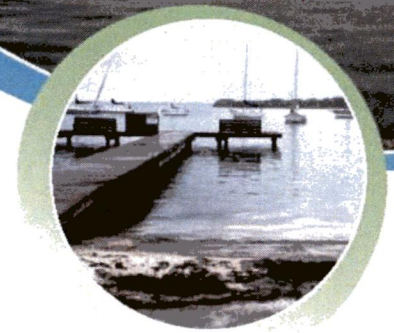




TAYLOR ENGINEERING, INC.

Town of Longboat Key Project Update

Canal Dredging Feasibility Study



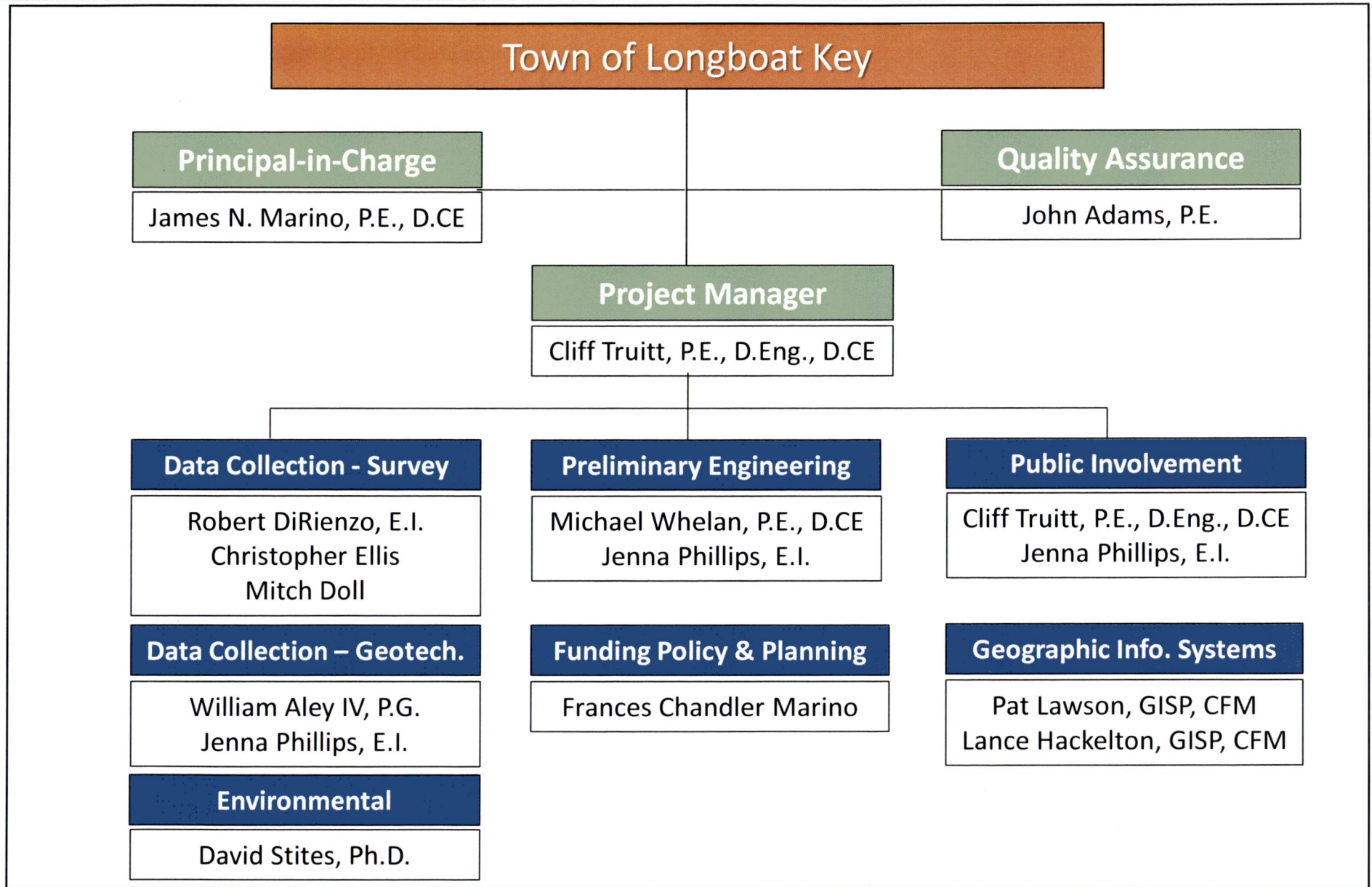
June 20, 2016

Company Overview

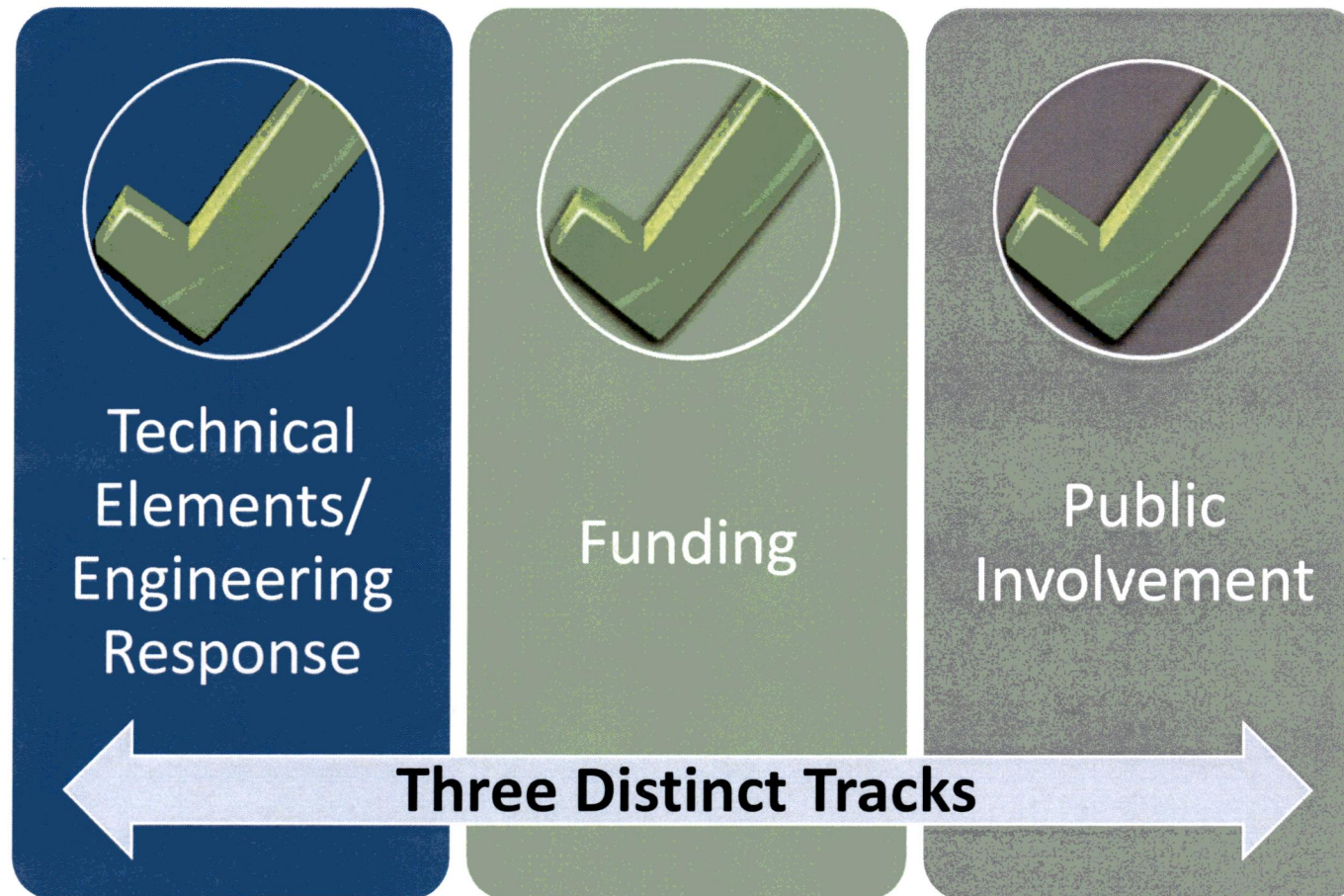
- Florida-based company
 - Specializes in marine, coastal, dredging, and water resources engineering and planning
 - Provides service on any project that touches the water's edge
 - In business since 1983
- Local Presence
 - Project manager and primary marine engineer are based in Sarasota
- Experience
 - Over 115 dredging projects that range from \$5k to \$1.2 million in contract value
 - Hundreds of waterfront projects that include “simple” boat ramps, piers, docks, and moorings to “complex” marina, terminal, and redevelopment projects



Project Team



Project Approach

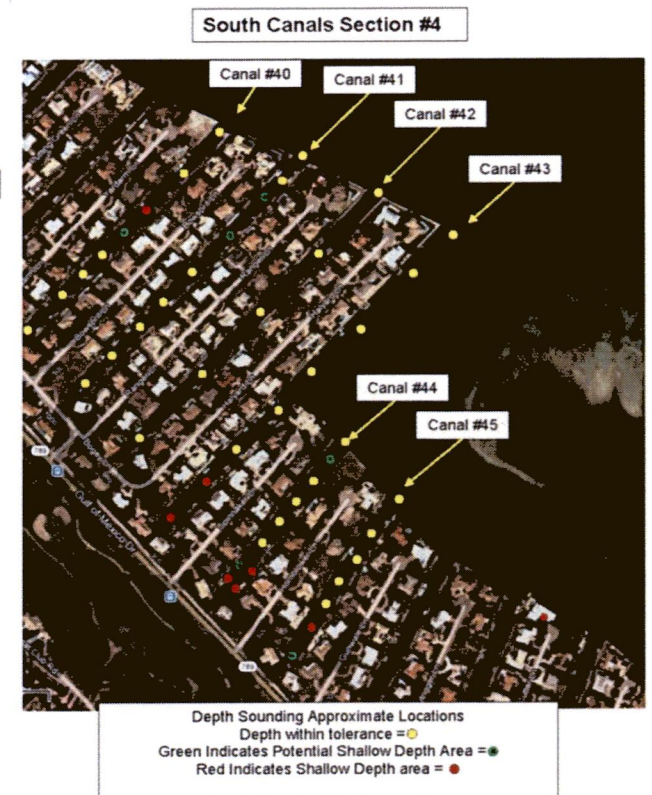
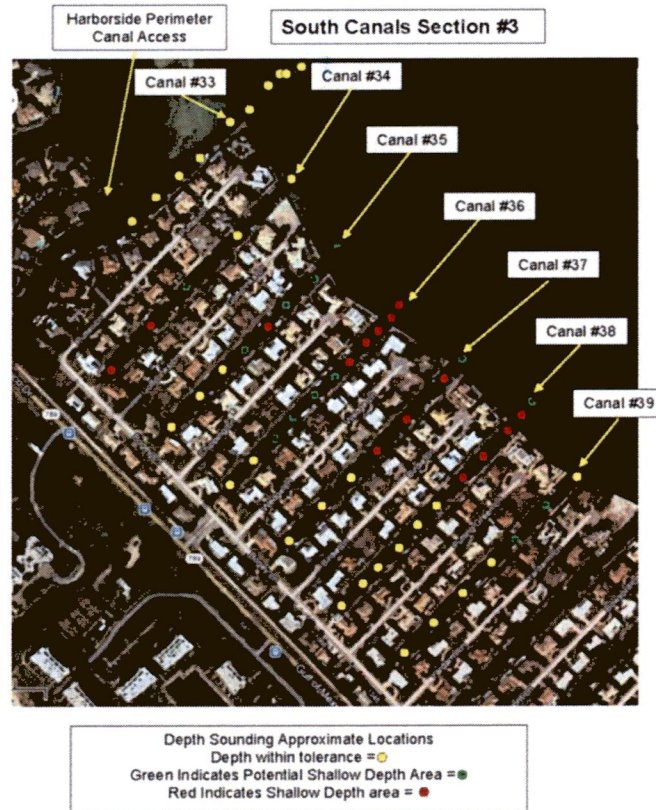
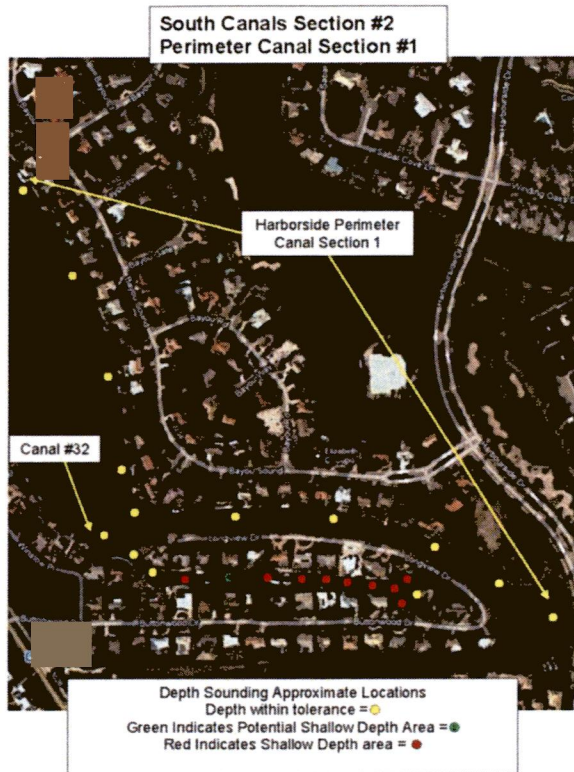


