



LOUISIANA BARRIER ISLAND COMPREHENSIVE MONITORING PROGRAM (BICM) Volume 1: Barrier Shoreline Post-Storm Assessment

Part 2: 2006/2007 Aerial Survey Photography

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Louisiana Barrier Island Comprehensive Monitoring Program (BICM)

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Introduction

The Louisiana Department of Natural Resources Office of Coastal Restoration and Management (LDNR) has implemented a Barrier Island Comprehensive Monitoring (BICM) Data Collection Program with science support from the Pontchartrain Institute for Environmental Sciences (PIES) at the University of New Orleans (UNO). UNO collected and analyzed data to facilitate the LDNR/Coastal Restoration Division (CRD) activities of barrier shoreline planning, design, maintenance, monitoring, and storm impact assessment. The baseline data collection effort and data delivery necessary to establish and develop the LDNR BICM program will provide invaluable information for future efforts involving restoration along Louisiana's sandy shorelines. The effects of the 2005 Hurricane season in Louisiana and subsequent development of integrated hurricane protection and coastal restoration planning programs make this an appropriate time to collect the baseline data necessary for understanding the past and planning for the future.

The Barrier Shoreline Post Storm Assessment consists of 5 Parts:

Part 1: 2005 Post Hurricanes Katrina and Rita Photography

Part 2: 2006/2007 Aerial Survey Photography

Part 3: 2005 – 2006/2007 Photo-Pairs

Part 4: Historic Photo-Pairs/Time Series

Part 5: 2006/2007 Aerial Video Survey

Funding for the acquisition of 2006/2007 photography was provided by LCA Science & Technology Program, a partnership between the LDNR and the US Army Corps of Engineers (USACE), through LDNR Interagency Agreement No. 2512-06-06.

Part 2 includes:

1) Report

- a. water level data for time of acquisition
- b. location diagrams for the 2006/2007 photography created by Media Mapper software using USGS digital topos as background (figures 10-51)
- c. tables of location information for each frame generated by the MediaMapper software

2) 14 CDs:

- a. report file in Word and pdf
- b. excel file of location information for each frame (metadata)
- c. 2006/2007 digital photography grouped by date of acquisition, BICM region and segment.

Project Location

The LDNR BICM Program encompasses the mainland shoreline of the south Louisiana coast with special emphasis on the sandy beaches and barrier islands. Louisiana's mainland shoreline stretches 450 miles east from Sabine Pass on the Texas/Louisiana Border to the Pearl River on the Mississippi/Louisiana. Between Texas and Mississippi, Louisiana encompasses four distinct geologic regions: 1) Chenier Plain, 2) Acadiana Bays, 3) Mississippi River Delta Plain, and 4) the Pontchartrain Basin (Figure 1).

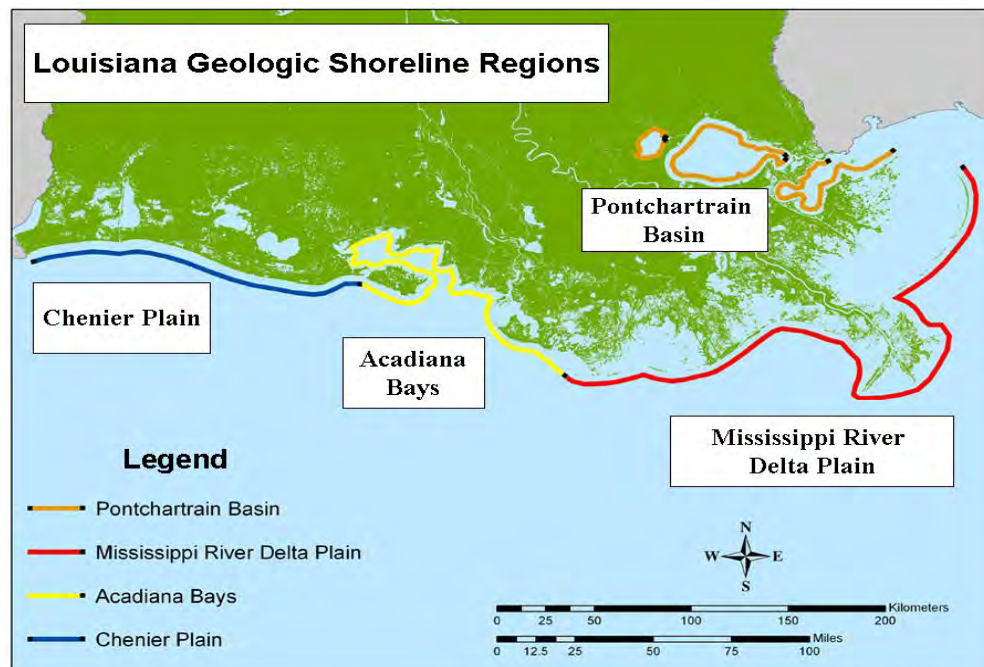


Figure 1. Louisiana's Geologic Shoreline Regions.

BICM further divided the coastline into eight regions: Western Chenier Plain, Eastern Chenier Plain, Acadiana Bays, Teche Delta, Lafourche Delta, Modern Delta, Chandeleur Islands, and the Lakes Region (Figure 2).

