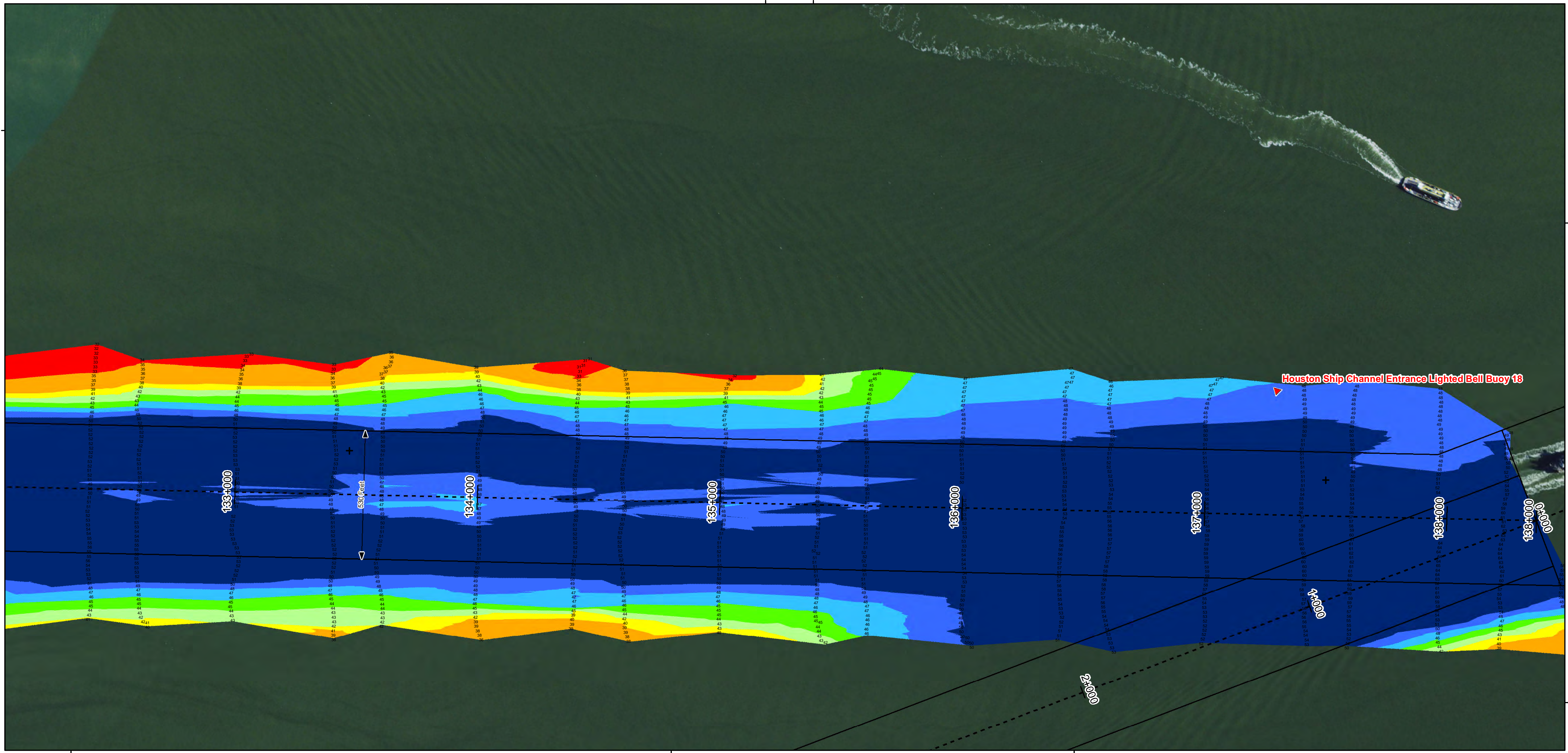
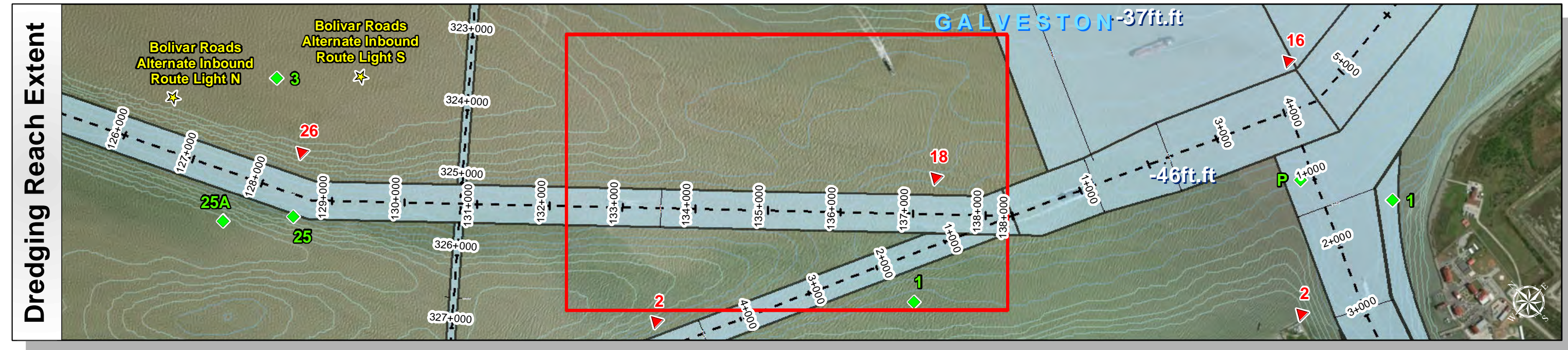
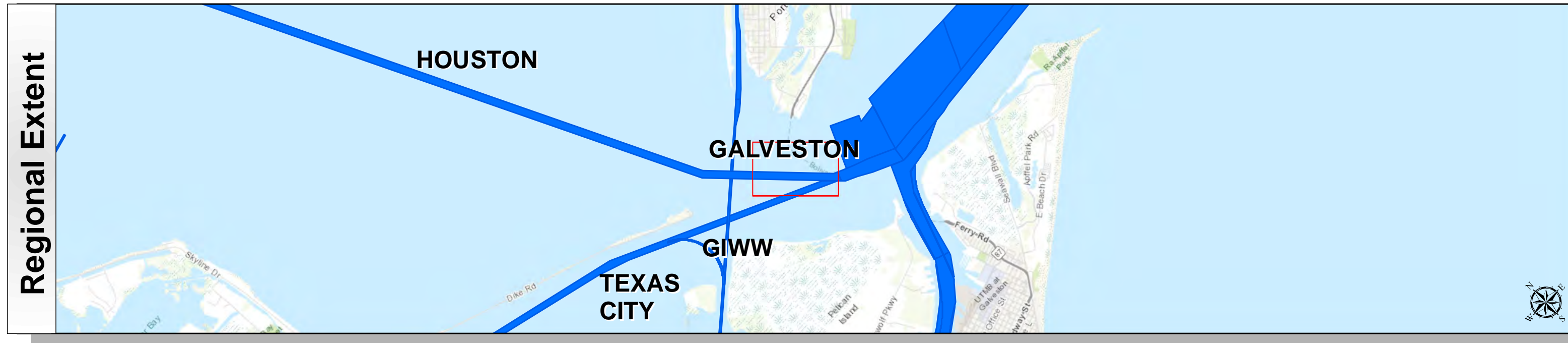


Houston Ship Channel: Bolivar Roads to Red Fish Light 1



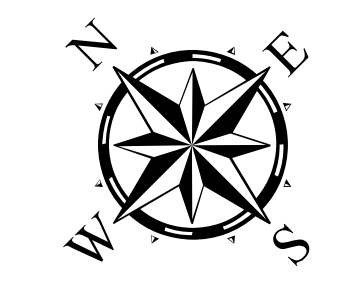
U.S. Army Corps of Engineers
Galveston District



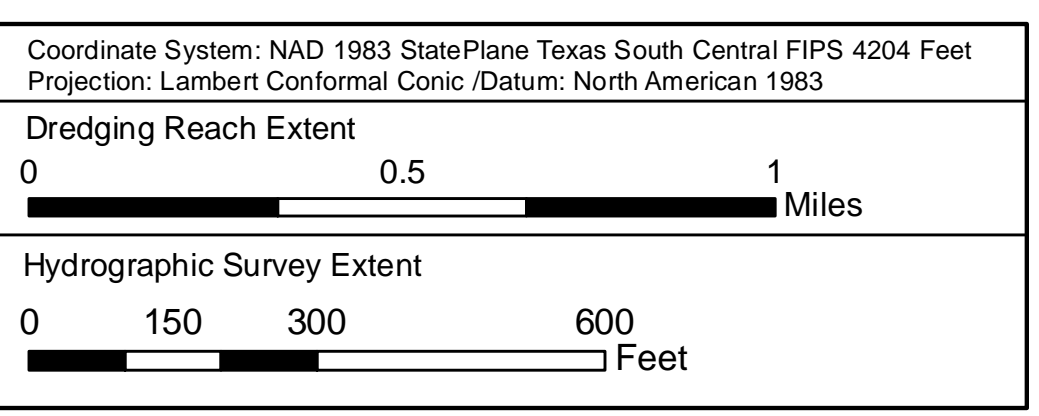
Channel Features	Aids to Navigation	MLLW
— Channel Toe	★ Lights	0 - 30
- - - Channel Center Line	▲ Red Side Aids	30 - 35
— Channel Station Lines	■ Green Side Aids	35 - 40
↔ Channel Dimensions	◆ Mooring Buoy	40 - 42
		42 - 44
		44 - 46
		46 - 48
		48 - 50
		50 >
		NOAA Bathymetry (DREDGING REACH EXTENT)
		0 - 10
		10 - 15
		15 - 20
		20 - 25
		25 - 30
		30 - 50

NOTES:

- HORIZONTAL COORDINATES ARE REFERENCED TO TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE NAD83 US SURVEY FEET.
- ELEVATIONS ARE REFERENCED TO MEAN LOWER LOW TIDE (MLLW) DATUM.
- THIS PROJECT WAS DESIGNED BY THE GALVESTON DISTRICT OF THE U.S. ARMY CORPS OF ENGINEERS. THE INITIALS AND SIGNATURES AND REGISTRATION DESIGNATIONS OF INDIVIDUALS APPEAR ON THESE PROJECT DOCUMENTS WITHIN THE SCOPE OF THEIR EMPLOYMENT AS REQUIRED BY ER1110-1-8152.
- THE INFORMATION DEPICTED ON THIS SURVEY MAP REPRESENTS THE RESULTS OF SURVEYS MADE ON THE DATES INDICATED AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITIONS EXISTING AT THAT TIME. THESE CONDITIONS ARE SUBJECT TO RAPID CHANGE DUE TO SHOALING EVENTS. A PRUDENT MARINER SHOULD NOT RELY EXCLUSIVELY ON THE INFORMATION PROVIDED HERE. REQUIRED BY 33 CFR 209.325
- FOR THE MOST UP TO DATE INFORMATION PLEASE CHECK OUR WEBSITE AT: [HTTP://WWW.SWG.USACE.ARMY.MIL/MISSIONS/NAVIGATION/HYDROGRAPHICS/SURVEYS/](http://www.swg.usace.army.mil/missions/navigation/hydrographics/surveys/)
- NOAA BATHYMETRY CONTOURS PRODUCED FROM HISTORIC BATHYMETRIC (HYDROGRAPHIC) SURVEYS CONDUCTED BY THE NOAA NATIONAL OCEAN SERVICE COAST SURVEY, AVAILABLE FROM THE NATIONAL GEOPHYSICAL DATA CENTER. SURVEYS VARY AS TO SOUNDING DENSITY, ACCURACY OF DEPTH, ACCURACY OF NAVIGATION, ZERO DATUM, DATE OF SURVEY AND TYPE OF INSTRUMENTATION.



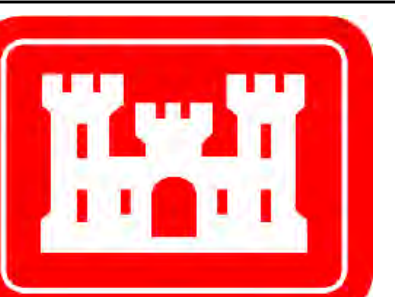
Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