Project Approach – Technical Elements

- Tasks 1 and 2: Start with common database for long-term consistency
 - Acquire/update Town's GIS
 - Integrate property appraiser's data
 - Framework for adding field data
- Task 3: Field Data Collection
 - Question of balancing cost vs. need
 - Bathymetry
 - Sediment
 - Resources
 - On-going monitoring program

Task 1: Data Collection and Review

2013 Soundings



Task 1: Data Collection and Review

53 navigable canals have been inventoried by the Town.

Longboat Key Canal Dredging Report
Canal Depth Table

Canal Surveys	Street to North	Street to South	Corrected Depth	Permitted/Permit Exemption Depth
Canal 2 (Inc. Access)				
2 Marker 2 red			6.3	5.4
marker 3			5.6	5.4
marker 4-5			6.1	5.4
marker 7 green (missing day-lite)			5.8	5.4
marker 9	Bayou Hammock Road		6.4	5.4
no marker 6881 LB Dr S			4	5.4
no marker 6851 LB Dr S			4.7	5.4
Center run 6841 LB Dr S to Jackson Way		Whitney Beach Association	3.9	5.4
			3.9	5.4
			4.1	5.4
Canal 3	Shinbone Alley	Juan Anasco Drive	3	3.4
			3.5	3.4
			4	
Canal 4	Juan Anasco Drive	DeNarvez Drive	5.2	5.4
			5.9	5.4
			5.6	5.4
			4.8	5.4
			4	5.4
Canal 5	DeNarvez Drive	Bayview Drive	4.9	5.4
Canal 6	Bayview Drive	Lyons Lane	5.4	4.4

Task 2: Develop GIS Database

Parcel Information:

Identify

Identify from: <Top-most layer>

Location: 530,546.521 381,464.087 Meter

Field Value

CanalFront 1

Shape Polygon

HasDock Substantial Dock

PARCELID 7835100004

NOBUILDNG 1

TWN 35S

RNG 16E

SEC 23

STATEPARID C51-000-538-4799-2

ACRES .78

OBJECTID_1 1665

OBJECTID 2589

SELECTPIN 7835100004

OWNER MASTENBROEK,HENDRIKUS

SECONDARY_ MASTENBROEK,DEBORAH ANN

PRIMARY_AD 6516 BAYOU HAMMOCK RD

PROP_HIN 6516

PROP_SN BAYOU HAMMOCK

PROP_DIR

PROP_CITYN LONGBOAT KEY

PROP_ZIP 34228

COMMISSION John Chappie

SUBDNUM 0000000

SUBDIVISIO NOT IN SUBDIVISION 0/0

SUBDIVIS_1 N/A N/A

LUC 0100

LUC_DESCRI Single Family Residential (1554

ZONING LBK_R-1SF

FUTURE_LAN CITY

SECTION_IN S22,23 T35 R16

HIST_NAME NONE

OVERLAYS NONE

WATERSHED NONE

HISTORIC URBAN-A

FIRE_DISTR Longboat Key

EVACUATION A,NONE

IMPACT_FEE A - SW

SPECIAL_AR CRA,NONE

SCHOOL_SVC SSA-4

Table

Parcels

CanalFront	Shape *	HasDock	PARCELID	NOBUILDNG	TWN	RNG	SEC	STATEPARID	ACRES	OBJECTID_1 *	OBJECTID	SELECTPIN	OWNER	
1	Polygon	Substantial Dock	7835100004	1	35S	16E	23	C51-000-538-4799-2	.78	1665	2589	7835100004	MASTENBROEK,HENDRIKUS	MAS

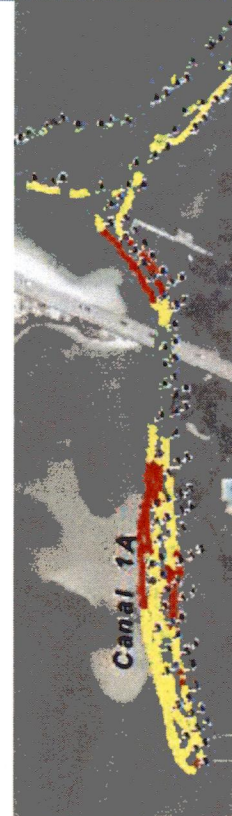
Task 3: Field Investigation

New Waypoint at Vessel

Name
1A

N 27°26.403' | W 82°41.221'

Save Cancel



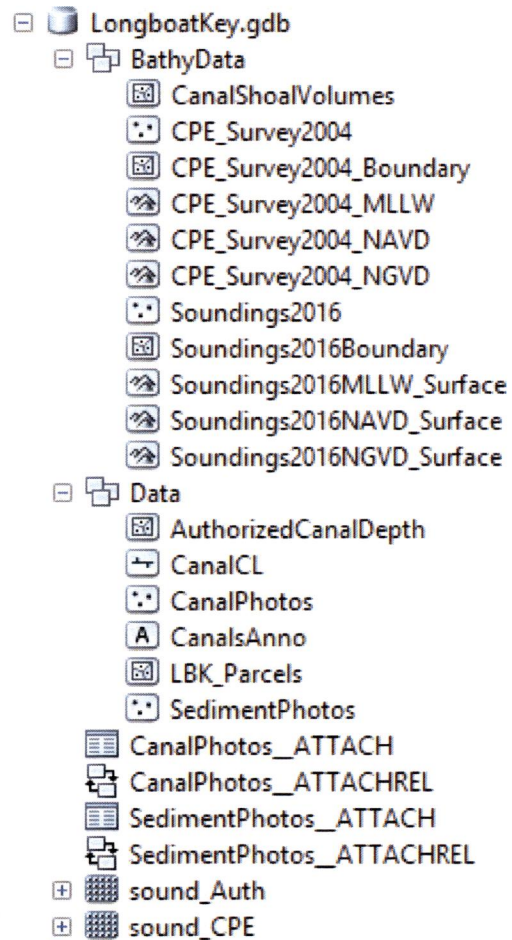
DateTimeZ	X	Z	Depth
2016-03-10T13:22:17Z	-82.68685	27.440046	-3.829
2016-03-10T13:22:17Z	-82.68686	27.440046	-3.754
2016-03-10T13:22:18Z	-82.68686	27.44003	-3.7215
2016-03-10T13:22:20Z	-82.68688	27.440014	-3.52867
2016-03-10T13:22:20Z	-82.6869	27.439998	-3.19414
2016-03-10T13:22:21Z	-82.68692	27.439982	-2.84729
2016-03-10T13:22:22Z	-82.68694	27.439982	-2.654
2016-03-10T13:22:24Z	-82.68694	27.439966	-2.721
2016-03-10T13:22:24Z	-82.68695	27.43995	-2.88075
2016-03-10T13:22:26Z	-82.68697	27.439934	-2.97333
2016-03-10T13:22:26Z	-82.68698	27.439934	-3.067
2016-03-10T13:22:28Z	-82.68698	27.439918	-3.18933
2016-03-10T13:22:28Z	-82.687	27.439902	-3.313
2016-03-10T13:22:30Z	-82.68702	27.439886	-3.42814
2016-03-10T13:22:30Z	-82.68703	27.439886	-3.82882
2016-03-10T13:22:32Z	-82.68705	27.43987	-3.81243
2016-03-10T13:22:32Z	-82.68705	27.439846	-3.91145
2016-03-10T13:22:33Z	-82.68707	27.439846	-3.8862
2016-03-10T13:22:35Z	-82.68708	27.43983	-3.8564
2016-03-10T13:22:35Z	-82.6871	27.439814	-3.78268
2016-03-10T13:22:37Z	-82.68712	27.439798	-3.72093
2016-03-10T13:22:37Z	-82.68713	27.439798	-3.76171
2016-03-10T13:22:38Z	-82.68713	27.439782	-3.58981
2016-03-10T13:22:39Z	-82.68715	27.439766	-3.50184
2016-03-10T13:22:41Z	-82.68717	27.439766	-3.71857
2016-03-10T13:22:41Z	-82.68717	27.43975	-3.48195
2016-03-10T13:22:42Z	-82.68719	27.43975	-3.69576
2016-03-10T13:22:44Z	-82.68719	27.439734	-3.37317
2016-03-10T13:22:44Z	-82.6872	27.439718	-3.31522
2016-03-10T13:22:46Z	-82.68721	27.439702	-3.39186
2016-03-10T13:22:48Z	-82.68723	27.439686	-3.392
2016-03-10T13:22:48Z	-82.68725	27.439686	-3.01657
2016-03-10T13:22:49Z	-82.68725	27.43967	-3.20729

Task 3: Field Investigation - continued



Task 2: Develop GIS Database - revise

Database Schema:



Task 2: Develop GIS Database - revise

Canal Centerline Information:

Identify	
Identify from:	<Top-most layer>
Location:	532,548.919 379,982.880 Meters
Field	Value
OBJECTID	3
SHAPE	Polyline Z
Canal Name	16
Previous Name	16
Length (FT)	1730.084508
Width (FT)	<null>
Street to North	Evergreen Way
Street to South	Jungle Queen Way
Exempt Yes or No	Yes
Permit Exemption Depth (NGVD)	-4.4
Permit Status	<null>
Permit Depth (NGVD)	<null>
Notes from Longboat Key	Entrance is exempt to -5.4 feet.
General Field Notes	2 outfalls at end
Outfall Presence	Y
Sediment Sample Location	at end
Sediment Type 1	Muck
Sediment Type 2	<null>
Seagrass Potential	High
Other Benthic Resources	<null>
Notable Wildlife Observed	<null>
Depth Range	<null>
SHAPE_Length	1730.084508
Location Notes	<null>



Reference Datums, “Level of Service;” Thresholds

What you “see” depends on your reference....!