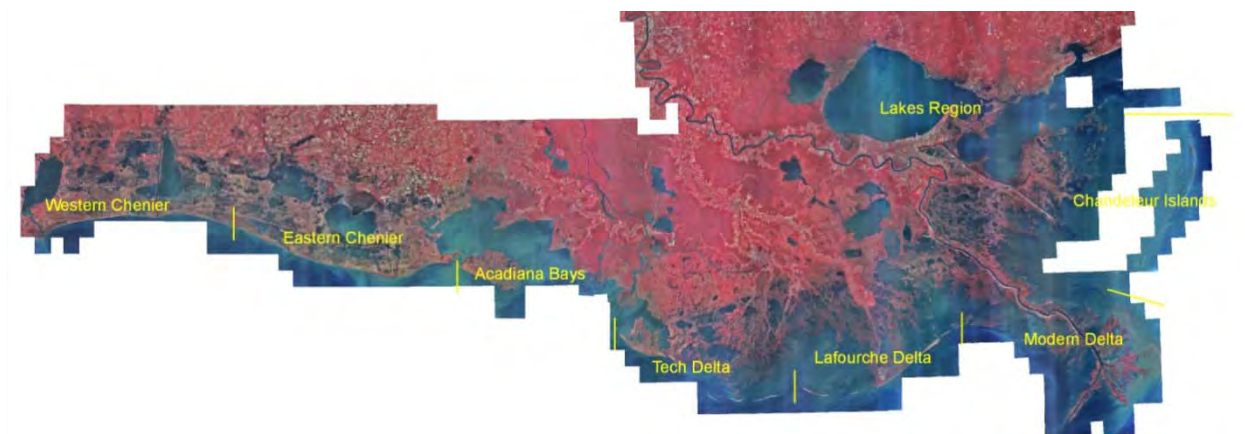


Figure 2. BICM divides coastal Louisiana into eight regions.

Methodology

The 2006/2007 oblique photography was taken from a helicopter during simultaneous video imagery capture as part of the 2006/2007 Aerial Video Survey of Coastal Louisiana. Along the Gulf shoreline, the helicopter traveled from west to east from Sabine Pass to the Mississippi River Delta, and then south to north along the Chandeleur Islands. The bays were recorded by keeping the undulating shoreline on the left side of the helicopter. The altitude was usually 200-300 ft other than at the end of islands, where the altitude was increased to 700 feet or more for a longshore view. The ground speed varied depending on the character of the shoreline and the altitude but averaged around 55 miles per hour. Photos were taken by a Canon PowerShot S3 IS digital camera. Jpgs created by the camera have a file size at 1MB with dimensions averaging 2272x1704 pixels at 180 pixels/inch which corresponds roughly to 380dpi at 4x6 inch size.

The dates and areas of acquisition were

November 20, 2006 –

Western Chenier Plain – Sabine Pass (11:49:49 CST) to Mud Lake Outlet (12:45:32 CST)

Eastern Chenier Plain – Mud Lake Outlet (14:49:37 CST) to Southwest Pass (16:11:11 CST)

Acadiana Bays – Gulfside of Marsh Island (16:10:59 CST – 16:34:52 CST)

November 21, 2006 –

Acadiana Bays - Bayside Marsh Island (10:06:26 CST) to Point au Fer Island (15:29:09 CST)

Teche Delta –

Point au Fer (15:27:17-15:29:09, 15:30:12 CST) to Caillou Boca (16:08:31 CST)

April 20, 2007 –

Teche Delta -Raccoon Island of the Isles Dernieres (9:18:05 CDT) to Wine Island (10:02:46 CST)

Lafourche Delta – Timbalier Island (10:06:40 CDT) to East Grand Terre Island (12:03:31 CDT)

Modern Delta – Cheniere Ronquille (12:06:59 CDT) to Sandy Point (12:43:19 CDT)

Sandy Point Bay (12:43:19 CDT) to Pass a Loutre (14:09:59 CDT)

April 21, 2007 –

Modern Delta - Pass a Loutre (09:10:00 CDT) to Deepwater Point (09:42:42 CDT),
Chandeleur Islands (10:15:53 – 11:18:23 CDT)

Lakes Region

Lake Borgne from Isle au Pitre (11:35:54 CDT) to the Rigolets (14:27:43 CDT)
Rigolets, Lake Borgne (14:27:43 CDT) to Lake Pontchartrain (14:34:15 CDT)
Lake Pontchartrain from the Rigolets (14:35:14 CDT) to the 17th Street Canal
(15:06:49 CDT);

April 22, 2007 –

Lakes Region –

South Lake Pontchartrain from West End (8:08:23 CDT) to Pass Manchac
(08:45:16 CDT),
Lake Maurepas (08:44:44 – 09:39:09 CDT),
North Lake Pontchartrain from Pass Manchac (09:38:44 CDT) to the Rigolets
(11:26:21 CDT),
Rigolets from Lake Pontchartrain (11:25:55 CDT) to Lake Borgne (11:33:46
CDT)
Lake Borgne from the Rigolets (11:33:46 CDT) to the Pearl River (11:41:26
CDT).

The flight line was generated from GPS data through the Red Hen System, Inc and Media Mapper software. The digital photos were calibrated with the time code of the GPS unit and integrated with the GPS data collected during video and photo acquisition. This created a database file within the RedHen System that could be downloaded as an excel file. Some of the frames failed to be integrated because of gaps in the GPS data that precluded any time code with which to coordinate image with data. Most of these missing frames were manually added by estimating location based on the image and available maps and vertical aerial photography that were conveniently provided through the Media Mapper software.

Water level

Table 1 lists the historical mean range, spring range, and mean tide level for various stations along the Louisiana coastline. The table is modified from the NOAA website:
<http://tidesandcurrents.noaa.gov/tides07/tab2ec4.html#108>

Table 1. Normal tide ranges for coastal Louisiana. Many of the listed stations are no longer active.

