

City of Jacksonville

Shoaling investigation

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Phase 1. Pre-study.

Initial sampling, matching and tracer manufacture of shoaling sediment compositions, tracer placement, and monitoring.

1. Sampling of sediment composition of shoals and areas of suspected source material.
2. Manufacture tracer grains that match probable source compositions.
3. Emplace grains in place of suspected source.
4. Monitor shoals for accumulation of tracer grains from chronic and acute events.

Summary of Phase 1. Pre-study.

This portion of the study will focus on tracking sediment grains made to match the sediment of suspected shoal source material. Sediment grains that are UV reactive and magnetic will be produced by Paratec Geomarine to match samples from the shoaling area. We will emplace these samples in the probable source area and begin to synoptically sampling. Sampling will take place over a 12-month period to ensure coverage of the wet and dry seasons and the effects of possible tropical systems. Samples will be collected by Dr. Stalker, Dr. Pinto, undergraduate and graduate students from JU. Samples will be collected, prepared, and analyzed by microscope at the Jacksonville University Marine Science Research Institute.

Phase 1a:

We will collect samples along the flow path of the spoil sight from the area of emplacement to the discharge point (Figure 1). This will help determine the sediment makeup of the spoil pile. This will consist of several push core samples of the surface sediments. Samples will then be dewatered in a drying oven, and run through a standard set of sieves and examined under a microscope to determine the grain size distribution and mineralogy of the spoil sediments.



Figure 1. Estimated spoil sample sites. Orange circles represent approximate push core sample sites, orange arrows indicate probable flow path of dredge materials.

Phase 1b:

Samples of the shoal and surrounding areas will be collected to determine the sediment makeup of the benthic sediments. Samples will be taken by push core near the outfall area of the pile, in the probably flow path of the river to the shoal, and on the shoal itself (Figure 2). The shoal is presumably lenticular in shape and samples will be distributed in the head region, the tail region and the distal sides of the shoal. All samples will be dewatered in a drying oven and run through a set of standard sieves and examined under a microscope to determine the sediment distribution and mineralogy of the shoal sediments. This sampling will in part be driven by examination of the high precision benthic survey acquired during the emplacement of warning signage.



Figure 2. Probable push core locations in river sediments and submarine/subaerial trap locations. The solid red line indicates the approximate outline of the shoal, red circles indicate push core samples, blue triangles subaquatic magnetic traps, and green triangles subaerial filter traps.

Phase 1c:

A representative set of samples of the spoil material will be dried and sent to Paratec for matching the tracer sediments. Paratec will produce a tracer sediment that matches the spoil sediments to properly behave like the sediments in the spoil pile.

Phase 1d:

Submarine Tracer grain “traps” will be deployed along the predicted flow paths of the river in the area around the spoil pile. Multiple Sediment collection plates will be deployed at several areas on the shoal (Figure 2). Subaerial filter traps will be deployed adjacent to the river in between the spoil pile and the shoal to help determine any aeolian sediment transport that may be contributing to the shoal from the spoil. When the traps and plates are in place, the tracer grains will be deployed in the spoil pile at multiple points along the flow path of the system. The timing of this material ideally will coincide with active dredging to mimic the normal sediment movement in this phase of activity in the spoil. During dredging, weekly push cores will be collected in the sediments between the discharge point of the spoil through the shoaling area. The shoal will be sampled on all sides and in the center as well. Samples will be dewatered, and examined by UV light, and magnetics to determine the presence

of tracer material if any that is present in the sample. Submarine, and subaerial traps will be sampled bi weekly to look for the presence of the tracer grains. Settling plates will be inspected monthly to determine growth rates of the different areas of the shoals.

Deliverables:

1. Confirmation of Refute of suspected sources.

Phase 1 Cost: \$297,000

Phase 2. Detailed mapping and sampling.

Objectives:

1. High resolution bathymetric mapping of areas of COJ shoaling concerns.
2. High resolution water flow data.
3. Initial sampling of sediment composition of shoals and areas of suspected source material.

Summary of Phase 2.