MLLW



NGVD29



NAVD88

Reference Datums - continued

Cortez, Sarasota Bay, FL StationId: 8726217

Referenced to Station: St Petersburg, Tampa Bay (8726520)

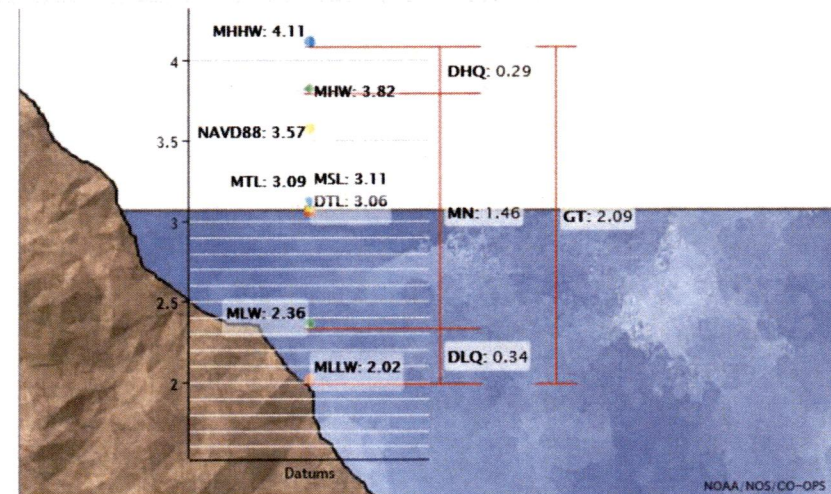
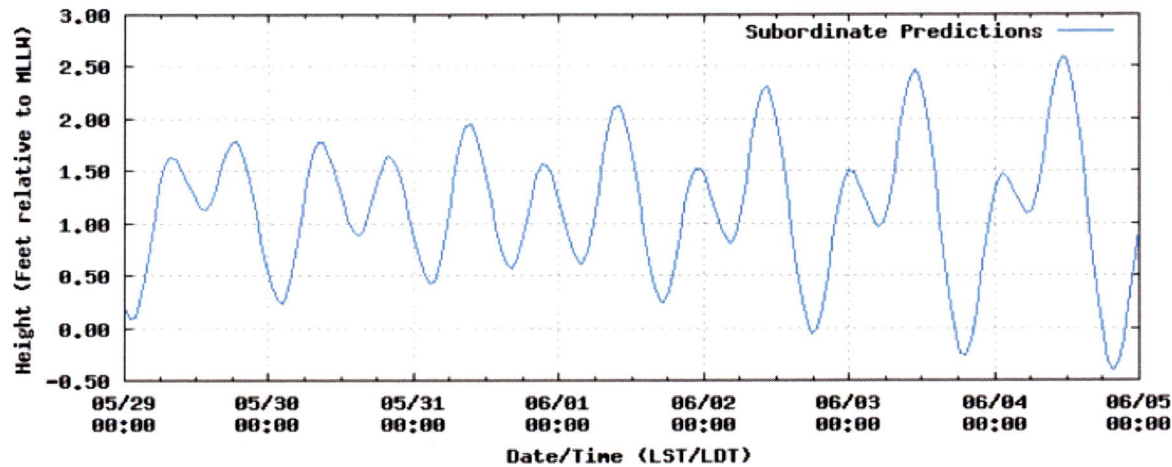
Time offset in mins (high:-120 low: -85) Height offset in feet (high:* 0.96 low: *0.96)

Weekly Tide Prediction in Feet

Time Zone: **LST/LDT**

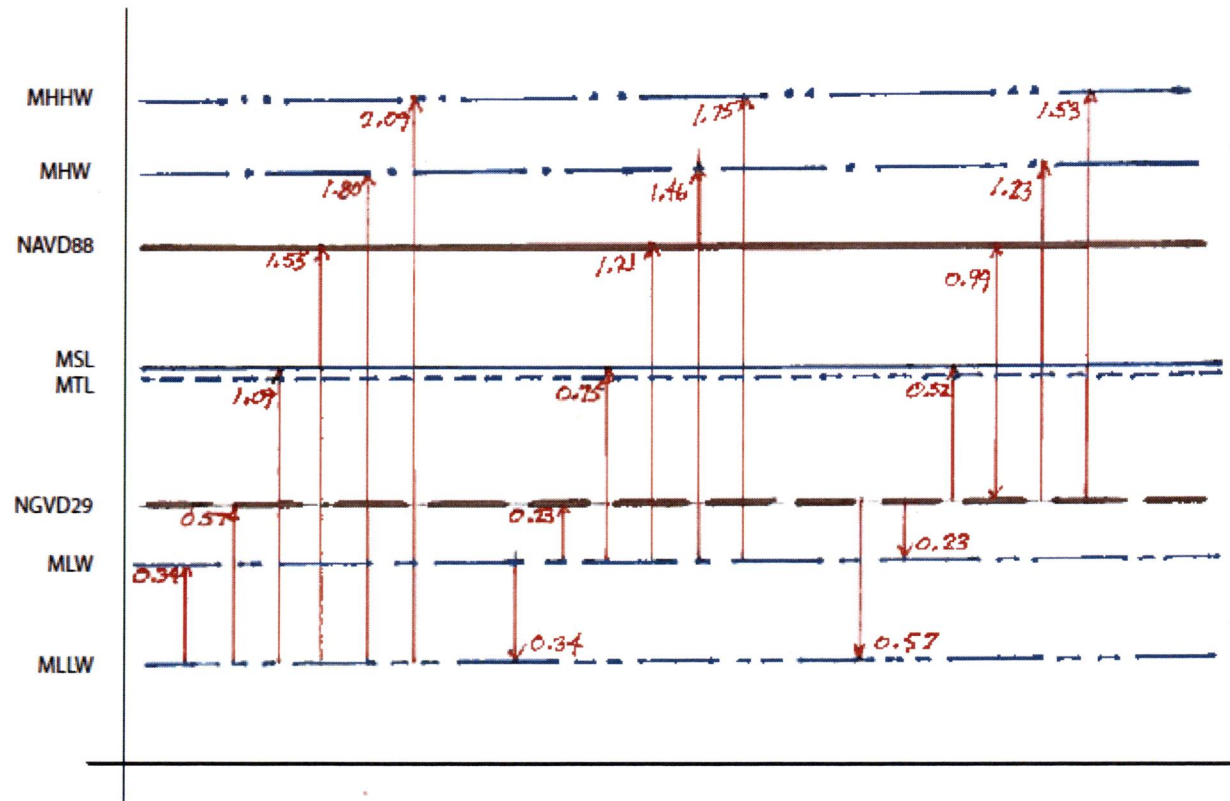
Datum: **MLLW**

◀ 2016/05/29 - 2016/06/04 ▶



Reference Datums - continued

Cortez (Sta. 8726217)



Reference Datums - continued

Regulatory Exemptions, Permits....

40D-4.051 Exemptions from Permitting.

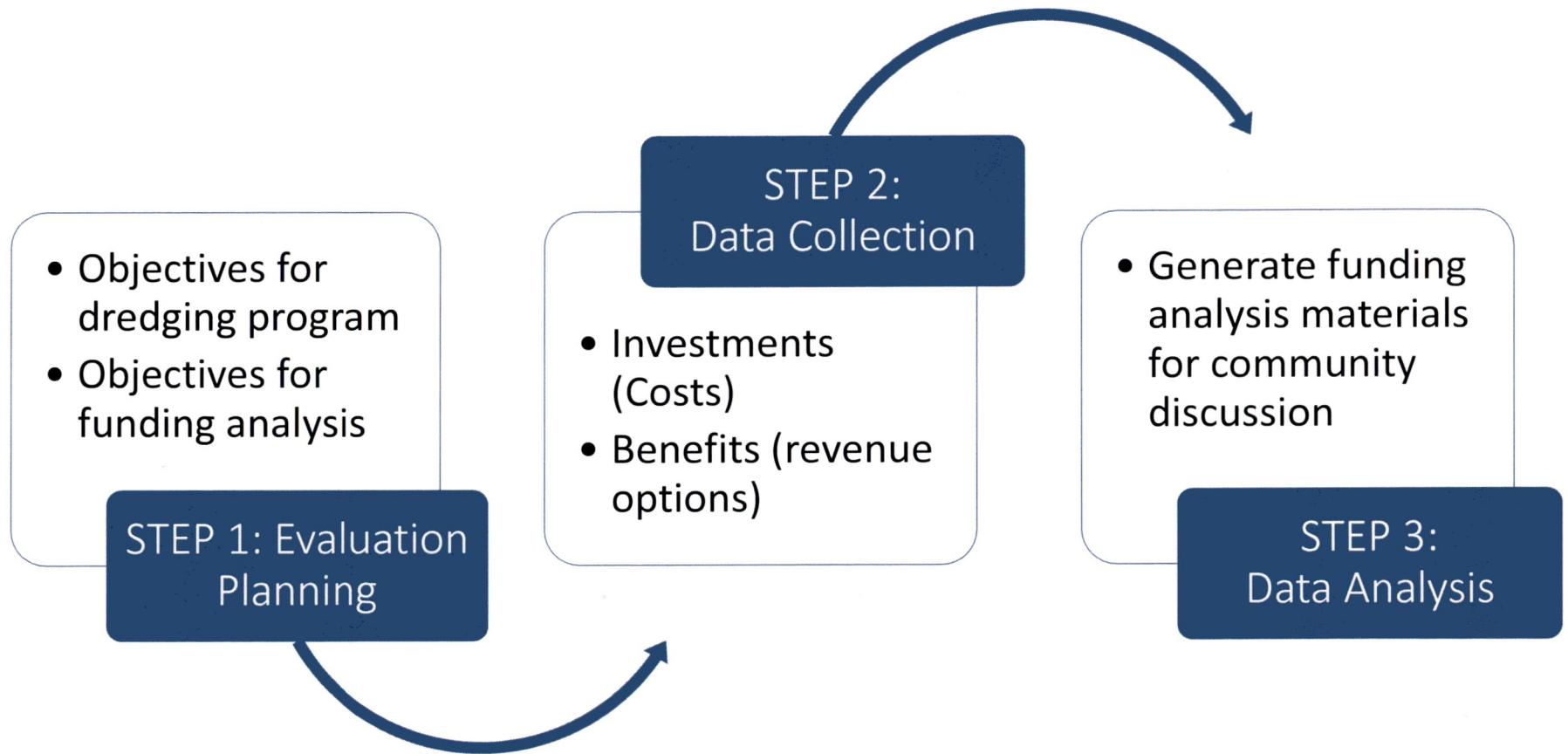
The performance of maintenance dredging of existing manmade canals, channels, basins, berths [...] to a depth of no more than 5 feet below mean low water.