Station	Latitude	Longitude	Mean Range (ft)	Spring Range (ft)	Mean Tide Level (ft)
Bayou BonFouca, Route 433	30° 16.3'	89° 47.6'	0.53	0.53	0.26
Tchefuncta River, Lake Pontchartrain	30° 22.7'	90° 09.6'	0.57	0.57	0.28
New Canal USCG station, Lake Pontchartrain	30° 01.6'	90° 06.8'	0.51	0.52	0.26

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Chef Menteur, Chef Menteur Pass	30° 03.9' 89° 48.0'	0.97	1.06	0.56
Michoud Substation, ICWW	30° 00.4' 89° 56.2'	1.23	1.39	0.70
Shell Beach, Lake Borgne	29° 52.1' 89° 40.4'	1.28	1.41	0.72
Grand Pass	30° 07.6' 89° 13.3'	1.14	1.47	0.73
Chandeleur Light	30° 03' 88° 52'	--	1.2	0.6
Comfort Island	29° 49.4' 89° 16.2'	1.45	1.57	0.80
Bay Gardene	29° 35.9' 89° 37.1'	1.34	1.44	0.75
Breton Islands	29° 29.6' 89° 10.4'	1.37	1.37	0.69
Jack Bay	29° 22.0' 89° 20.7'	--	1.2	0.6
Grand Bay	29° 23.1' 89° 22.8'	1.25	1.34	0.67
Lonesome Bayou (Thomasin)	29° 14' 89° 03'	--	1.1	0.5
Mississippi River				
North Pass, Pass a Loutre	29° 12.3' 89° 02.2'	1.08	1.10	0.55
Southeast Pass	29° 07.0' 89° 02.7'	--	1.2	0.6
SOUTH PASS	28° 59.4' 89° 08.4'	1.18	1.22	0.61
Port Eads, South Pass	29° 00.9' 89° 09.6'	--	1.1	0.5
Southwest Pass	28° 55.9' 89° 25.7'	--	1.3	0.6
Joseph Bayou	29° 03.5' 89° 16.3'	--	1.4	0.7
Paris Road Bridge	30° 00' 89° 56'	--	1.1	0.6
Empire Jetty	29° 15.0' 89° 36.5'	--	1.3	0.7
Bastian Island	29° 17.2' 89° 39.8'	--	1.2	0.6
Quatre Bayous Pass	29° 18.6' 89° 51.2'	--	1.3	0.6
Barataria Pass	29° 16' 89° 57'	--	1.2	0.6
Barataria Bay				
EAST POINT, GRAND ISLE	29° 15.8' 89° 57.4'	1.04	1.06	0.53
Bayou Rigaud, Grand Isle	29° 16' 89° 58'	--	1.0	0.5
Caminada Pass (bridge)	29° 12.6' 90° 02.4'	0.99	0.99	0.50
Timbalier Island, Timbalier Bay	29° 05' 90° 32'	--	1.2	0.6
Pelican Islands, Timbalier Bay	29° 07.7' 90° 25.4'	--	1.2	0.6
Wine Island, Terrebonne Bay	29° 04.7' 90° 37.1'	--	1.3	0.6
Cocodrie, Terrebonne Bay	29° 14.7' 90° 39.7'	1.01	1.05	0.53
Caillou Boca	29° 03.8' 90° 48.4'	--	1.4	0.7
Raccoon Point, Caillou Bay	29° 03.5' 90° 57.7'	--	1.7	0.8
Ship Shoal Light	28° 55' 91° 04'	--	1.6	0.8
Atchafalaya Bay				
Eugene Island	29° 22' 91° 23'	--	1.9	1.0
Point Au Fer	29° 20' 91° 21'	--	2.0	1.0
Shell Island	29° 28' 91° 18'	--	1.5	0.7
Point Chevreuil	29° 31' 91° 33'	--	1.5	0.8
Rabbit Island, 5 miles south of	29° 25' 91° 36'	--	2.0	1.0
South Point, Marsh Island	29° 29' 91° 46'	--	1.8	0.9
Lighthouse Point	29° 31' 92° 03'	--	2.0	1.0
Cote Blanche Island, West Cote Blanche Bay	29° 44' 91° 43'	--	1.4	0.7
Southwest Pass, Vermilion Bay	29° 35' 92° 02'	--	1.6	0.8
Weeks Bay, Vermilion Bay	29° 48' 91° 50'	--	1.5	0.7
Mermentau River entrance	29° 45' 93° 06'	--	2.5	1.2
Calcasieu Pass, Lighthouse wharf	29° 47' 93° 21'	--	2.0	1.0

Few of the stations in the previous list provided data along the coast for the time period needed, and some of these had limited data for limited periods of time. The data varied between every 6 minutes, every hour or monthly, with more detailed data available for more recent dates. The stations used are highlighted in red on the list and were:

Sabine Pass North #8778094;
Calcasieu Pass, East Jetty #8768094;
Tesoro Marine Terminal (Morgan City, Atchafalaya River) #8764044
Grand Isle, East Point #8761724;
Pilots Station East, Southwest Pass #8760922;
Gulfport Harbor #8745557; and
New Canal Station (South shore of Lake Pontchartrain) #8761927

Figures 3-9 are graphs of the predicted or normal tide levels (blue line) and observed (red line) tide levels at the selected stations during photo acquisition (NOAA at <http://tidesandcurrents.noaa.gov/>.) The data obtained showed that the waterlevels during the November flight of western Louisiana and the Acadiana Bays were roughly a foot below normal, while the April water levels for southeastern, eastern and the Lakes Region were very close to normal or slightly (a few inches) above that predicted.

