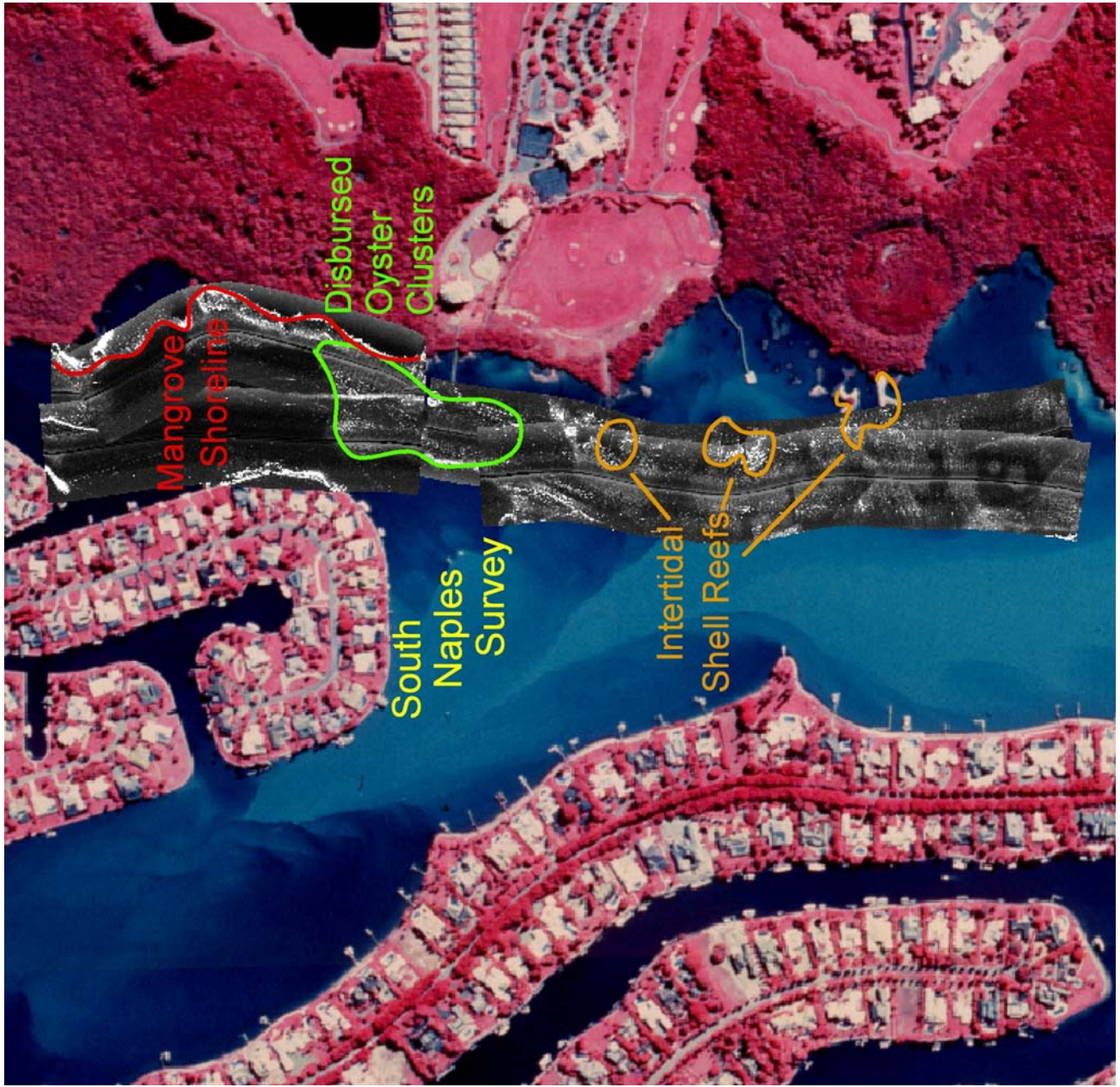
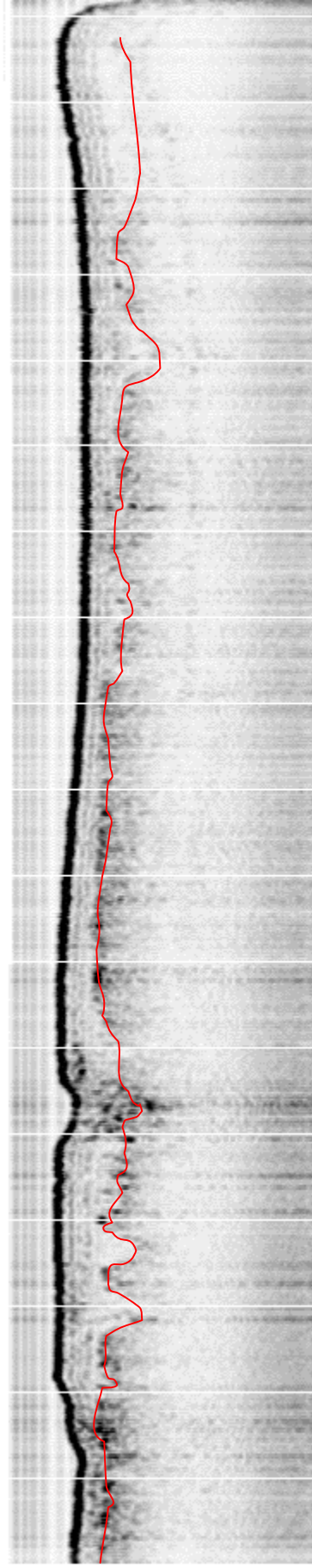


Figure 24. Side-scan sonar results for the southern area of Naples Bay. A number of substrate types is indicated.



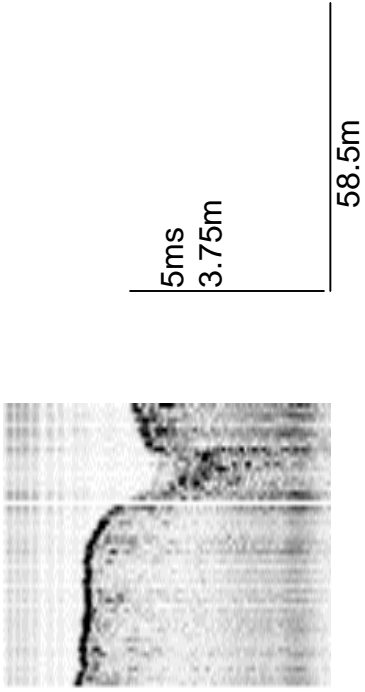
Naples Bay Line 3



Antecedent geology 1-3m below present sediment surface. Possibly old ravinement surface during a lower stand in sea level.

Figure 25. CHIRP profile under portion of line 3 in northern Naples Bay. Recent sediments, those within thicknesses of 1 m, are relatively flat-lying. The deeper subsurface displays an erosional ravinement surface that was probably created during a lower stand in sea level.

Sediment Fill within the channel running along the western margin of North Naples Bay



Naples Bay Line 5

Figure 26. CHIRP profile results for portion of line 5 in northern Naples Bay. Channel running along western edge of survey area showing deep cut and channel-infill sediments.