Task 4: Evaluation of Volumes [...] Options

... leads to comparison of "surfaces" for volume calculation.



Project Approach – Funding



Project Approach – Public Involvement

- Start by engaging small groups (HOAs, condo associations...)
- A program that focuses on:
 - Open and informed discussion
 - Building relationships
 - Establishing expectations
 - Clarifying results/success

“There are many paths to enlightenment!”

Lao Tzu

Project Approach – Public Involvement

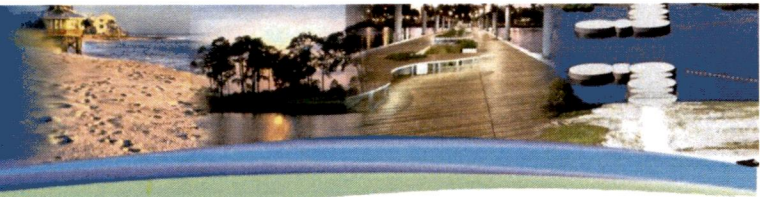
- Public involvement
 - Clarify goals of community engagement
 - Identify the audience
 - Identify the message(s)
 - Assess/agree on delivery methods
 - Provide for on-going involvement of community

Town Staff and Taylor Engineering suggest the Town Commission consider establishing a Citizen's Canal Maintenance Working Group to facilitate public input on funding options.



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Delivering Leading-Edge Solutions

www.taylorengeering.com



THANK YOU
Questions?



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**LONGBOAT KEY
PRELIMINARY BATHYMETRIC
SOUNDINGS**



SARASOTA COUNTY &
MANATEE COUNTY, FL

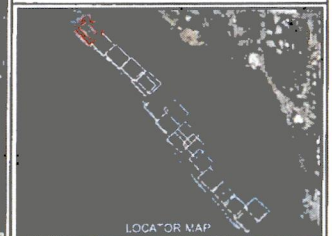
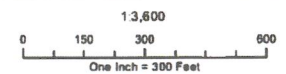


Image Source on UTM Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar
Geographics, CNES/Airbus DS, USDA, USGS, AEX, GeoEye, AeroGRID, IGN,
ICP, and the GIS User Community

Depth (MLLW)

- > 4'
- 2' - 3.9'
- < 2'



PROJECT	C2016-006
DRAWN BY	PL
DATE	4/18/2016
DATUM	NAD83, MLLW
SHEET	1 of 18

Image source: FDOT 2014



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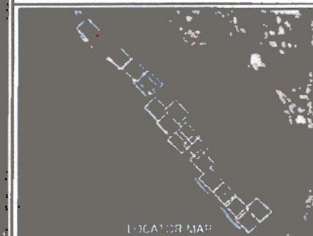
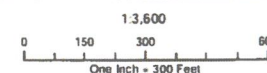


Image Source: on Location Map. Source: Esri, DigitalGlobe, GeoEye, Earthstar
Geographics, CNES/Airbus DS, USDA, USGS, Aero, GeoEye, AeroGrid, IGN,
GPS, Swiremap, and the U.S. Navy Community

Depth (MLLW)

- > 4'
- 2' - 3.9'
- < 2'



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LONGBOAT KEY
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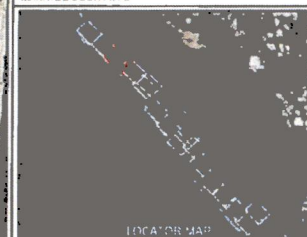
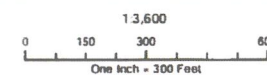


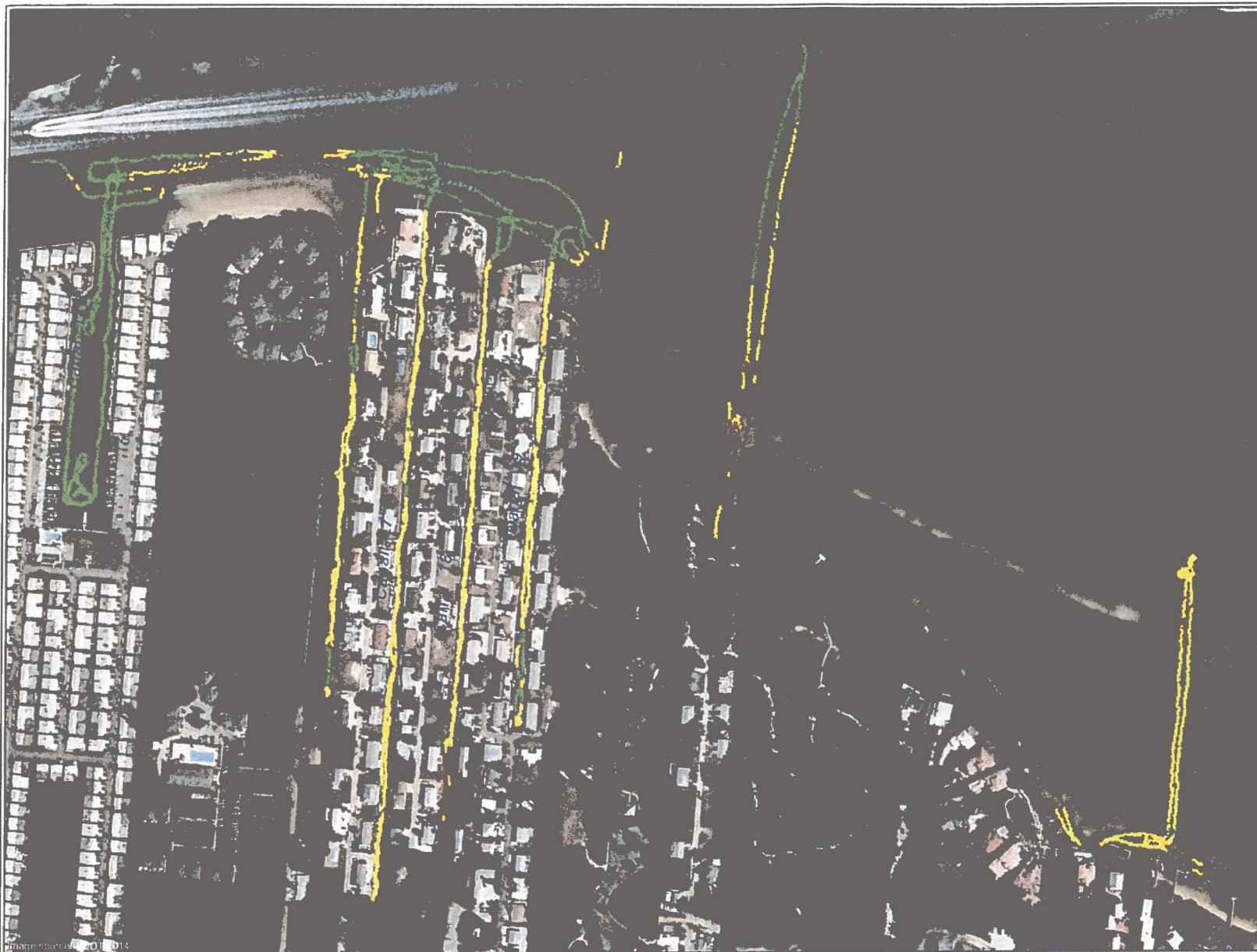
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Geographics; CNES/Airbus DS, USDA, USGS, Aero, GeoEye, AeroMap, IGN, CIP, Imagery, and the GIS User Community

Depth (MLLW)

- > 4'
- 2' - 3.9'
- < 2'



PROJECT	C2016-008
DRAWN BY	PL
DATE	4/18/2016
DATUM	NAD83, MLLW
SHEET	3 of 18

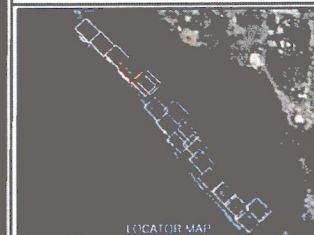


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 PRELIMINARY BATHYMETRIC
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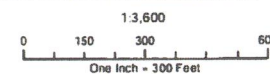


SARASOTA COUNTY &
 MANATEE COUNTY, FL



Depth (MLLW)

- > 4'
- 2' - 3.9'
- < 2'



PROJECT	C2016-006
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DATUM	NAD83, MLLW
SHEET	4 of 18

