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# Preliminary assessment of benthic macrofauna community within intertidal mudflats, Lake Rudee, Virginia Beach, Virginia

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# PRELIMINARY ASSESSMENT OF BENTHIC MACROFAUNA COMMUNITY WITHIN INTERTIDAL MUDFLATS

8/8/2019

Lake Rudee, Virginia Beach, Virginia

A report to:
Waterway Surveys and Engineering Ltd.
and Emery Chickey

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Virginia Institute of Marine Science

# Preliminary assessment of benthic macrofauna community within intertidal mudflats

LAKE RUDEE, VIRGINIA BEACH, VIRGINIA

## Award Information

**Principal Investigator:** M. Lisa Kellogg

**Award Period:** July 15, 2019 – December 31, 2019

**Grantee Org.:** Virginia Institute of Marine Science

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## Goal of Preliminary Assessment

The goal of this assessment was to evaluate the proposed dredging site at Lake Rudee to determine whether the natural resources within the proposed dredge area were of sufficient value that the permitting agency might require further data to be collected to aid in determining whether to grant a dredging permit or how much mitigation to require.

## Summary of Preliminary Assessment

Assessment of the proposed dredging site on August 1, 2019 found an intertidal community at the site typical of that associated with fringing marsh habitats in the region. Given these findings, the permitting agency may choose to require additional sampling to characterize the benthic resources prior to setting the required mitigation.

# General Description

The intertidal area at this site is fairly typical of intertidal environments normally found adjacent to salt marshes in the area despite the degree to which the shorelines at the site have be hardened. With the exception of the area adjacent to the storm drain and the areas covered by riprap, sediments are composed primarily of mud with a significant amount of terrestrial matter (e.g. leaves, sticks), shell and sand in the areas that could be assessed directly by walking within the site. For the purposes of this report, four different areas have been delineated within the proposed dredge area (Fig 1).

## Section A

Section A (Fig. 2) is the farthest from the mouth of the canal and is the location of a storm drain that drains into the canal. There is a small amount of riprap adjacent to the outlet of the storm drain. The other edges of the canal in this area do not have riprap. This section of the canal characterized by firmer, sandier sediments than other sections of the canal presumably as a result of the storm drain. There are two floating docks within this section of the site. This section is entirely intertidal but contains a manmade pool at low tide created by prop wash from the boat docked in the canal. Observations in this section were made by walking in the canal.

