10CCT03_ss_1m.tif

Metadata:

Identification_Information:
Citation:
Citation_Information:
Originator:
U.S. Geological Survey - St. Petersburg Coastal and Marine Science Center
Originator: Nancy T. DeWitt
Originator: James G. Flocks
Originator: William R. Pfeiffer
Publication_Date: 20111001
Title:
10CCT03_ss_1m.tif: the 1-m resolution grid of the side scan sonar data from USGS Cruise 10cct03
Geospatial_Data_Presentation_Form: remote-sensing image
Series_Information:
Series_Name: USGS Data Series Publication
Issue_Identification: DS671
Publication_Information:
Publication_Place: St. Petersburg, FL
Publisher:
U.S. Geological Survey - St. Petersburg Coastal and Marine Science Center
Originator: James N. Gibson
Originator: Dana S. Wiese
Online_Linkage: <http://pubs.usgs.gov/ds/671>
Description:
Abstract:

In April of 2010, the U.S. Geological Survey (USGS) conducted a geophysical survey from the east end of West Ship Island, MSiss., extending to the middle of Dauphin Island, Ala. This survey had a dual purpose: (1) to interlink previously conducted nearshore geophysical surveys (shoreline to ~2 kilometers, km) with those of offshore surveys (~2 km to ~9 km) in the ares and (2) to extend the geophysical survey to include a portion of the Dauphin Island nearshore zone. The efforts were part of the USGS Gulf of Mexico Science Coordination partnership with the U.S. Army Corps of Engineers (USACE) to assist the Mississippi Coastal Improvements Program (MsCIP) and the Northern Gulf of Mexico (NGOM) Ecosystem Change and Hazards Susceptibility Project by mapping the shallow geological stratigraphic framework of the Mississippi Barrier Island Complex.

Purpose:
This report serves as an archive of the processed multibeam bathymetry and side scan sonar (SSS) data. Data products herein include gridded and interpolated digital depth

surfaces, seabed surface backscatter imagery, and x,y,z data products for both multibeam bathymetry and side scan sonar imagery. Additional files include trackline maps, navigation files, Geograpahic Infromation System (GIS) files, Field Activity Collection System (FACS) logs, and formal Federal Geographic Data Committee (FGDC) metadata. Scanned images of the handwritten FACS logs and digital FACS logs are also provided as PDF files. Refer to the Acronyms page for expansion of acronyms and abbreviations used in this report or hold the cursor over an acronym for a pop-up explanation.

Supplemental_Information:

These geophysical surveys will provide the data necessary for scientists to define, interpret, and provide baseline bathymetry and seafloor habitat for this area and to aid scientists in predicting future geomorpholocial changes of the islands with respect to climate change, storm impact, and sea-level rise. Furthermore, these data will provide information for barrier island restoration, particularly in Camille Cut, and provide protection for the historical Fort Massachusetts. For more information refer to <http://ngom.usgs.gov/gomsc/mscip/index.html>.

Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: 20100417
Beginning_Time: unknown
Ending_Date: 20100428
Ending_Time: unknown

Currentness_Reference: data collection interval

Status:

Progress: Complete
Maintenance_and_Update_Frequency: None planned

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: -88.883546
East_Bounding_Coordinate: -88.160394
North_Bounding_Coordinate: 30.259925
South_Bounding_Coordinate: 30.116279

Keywords:

Theme:

Theme_Keyword_Thesaurus: ISO 19115 Topic Category
Theme_Keyword: oceans
Theme_Keyword: elevation
Theme_Keyword: location

Theme:

Theme_Keyword_Thesaurus: General
Theme_Keyword: trackline
Theme_Keyword: side scan sonar
Theme_Keyword: bathymetry
Theme_Keyword: USGS
Theme_Keyword: side scan sonar mosaic
Theme_Keyword: Klein 3900
Theme_Keyword: GeoTIFF
Theme_Keyword:

U.S. Geological Survey (USGS), St. Petersburg Coastal and Marine Science Center

Theme_Keyword: U.S. Army Corps of Engineers (USACE) Mobile Alabama District
Theme_Keyword: Gulf Islands National Seashore (GUIS)

Place:

Place_Keyword_Thesaurus: GNIS
Place_Keyword: Mississippi

Place_Keyword: West Ship Island
Place_Keyword: Horn Island
Place_Keyword: Dauphin Island
Stratum:
Stratum_Keyword_Thesaurus: General
Stratum_Keyword: Water
Temporal:
Temporal_Keyword_Thesaurus: General
Temporal_Keyword: April 2010
Access_Constraints:
The U.S. Geological Survey requests that it be referenced as the originator of this dataset in any future products or research derived from these data.
Use_Constraints: These data are not to be used for navigation
Point_of_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Nancy T. DeWitt
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U.S. Geological Survey - St. Petersburg Coastal and Marine Science Center
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Data_Set_Credit:
Nancy T. DeWitt, James G. Flocks, William R. Pfeiffer, James N. Gibson, Dana Wiese
Native_Data_Set_Environment:
Microsoft Windows XP Version 5.1 (Build 2600) Service Pack 3; ESRI ArcCatalog 9.3.1.3000; 10cct03_ss_1m.txt;0.338 MB

Data_Quality_Information:
Attribute_Accuracy:
Attribute_Accuracy_Report:
The accuracy of the data is determined during data collection. This dataset is from a single cruise and therefore internally consistent. Methods are employed to maintain data collection consistency aboard various platforms. During mobilization, each piece of equipment (swath and sonar) is isolated to obtain internal and external offset measurements with respect to the survey platform. All the critical measurements are recorded manually and digitally and entered into their respective programs for calibration. Once calibration is complete and calibration status is considered acceptable, then survey operations commence. HYPACK, Inc., HYPSWEEP version 10 was used for the multibeam data acquisition, system calibration,and data post-processing. A patch test was performed at the beginning of the survey to calibrate the SEABAT 8125 and included latency, roll, pitch, and yaw. This involved collecting multibeam data along lines over a sloping surface for the latency, pitch, and yaw tests and over a flat surface for the roll test. The resulting offsets from the patch test were applied to the hardware configuration file prior to survey data acquisition. The Applanix POS MV is not a gyro and therefore did not need calibration. The RESON

SeaBat 8125 multibeam transducer head was mounted on a retractable strut-arm that is lowered between the catamaran hulls. Offsets between the sonar head and the DGPS antennas were measured and entered into the respective program. DGPS is always implemented for navigational accuracy. During data acquisition, the differentially corrected positions supplied through the Trimble DSM 212 interface were recorded in the WGS84 datum. Ship heading and motion (roll, pitch, heave) were measured by the Applanix POS MV motion unit. Sound velocity was recorded at the multibeam sonar head. Additional sound velocity casts were conducted at the start and finish of each survey day and as needed throughout the survey. All multibeam bathymetry data were collected using the RESON SeaBat 8125. All side scan sonar data were collected using the Klein 3900 system.

Logical_Consistency_Report:

This dataset was completed on the same research vessel platform.

Completeness_Report:

This is a complete processed side scan socar mosaic in GeoTIFF format. These data provide a continuous and complete surface; however, there may in some cases be data missing and inconsistent with reported tracklines. This is directly due to the exclusion of poor data or instrument failures.

Positional_Accuracy:

Horizontal_Positional_Accuracy:

Horizontal_Positional_Accuracy_Report:

Differential navigation was acquired using a local National Geodetic Survey (NGS) Continuously Operating Reference Station (CORS) beacon that broadcasts carrier phase and code range measurements that are captured in real-time using the Applanix Position and Orientation System for Marine Navigation (POS MV). The multibeam bathymetry and side scan sonar data were collected simultaneously using HYSWEEP version 10 and SonarPro version 11.3, respectively. The multibeam bathymetry and the side scan sonar data were collected with separate instruments but utilized the same navigation string from the Applanix POS MV. Unless noted, all DGPS data are referenced to WGS84.

Quantitative_Horizontal_Positional_Accuracy_Assessment:

Horizontal_Positional_Accuracy_Value: 10

Horizontal_Positional_Accuracy_Explanation: centimeters

Vertical_Positional_Accuracy:

Vertical_Positional_Accuracy_Report:

The towfish altitude varied considerably during the cruises due to the nature of shallow-water surveying operations. Ideally, SSS is flown at a relatively considerable distance from the vessel and other instruments to avoid acoustical interference. Typical sources of acoustical interference are vessel vibrations and other instruments that utilize similar frequency ranges. However, in shallow-water surveying the optimal distance is difficult to achieve due to the negative buoyancy of the towfish and the effect of unanticipated isolated shoals.