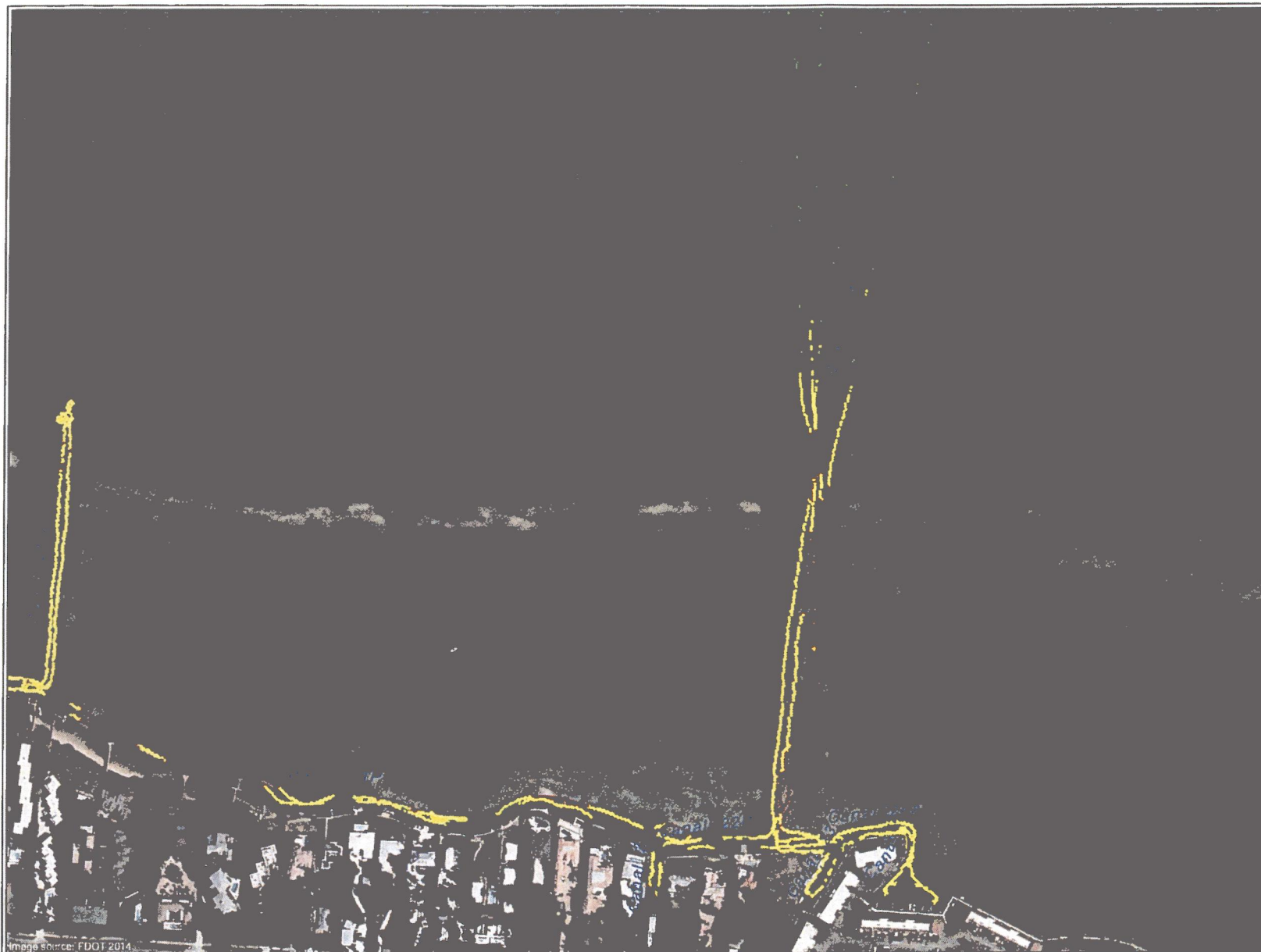


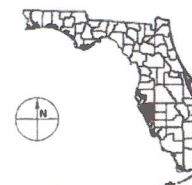
Image source: FDOT 2014

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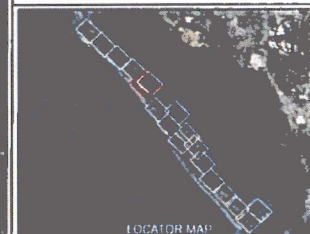


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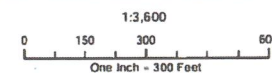


LOCATOR MAP

Image Source on Locator Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar
Geographics, CNR/SARLabs, USGS, USDA, USGS, AER, GeoEye, AeroGrid, IGN,
GPS, Swiremap, and the GIS User Community

Depth (MLLW)

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PROJECT	C2016-006
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DATUM	NAD83, MLLW
SHEET	5 of 18

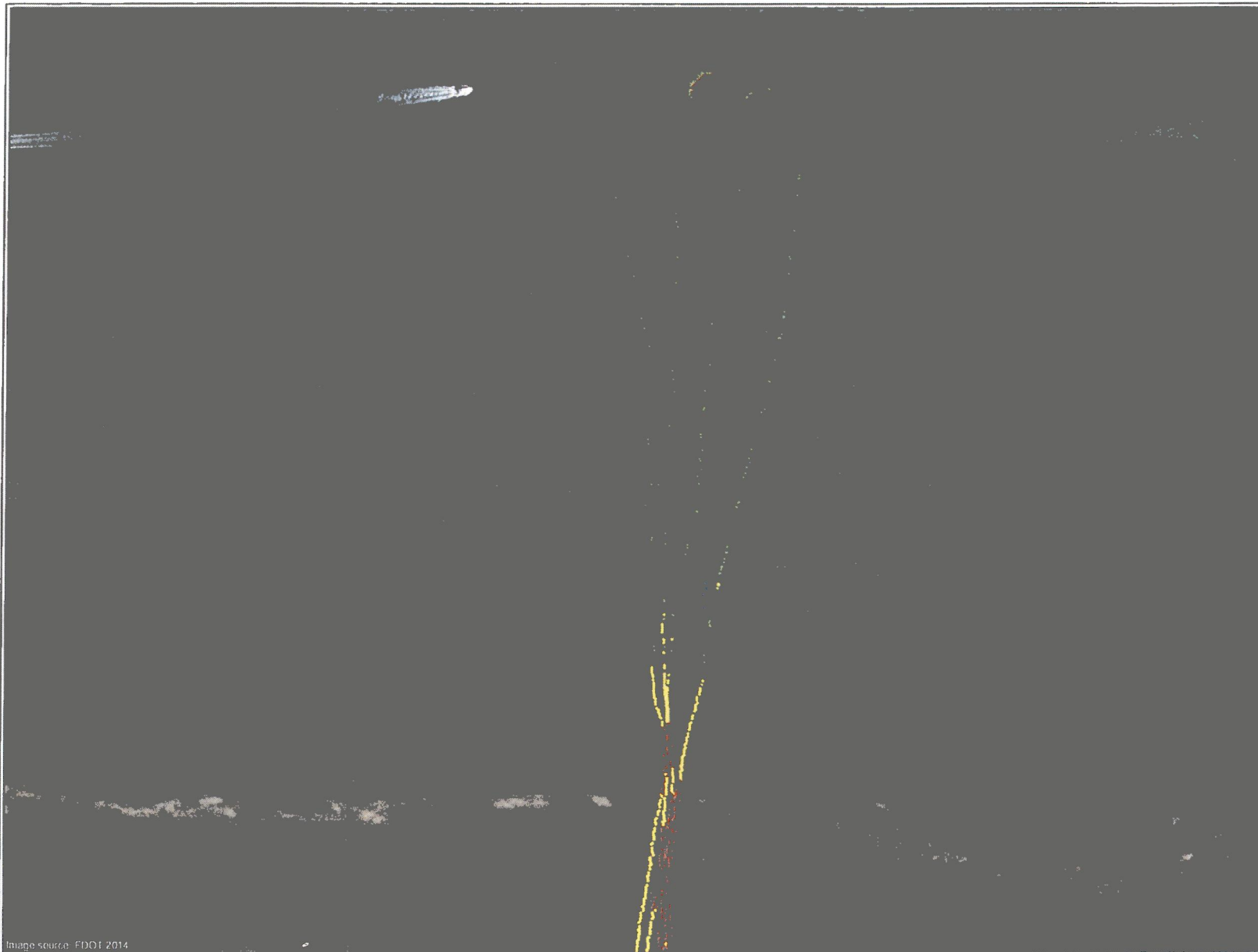
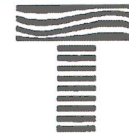


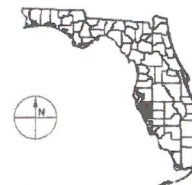
Image source: FDOI 2014

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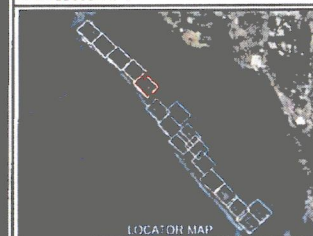
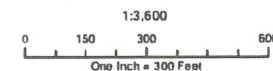


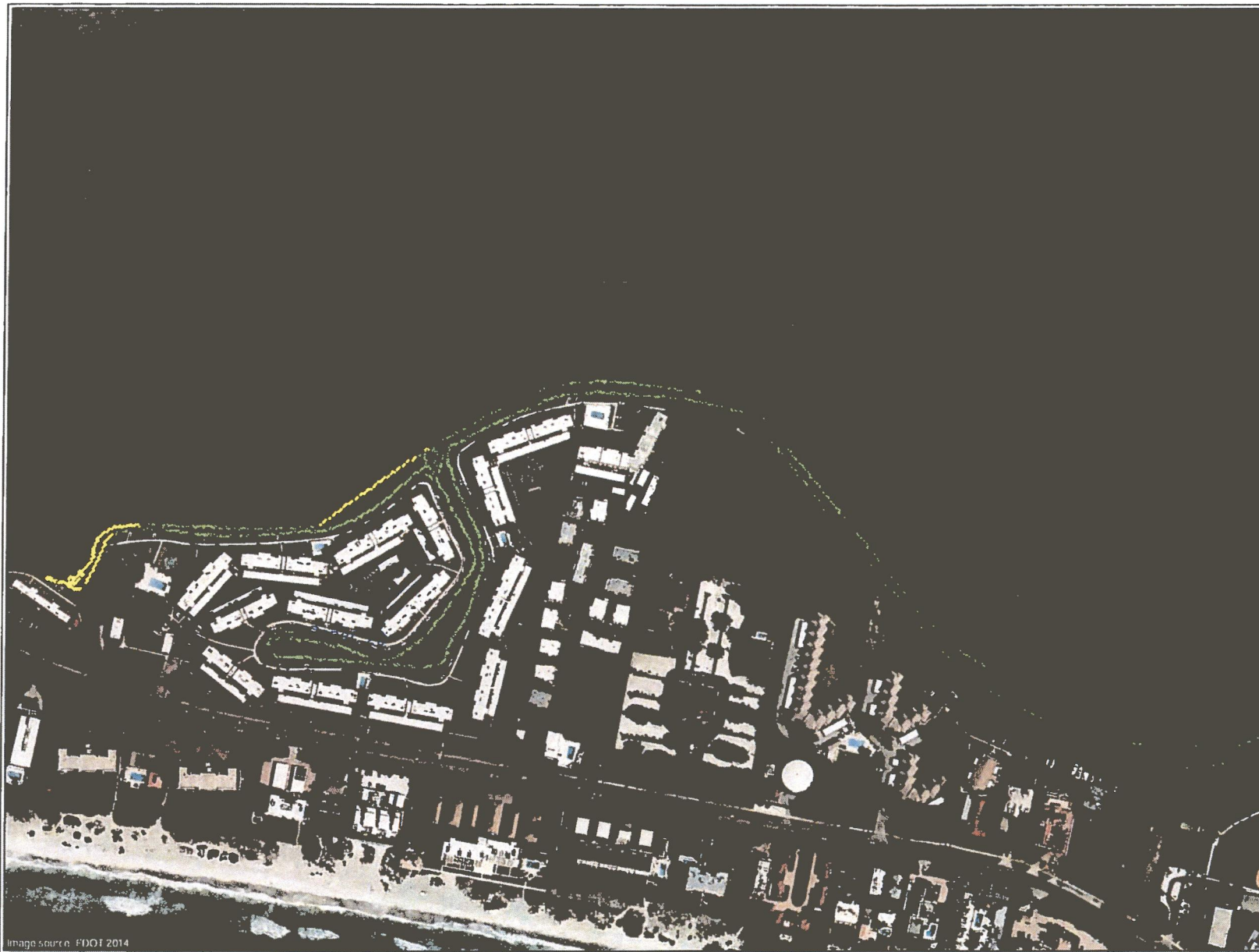
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COP, Swiremap, and the GIS User Community

Depth (MLLW)

- > 4'
- 2' - 3.9'
- < 2'

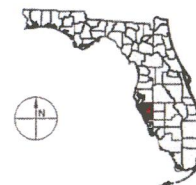


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DATUM	NAD83, MLLW
SHEET	6 of 18