This initial portion of the study involves intensive mapping of the areas of concern. This includes the areas around the mouth of Clapboard Creek (CK), and the Black River (BR) back-cut. This will also include other areas of concern to the City of Jacksonville (COJ) Waterways Committee. This portion will include the acquisition of a Teledyne 6025 multibeam echo sounder and side scan sonar and mapping software for Jacksonville University. This mapping is critical to understanding the true size and shape of the shoals, locations of channels, and probable sediment pathways. The second part of Phase 1 will be mapping the surface water flow dynamics of the confluence of CK and BR at multiple tidal phases. This will get us a better understanding of the direction of flow and probable pathways of sediment transport and depositional areas, as well as tidal phases and water levels associated with probable erosional and depositional events. This will be accomplished using the existing Seabird ADCP at JU and rental of a shallow water RiverRay directional water velocity meter. The third part of this phase is the targeted sampling of sediments in and around the shoals and areas of probable sediment sources. This will include both coring and grab samples, processing and analysis of sediment composition and size distribution. This will be data used to produce and distribute manufactured sediment in Phase 2.

Deliverables:

1. High resolution bathymetric maps of the areas of concern.
2. Velocity flow maps of the areas of concern at multiple tidal stages.
3. Sediment emplacement rates and modeled growth of the shoal.

Estimated cost: \$280,000

Phase 3. Full Area Grain Tracer Study.

Objectives:

1. Manufacture tracer grains that match probable source compositions.
2. Emplace grains in place of suspected source.
3. Monitor shoals for accumulation of tracer grains from chronic and acute events.
4. Calculate sediment accumulation rates.

Summary of Phase 3.

This portion of the study will focus on tracking sediment grains made to match the sediment of suspected shoal source material, calculating rates of accumulation on the shoals and the main drivers of sediment production and emplacement. Sediment grains that are UV reactive and magnetic will be produced by Paratec Geomarine to match samples from Phase 1. We will emplace these samples in the probable source area and begin to synoptically sampling. Sampling will take place over a 12-month period to ensure coverage of the wet and dry seasons and the effects of possible tropical systems. This is to ensure analysis that looks at the long-term chronic sediment dynamics and the short, punctuated events around tropical systems. Samples will be collected by Dr. Stalker, Dr. Pinto, undergraduate and graduate students from JU. Samples will be collected and analyzed by microscope at JU for the presence, volume, and rate of accumulation of manufactured grains in the shoaling areas. This data, combined with the mapping and water flow data from Phase 1 will be combined into a predictive sediment flow model.

Deliverables:

2. Analysis of the rate accumulation of shoaling materials.
3. Growth dynamics of the shoals of interest.
4. Predictive model of sediment dynamics in the CK and BR confluence area.

Phase 3 Cost: \$430,000

This complete study will overall take 12-24 months to accomplish depending on the numbers of phases funded and the timing of dredge operations. Results and analysis will be ongoing as data is collected and analyzed with deliverable to be due during and at the end of that time frame. This study will benefit the city in indirect ways. The acquisition of analytical equipment will ensure that this kind of analysis will be available and low cost or pro bono in future studies. The work will employ and train multiple JU undergraduate and graduate students to conduct these kinds of studies in their professional careers. Equipment will be used in courses and as part of the department curriculum as well. If the suspected primary source of sediment is inconclusive the equipment will all be in place to investigate other possible source sites or investigate other areas of shoaling problems.