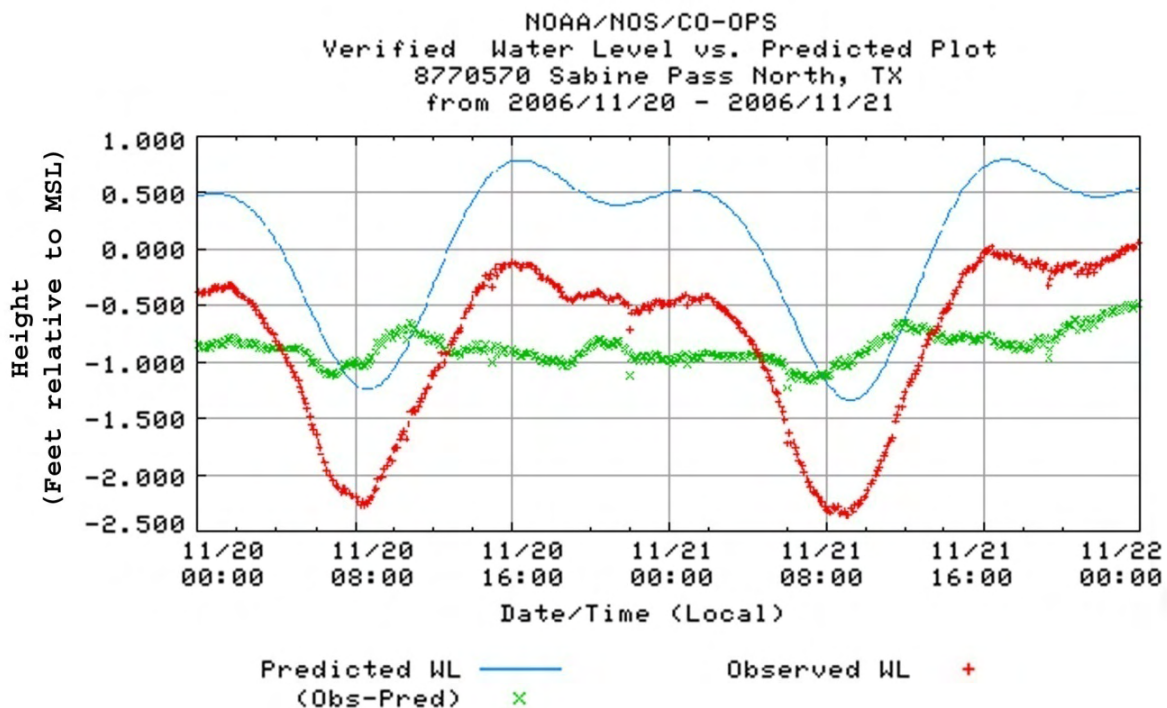


Figure 3. Graph of the tide levels at Sabine Pass North for November 20-21, 2006 during photo acquisition on 11/20 for western Louisiana. This shows that the water levels were roughly a foot lower than predicted for the vicinity of BICM regions Western and Eastern Chenier Plain.

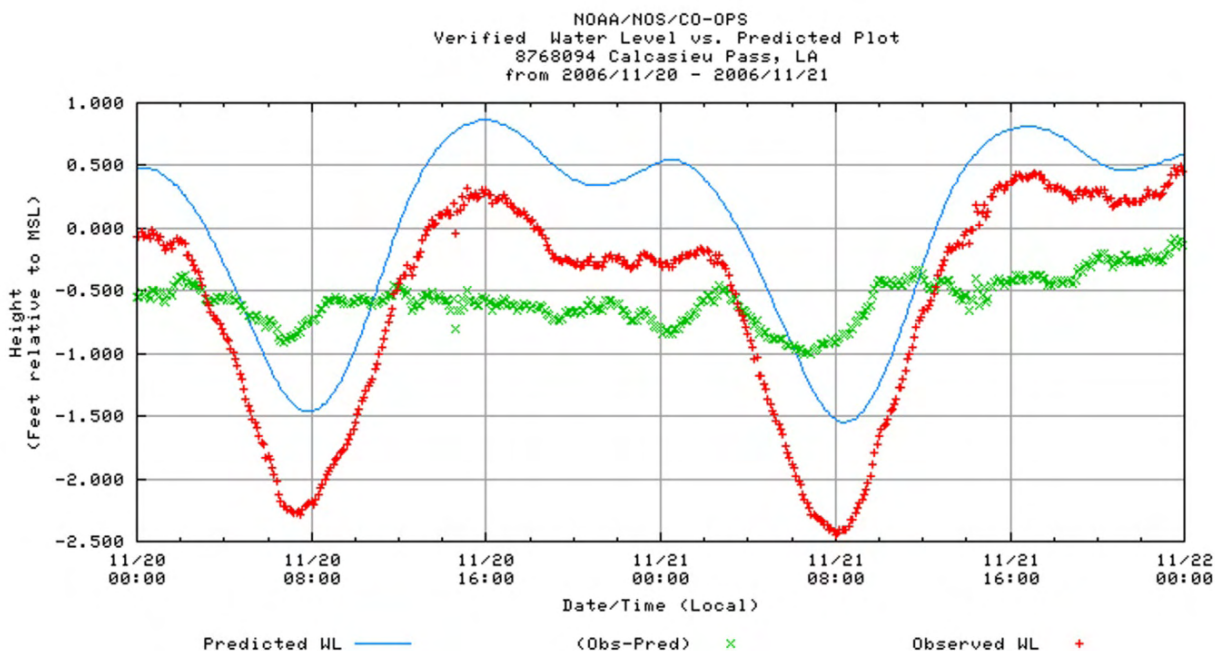


Figure 4. Graph of the tide levels at Calcasieu Pass for November 20-21, 2006 during photo acquisition on 11/20 for western Louisiana. This shows that the water levels were roughly a half a foot lower than predicted for the vicinity of BICM regions Western and Eastern Chenier Plain.