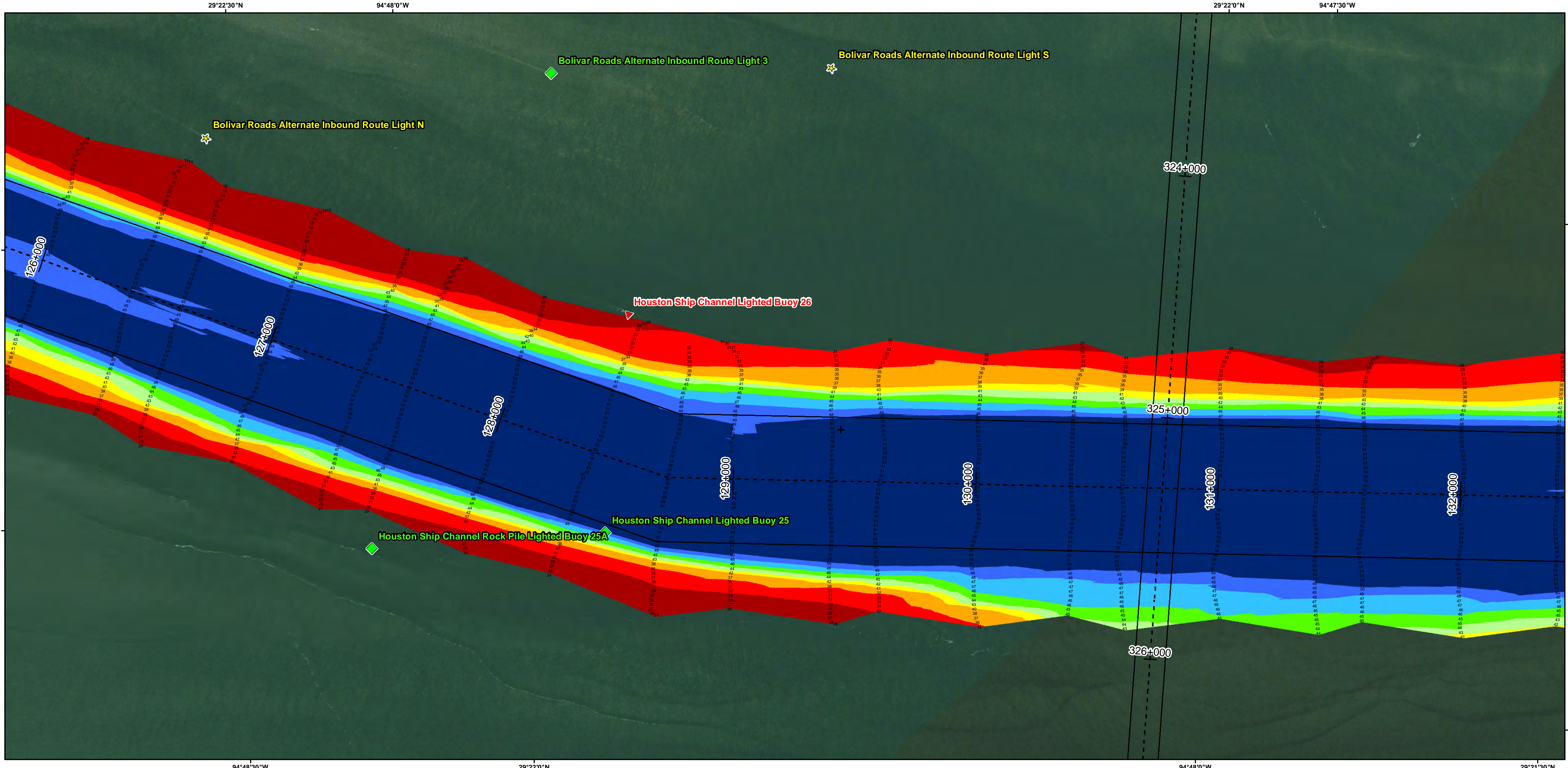
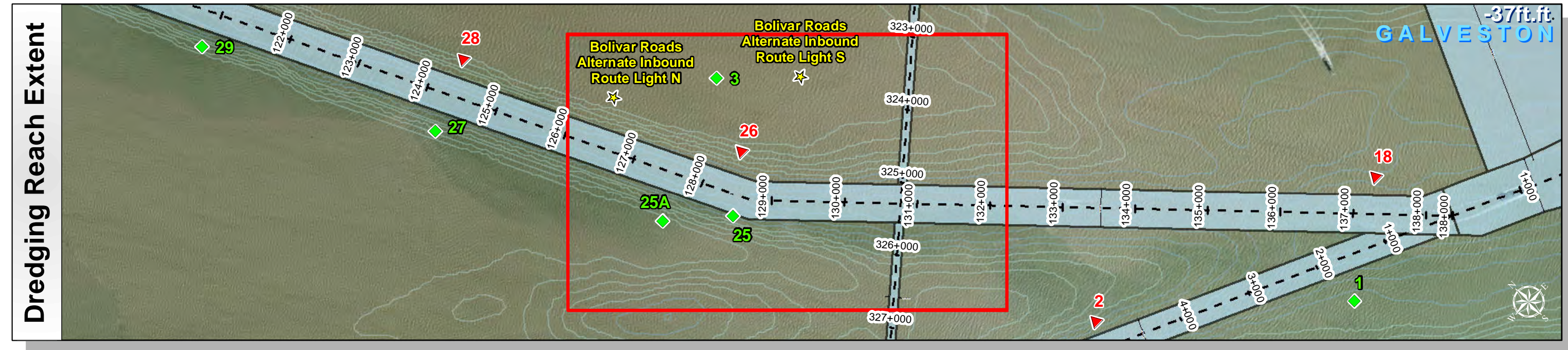
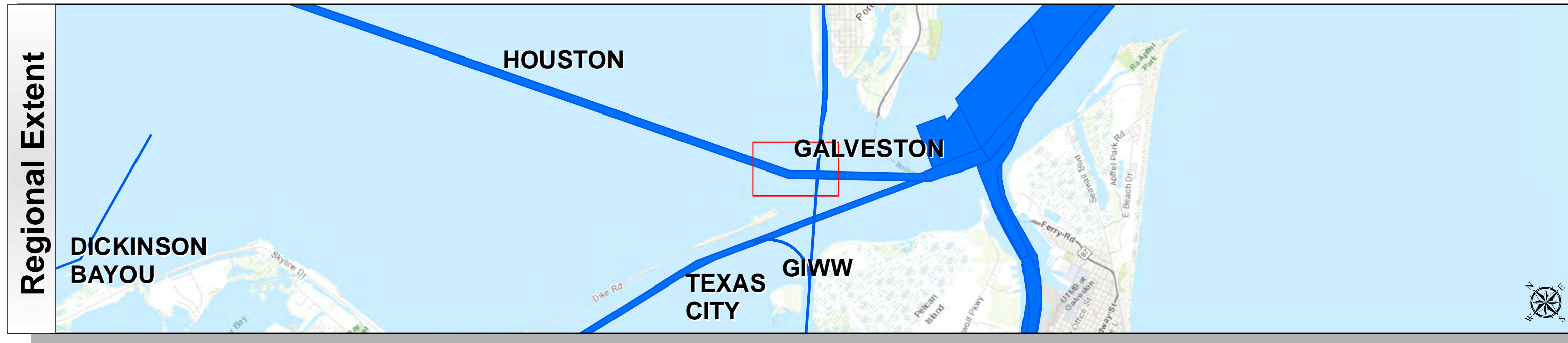
Survey Date(s): 11 May 2018	Authorized Depth: -46ft.
Page: 1 of 56	Side Slope Ratio: (Rise : Run)
Scale: 1:2,400	Additional Imagery: © DigitalGlobe Inc.
Mapped by: MSAOX PAC	Print Date: 5/30/2018
Additional Info:	

HYDROGRAPHIC SURVEY
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
GALVESTON, TEXAS
Bolivar Roads to Red Fish Light 1
Station: 138+476 to 78+844
HOUSTON
HOUSTON, TEXAS

Houston Ship Channel: Bolivar Roads to Red Fish Light 1



U.S. Army Corps of Engineers
Galveston District



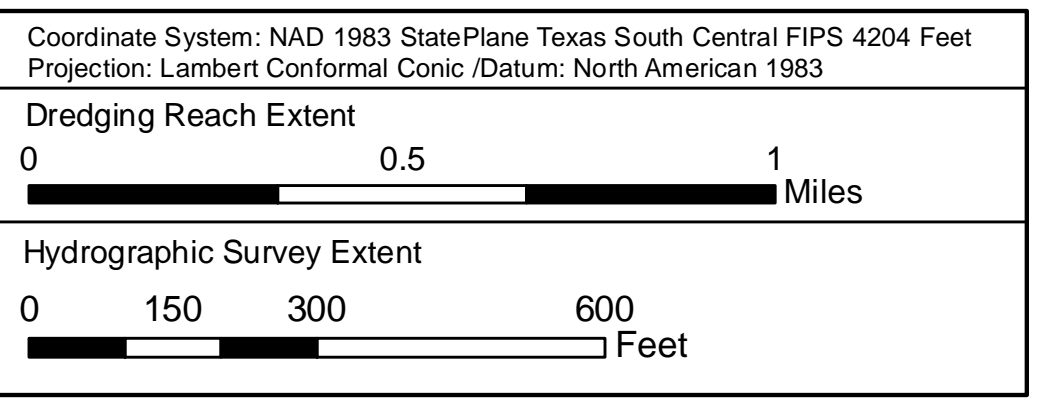
Channel Features	Aids to Navigation	MLLW
— Channel Toe	★ Lights	0 - 30
- - - Channel Center Line	▲ Red Side Aids	30 - 35
— Channel Station Lines	■ Green Side Aids	35 - 40
↔ Channel Dimensions	◆ Mooring Buoy	40 - 42
		42 - 44
		44 - 46
		46 - 48
		48 - 50
		50 >
		NOAA Bathymetry (DREDGING REACH EXTENT)
		0 - 10 10 - 15 15 - 20 20 - 25 25 - 30 30 - 50

NOTES:
 1. HORIZONTAL COORDINATES ARE REFERENCED TO TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE NAD83 US SURVEY FEET.
 2. ELEVATIONS ARE REFERENCED TO MEAN LOWER LOW TIDE (MLLW) DATUM.
 3. THIS PROJECT WAS DESIGNED BY THE GALVESTON DISTRICT OF THE U.S. ARMY CORPS OF ENGINEERS. THE INITIALS AND SIGNATURES AND REGISTRATION DESIGNATIONS OF INDIVIDUALS APPEAR ON THESE PROJECT DOCUMENTS WITHIN THE SCOPE OF THEIR EMPLOYMENT AS REQUIRED BY ER1110-1-8152.

4. THE INFORMATION DEPICTED ON THIS SURVEY MAP REPRESENTS THE RESULTS OF SURVEYS MADE ON THE DATES INDICATED AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITIONS EXISTING AT THAT TIME. THESE CONDITIONS ARE SUBJECT TO RAPID CHANGE DUE TO SHOALING EVENTS. A PRUDENT MARINER SHOULD NOT RELY EXCLUSIVELY ON THE INFORMATION PROVIDED HERE. REQUIRED BY 33 CFR 209.325
 5. FOR THE MOST UP TO DATE INFORMATION PLEASE CHECK OUR WEBSITE AT: [HTTP://WWW.SWG.USACE.ARMY.MIL/MISSIONS/NAVIGATION/HYDROGRAPHICS/SURVEYS/](http://www.swg.usace.army.mil/missions/navigation/hydrographics/surveys/)
 6. NOAA BATHYMETRY CONTOURS PRODUCED FROM HISTORIC BATHYMETRIC (HYDROGRAPHIC) SURVEYS CONDUCTED BY THE NOAA NATIONAL OCEAN SERVICE COAST SURVEY, AVAILABLE FROM THE NATIONAL GEOPHYSICAL DATA CENTER. SURVEYS VARY AS TO SOUNDING DENSITY, ACCURACY OF DEPTH, ACCURACY OF NAVIGATION, ZERO DATUM, DATE OF SURVEY AND TYPE OF INSTRUMENTATION.



Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community
 Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



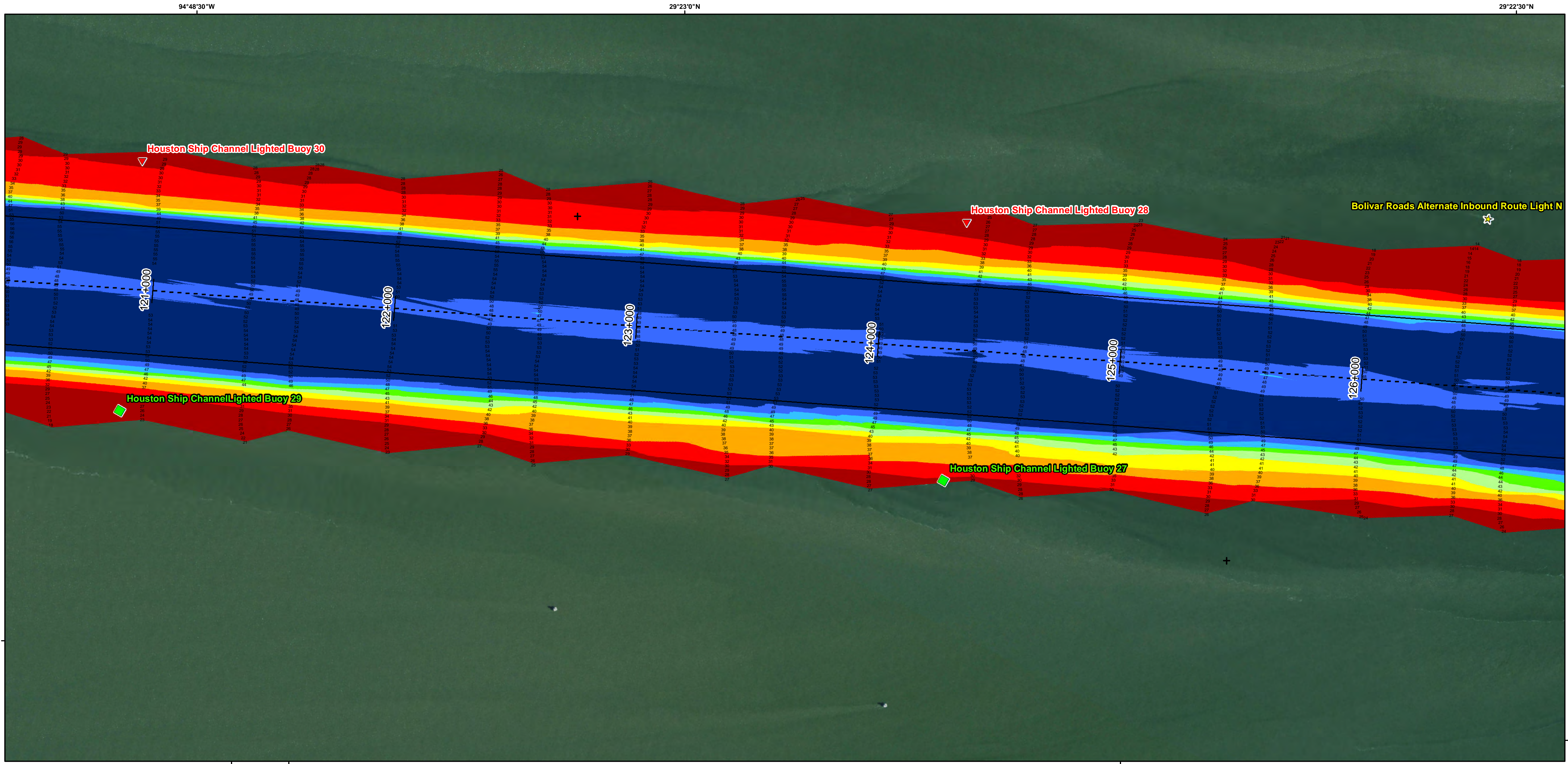
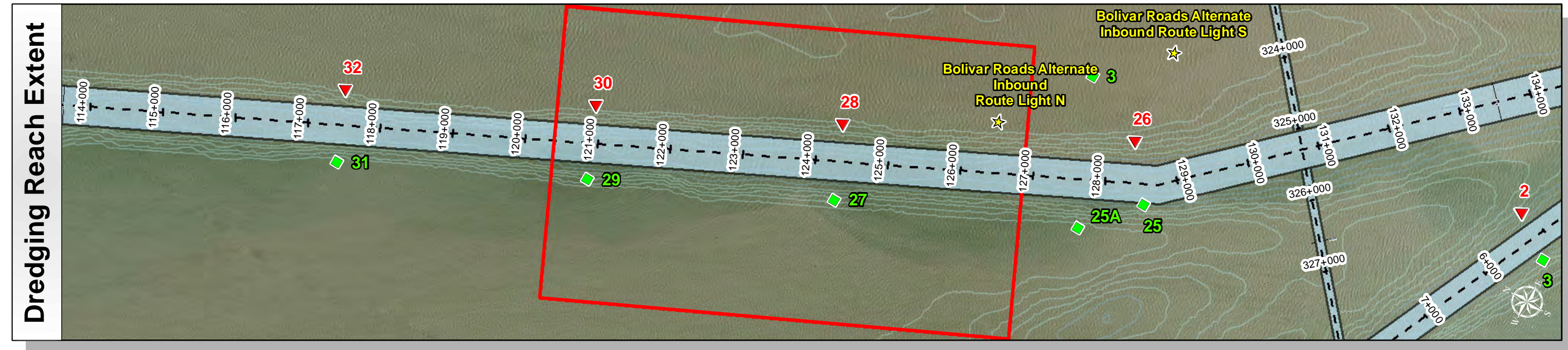
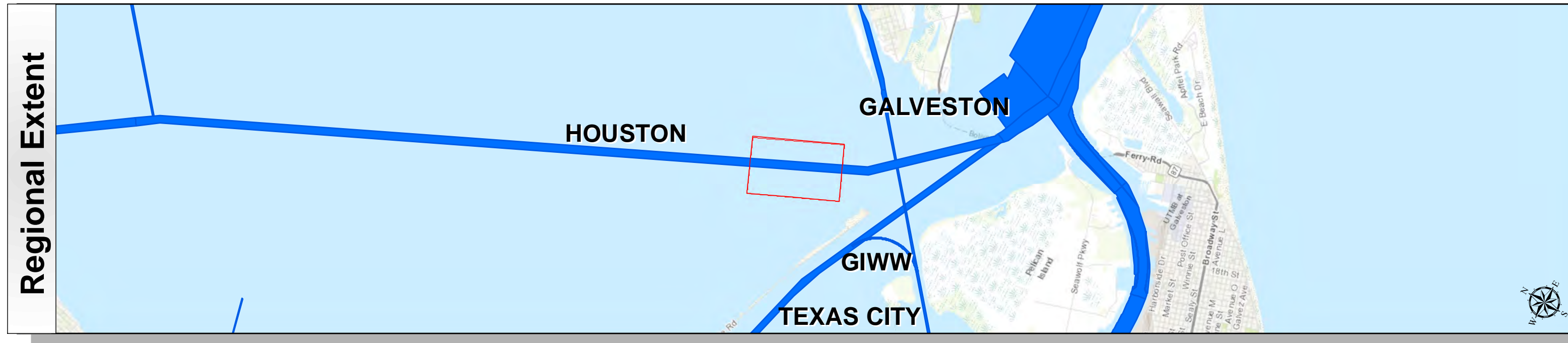
Survey Date(s): 11 May 2018	Authorized Depth: -46ft.
Page: 2 of 56	Side Slope Ratio: (Rise : Run)
Scale: 1:2,400	Map: Additional Imagery: © DigitalGlobe Inc.
Mapped by: MSAOX PAC	Print Date: 5/30/2018
Additional Info:	