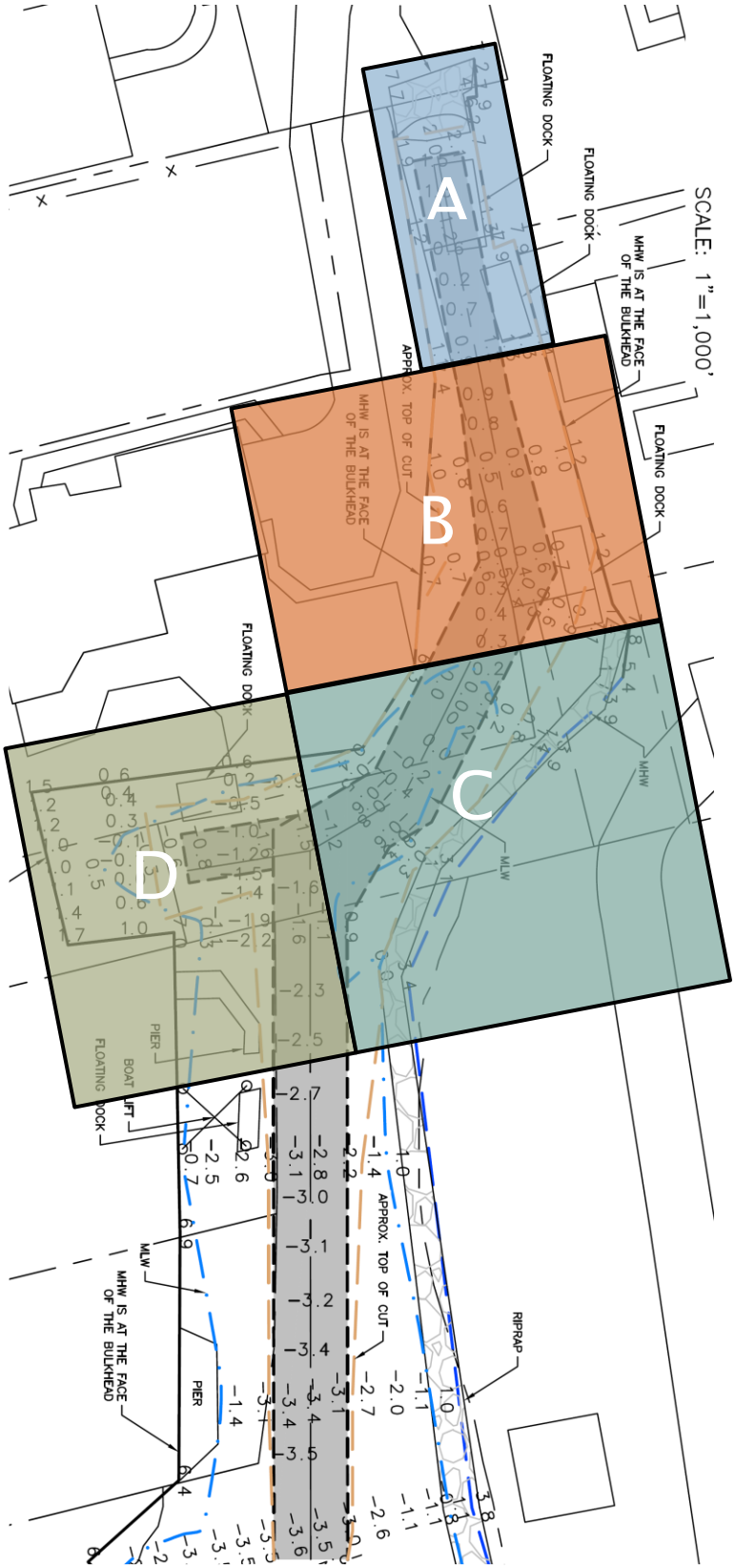


**Figure 1.** Map of canal showing section designations used in this report.


**Figure 2.** Photos of Section A including: a) a photo of Section A looking towards Section B, b) the storm drain that feeds into this section, c) the riprap adjacent to the storm drain outflow, and d) the pool created by prop wash from the boat docked in Section A.

## Section B

Section B (Fig. 3) lies downstream of Section A, is characterized by muddier sediments and has one floating dock. Edges of the canal here were seawall with some riprap on the northern side of the canal. Sediment water content increases from the center of the canal towards the edges. Most of this section is intertidal. Using the middle of the canal, it was possible to walk as far as the midpoint of the floating dock, but no farther. Thus, observations for this section are based on both walking in the canal and from the adjacent shore.