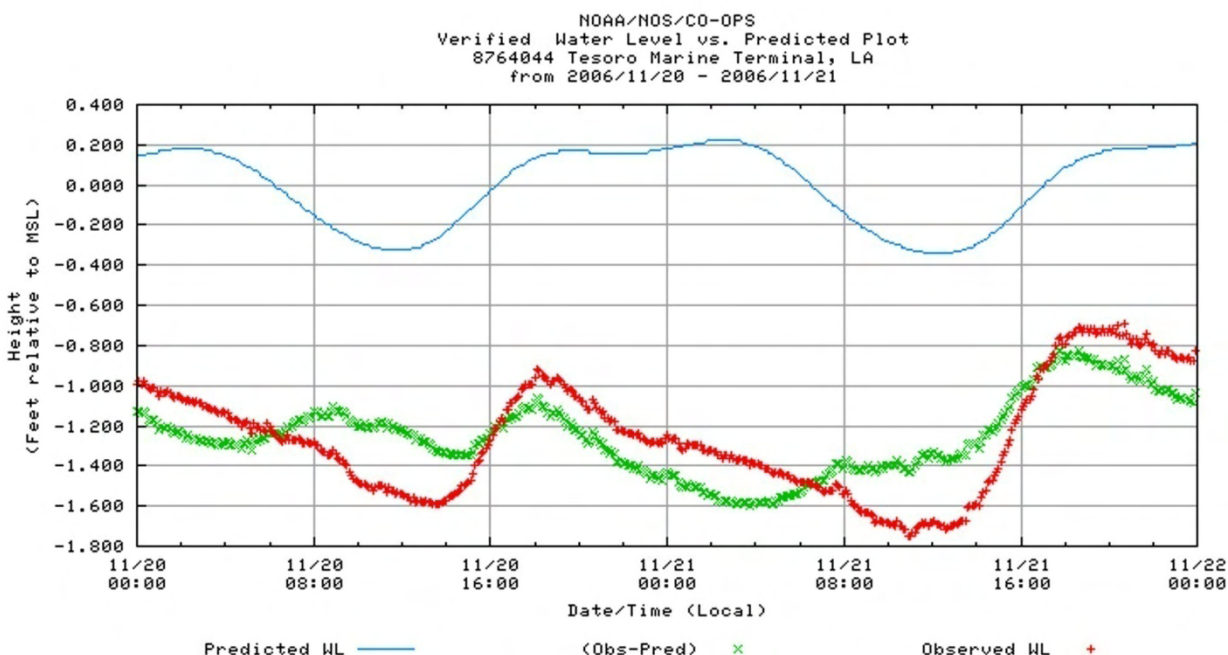


Figure 5. Graph of the tide levels at Morgan City on the Atchafalaya River for November 20-21, 2006 during photo acquisition on 11/21 for south central Louisiana. This shows that the water levels were roughly a foot lower than predicted for the vicinity of BICM region Acadiana Bays.

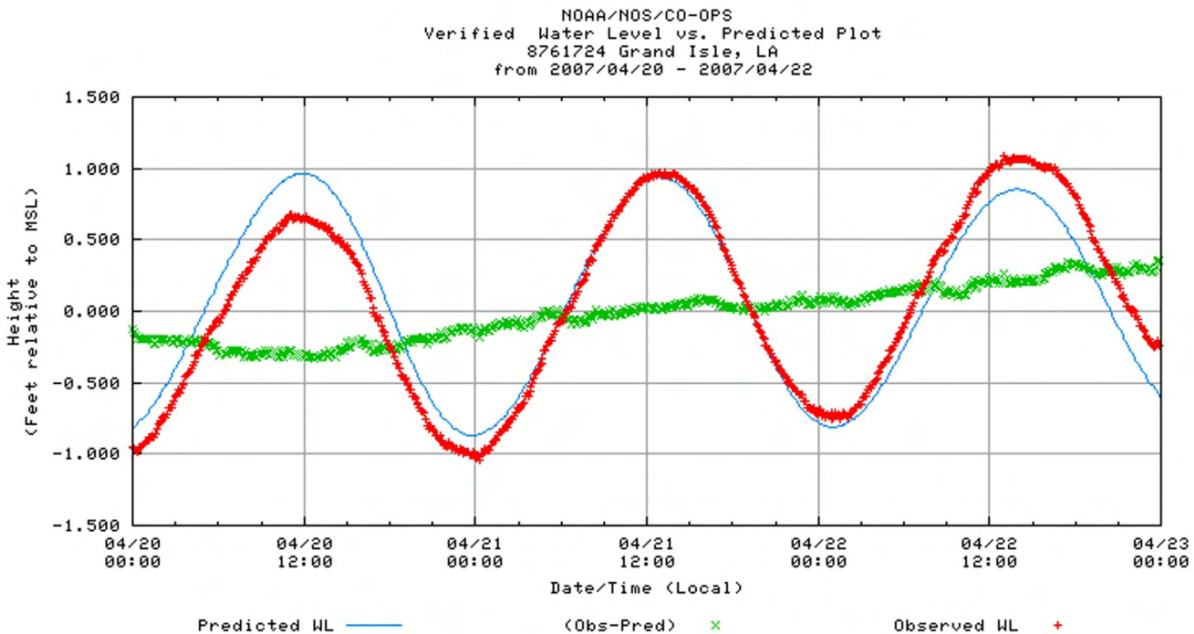


Figure 6. Graph of the tide levels at Grand Isle East Point, LA for April 20-22, 2007 during photo acquisition on 4/20 for south eastern Louisiana. This shows that the observed water levels were normal and close to those predicted for the vicinity of BICM regions Teche Delta and Lafourche Delta.