HYDROGRAPHIC SURVEY
 U.S. ARMY ENGINEER DISTRICT
 CORPS OF ENGINEERS
 GALVESTON, TEXAS
 Bolivar Roads to Red Fish Light 1
Station: 138+476 to 78+844
HOUSTON
 HOUSTON, TEXAS

Houston Ship Channel: Bolivar Roads to Red Fish Light 1



U.S. Army Corps of Engineers
Galveston District

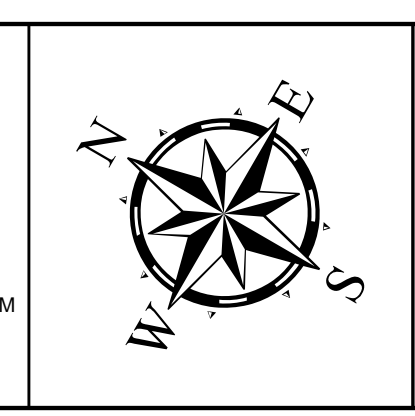


Survey Date(s): 11 May 2018	Authorized Depth: -46ft.
Page: 3 of 56	Side Slope Ratio: (Rise : Run)
Scale: 1:2,400	Additional Imagery: © DigitalGlobe Inc.
Mapped by: MSAOX PAC	Print Date: 5/30/2018
Additional Info:	

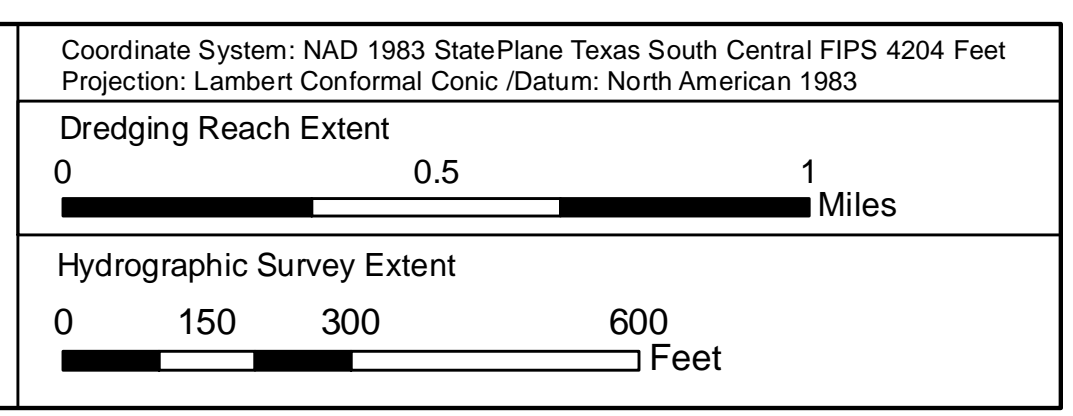
Channel Features	Aids to Navigation	MLLW
Channel Toe	Lights	0 - 30
Channel Center Line	Red Side Aids	30 - 35
Channel Station Lines	Green Side Aids	35 - 40
Channel Dimensions	Mooring Buoy	40 - 42
		42 - 44
		44 - 46
		46 - 48
		48 - 50
		50 >
		NOAA Bathymetry (DREDGING REACH EXTENT)
		0 - 10
		10 - 15
		15 - 20
		20 - 25
		25 - 30
		30 - 50

NOTES:

- HORIZONTAL COORDINATES ARE REFERENCED TO TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE NAD83 US SURVEY FEET.
- ELEVATIONS ARE REFERENCED TO MEAN LOWER LOW TIDE (MLLW) DATUM.
- THIS PROJECT WAS DESIGNED BY THE GALVESTON DISTRICT OF THE U.S. ARMY CORPS OF ENGINEERS. THE INITIALS AND SIGNATURES AND REGISTRATION DESIGNATIONS OF INDIVIDUALS APPEAR ON THESE PROJECT DOCUMENTS WITHIN THE SCOPE OF THEIR EMPLOYMENT AS REQUIRED BY ER1110-1-8152.
- THE INFORMATION DEPICTED ON THIS SURVEY MAP REPRESENTS THE RESULTS OF SURVEYS MADE ON THE DATES INDICATED AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITIONS EXISTING AT THAT TIME. THESE CONDITIONS ARE SUBJECT TO RAPID CHANGE DUE TO SHOALING EVENTS. A PRUDENT MARINER SHOULD NOT RELY EXCLUSIVELY ON THE INFORMATION PROVIDED HERE. REQUIRED BY 33 CFR 209.325
- FOR THE MOST UP TO DATE INFORMATION PLEASE CHECK OUR WEBSITE AT: [HTTP://WWW.SWG.USACE.ARMY.MIL/MISSIONS/NAVIGATION/HYDROGRAPHICS/SURVEYS/](http://www.swg.usace.army.mil/missions/navigation/hydrographics/surveys/)
- NOAA BATHYMETRY CONTOURS PRODUCED FROM HISTORIC BATHYMETRIC (HYDROGRAPHIC) SURVEYS CONDUCTED BY THE NOAA NATIONAL OCEAN SERVICE COAST SURVEY, AVAILABLE FROM THE NATIONAL GEOPHYSICAL DATA CENTER. SURVEYS VARY AS TO SOUNDING DENSITY, ACCURACY OF DEPTH, ACCURACY OF NAVIGATION, ZERO DATUM, DATE OF SURVEY AND TYPE OF INSTRUMENTATION.



Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



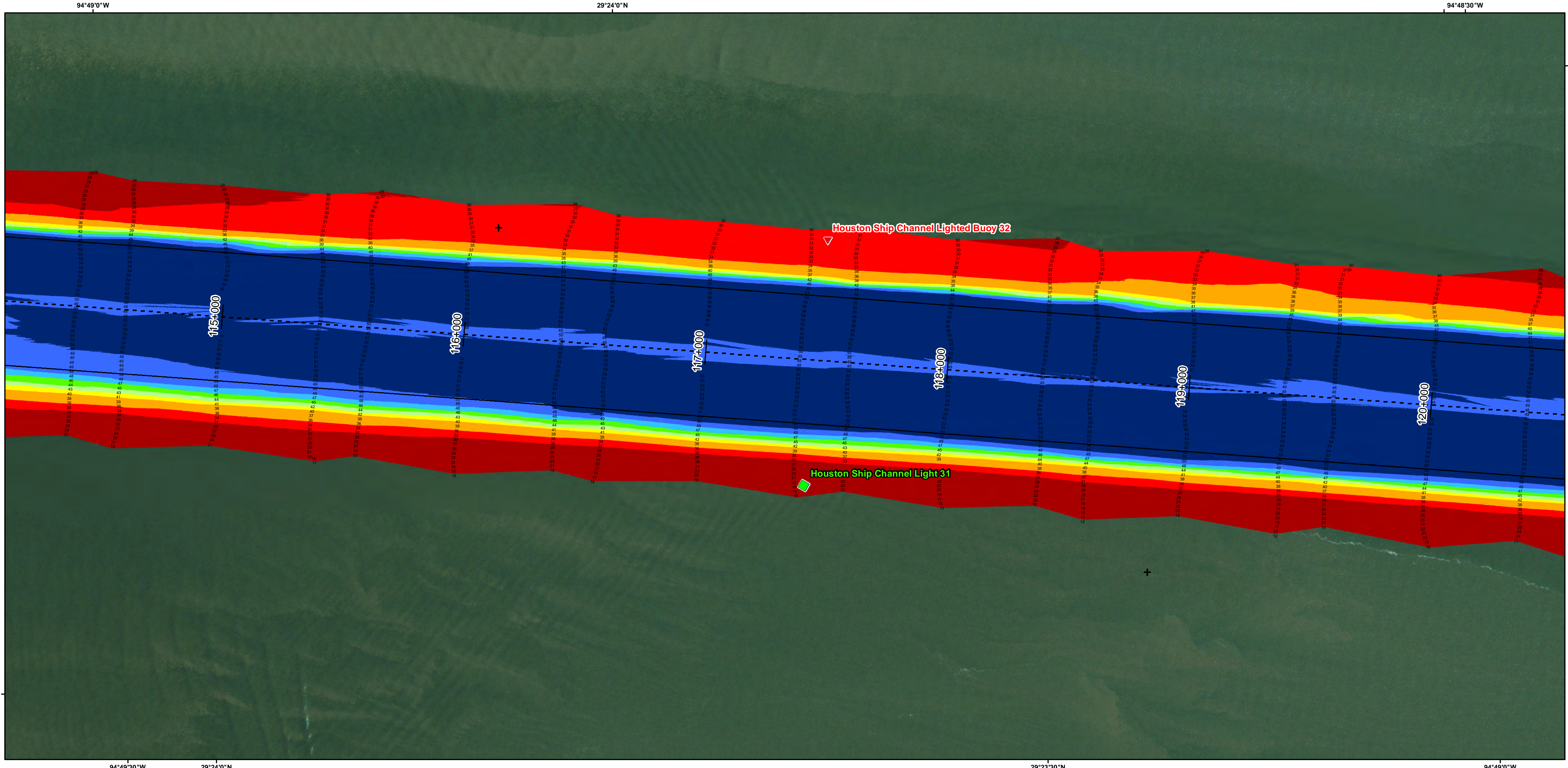
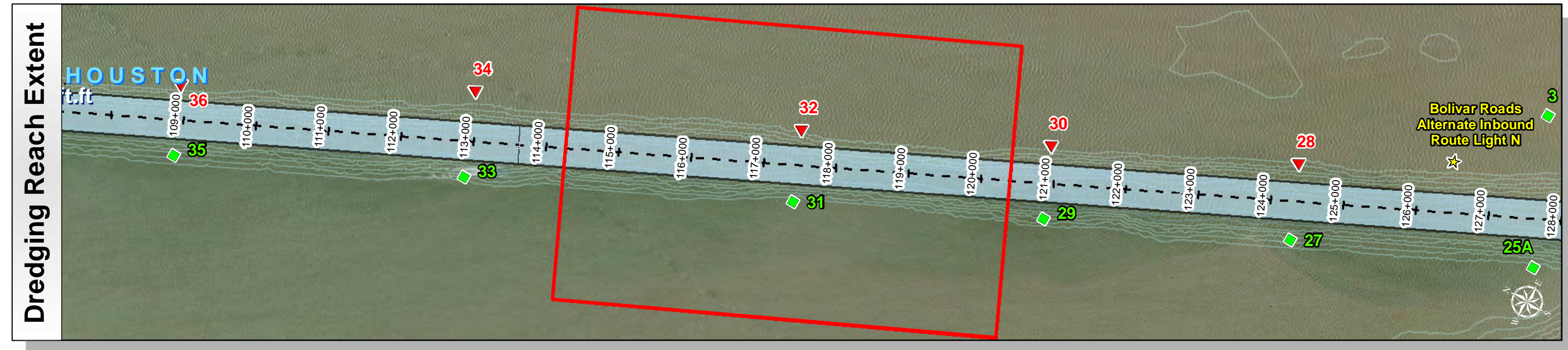
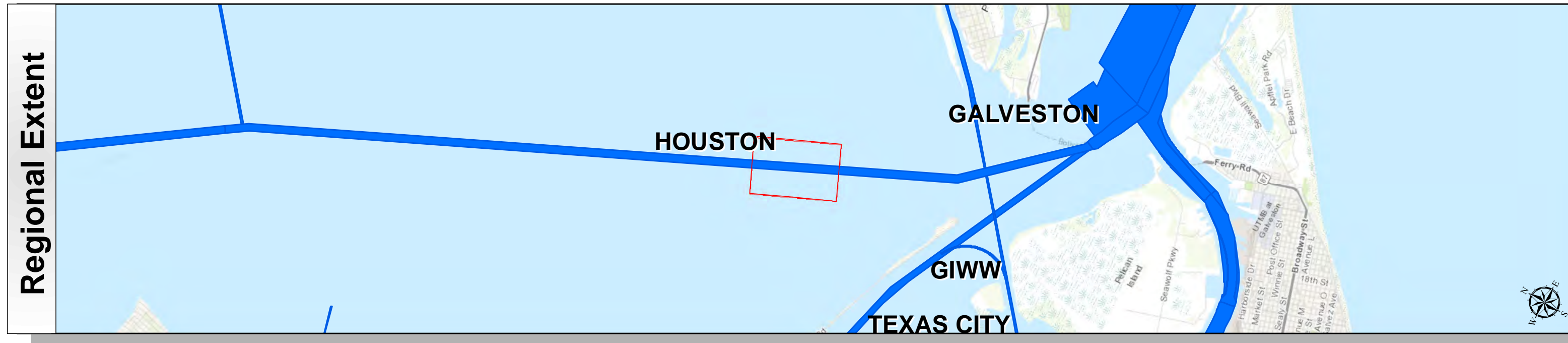
HYDROGRAPHIC SURVEY
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
GALVESTON, TEXAS
Bolivar Roads to Red Fish Light 1

Station: 138+476 to 78+844
HOUSTON
HOUSTON, TEXAS

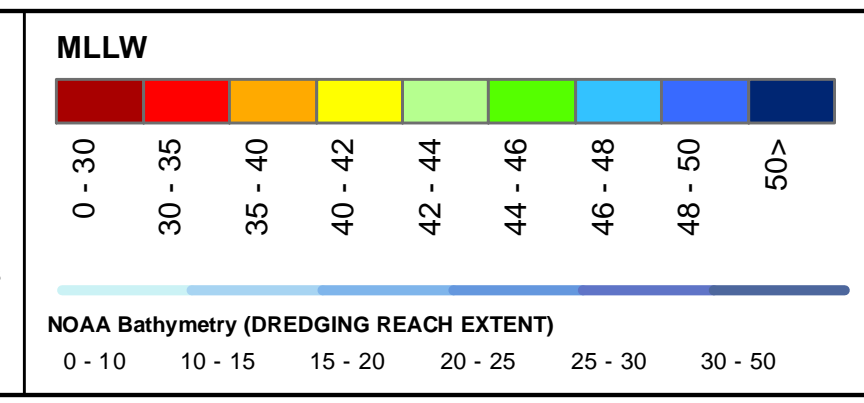
Houston Ship Channel: Bolivar Roads to Red Fish Light 1



U.S. Army Corps of Engineers
Galveston District



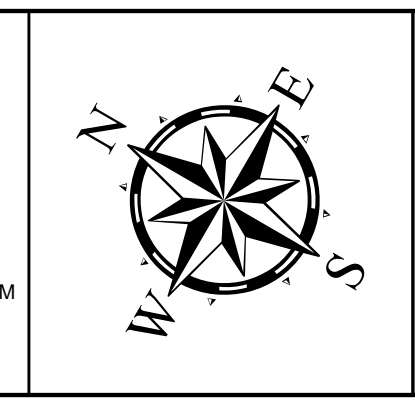
Channel Features	Aids to Navigation
— Channel Toe	★ Lights
- - - Channel Center Line	▲ Red Side Aids
— Channel Station Lines	■ Green Side Aids
↔ Channel Dimensions	◆ Mooring Buoy