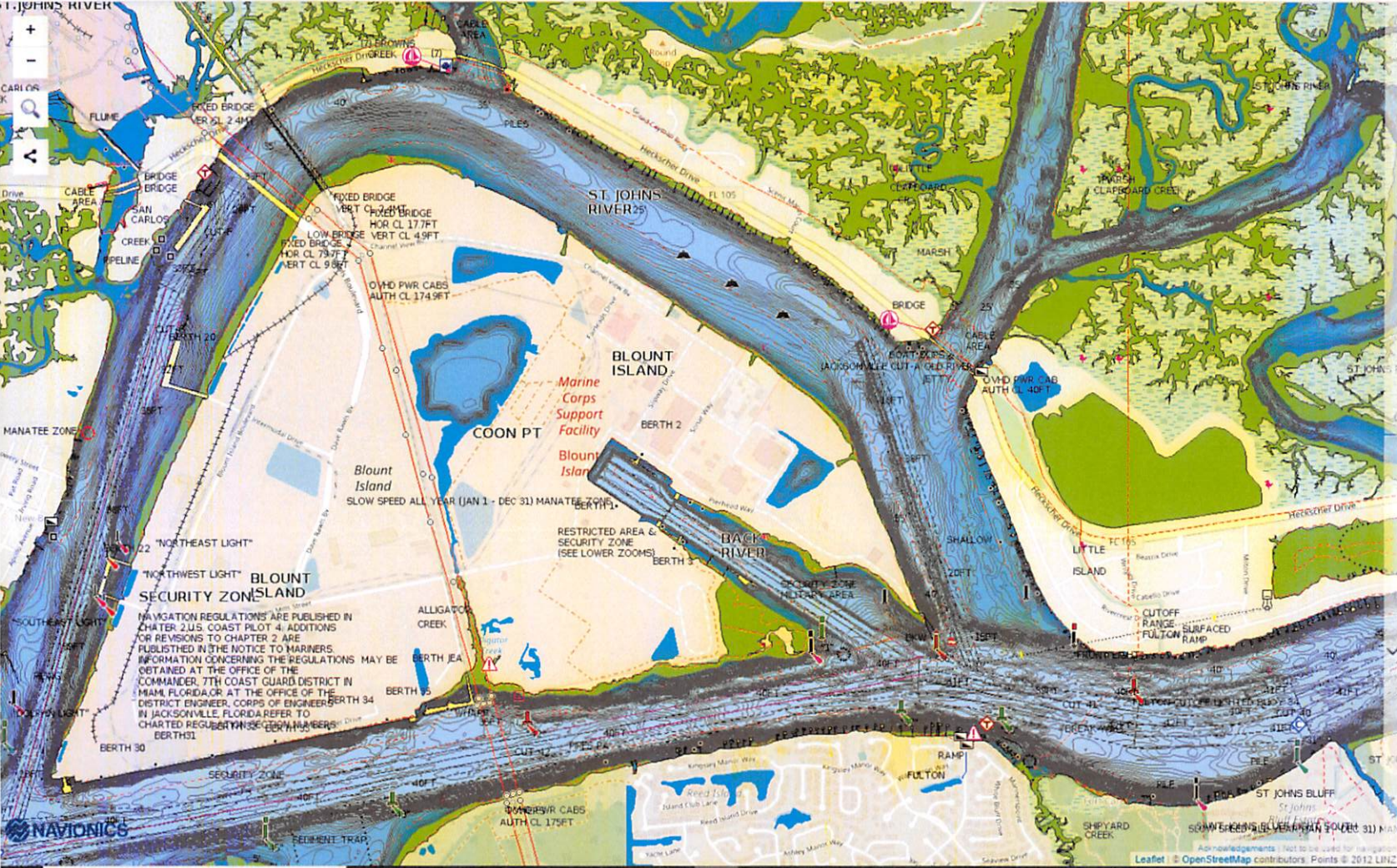
Clapboard Creek



Clapboard Creek

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Real Estate #: 160079 0000

Owner: ROBERTS MARK

Address: 6518 RAMOTH DR

Zip Code: 32226

Transaction Price: \$100

Transaction Year: 2018

Acre: 1.24

Book-Page: 1869200959

Map Panel: 8321

Legal Descriptions: 23-52 21-15-28E HECKSCHER DRIVE ESTATES UNIT 2 LOT 15 BLK 1

Flood Zone: 0.2 PCT ANNUAL CHANCE FLOOD HAZARD, VE, AE

AshSite:

EDA Level: NOT DISTRESSED

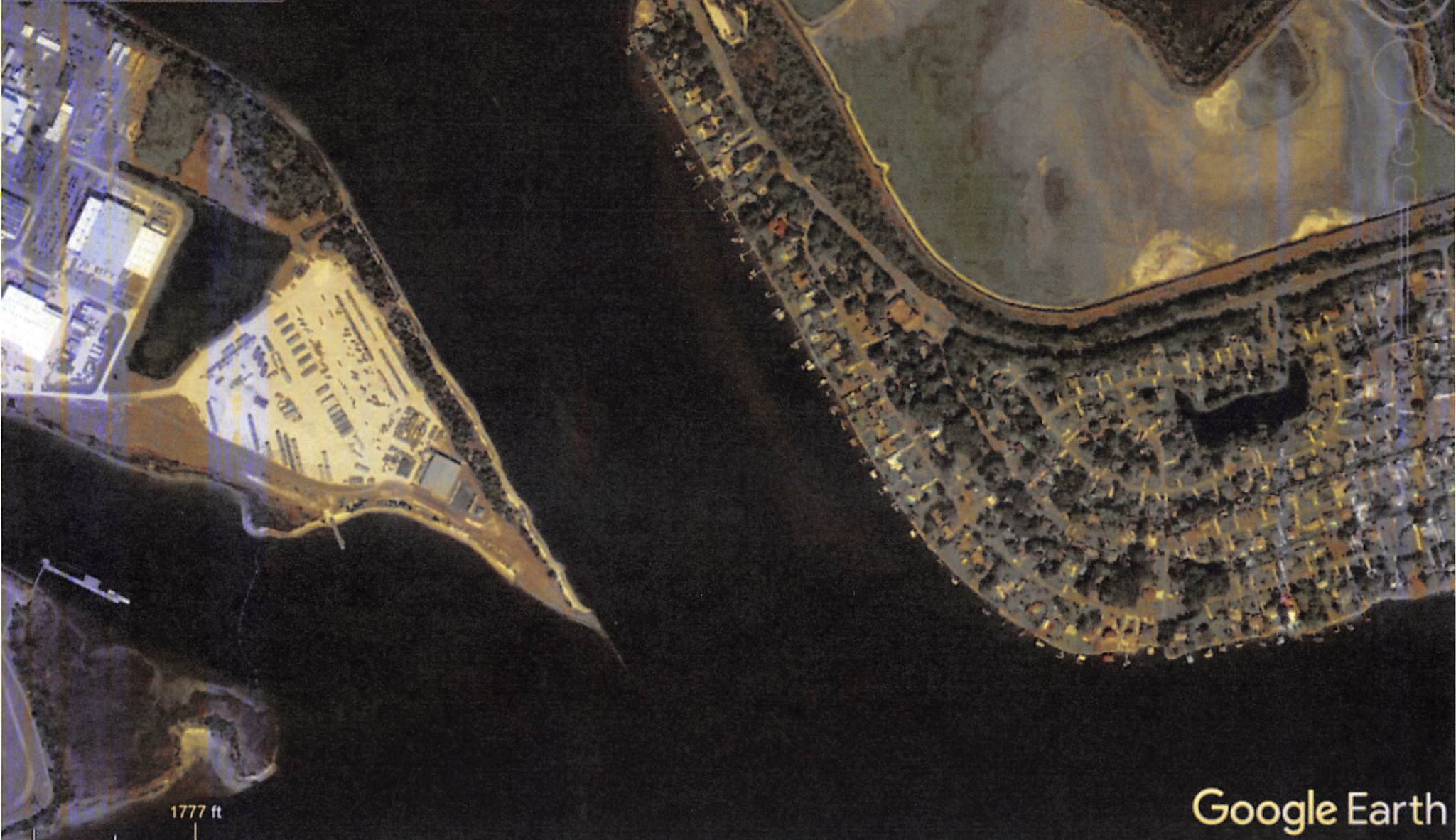
Evacuation Zone: ZONE A

Planning District: 6

Noise Zone: NA



1/2013
2019



1777 ft

Google Earth

Imagery Date: 1/22/2013 lat 30.400757° lon -81.499855° elev 0 ft eye alt 7689 ft

Red:
8 February 2021
Time: 1300
Low tide: 1245 (-0.2 ft)
Lower Low Tide: 12 February (-0.8 ft)

US Army Corps of Engineers
District: CE542

Hydrographic Survey

Survey Number: 2014-009
Survey Type: Examination
Survey Date: 08 August 2014

SHEET REFERENCE NUMBER
15 of 33

08_01_14R_2014009_CE_2014_009_3
Data Source: 25/009
Project Number: 13A-1-100102
This survey notebook supersedes all previous versions.

1:54:55 / 2:44:36

Talking Stream Source

Color
Options
CC
View All

Jacksonville Waterways Commission Meeting