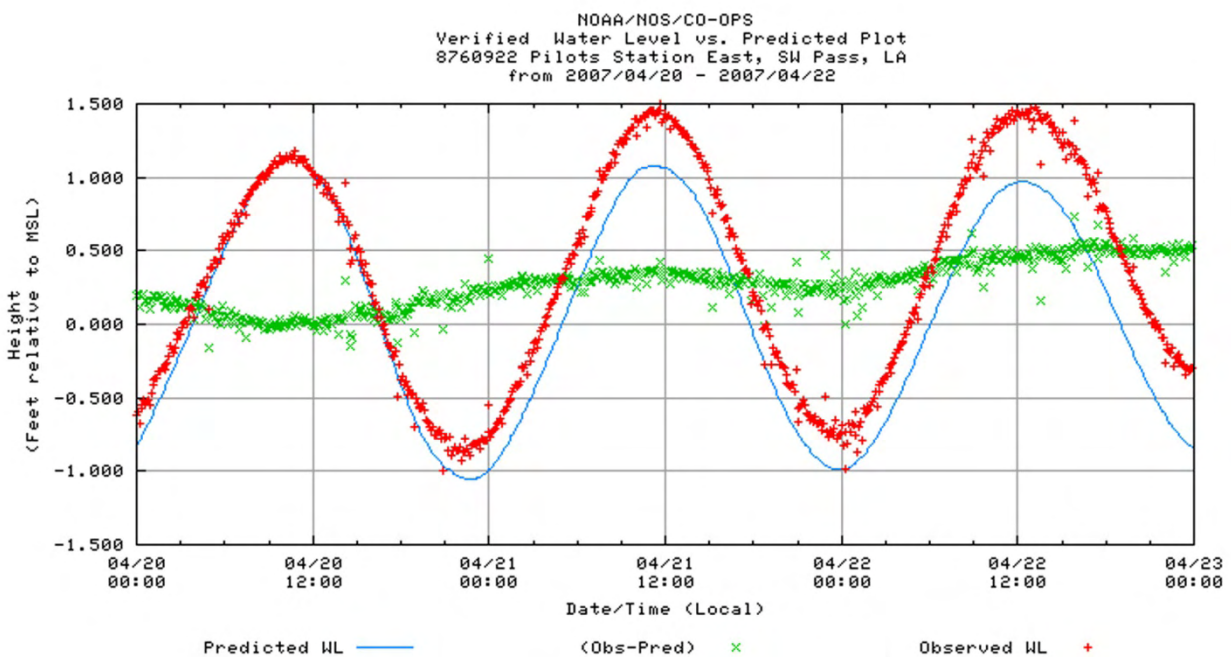


Figure 7. Graph of the tide levels at the mouth of Southwest Pass, LA for April 20-21, 2007 during photo acquisition on 4/20-21 for south eastern Louisiana. This shows that the observed water levels were normal and close to those predicted for the vicinity of BICM region Modern Delta.

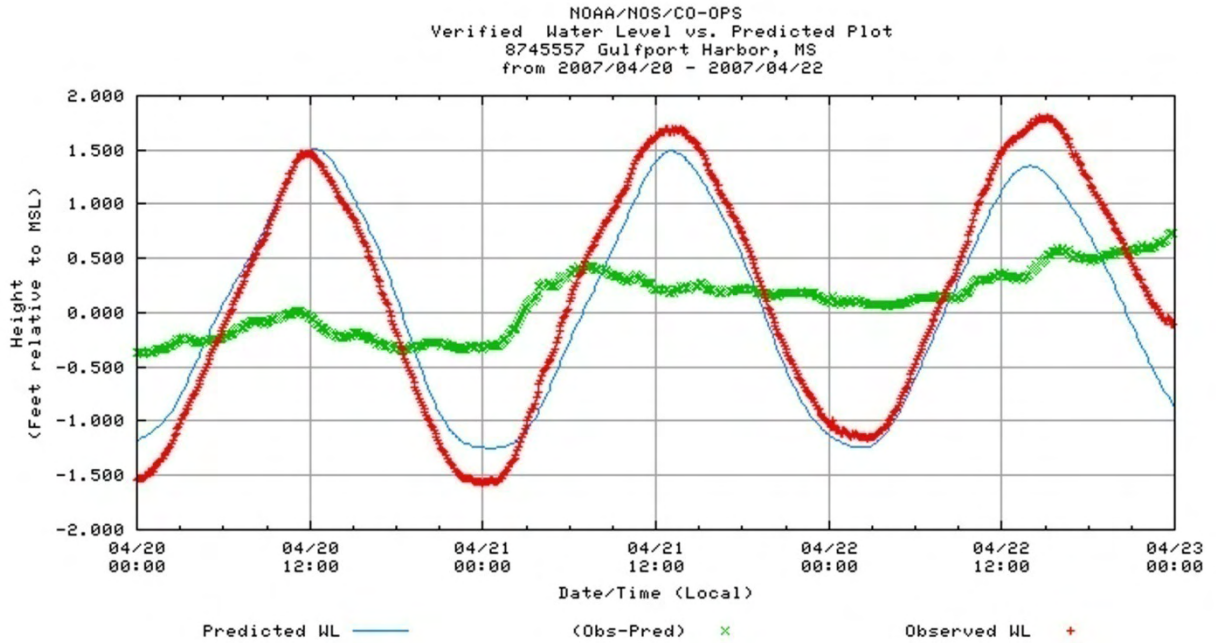


Figure 8. Graph of the tide levels at Gulfport, MS for April 20-22, 2007 during photo acquisition on 4/21 for eastern Louisiana. This shows that the observed water levels were normal and close to those predicted for the vicinity of BICM region Chandeleur Islands.