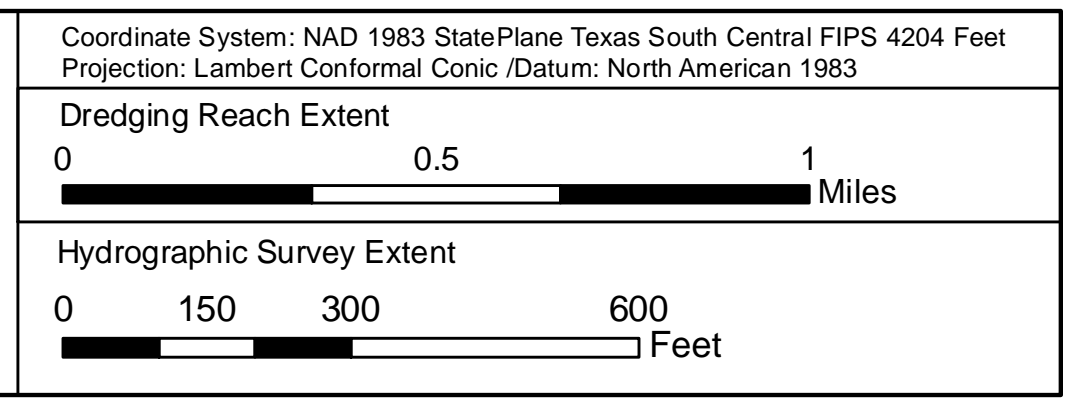
NOTES:

- HORIZONTAL COORDINATES ARE REFERENCED TO TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE NAD83 US SURVEY FEET.
- ELEVATIONS ARE REFERENCED TO MEAN LOWER LOW TIDE (MLLW) DATUM.
- THIS PROJECT WAS DESIGNED BY THE GALVESTON DISTRICT OF THE U.S. ARMY CORPS OF ENGINEERS. THE INITIALS AND SIGNATURES AND REGISTRATION DESIGNATIONS OF INDIVIDUALS APPEAR ON THESE PROJECT DOCUMENTS WITHIN THE SCOPE OF THEIR EMPLOYMENT AS REQUIRED BY ER1110-1-8152.

- THE INFORMATION DEPICTED ON THIS SURVEY MAP REPRESENTS THE RESULTS OF SURVEYS MADE ON THE DATES INDICATED AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITIONS EXISTING AT THAT TIME. THESE CONDITIONS ARE SUBJECT TO RAPID CHANGE DUE TO SHOALING EVENTS. A PRUDENT MARINER SHOULD NOT RELY EXCLUSIVELY ON THE INFORMATION PROVIDED HERE. REQUIRED BY 33 CFR 209.325
- FOR THE MOST UP TO DATE INFORMATION PLEASE CHECK OUR WEBSITE AT: [HTTP://WWW.SWG.USACE.ARMY.MIL/MISSIONS/NAVIGATION/HYDROGRAPHICSURVEYS/](http://www.swg.usace.army.mil/missions/navigation/hydrographicsurveys/)
- NOAA BATHYMETRY CONTOURS PRODUCED FROM HISTORIC BATHYMETRIC (HYDROGRAPHIC) SURVEYS CONDUCTED BY THE NOAA NATIONAL OCEAN SERVICE COAST SURVEY, AVAILABLE FROM THE NATIONAL GEOPHYSICAL DATA CENTER. SURVEYS VARY AS TO SOUNDING DENSITY, ACCURACY OF DEPTH, ACCURACY OF NAVIGATION, ZERO DATUM, DATE OF SURVEY AND TYPE OF INSTRUMENTATION.



Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community
 Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



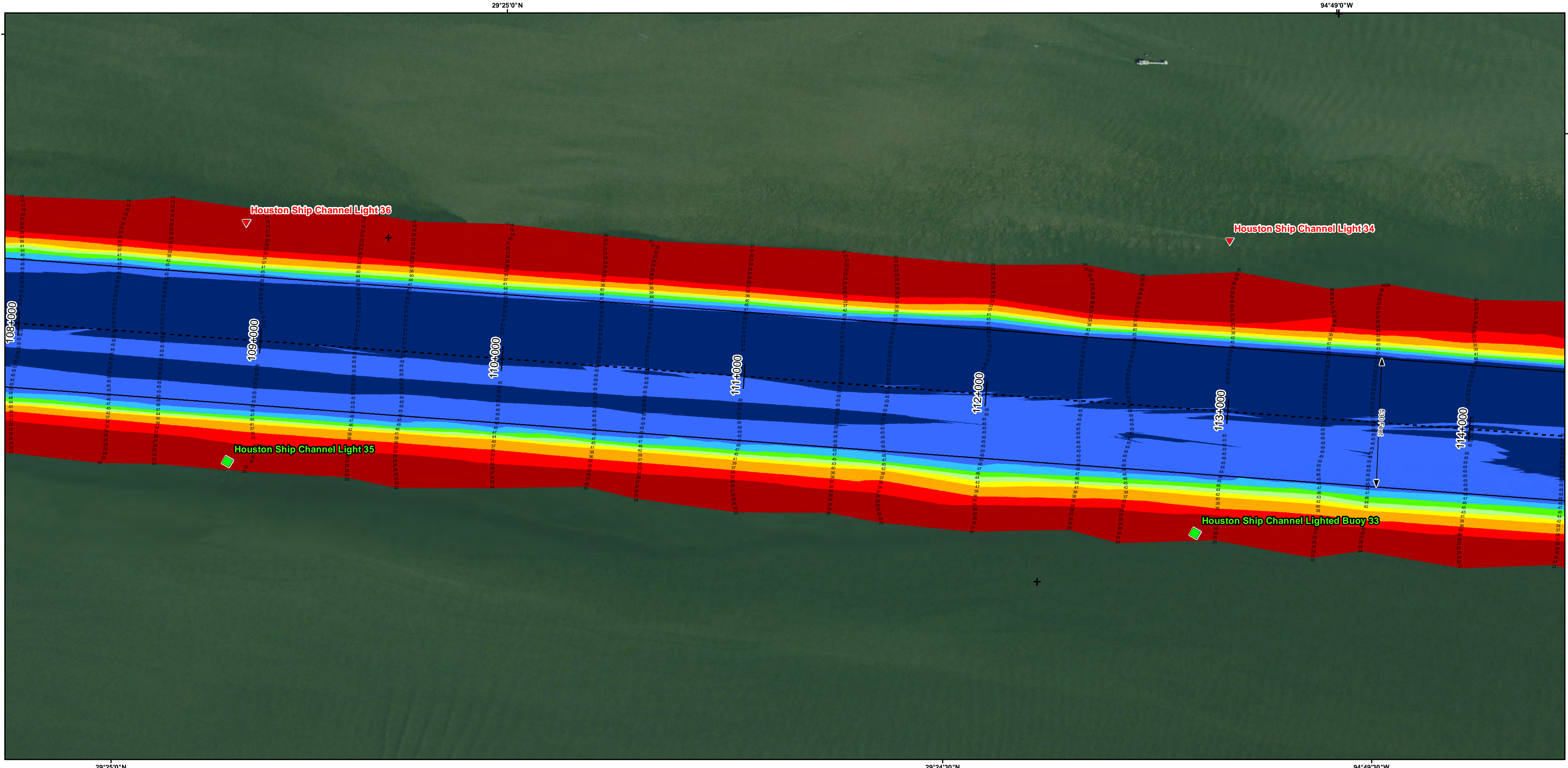
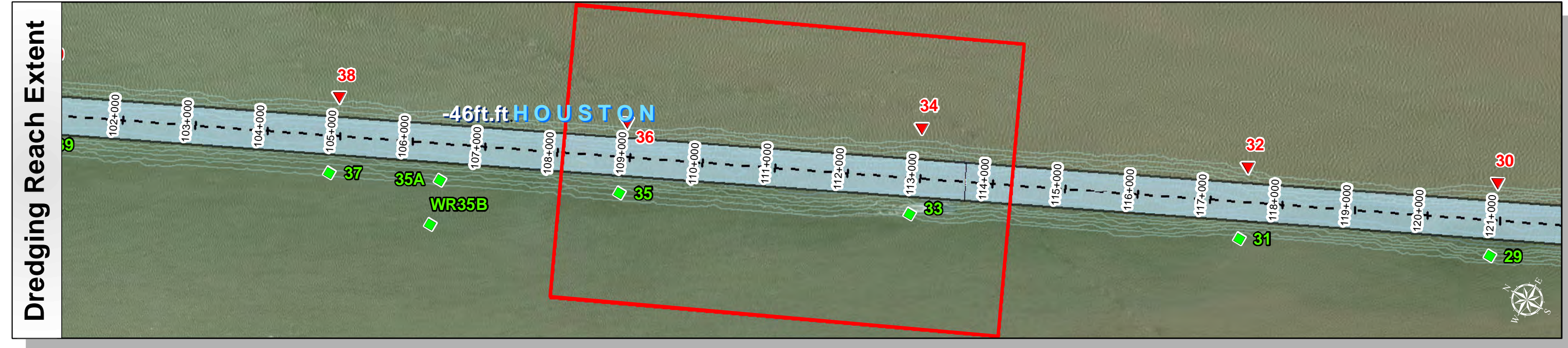
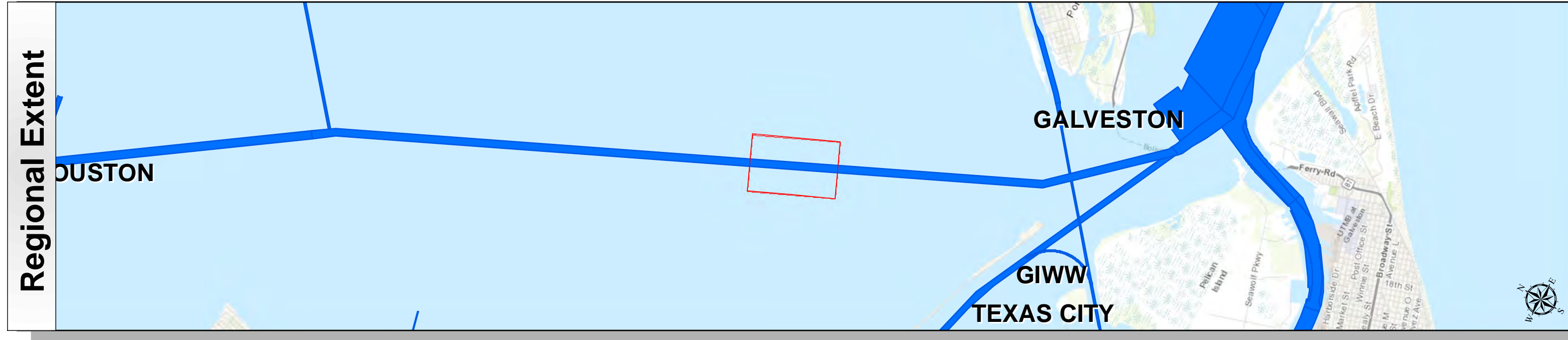
Survey Date(s): 11 May 2018	Authorized Depth: -46ft.
Page: 4 of 56	Side Slope Ratio: (Rise : Run)
Scale: 1:2,400	Map: Additional Imagery: © DigitalGlobe Inc.
Mapped by: M3A0XPAC	Print Date: 5/30/2018
Additional Info:	

HYDROGRAPHIC SURVEY
 U.S. ARMY ENGINEER DISTRICT
 CORPS OF ENGINEERS
 GALVESTON, TEXAS
 Bolivar Roads to Red Fish Light 1
Station: 138+476 to 78+844
HOUSTON
 HOUSTON, TEXAS

Houston Ship Channel: Bolivar Roads to Red Fish Light 1



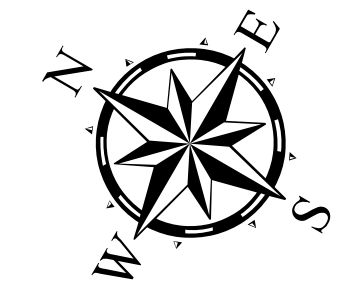
U.S. Army Corps of Engineers
Galveston District



Channel Features	Aids to Navigation	MLLW
— Channel Toe	★ Lights	0 - 30
- - - Channel Center Line	▲ Red Side Aids	30 - 35
— Channel Station Lines	■ Green Side Aids	35 - 40
↔ Channel Dimensions	◆ Mooring Buoy	40 - 42
		42 - 44
		44 - 46
		46 - 48
		48 - 50
		50 >
		NOAA Bathymetry (DREDGING REACH EXTENT)
		0 - 10
		10 - 15
		15 - 20
		20 - 25
		25 - 30
		30 - 50

NOTES:
 1. HORIZONTAL COORDINATES ARE REFERENCED TO TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE NAD83 US SURVEY FEET.
 2. ELEVATIONS ARE REFERENCED TO MEAN LOWER LOW TIDE (MLLW) DATUM.
 3. THIS PROJECT WAS DESIGNED BY THE GALVESTON DISTRICT OF THE U.S. ARMY CORPS OF ENGINEERS. THE INITIALS AND SIGNATURES AND REGISTRATION DESIGNATIONS OF INDIVIDUALS APPEAR ON THESE PROJECT DOCUMENTS WITHIN THE SCOPE OF THEIR EMPLOYMENT AS REQUIRED BY ER1110-1815Z.

4. THE INFORMATION DEPICTED ON THIS SURVEY MAP REPRESENTS THE RESULTS OF SURVEYS MADE ON THE DATES INDICATED AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITIONS EXISTING AT THAT TIME. THESE CONDITIONS ARE SUBJECT TO RAPID CHANGE DUE TO SHOALING EVENTS. A PRUDENT MARINER SHOULD NOT RELY EXCLUSIVELY ON THE INFORMATION PROVIDED HERE. REQUIRED BY 33 CFR 209.325
 5. FOR THE MOST UP TO DATE INFORMATION PLEASE CHECK OUR WEBSITE AT: [HTTP://WWW.SWG.USACE.ARMY.MIL/MISSIONS/NAVIGATION/HYDROGRAPHICS/SURVEYS/](http://www.swg.usace.army.mil/missions/navigation/hydrographics/surveys/)
 6. NOAA BATHYMETRY CONTOURS PRODUCED FROM HISTORIC BATHYMETRIC (HYDROGRAPHIC) SURVEYS CONDUCTED BY THE NOAA NATIONAL OCEAN SERVICE COAST SURVEY, AVAILABLE FROM THE NATIONAL GEOPHYSICAL DATA CENTER. SURVEYS VARY AS TO SOUNDING DENSITY, ACCURACY OF DEPTH, ACCURACY OF NAVIGATION, ZERO DATUM, DATE OF SURVEY AND TYPE OF INSTRUMENTATION.



Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community
 Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Coordinate System: NAD 1983 StatePlane Texas South Central FIPS 4204 Feet Projection: Lambert Conformal Conic /Datum: North American 1983
Dredging Reach Extent 0 0.5 1 Miles
Hydrographic Survey Extent 0 150 300 600 Feet

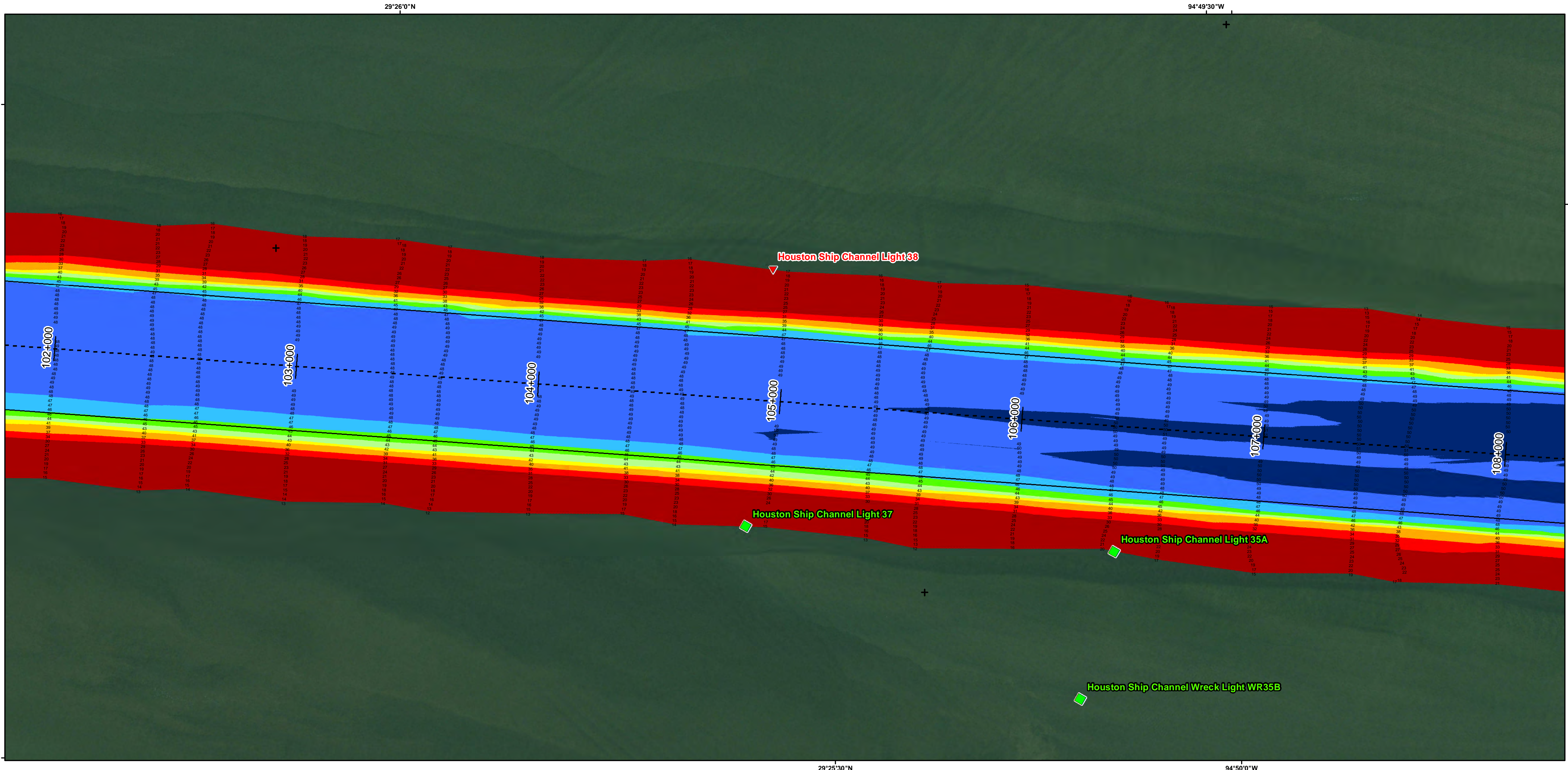
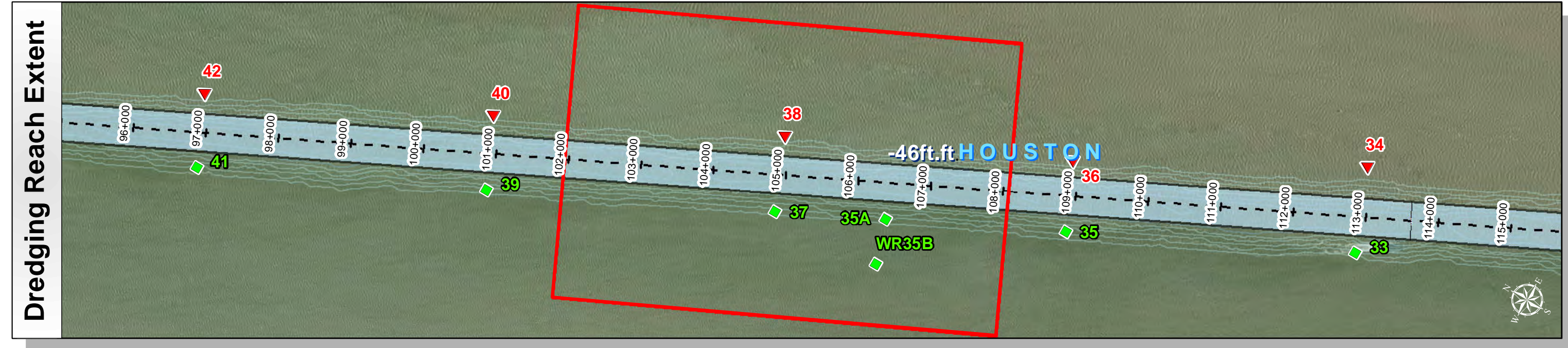
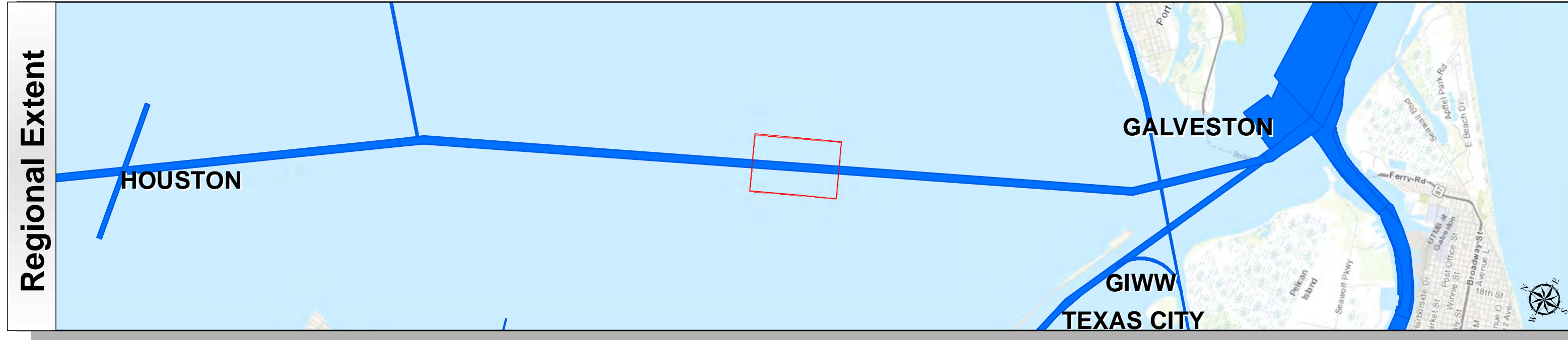
Survey Date(s): 11 May 2018	Authorized Depth: -46ft.
Page: 5 of 56	Side Slope Ratio: (Rise : Run)
Scale: 1:2,400	Additional Imagery: © DigitalGlobe Inc.
Mapped by: MSAOX PAC	Print Date: 5/30/2018
Additional Info:	

HYDROGRAPHIC SURVEY
 U.S. ARMY ENGINEER DISTRICT
 CORPS OF ENGINEERS
 GALVESTON, TEXAS
 Bolivar Roads to Red Fish Light 1
Station: 138+476 to 78+844
HOUSTON
 HOUSTON, TEXAS

Houston Ship Channel: Bolivar Roads to Red Fish Light 1



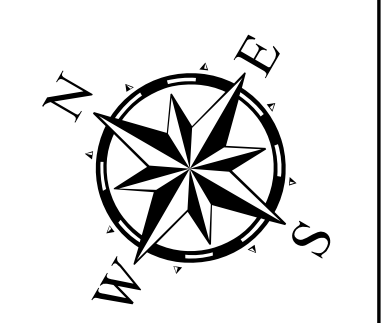
U.S. Army Corps of Engineers
Galveston District



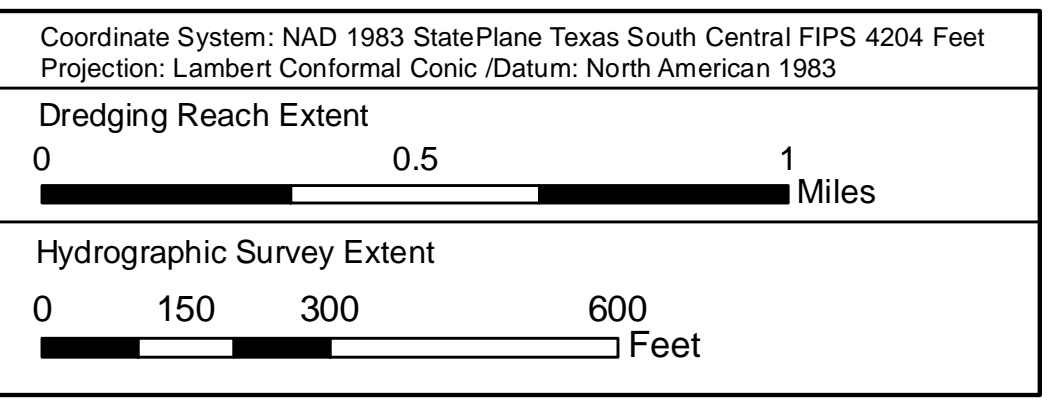
Channel Features	Aids to Navigation	MLLW
— Channel Toe	★ Lights	0 - 30
- - - Channel Center Line	▲ Red Side Aids	30 - 35
— Channel Station Lines	■ Green Side Aids	35 - 40
↔ Channel Dimensions	◆ Mooring Buoy	40 - 42
		42 - 44
		44 - 46
		46 - 48
		48 - 50
		50 >
		NOAA Bathymetry (DREDGING REACH EXTENT)
		0 - 10 10 - 15 15 - 20 20 - 25 25 - 30 30 - 50

NOTES:
 1. HORIZONTAL COORDINATES ARE REFERENCED TO TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE NAD83 US SURVEY FEET.
 2. ELEVATIONS ARE REFERENCED TO MEAN LOWER LOW TIDE (MLLW) DATUM.
 3. THIS PROJECT WAS DESIGNED BY THE GALVESTON DISTRICT OF THE U.S. ARMY CORPS OF ENGINEERS. THE INITIALS AND SIGNATURES AND REGISTRATION DESIGNATIONS OF INDIVIDUALS APPEAR ON THESE PROJECT DOCUMENTS WITHIN THE SCOPE OF THEIR EMPLOYMENT AS REQUIRED BY ER1110-1-8152.

4. THE INFORMATION DEPICTED ON THIS SURVEY MAP REPRESENTS THE RESULTS OF SURVEYS MADE ON THE DATES INDICATED AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITIONS EXISTING AT THAT TIME. THESE CONDITIONS ARE SUBJECT TO RAPID CHANGE DUE TO SHOALING EVENTS. A PRUDENT MARINER SHOULD NOT RELY EXCLUSIVELY ON THE INFORMATION PROVIDED HERE. REQUIRED BY 33 CFR 209.325
 5. FOR THE MOST UP TO DATE INFORMATION PLEASE CHECK OUR WEBSITE AT: [HTTP://WWW.SWG.USACE.ARMY.MIL/MISSIONS/NAVIGATION/HYDROGRAPHIC/SURVEYS/](http://www.swg.usace.army.mil/missions/navigation/hydrographic/surveys/)
 6. NOAA BATHYMETRY CONTOURS PRODUCED FROM HISTORIC BATHYMETRIC (HYDROGRAPHIC) SURVEYS CONDUCTED BY THE NOAA NATIONAL OCEAN SERVICE COAST SURVEY, AVAILABLE FROM THE NATIONAL GEOPHYSICAL DATA CENTER. SURVEYS VARY AS TO SOUNDING DENSITY, ACCURACY OF DEPTH, ACCURACY OF NAVIGATION, ZERO DATUM, DATE OF SURVEY AND TYPE OF INSTRUMENTATION.



Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community
 Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