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**LONGBOAT KEY
PRELIMINARY BATHYMETRIC
SOUNDINGS**



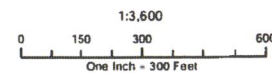
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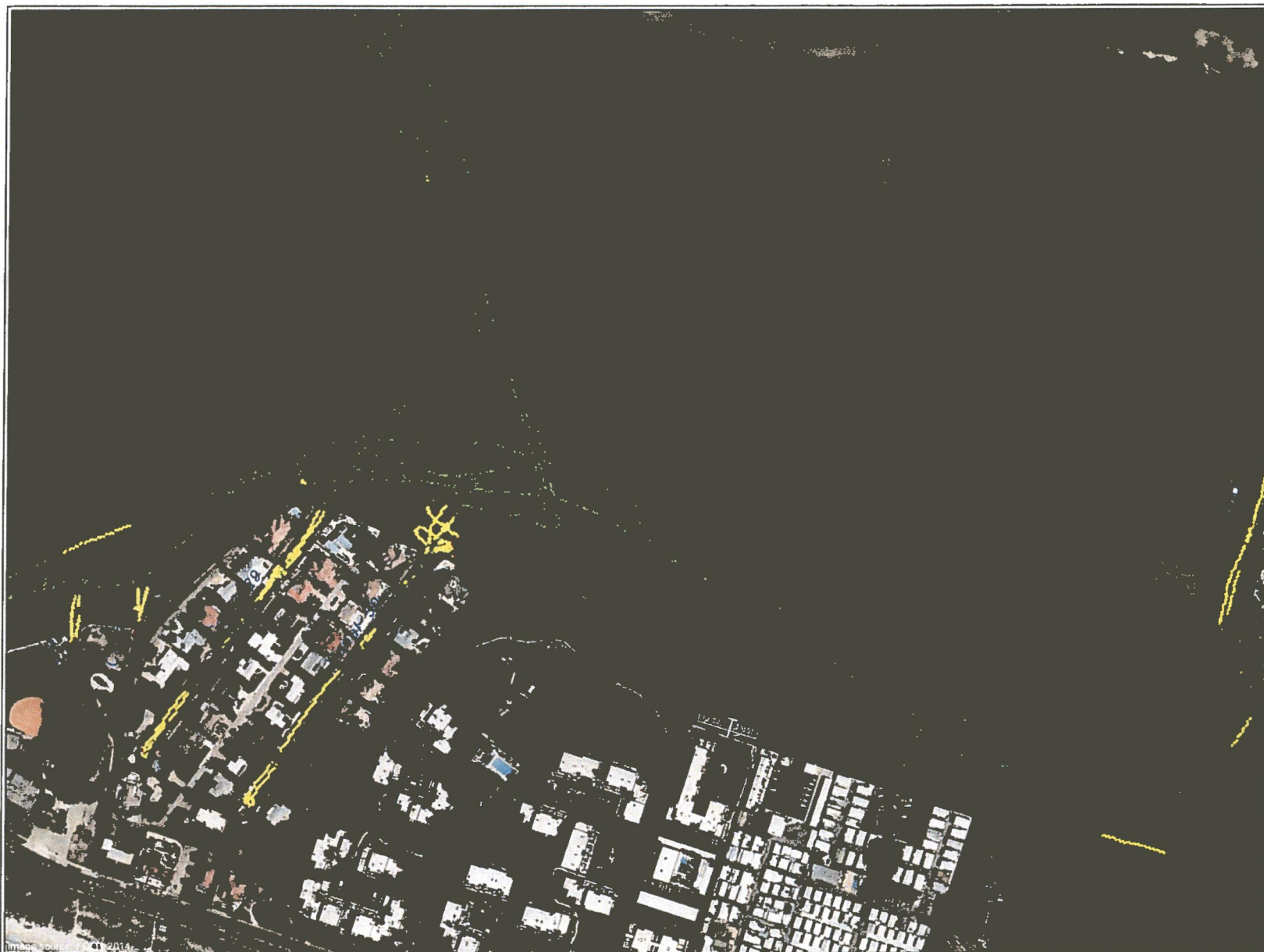
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Geographics, CNES/Airbus DS, USDA, USGS, AEX, GeoEye, AeroMap, IGN,
KSP, Swisstopo, and the GIS User Community

Depth (MLLW)

- > 4'
- 2' - 3.9'
- < 2'

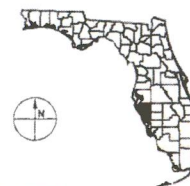


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DATUM	NAD83, MLLW
SHEET	7 of 18



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**LONGBOAT KEY
PRELIMINARY BATHYMETRIC
SOUNDINGS**



SARASOTA COUNTY &
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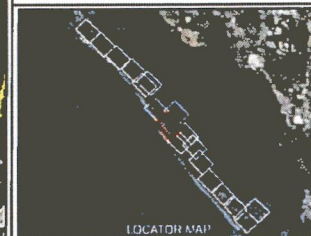
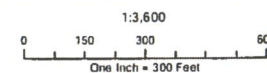


Image Source on Locator Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar
Geographics, CNES/Airbus DS, USDA, USGS, Aero, GeoEye, AeroMap, IGN,
ICP, GeoEye, and the GIS User Community

Depth (MLLW)

- > 4'
- 2' - 3.9'
- < 2'



PROJECT	C2016-006
DRAWN BY	PL
DATE	4/18/2016
DATUM	NAD83, MLLW
SHEET	8 of 18

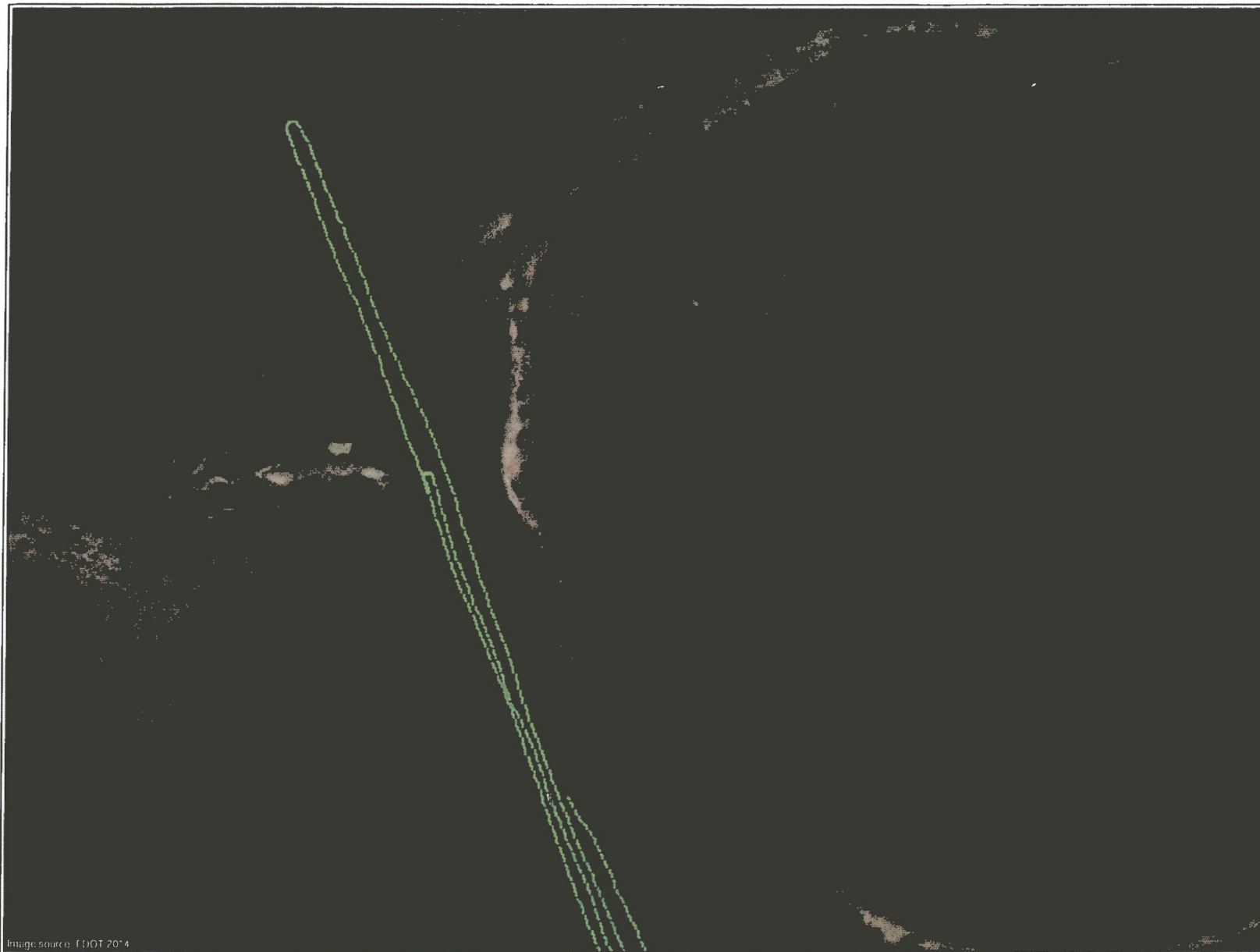


Image source: FDOT 2014

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LONGBOAT KEY
PRELIMINARY BATHYMETRIC
SOUNDINGS



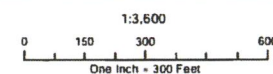
SARASOTA COUNTY &
MANATEE COUNTY, FL



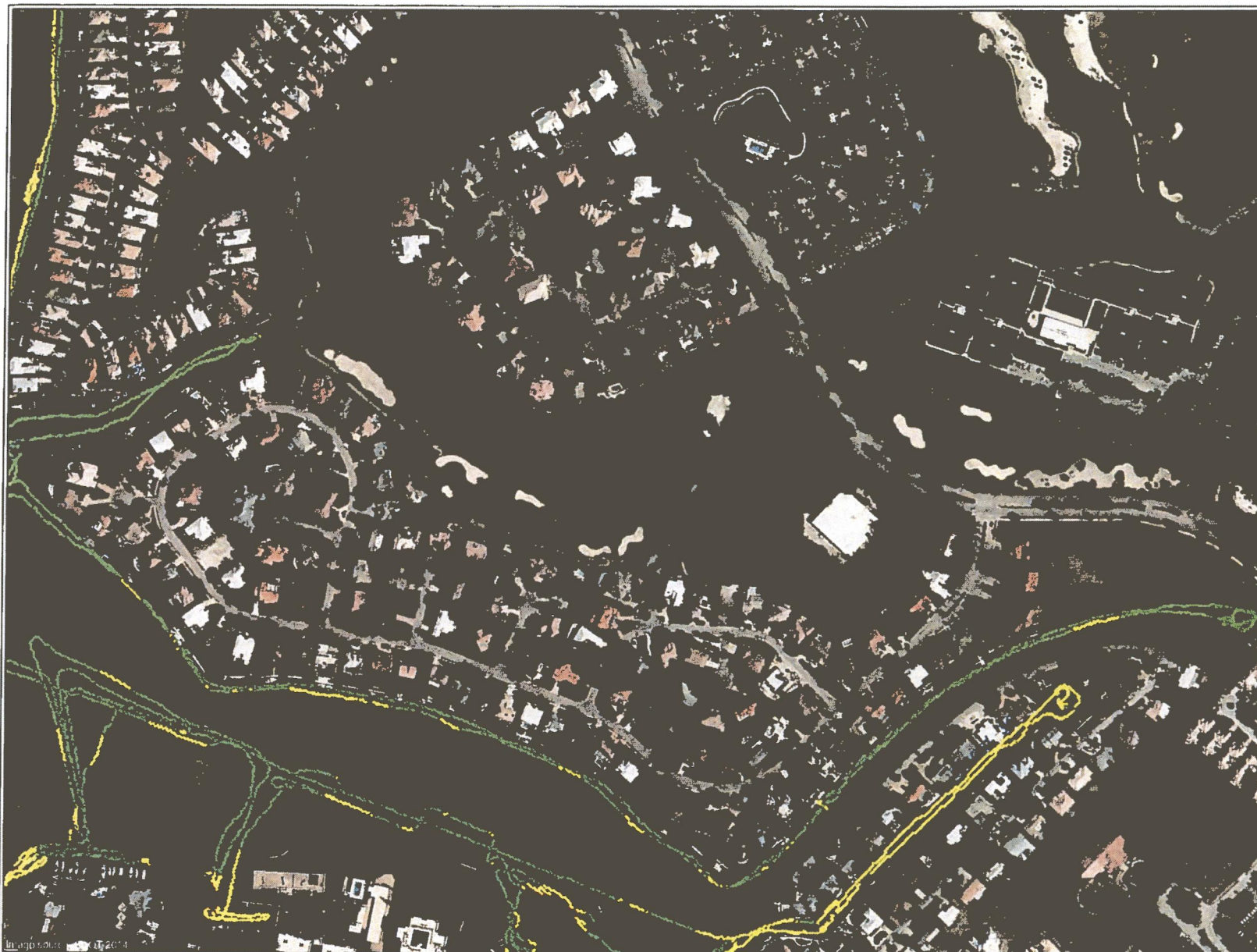
Image Source: on Locator Map. Source: Esri, DigitalGlobe, GeoEye, Earthstar
Geographics, CNES/Airbus DS, USDA, USGS, Aero, GeoMapping, AeroGRID, IGN,
ICP, Swiremap, and the GIS User Community