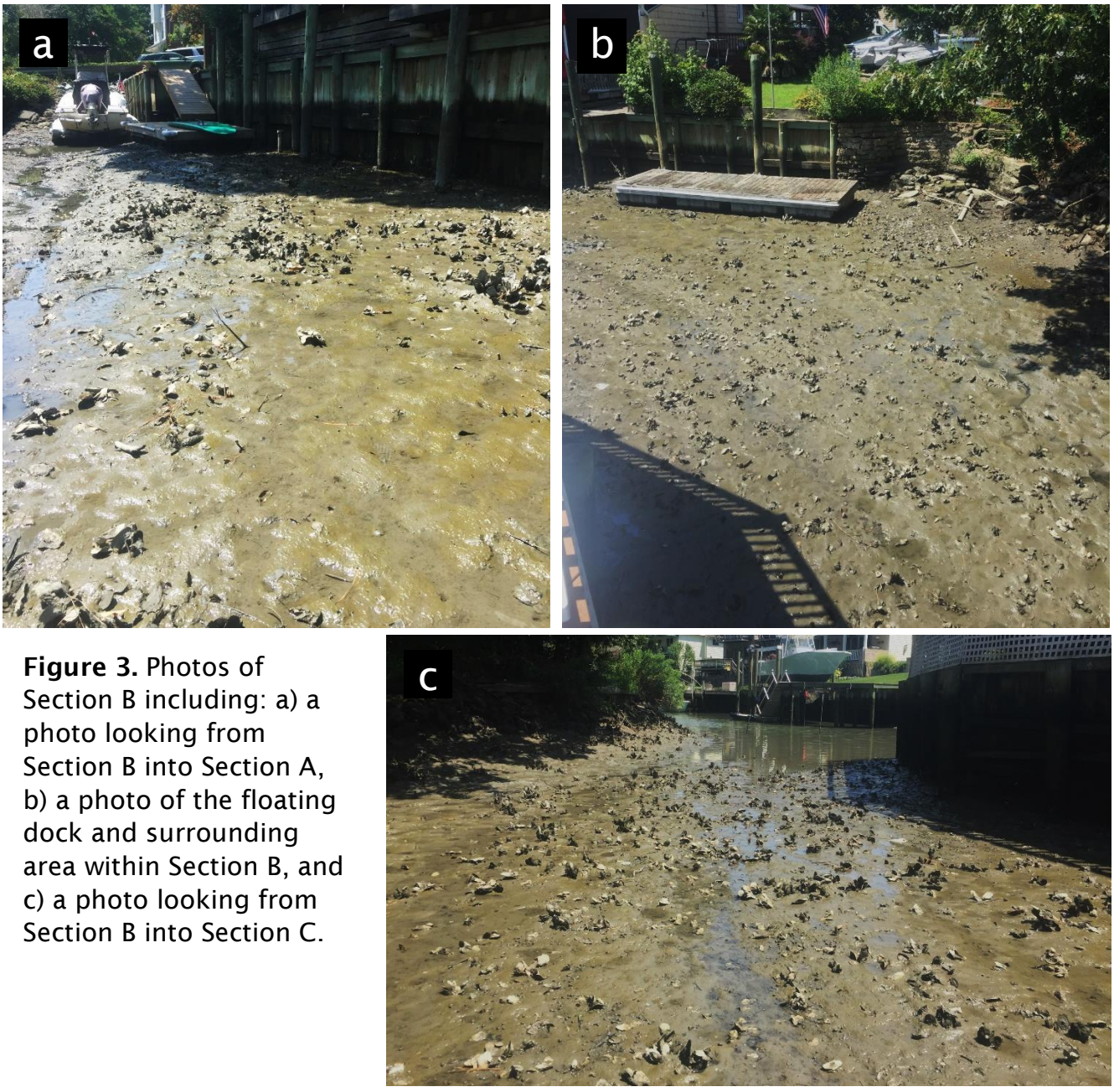


**Figure 3.** Photos of Section B including: a) a photo looking from Section B into Section A, b) a photo of the floating dock and surrounding area within Section B, and c) a photo looking from Section B into Section C.

## Section C

Section C (Fig 4) lies downstream of Section B. The north side of this section is composed of riprap in front of a seawall. On the north side the intertidal zone is dominated by riprap but some areas have a strip of intertidal mudflat in front of the riprap. On the south side some sections of the seawall have a narrow intertidal mudflat area but others have no intertidal area. This section has a relatively small proportion of intertidal area. All observations in this section were made from shore.


**Figure 4.** Photos of Section C showing: a) the seawall fronted by riprap that makes up most of the northern side and b) the seawall without riprap on the southern side.

## Section D

Section D (Fig. 5) lies to the south of Section C. It has one floating dock and is dominated by an intertidal mudflat. All observations in this section were made from shore.




**Figure 5.** Photos of Section D showing: a) the majority of the intertidal mudflat area, b) the area adjacent to the southernmost section of the seawall that has the highest density of oysters, and c) a view from Section D into Section C showing the floating dock.

## Intertidal Epifauna

Significant numbers of the eastern oyster *Crassostrea virginica* were observed in all four sections (Fig. 6). Oyster clumps on the sediment surface were most common in Section B. Oyster clumps attached to riprap were most common in Section C. Most oysters were live and showed signs of recent growth.