Quantitative_Vertical_Positional_Accuracy_Assessment:

Vertical_Positional_Accuracy_Value: 1

Vertical_Positional_Accuracy_Explanation: meter

Lineage:

Process_Step:

Process_Description:

The XTF files collected were converted into CARIS HIPS and SIPS version 7.0 data format structure called Sonar Information Processing System (SIPS) for the purpose of editing and side scan mosaic creation. All horizontal positions were offset relative to a central ship navigation point. The first step in SSS data processing was to correct the altitude, or first return. This was achieved by a combination of auto-prediction parameters set and manual boundary

digitization of the water column and seafloor. The second step was application of the beam pattern correction, which was accomplished by sampling a series of beams over homogeneous surface content. The purpose of beam pattern correction is to identify and offset the inherent instrument intensity variance as the across-track range increases. Near nadir the acoustic return is significantly more intense and decreases as across-track range increases. These phenomena result in a false high intensity value strip along the centerline of the SSS swath. Several other SSS editing tools were used, including angle-varying gain and time-varied gain corrections, which were used to further smooth the resulting intensity range artifacts, offering a more consistent along- and across-track image. The despeckle editing tool was also employed to identify and mute isolated pixels having extreme high or low intensity values relative to adjacent pixels. After all the individual side scan lines were examined and edited, Geo-referenced Backscatter Rasters (GeoBars) were created. For this dataset a resolution of 1 m was chosen. From the series of GeoBars, a side scan mosaic image was generated as a composite of the GeoBars, which also provides for a continuous image of a single intensity value range for geographic comparison.

Process_Date: 20111001

Process_Contact:

Contact_Information:

Contact_Person_Primary:

Contact_Person: William R. Pfeiffer

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Country: USA

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Contact_Electronic_Mail_Address: `wpfeiffer@usgs.gov`

Spatial_Data_Organization_Information:

Direct_Spatial_Reference_Method: Raster

Raster_Object_Information:

Raster_Object_Type: Pixel

Row_Count: 14996

Column_Count: 69439

Vertical_Count: 1

Spatial_Reference_Information:

Horizontal_Coordinate_System_Definition:

Planar:

Planar_Coordinate_Information:

Planar_Coordinate_Encoding_Method: row and column

Coordinate_Representation:

Abscissa_Resolution: 1

Ordinate_Resolution: 1

Planar_Distance_Units: meters

Grid_Coordinate_System:

Grid_Coordinate_System_Name: Universal Transverse Mercator
Universal_Transverse_Mercator:
UTM_Zone_Number: 16
Transverse_Mercator:
Scale_Factor_at_Central_Meridian: 0.999600
Longitude_of_Central_Meridian: -87.000000
Latitude_of_Projection_Origin: 0.000000
False_Easting: 500000.000000
False_Northing: 0.000000
Geodetic_Model:
Horizontal_Datum_Name: D_WGS_1984
Ellipsoid_Name: WGS_1984
Semi-major_Axis: 6378137.000000
Denominator_of_Flattening_Ratio: 298.25722356300003
Vertical_Coordinate_System_Definition:
Depth_System_Definition:
Depth_Datum_Name: Mean lower low water
Depth_Resolution: 1
Depth_Distance_Units: meters
Depth_Encoding_Method: Explicit depth coordinate included with horizontal coordinates

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Entity_and_Attribute_Information:
Detailed_Description:
Entity_Type:
Entity_Type_Label: 10cct03_ss_1m.tif
Entity_Type_Definition: ESRI ArcGIS 9.3
Entity_Type_Definition_Source: ESRI ArcMap 9.3.1 GeoTIFF
Overview_Description:
Entity_and_Attribute_Overview: The processed side scan sonar TIFF file is 10cct03_ss_1m.tif
Entity_and_Attribute_Detail_Citation: <http://ngom.usgs.gov/gomsc/mscip/index.html>

Distribution_Information:
Distributor:
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Resource_Description: Downloadable Data

Distribution_Liability:
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Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Format_Name: 10cct03_ss_1m.tif
Format_Version_Number: TIFF
File_Decompression_Technique: no compression applied
Transfer_Size: 0.338
Digital_Transfer_Option:
Online_Option:
Computer_Contact_Information:
Network_Address:
Network_Resource_Name: <http://pubs.usgs.gov/ds/671>
Offline_Option:
Offline_Media: DVD
Recording_Format: CDR/DVD
Fees: none
Custom_Order_Process: none
Technical_Prerequisites: image viewer
Available_Time_Period:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 20111001
Time_of_Day: unknown

Metadata_Reference_Information:
Metadata_Date: 20111001
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Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata

Metadata_Standard_Version: FGDC-STD-001-1998
Metadata_Time_Convention: local time
Metadata_Access_Constraints:
The U.S. Geological Survey request that it be referenced as the originator of this dataset in any future products or research derived from these data.
Metadata_Use_Constraints:
The U.S. Geological Survey request that it be referenced as the originator of this dataset in any future products or research derived from these data.
Metadata_Security_Information:
Metadata_Security_Classification_System: none
Metadata_Security_Classification: Unclassified
Metadata_Security_Handling_Description: none
Metadata_Extensions:
Online_Linkage: <http://www.esri.com/metadata/esriprof80.html>
Profile_Name: ESRI Metadata Profile

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