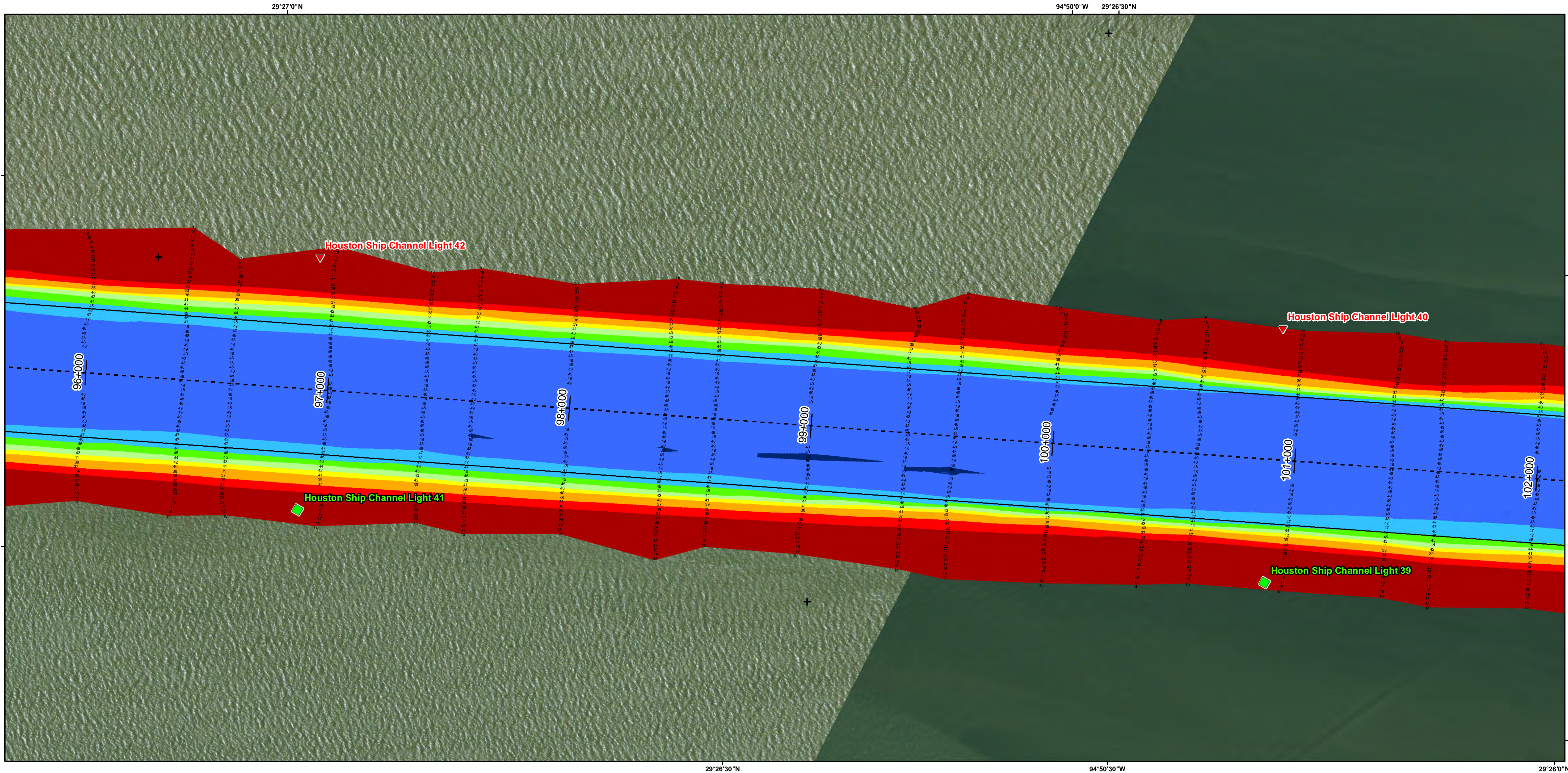
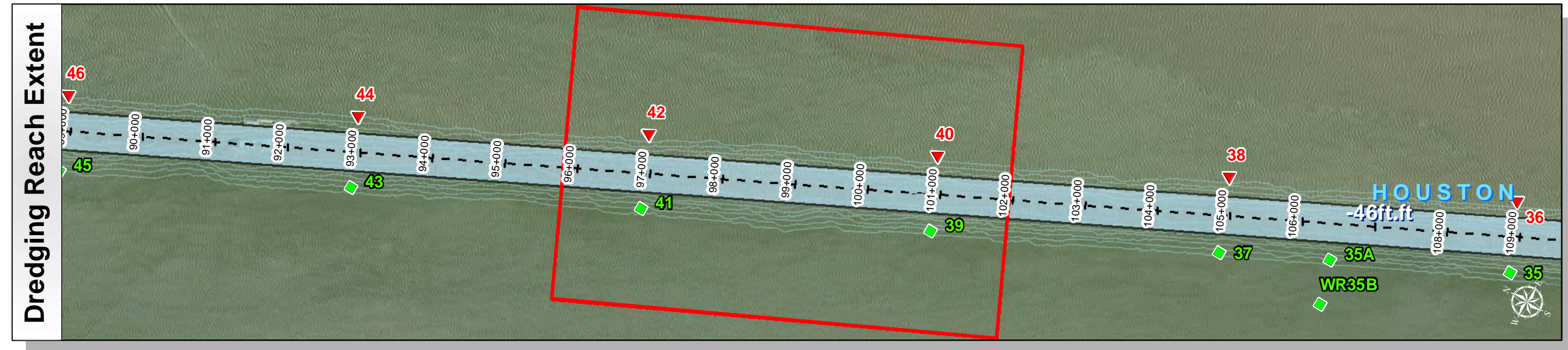
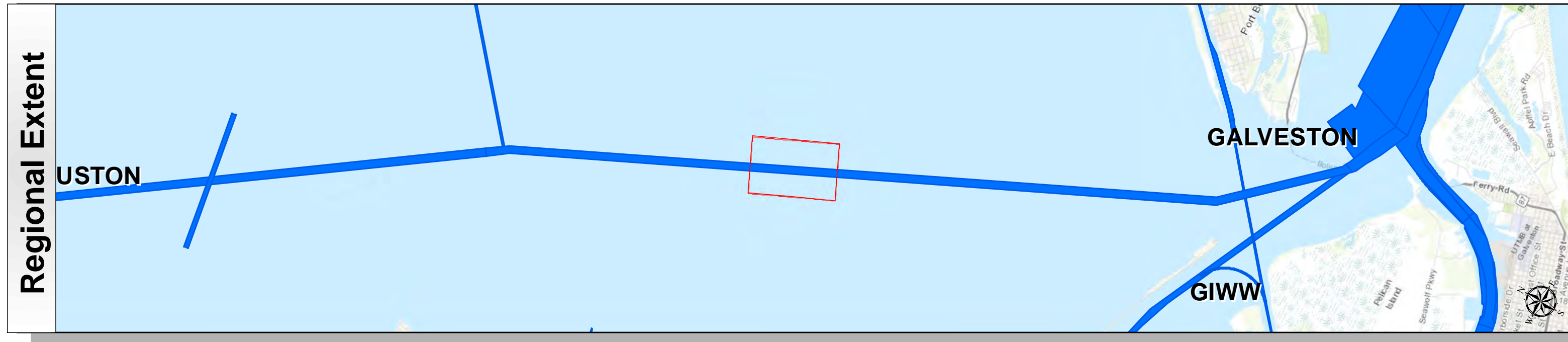
Survey Date(s): 11 May 2018	Authorized Depth: -46ft.
Page: 6 of 56	Side Slope Ratio: (Rise : Run)
Scale: 1:2,400	Additional Imagery: © DigitalGlobe Inc.
Mapped by: MSAOX PAC	Print Date: 5/30/2018
Additional Info :	

HYDROGRAPHIC SURVEY
 U.S. ARMY ENGINEER DISTRICT
 CORPS OF ENGINEERS
 GALVESTON, TEXAS
 Bolivar Roads to Red Fish Light 1
Station: 138+476 to 78+844
HOUSTON
 HOUSTON, TEXAS

Houston Ship Channel: Bolivar Roads to Red Fish Light 1



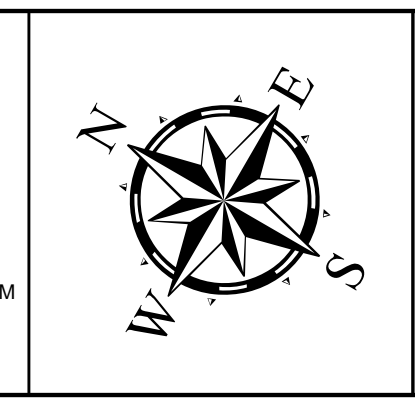
U.S. Army Corps of Engineers
Galveston District



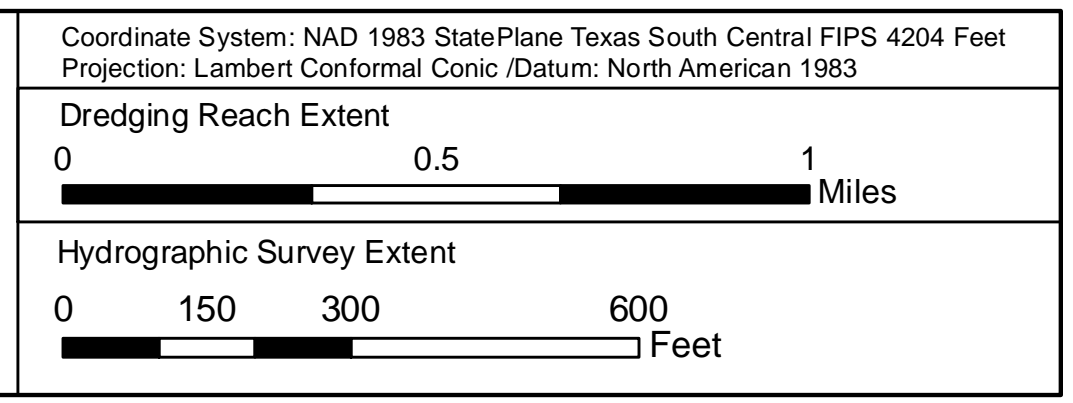
Channel Features	Aids to Navigation	MLLW
— Channel Toe	★ Lights	0 - 30
- - - Channel Center Line	▲ Red Side Aids	30 - 35
— Channel Station Lines	■ Green Side Aids	35 - 40
↔ Channel Dimensions	◆ Mooring Buoy	40 - 42
		42 - 44
		44 - 46
		46 - 48
		48 - 50
		50+
		NOAA Bathymetry (DREDGING REACH EXTENT)
		0 - 10 10 - 15 15 - 20 20 - 25 25 - 30 30 - 50

NOTES:
 1. HORIZONTAL COORDINATES ARE REFERENCED TO TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE NAD83 US SURVEY FEET.
 2. ELEVATIONS ARE REFERENCED TO MEAN LOWER LOW TIDE (MLLW) DATUM.
 3. THIS PROJECT WAS DESIGNED BY THE GALVESTON DISTRICT OF THE U.S. ARMY CORPS OF ENGINEERS. THE INITIALS AND SIGNATURES AND REGISTRATION DESIGNATIONS OF INDIVIDUALS APPEAR ON THESE PROJECT DOCUMENTS WITHIN THE SCOPE OF THEIR EMPLOYMENT AS REQUIRED BY ER1110-1-8152.

4. THE INFORMATION DEPICTED ON THIS SURVEY MAP REPRESENTS THE RESULTS OF SURVEYS MADE ON THE DATES INDICATED AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITIONS EXISTING AT THAT TIME. THESE CONDITIONS ARE SUBJECT TO RAPID CHANGE DUE TO SHOALING EVENTS. A PRUDENT MARINER SHOULD NOT RELY EXCLUSIVELY ON THE INFORMATION PROVIDED HERE. REQUIRED BY 33 CFR 209.325
 5. FOR THE MOST UP TO DATE INFORMATION PLEASE CHECK OUR WEBSITE AT: [HTTP://WWW.SWG.USACE.ARMY.MIL/MISSIONS/NAVIGATION/HYDROGRAPHIC/SURVEYS/](http://www.swg.usace.army.mil/missions/navigation/hydrographic/surveys/)
 6. NOAA BATHYMETRY CONTOURS PRODUCED FROM HISTORIC BATHYMETRIC (HYDROGRAPHIC) SURVEYS CONDUCTED BY THE NOAA NATIONAL OCEAN SERVICE COAST SURVEY, AVAILABLE FROM THE NATIONAL GEOPHYSICAL DATA CENTER. SURVEYS VARY AS TO SOUNDING DENSITY, ACCURACY OF DEPTH, ACCURACY OF NAVIGATION, ZERO DATUM, DATE OF SURVEY AND TYPE OF INSTRUMENTATION.



Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community
 Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



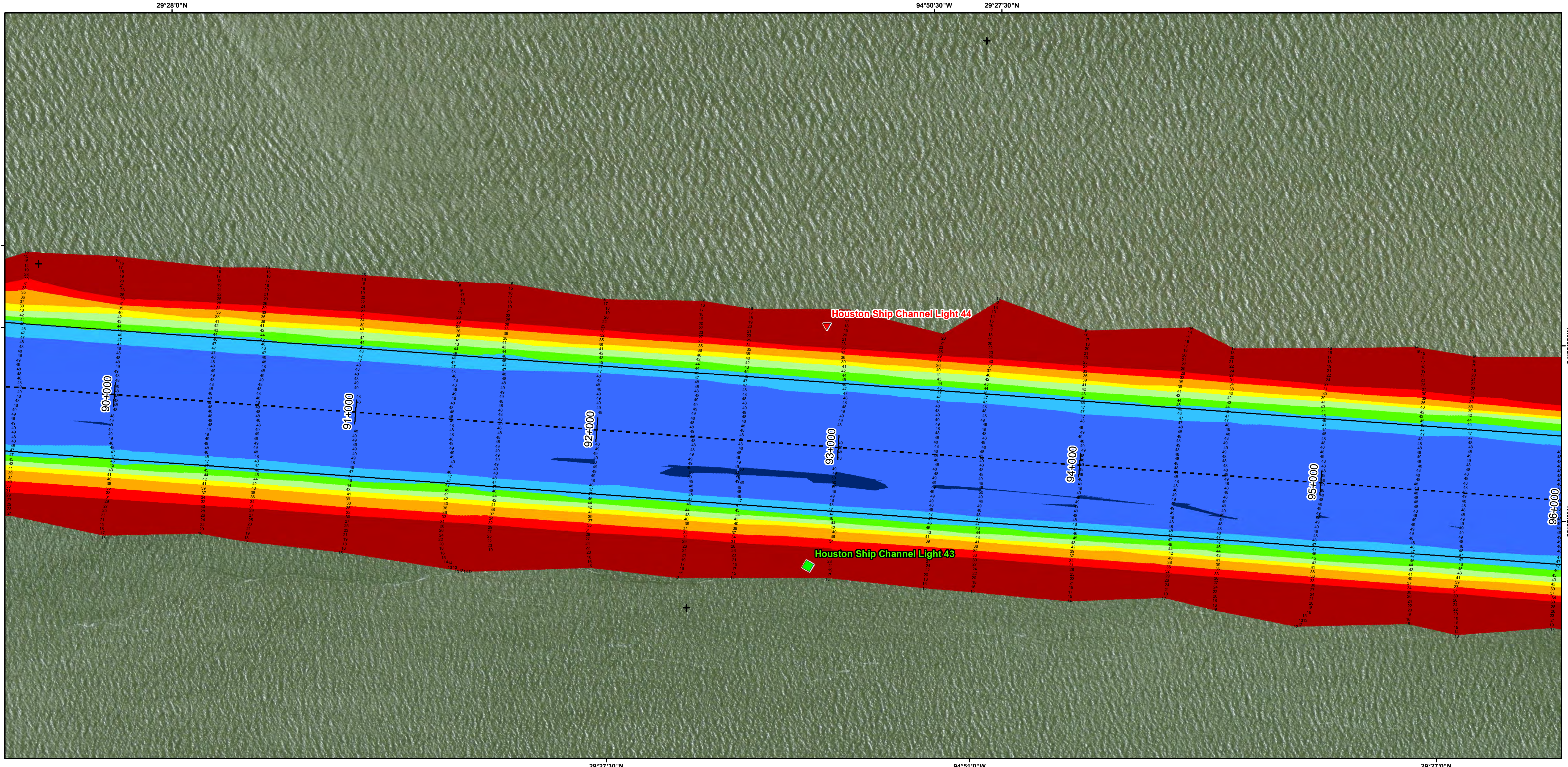
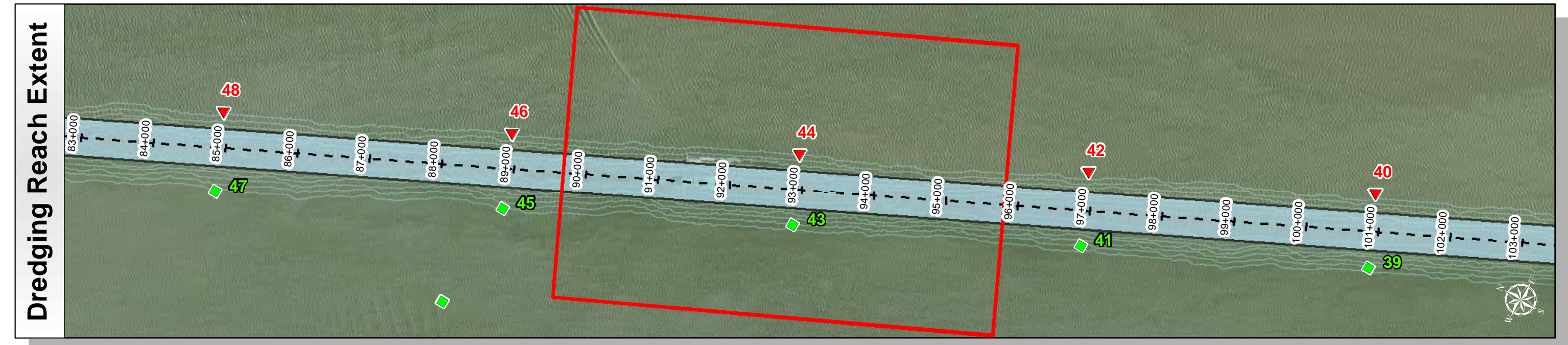
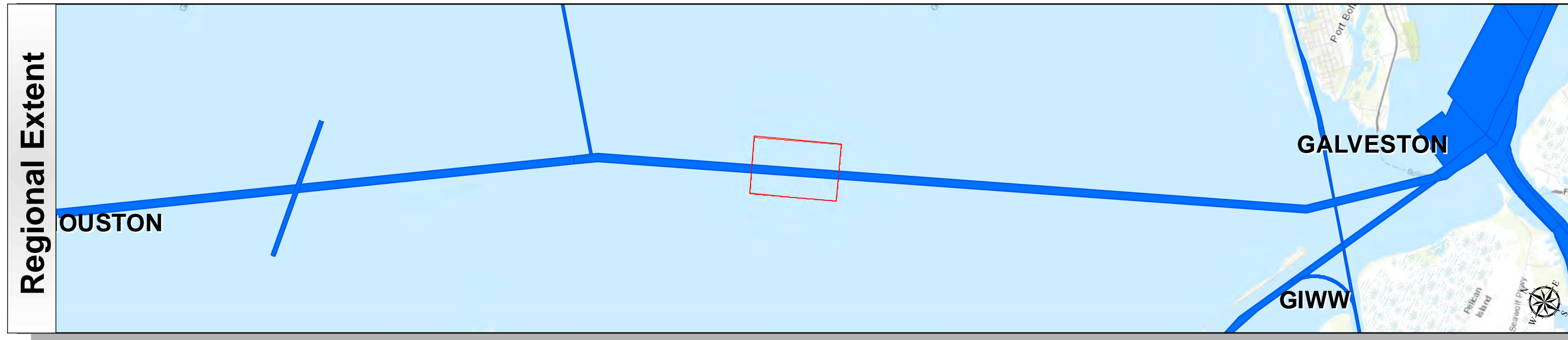
Survey Date(s): 11 May 2018	Authorized Depth: -46ft.
Page: 7 of 56	Side Slope Ratio: (Rise : Run)
Scale: 1:2,400	Additional Imagery: © DigitalGlobe Inc.
Mapped by: MSAOX PAC	Print Date: 5/30/2018
Additional Info :	