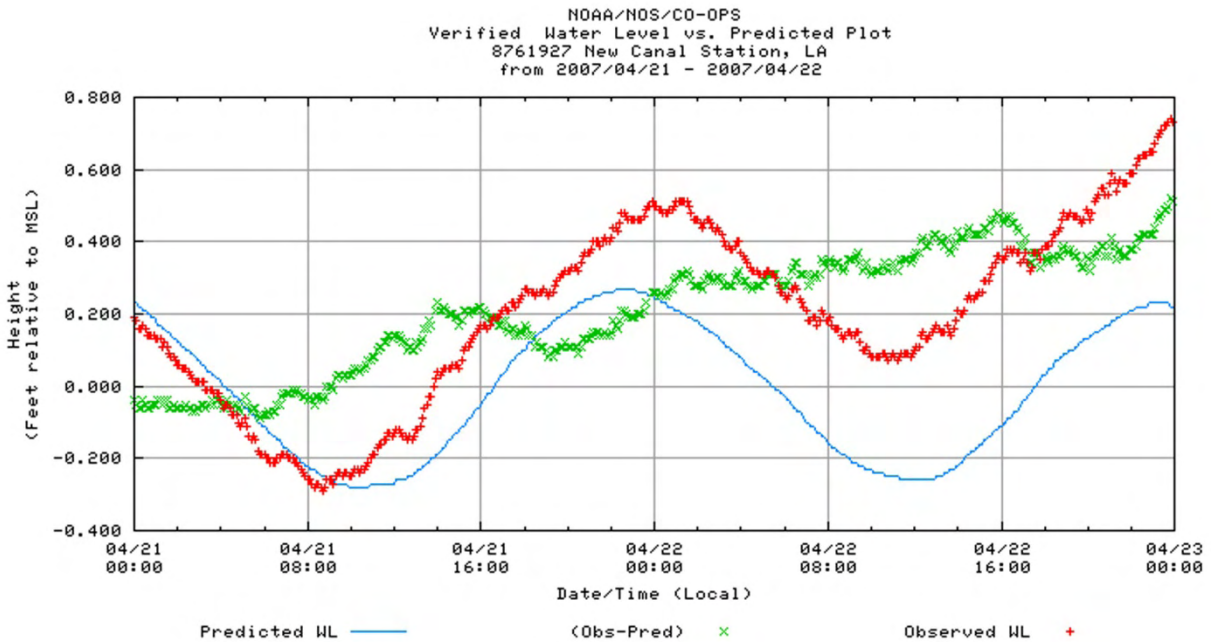


Figure 9. Graph of the tide levels at New Canal at the south shore of Lake Pontchartrain, LA for April 20-22, 2007 during photo acquisition on 4/21-22 for Lake Pontchartrain. This shows that the observed water levels were increasing during the day but still close to those predicted for the vicinity of BICM Lakes Region.

Location Methodology

The imagery collected by the Canon PowerShot S3 IS digital camera was geo-referenced by an automating feature of the Media Mapper software. The time code from the camera was calibrated to the GPS data during import so that each frame was matched with an existing data point on the video flight path. This provided all data gathered by the GPS at that specific point, for each photo that could be matched. Where GPS data were missing, these frames were manually located, so do not contain this data. The manually located photos are marked in the "NonGPS" column of the tables by the word "TRUE," and the date and time was copied from the generated data above the entry.

Specific photographs can be located using the diagrams and tables included in this section, or by the html DVDs included in Part 5. This section should be used if specific BICM segments are needed, as these are not delineated on the html version.

Media Mapper provided location data by latitude/longitude, so these numbers were converted to UTM Zone 15 North, NAD 83 as requested by DNR, by Corpscon6, a conversion software. The camera angle can be interpreted as 90 degrees counter-clockwise from the trackline since the camera was aimed roughly perpendicular to the shoreline.

The data tables and associated excel files are organized by BICM region (Figure 2) with the images for each region on a different worksheet or separate table. Additionally, the BICM segment breaks are indicated on the tables by BICM segment number and title. To be consistent with other data, all images are listed generally from the west to east.

USGS digital maps were used as a background for the figures, and were screen grabs from the Media Mapper system used with the video in Part 5. The figures have been annotated in PhotoShop with BICM segment numbers and names, and a few four-digit image numbers have been added for reference.

Location Diagrams for the 2006/2007 Aerial Survey Photography

BICM divides coastal Louisiana into eight regions (Figure 2):

- Western Chenier Plain
- Eastern Chenier Plain
- Acadiana Bays
- Teche Delta
- Lafourche Delta
- Modern Delta
- Chandeleur Islands
- Lakes Region

Locations of each image are indicated on the following diagrams (Figures 10-51) by a blue triangular marker. The red line indicates the video flight path that was used to geo-reference the images. Map divisions were based on BICM segments where possible,

covering 14-20 miles. BICM segments are approximated with an orange line, and a few images are labeled by the 4-digit image file-number for reference.

The data tables that follow the figures give more specific location information.