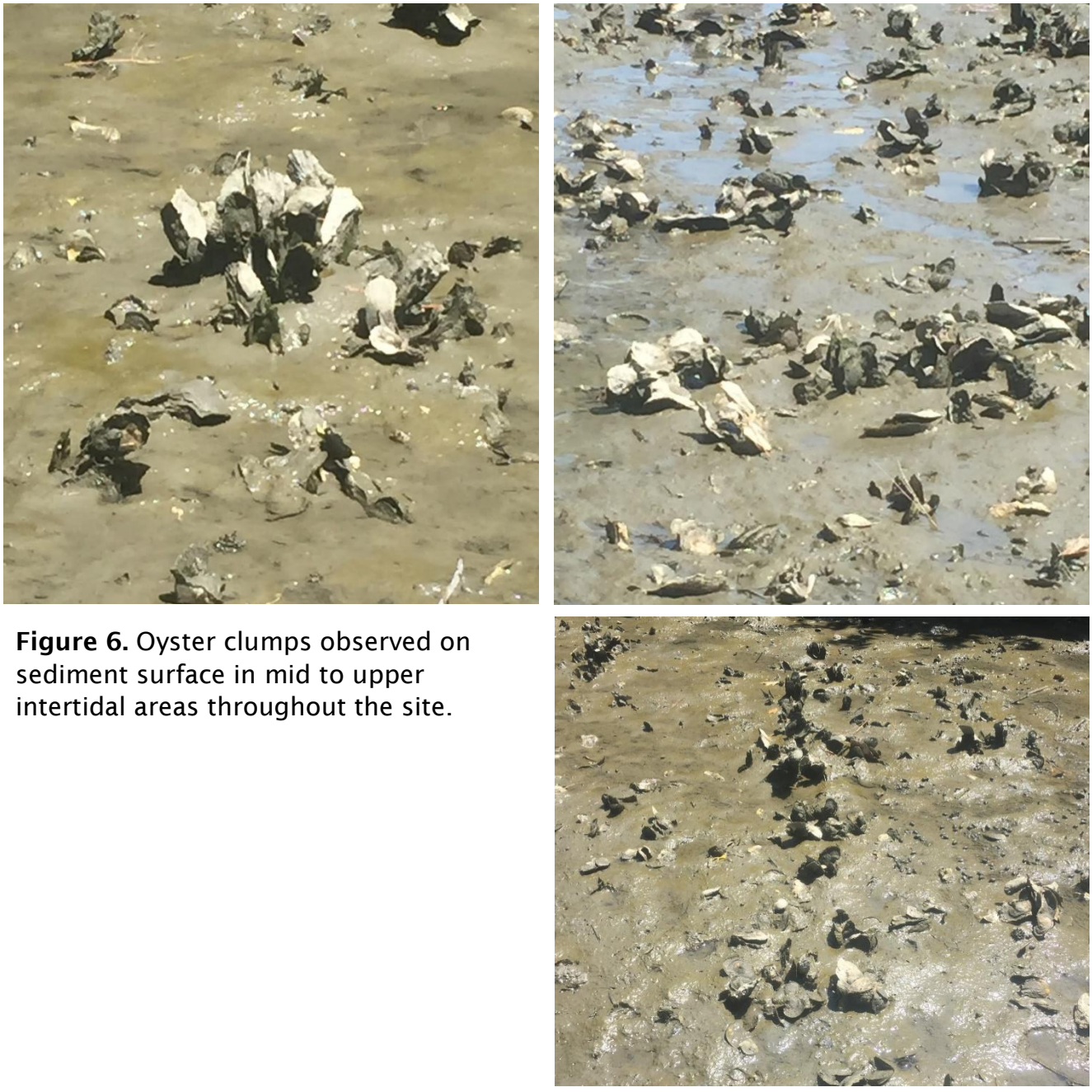

**Figure 6.** Oyster clumps observed on sediment surface in mid to upper intertidal areas throughout the site.

Mudsnails were abundant and observed in all sections (Fig. 7). Mudsnails were common both on the sediment surface and at the edges of small and larger pools within the intertidal zone.


**Figure 7.** Photos of: a,b) mudsnails found on the sediment surface, c) mudsnails at the edge of a pool of water, and d) a cleaned mudsnail.

Other epifaunal organisms observed included fiddler crabs in Section A, although they were not abundant.

## Intertidal Infauna

Indications of the presence of infaunal organisms were abundant in the areas where they could be assessed by walking on the sediment surface (Section A and a portion of Section B; Fig. 8). The most common evidence was the presence of small holes in the sediment surface. Sieving of a few exploratory core samples found polychaete worms to be the most abundant macrofauna living beneath the sediment surface that were easily visible to the naked eye. Several pairs of articulated clam shells were also found suggesting that this area may provide habitat for clams as well.