HYDROGRAPHIC SURVEY
 U.S. ARMY ENGINEER DISTRICT
 CORPS OF ENGINEERS
 GALVESTON, TEXAS
 Bolivar Roads to Red Fish Light 1
Station: 138+476 to 78+844
HOUSTON
 HOUSTON, TEXAS

Houston Ship Channel: Bolivar Roads to Red Fish Light 1



U.S. Army Corps of Engineers
Galveston District



Channel Features	Aids to Navigation	MLLW
— Channel Toe	★ Lights	0 - 30
- - - Channel Center Line	▲ Red Side Aids	30 - 35
— Channel Station Lines	■ Green Side Aids	35 - 40
↔ Channel Dimensions	◆ Mooring Buoy	40 - 42
		42 - 44
		44 - 46
		46 - 48
		48 - 50
		50 >
		NOAA Bathymetry (DREDGING REACH EXTENT)
		0 - 10 10 - 15 15 - 20 20 - 25 25 - 30 30 - 50

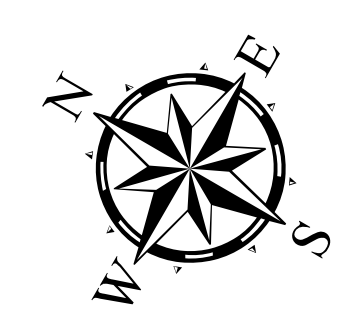
NOTES:

- HORIZONTAL COORDINATES ARE REFERENCED TO TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE NAD83 US SURVEY FEET.
- ELEVATIONS ARE REFERENCED TO MEAN LOWER LOW TIDE (MLLW) DATUM.
- THIS PROJECT WAS DESIGNED BY THE GALVESTON DISTRICT OF THE U.S. ARMY CORPS OF ENGINEERS. THE INITIALS AND SIGNATURES AND REGISTRATION DESIGNATIONS OF INDIVIDUALS APPEAR ON THESE PROJECT DOCUMENTS WITHIN THE SCOPE OF THEIR EMPLOYMENT AS REQUIRED BY ER1110-1-8152.

4. THE INFORMATION DEPICTED ON THIS SURVEY MAP REPRESENTS THE RESULTS OF SURVEYS MADE ON THE DATES INDICATED AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITIONS EXISTING AT THAT TIME. THESE CONDITIONS ARE SUBJECT TO RAPID CHANGE DUE TO SHOALING EVENTS. A PRUDENT MARINER SHOULD NOT RELY EXCLUSIVELY ON THE INFORMATION PROVIDED HERE. REQUIRED BY 33 CFR 209.325

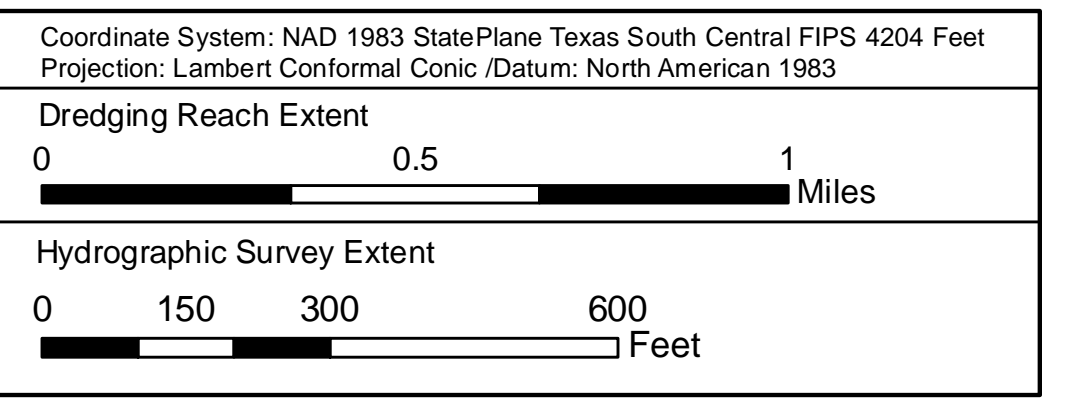
5. FOR THE MOST UP TO DATE INFORMATION PLEASE CHECK OUR WEBSITE AT: [HTTP://WWW.SWG.USACE.ARMY.MIL/MISSIONS/NAVIGATION/HYDROGRAPHIC-SURVEYS/](http://www.swg.usace.army.mil/missions/navigation/hydrographic-surveys/)

6. NOAA BATHYMETRY CONTOURS PRODUCED FROM HISTORIC BATHYMETRIC (HYDROGRAPHIC) SURVEYS CONDUCTED BY THE NOAA NATIONAL OCEAN SERVICE COAST SURVEY, AVAILABLE FROM THE NATIONAL GEOPHYSICAL DATA CENTER. SURVEYS VARY AS TO SOUNDING DENSITY, ACCURACY OF DEPTH, ACCURACY OF NAVIGATION, ZERO DATUM, DATE OF SURVEY AND TYPE OF INSTRUMENTATION.



Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Survey Date(s): 11 May 2018	Authorized Depth: -46ft.
Page: 8 of 56	Side Slope Ratio: (Rise : Run)
Scale: 1:2,400	Additional Imagery: © DigitalGlobe Inc.
Mapped by: M3A0XPAC	Print Date: 5/30/2018
Additional Info :	

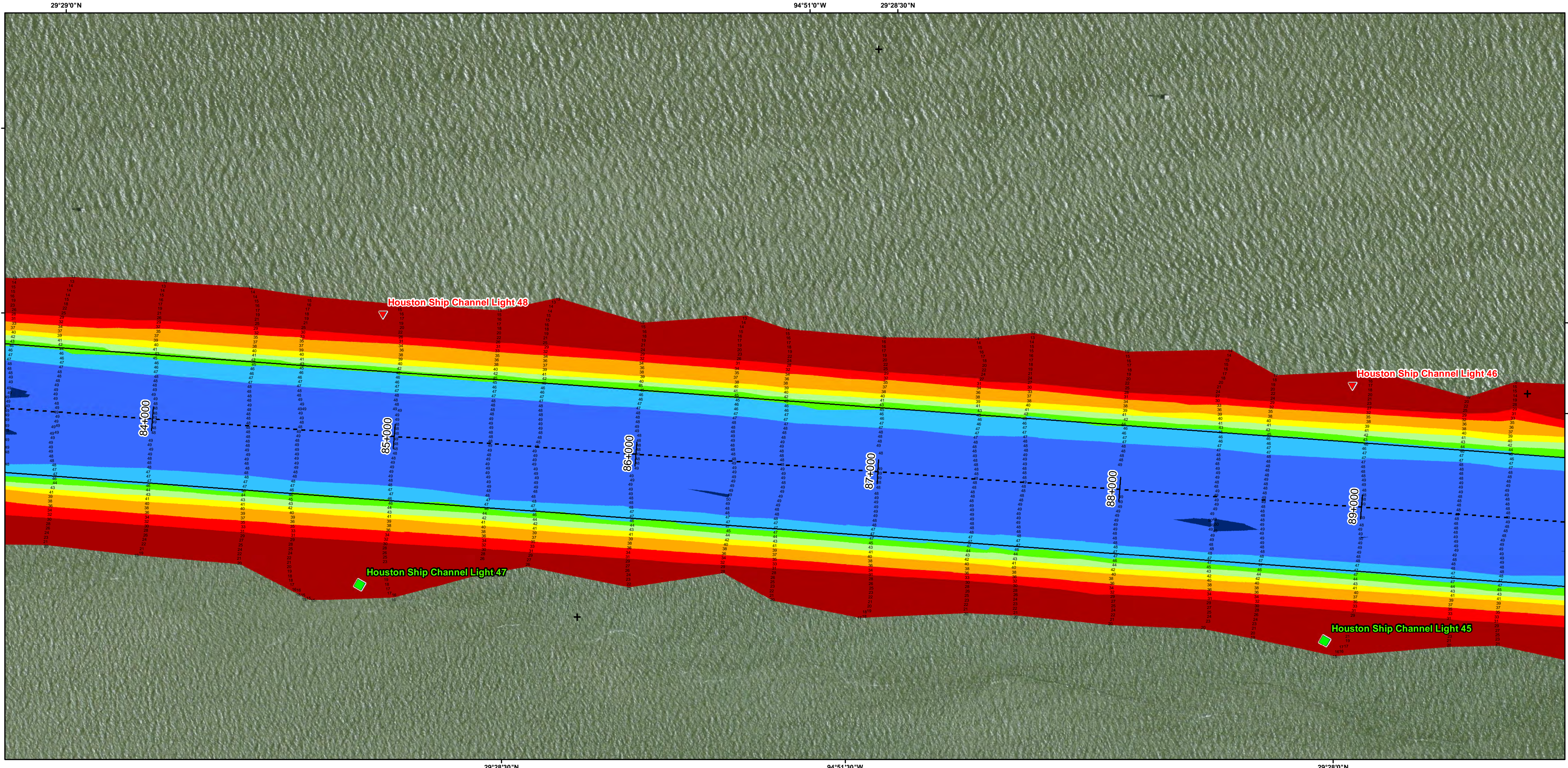
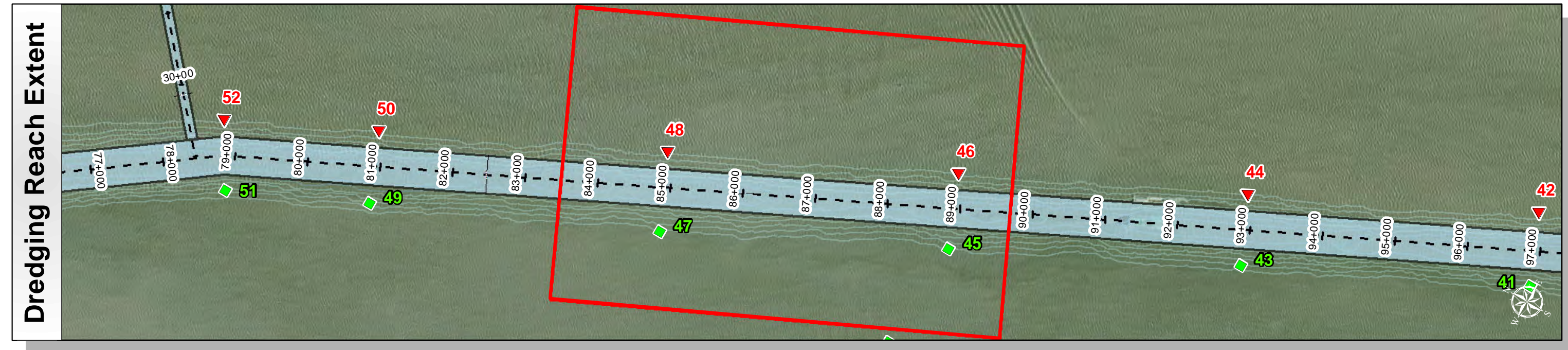
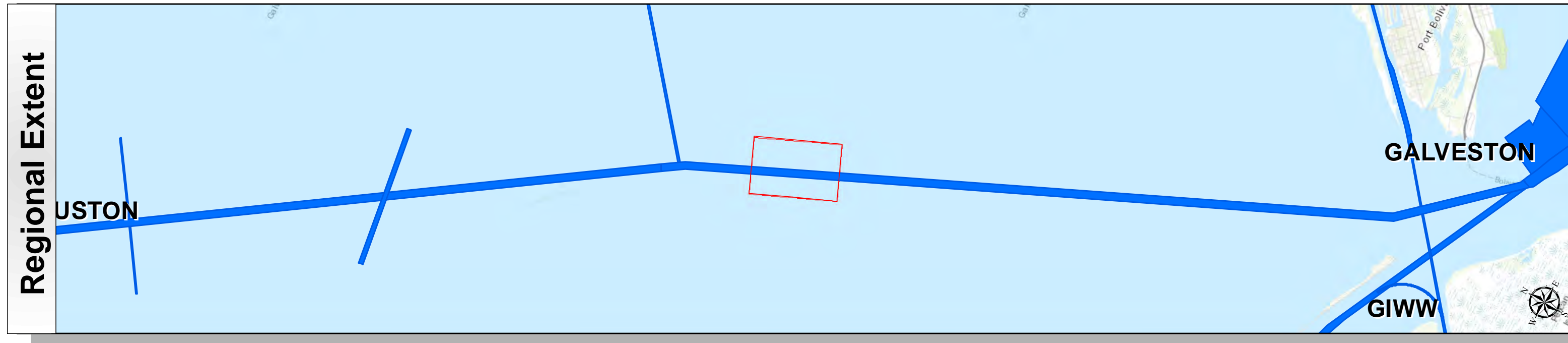
HYDROGRAPHIC SURVEY
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
GALVESTON, TEXAS
Bolivar Roads to Red Fish Light 1

Station: 138+476 to 78+844
HOUSTON
HOUSTON, TEXAS

Houston Ship Channel: Bolivar Roads to Red Fish Light 1



U.S. Army Corps of Engineers
Galveston District



Survey Date(s): 11 May 2018	Authorized Depth: -46ft.
Page: 9 of 56	Side Slope Ratio: (Rise : Run)
Scale: 1:2,400	Additional Imagery: © DigitalGlobe Inc.
Mapped by: MSAOX PAC	Print Date: 5/30/2018
Additional Info:	

Channel Features

- Channel Toe
- Channel Center Line
- Channel Station Lines
- Channel Dimensions

Aids to Navigation

- Lights
- Red Side Aids
- Green Side Aids
- Mooring Buoy

MLLW

0 - 30
30 - 35
35 - 40
40 - 42
42 - 44
44 - 46
46 - 48
48 - 50
50 >

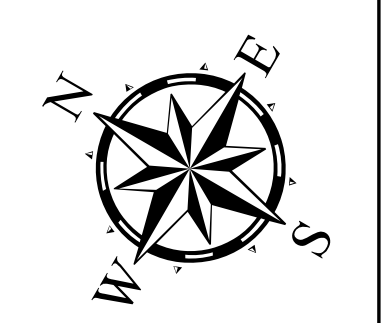
NOAA Bathymetry (DREDGING REACH EXTENT)

0 - 10 10 - 15 15 - 20 20 - 25 25 - 30 30 - 50

NOTES:

- HORIZONTAL COORDINATES ARE REFERENCED TO TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE NAD83 US SURVEY FEET.
- ELEVATIONS ARE REFERENCED TO MEAN LOWER LOW TIDE (MLLW) DATUM.
- THIS PROJECT WAS DESIGNED BY THE GALVESTON DISTRICT OF THE U.S. ARMY CORPS OF ENGINEERS. THE INITIALS AND SIGNATURES AND REGISTRATION DESIGNATIONS OF INDIVIDUALS APPEAR ON THESE PROJECT DOCUMENTS WITHIN THE SCOPE OF THEIR EMPLOYMENT AS REQUIRED BY ER1110-1-8152.