Depth (MLLW)

- > 4'
- 2' - 3.9'
- < 2'



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**LONGBOAT KEY
PRELIMINARY BATHYMETRIC
SOUNDINGS**



SARASOTA COUNTY &
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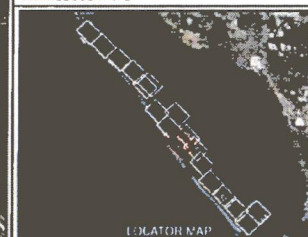
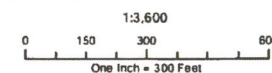


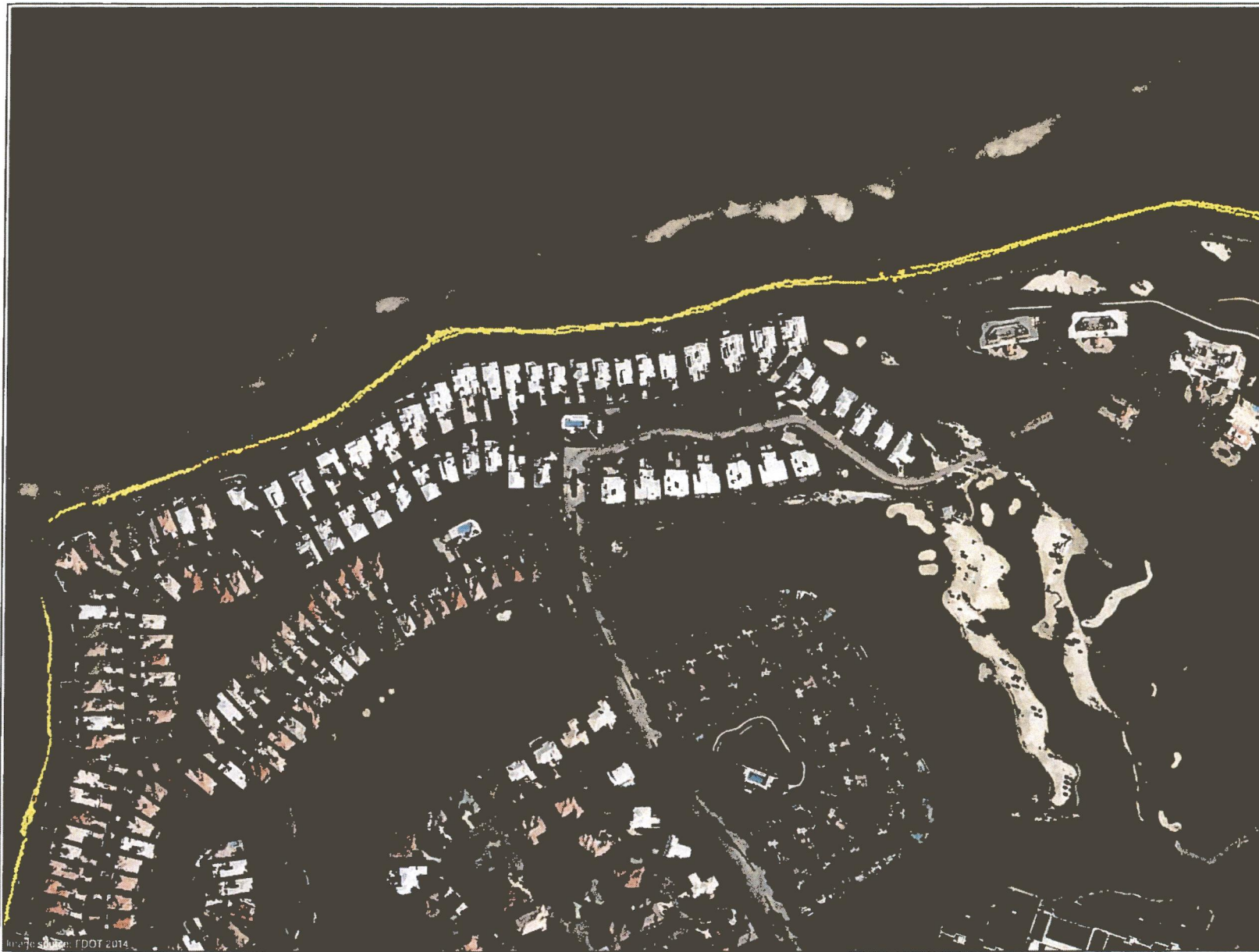
Image Source on Locator Map: Source: Earth DigitalGlobe, GeoEye, Earthstar
Geographics, CNES/Airbus DS, USDA, USGS, AEX, GeoSwapping, AeroGrid, IGN,
IGN, Swisstopo, and the GIS User Community

Depth (MLLW)

- > 4'
- 2' - 3.9'
- < 2'



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**LONGBOAT KEY
PRELIMINARY BATHYMETRIC
SOUNDINGS**



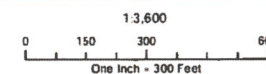
SARASOTA COUNTY &
MANATEE COUNTY, FL



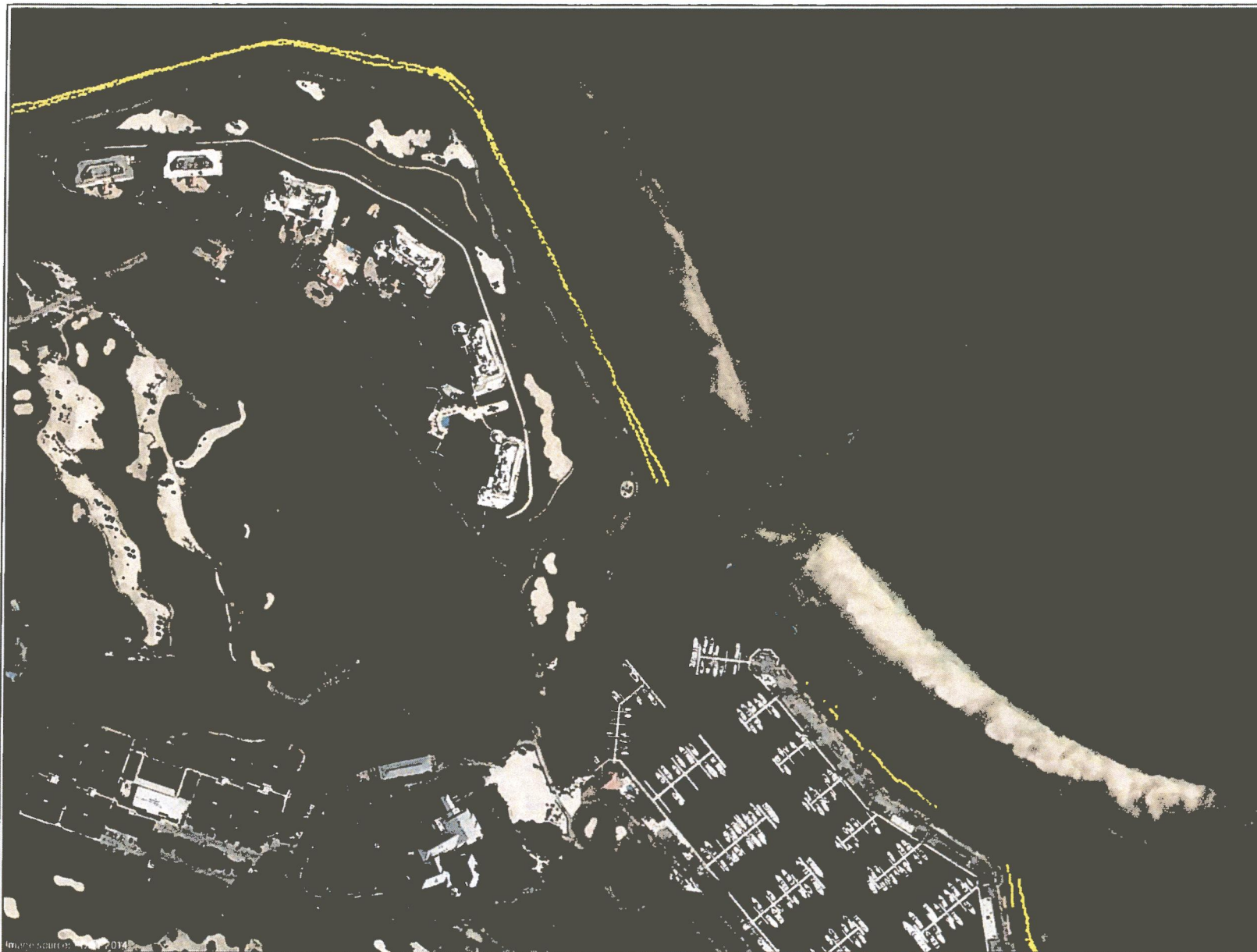
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Geographics, CNES/Airbus DS, USDA, Aero, Aerial, GeoEye, Aerial, IGN,
CNES, GeoEye, and the U.S. Navy Community

Depth (MLLW)

- > 4'
- 2' - 3.9'
- < 2'



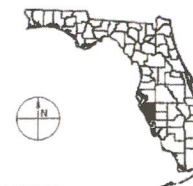
PROJECT	C2016-006
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DATUM	NAD83, MLLW
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**LONGBOAT KEY
PRELIMINARY BATHYMETRIC
SOUNDINGS**



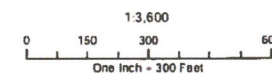
SARASOTA COUNTY &
MANATEE COUNTY, FL



Image Source on Locator Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar
Geographics, CNES/Airbus DS, USDA, USGS, AeroX, GeoEye, AeroStar, IGN,
Esri, Swisstopo, and the GIS User Community