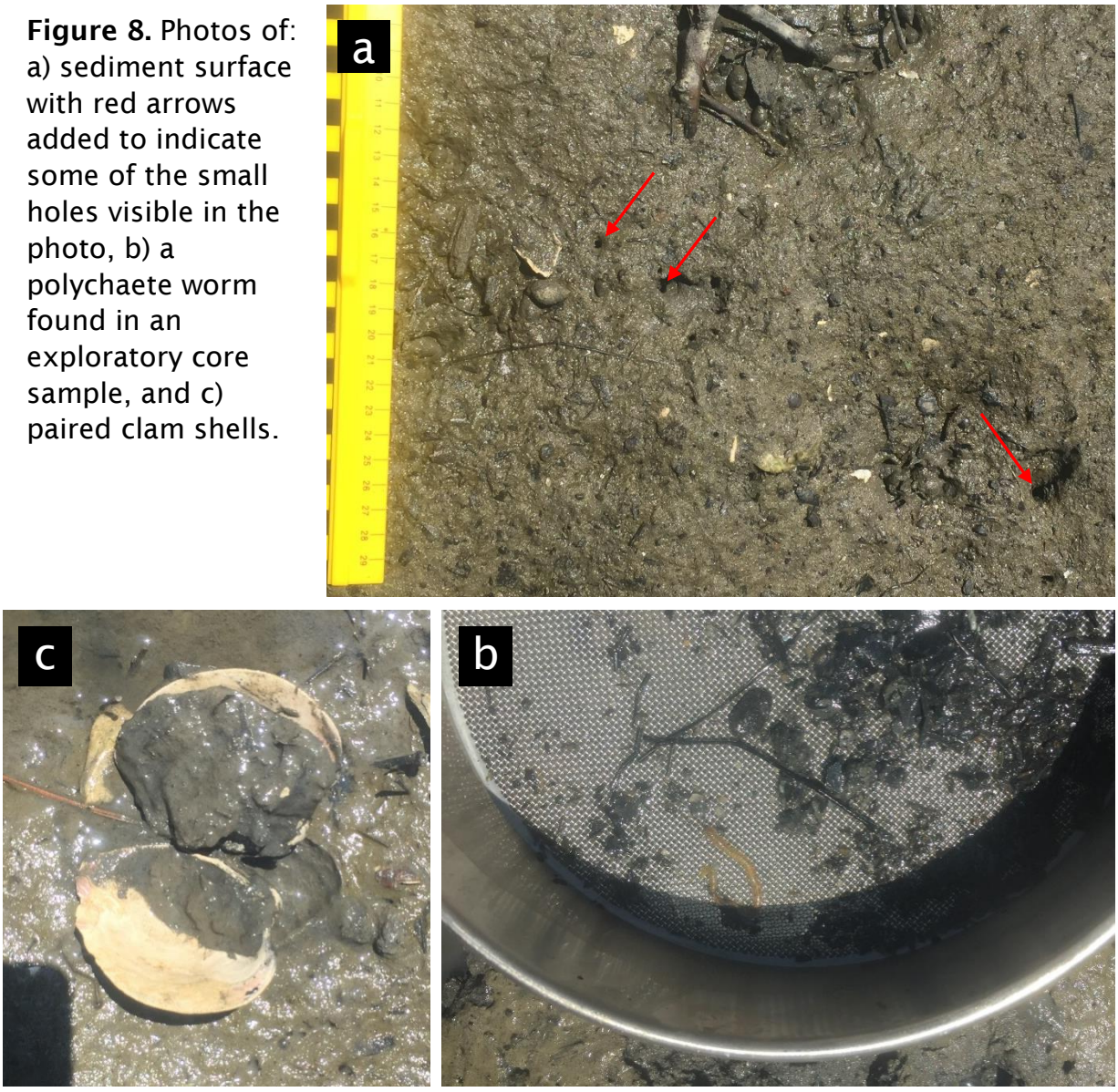


**Figure 8.** Photos of: a) sediment surface with red arrows added to indicate some of the small holes visible in the photo, b) a polychaete worm found in an exploratory core sample, and c) paired clam shells.

## Evidence for Use by Other Species

Observations suggest that the proposed dredge area is commonly used by highly mobile invertebrates and vertebrates including blue crabs and several species of fish. The small pool created by the boat prop wash in Section A (Fig. 2d), contained a number of organisms including at least: one blue crab, >50 small (~3-5cm in total length) schooling fish of unknown species, ~10 slightly larger schooling fish of unknown species, and two non-schooling juvenile fish (<3cm) that were black in color and were very different in shape from other species observed. Observations were also made from the seawall at the northwestern corner of Section D as the tide began to come in. During this time, animals observed feeding at the edges of the mudflat as the tide rose included at least three blue crabs and nine schools (~20 fish in each) of small fish. Depressions in the soft sediments, especially in Section D, suggest that organisms such as larger benthic-feeding fish and/or rays may feed in the area when it is covered by water.


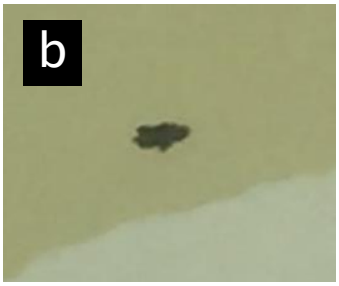


**Figure 8.** Photos of: a) area were multiple crabs and schools of small fish were observed feeding as the tide rose and b) one of two juvenile fish observed in pool in Section A. Note depressions in sediment surface (a) are likely due to feeding of larger fish and/or rays.