- THE INFORMATION DEPICTED ON THIS SURVEY MAP REPRESENTS THE RESULTS OF SURVEYS MADE ON THE DATES INDICATED AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITIONS EXISTING AT THAT TIME. THESE CONDITIONS ARE SUBJECT TO RAPID CHANGE DUE TO SHOALING EVENTS. A PRUDENT MARINER SHOULD NOT RELY EXCLUSIVELY ON THE INFORMATION PROVIDED HERE. REQUIRED BY 33 CFR 209.325
- FOR THE MOST UP TO DATE INFORMATION PLEASE CHECK OUR WEBSITE AT: [HTTP://WWW.SWG.USACE.ARMY.MIL/MISSIONS/NAVIGATION/HYDROGRAPHICSURVEYS/](http://www.swg.usace.army.mil/missions/navigation/hydrographicsurveys/)
- NOAA BATHYMETRY CONTOURS PRODUCED FROM HISTORIC BATHYMETRIC (HYDROGRAPHIC) SURVEYS CONDUCTED BY THE NOAA NATIONAL OCEAN SERVICE COAST SURVEY, AVAILABLE FROM THE NATIONAL GEOPHYSICAL DATA CENTER. SURVEYS VARY AS TO SOUNDING DENSITY, ACCURACY OF DEPTH, ACCURACY OF NAVIGATION, ZERO DATUM, DATE OF SURVEY AND TYPE OF INSTRUMENTATION.



Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Coordinate System: NAD 1983 StatePlane Texas South Central FIPS 4204 Feet
Projection: Lambert Conformal Conic /Datum: North American 1983

Dredging Reach Extent

0 0.5 1 Miles

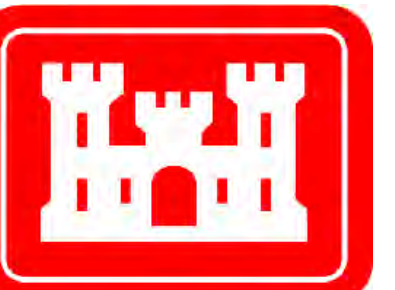
Hydrographic Survey Extent

0 150 300 600 Feet

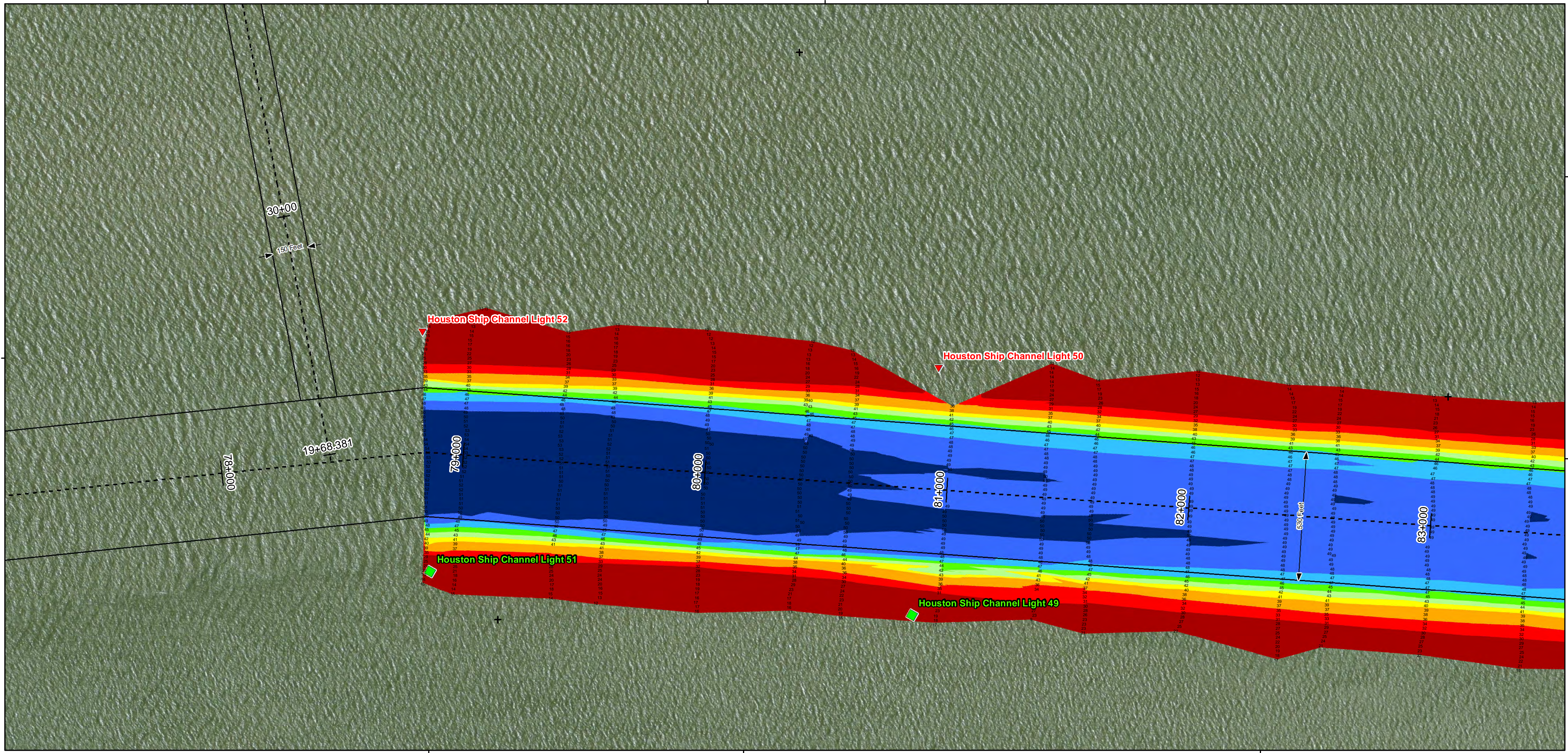
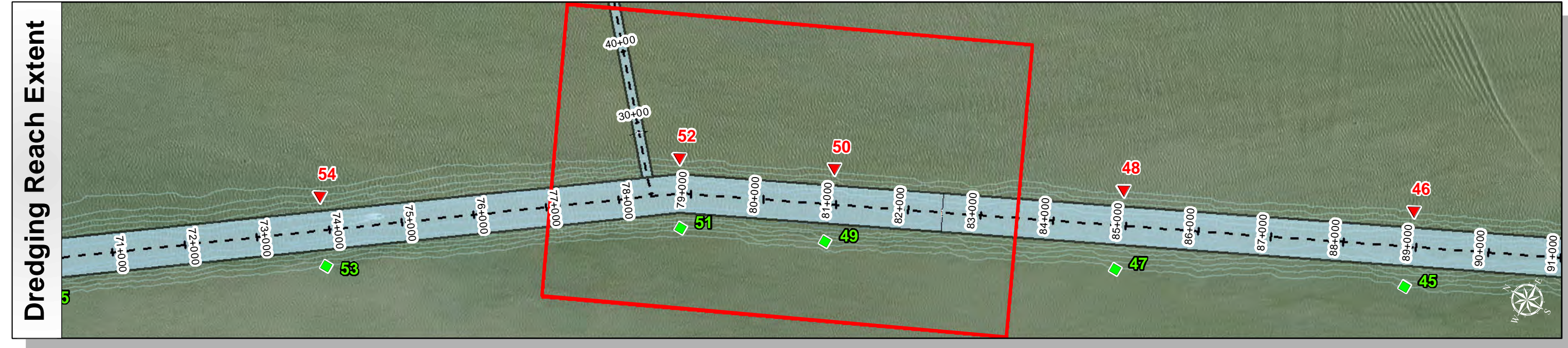
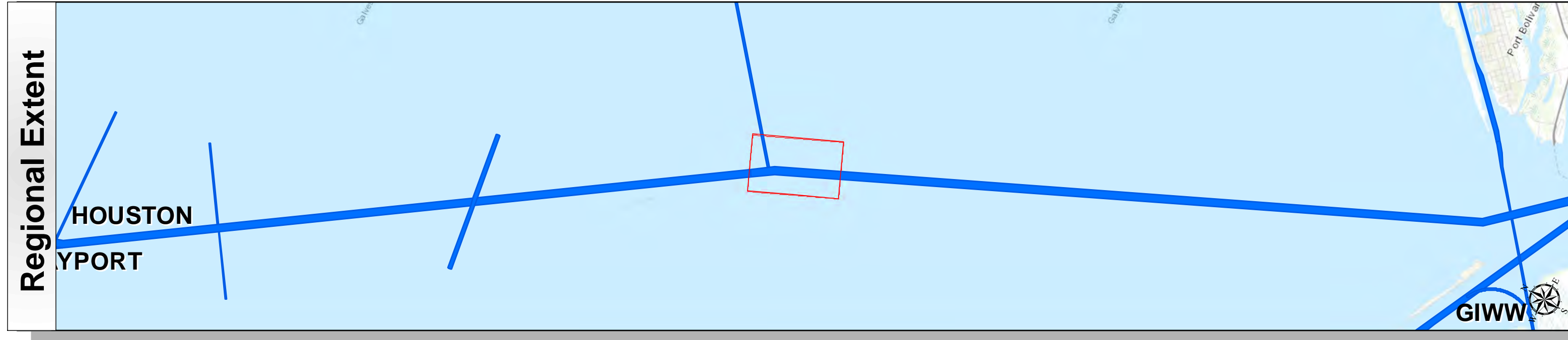
HYDROGRAPHIC SURVEY
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
GALVESTON, TEXAS
Bolivar Roads to Red Fish Light 1

Station: 138+476 to 78+844
HOUSTON
HOUSTON, TEXAS

Houston Ship Channel: Bolivar Roads to Red Fish Light 1



U.S. Army Corps of Engineers
Galveston District

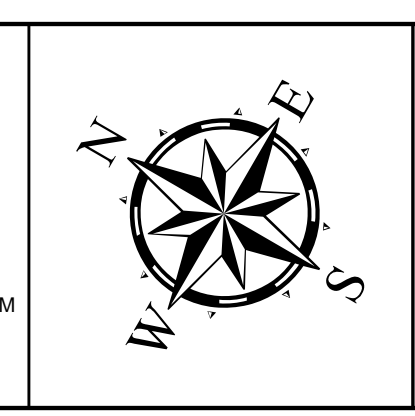


Channel Features	Aids to Navigation	MLLW
Channel Toe	Lights	0 - 30
Channel Center Line	Red Side Aids	30 - 35
Channel Station Lines	Green Side Aids	35 - 40
Channel Dimensions	Mooring Buoy	40 - 42
		42 - 44
		44 - 46
		46 - 48
		48 - 50
		50 >
NOAA Bathymetry (DREDGING REACH EXTENT)		
		0 - 10
		10 - 15
		15 - 20
		20 - 25
		25 - 30
		30 - 50

NOTES:

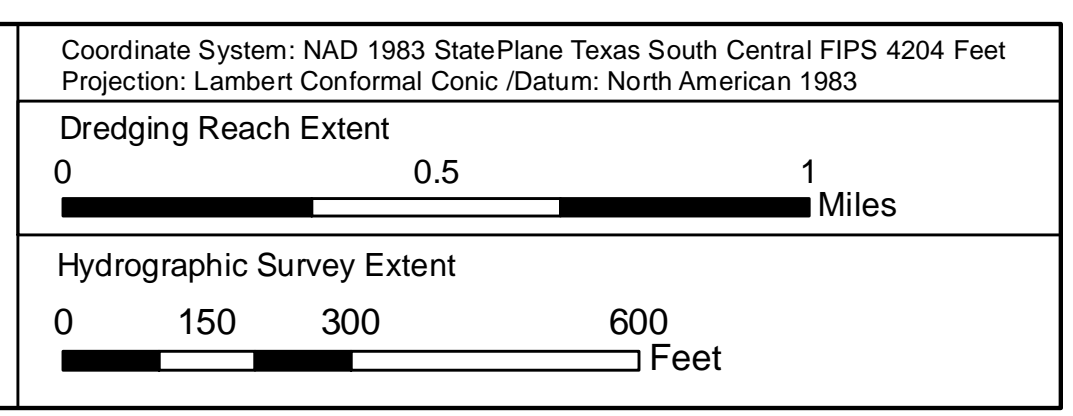
- HORIZONTAL COORDINATES ARE REFERENCED TO TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE NAD83 US SURVEY FEET.
- ELEVATIONS ARE REFERENCED TO MEAN LOWER LOW TIDE (MLLW) DATUM.
- THIS PROJECT WAS DESIGNED BY THE GALVESTON DISTRICT OF THE U.S. ARMY CORPS OF ENGINEERS. THE INITIALS AND SIGNATURES AND REGISTRATION DESIGNATIONS OF INDIVIDUALS APPEAR ON THESE PROJECT DOCUMENTS WITHIN THE SCOPE OF THEIR EMPLOYMENT AS REQUIRED BY ER1110-1-8152.

- THE INFORMATION DEPICTED ON THIS SURVEY MAP REPRESENTS THE RESULTS OF SURVEYS MADE ON THE DATES INDICATED AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITIONS EXISTING AT THAT TIME. THESE CONDITIONS ARE SUBJECT TO RAPID CHANGE DUE TO SHOALING EVENTS. A PRUDENT MARINER SHOULD NOT RELY EXCLUSIVELY ON THE INFORMATION PROVIDED HERE. REQUIRED BY 33 CFR 209.325
- FOR THE MOST UP TO DATE INFORMATION PLEASE CHECK OUR WEBSITE AT: [HTTP://WWW.SWG.USACE.ARMY.MIL/MISSIONS/NAVIGATION/HYDROGRAPHICS/SURVEYS/](http://www.swg.usace.army.mil/missions/navigation/hydrographics/surveys/)
- NOAA BATHYMETRY CONTOURS PRODUCED FROM HISTORIC BATHYMETRIC (HYDROGRAPHIC) SURVEYS CONDUCTED BY THE NOAA NATIONAL OCEAN SERVICE COAST SURVEY, AVAILABLE FROM THE NATIONAL GEOPHYSICAL DATA CENTER. SURVEYS VARY AS TO SOUNDING DENSITY, ACCURACY OF DEPTH, ACCURACY OF NAVIGATION, ZERO DATUM, DATE OF SURVEY AND TYPE OF INSTRUMENTATION.



Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Survey Date(s): 11 May 2018	Authorized Depth: -46ft.
Page: 10 of 56	Side Slope Ratio: (Rise : Run)
Scale: 1:2,400	Additional Imagery: © DigitalGlobe Inc.
Mapped by: MSAOX PAC	Print Date: 5/30/2018
Additional Info:	

HYDROGRAPHIC SURVEY
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
GALVESTON, TEXAS
Bolivar Roads to Red Fish Light 1

Station: 138+476 to 78+844
HOUSTON
HOUSTON, TEXAS