Depth (MLLW)

- > 4'
- 2' - 3.9'
- < 2'



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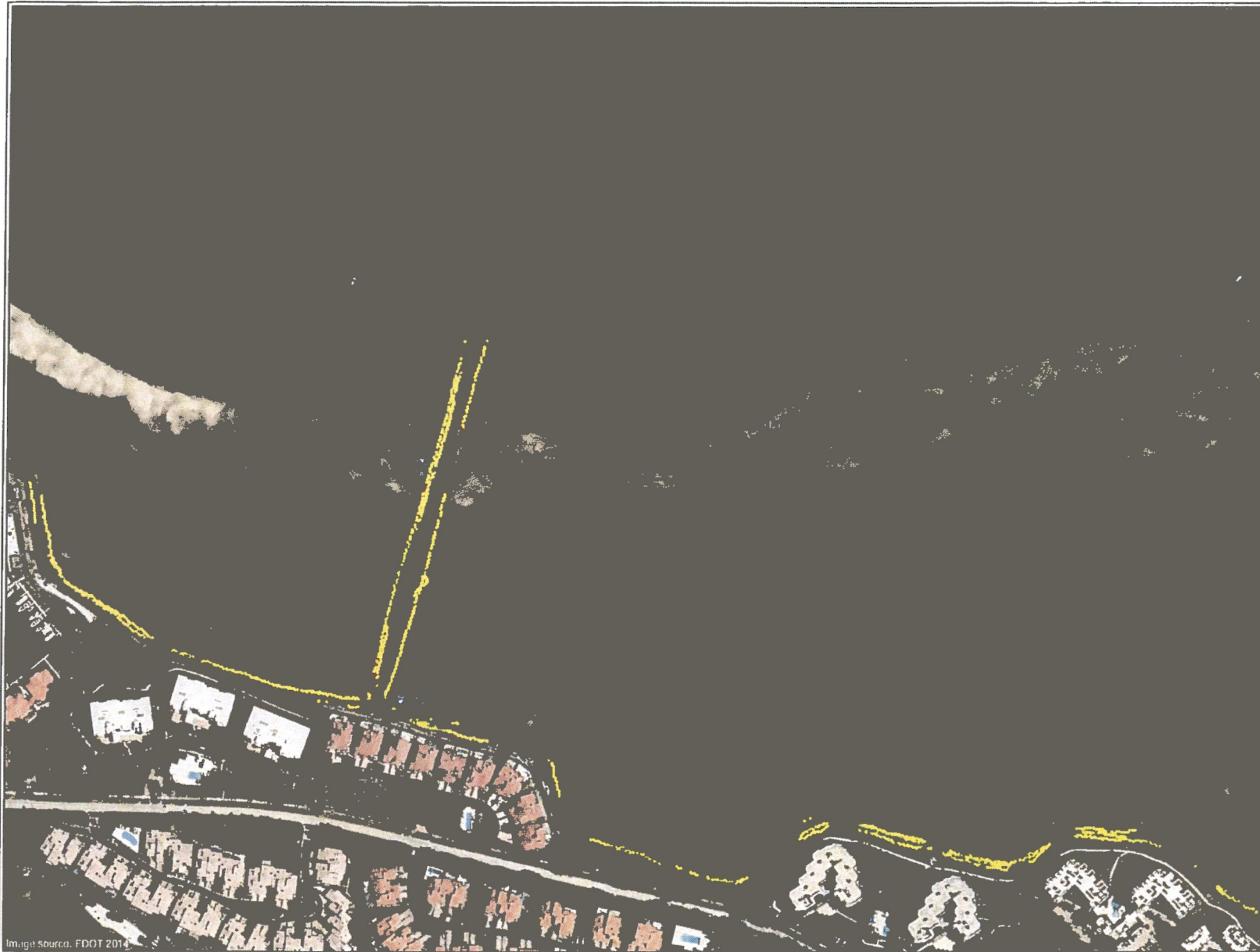
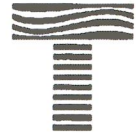


Image source: FDOT 2014

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**LONGBOAT KEY
PRELIMINARY BATHYMETRIC
SOUNDINGS**



SARASOTA COUNTY &
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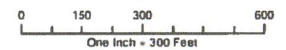
LOCATOR MAP

Image Source on Locator Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar
Geographics, CNES/Airbus DS, USDA, USGS, AeroX, GeoEye, AeroGrid, IGN,
ICP, Swirephoto, and the GIS User Community

Depth (MLLW)

- > 4'
- 2' - 3.9'
- < 2'

1:3,600



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**LONGBOAT KEY
PRELIMINARY BATHYMETRIC
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SARASOTA COUNTY &
MANATEE COUNTY FL

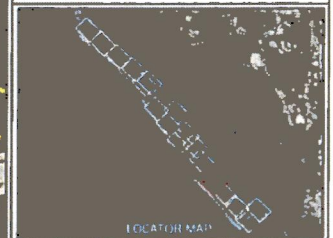
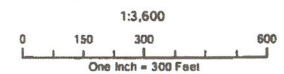


Image Source on Locator Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar
Geographics, CNES/Airbus DS, USDA, USGS, AeroX, Calmapping, AeroGrid, IGN,
EPT, TerraSto, and the GIS User Community

Depth (MLLW)

- > 4'
- 2' - 3.9'
- < 2'



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**LONGBOAT KEY
PRELIMINARY BATHYMETRIC
SOUNDINGS**



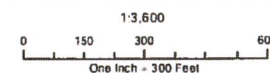
SARASOTA COUNTY &
MANATEE COUNTY, FL



Image Sources: Locator Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar
Geographics, CNES/Airbus DS, USDA, USGS, AeroX, GeoEye, AeroGRID, IGN,
SIP, Swiremap, and the GIS User Community

Depth (MLLW)

- > 4'
- 2' - 3.9'
- < 2'



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Image source: FDOT 2014

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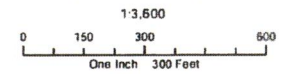
SARASOTA COUNTY &
MANATEE COUNTY, FL



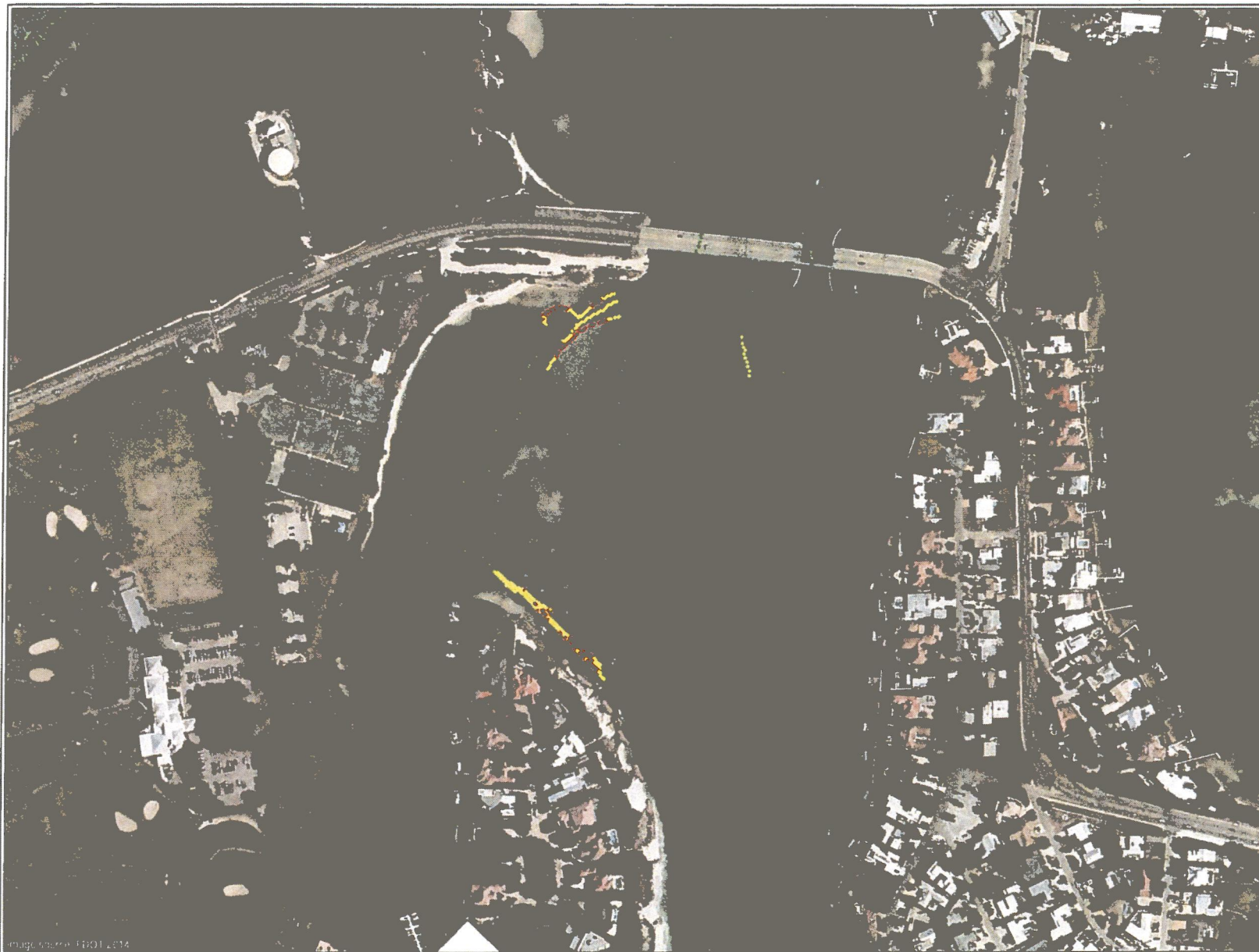
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ECP, swisstopo, and the GIS User Community

Depth (MLLW)

- > 4'
- 2' - 3.9'
- < 2'



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**LONGBOAT KEY
 PRELIMINARY BATHYMETRIC
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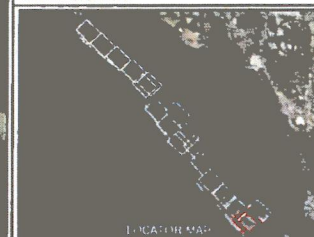


Image Source on Locator Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar
 Geographics, CNES/Airbus DS, USDA, USGS, AEX, Geomatics, AeroGRID, IGN,
 ECP, satellite, and the GIS User Community

Depth (MLLW)

- > 4'
- 2' - 3.9'
- < 2'

1:3,600
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 One Inch = 300 Feet

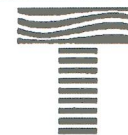
PROJECT	C2016-006
DRAWN BY	PL
DATE	4/18/2016
DATUM	NAD83, MLLW
SHEET	17 of 18

Image Source: 1/2014/2014



Image source: FDOT 2014

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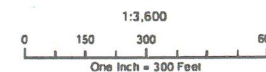
SARASOTA COUNTY &
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Image Source on Locator Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar
Geographics, CNES/Airbus DS, USDA, USGS, AeroX, Getmapping, Aerogrid, IGN,
IPI, Swisstopo, and the GIS User Community

Depth (MLLW)

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- < 2'



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