Western Chenier Plain

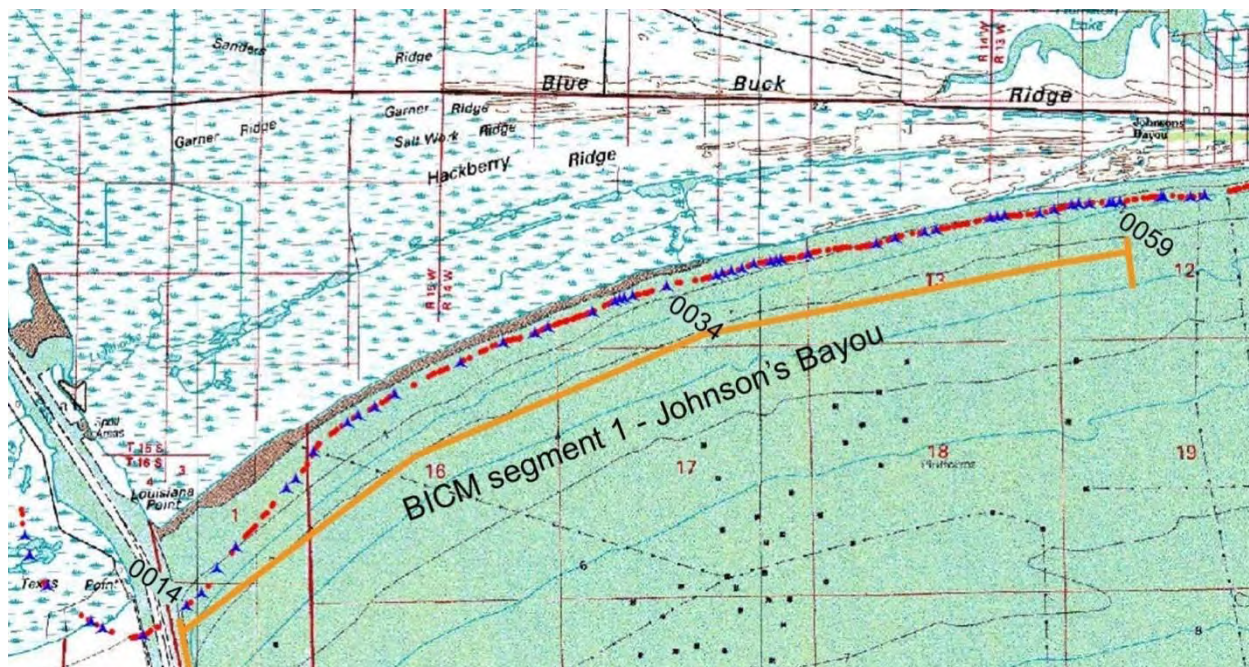


Figure 10. Location of the 2006 digital photos, frames 0007 to 0063, taken November 20, 2006 in BICM segment 1 – “Johnson's Bayou” along the Western Chenier Plain shoreline from Sabine Pass to Johnsons Bayou, Louisiana. 4-digit numbers represent photo file-numbers.

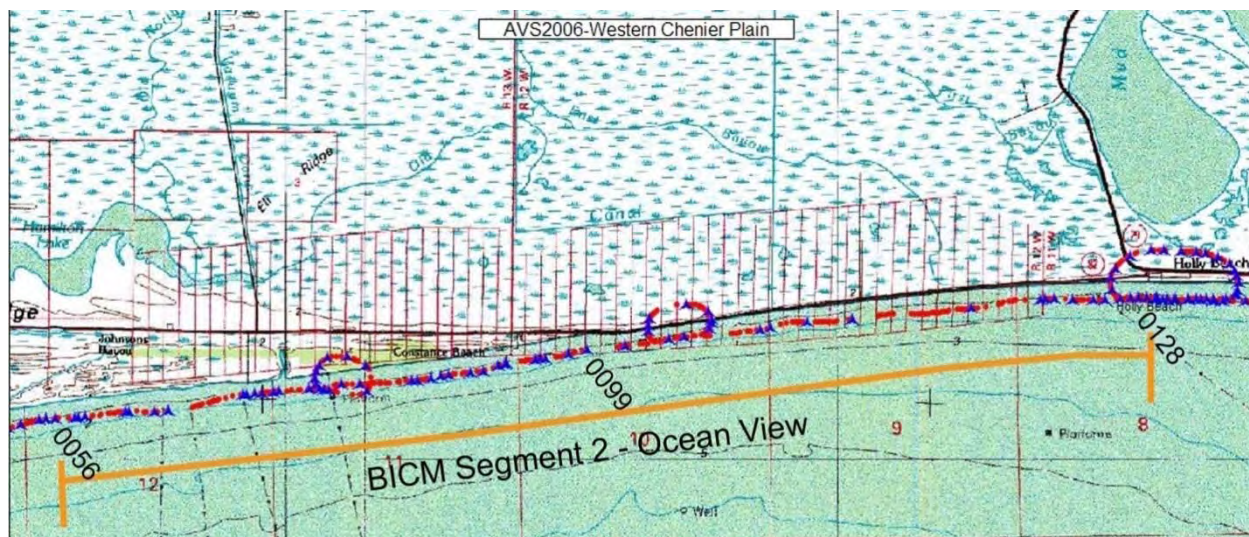


Figure 11. Location of the 2006 digital photos, frames 0053 to 0135, taken November 20, 2006 in BICM segment 2 – “Ocean View” along the Western Chenier Plain shoreline from Johnsons Bayou to Holly Beach, Louisiana. 4-digit numbers represent photo file-numbers.

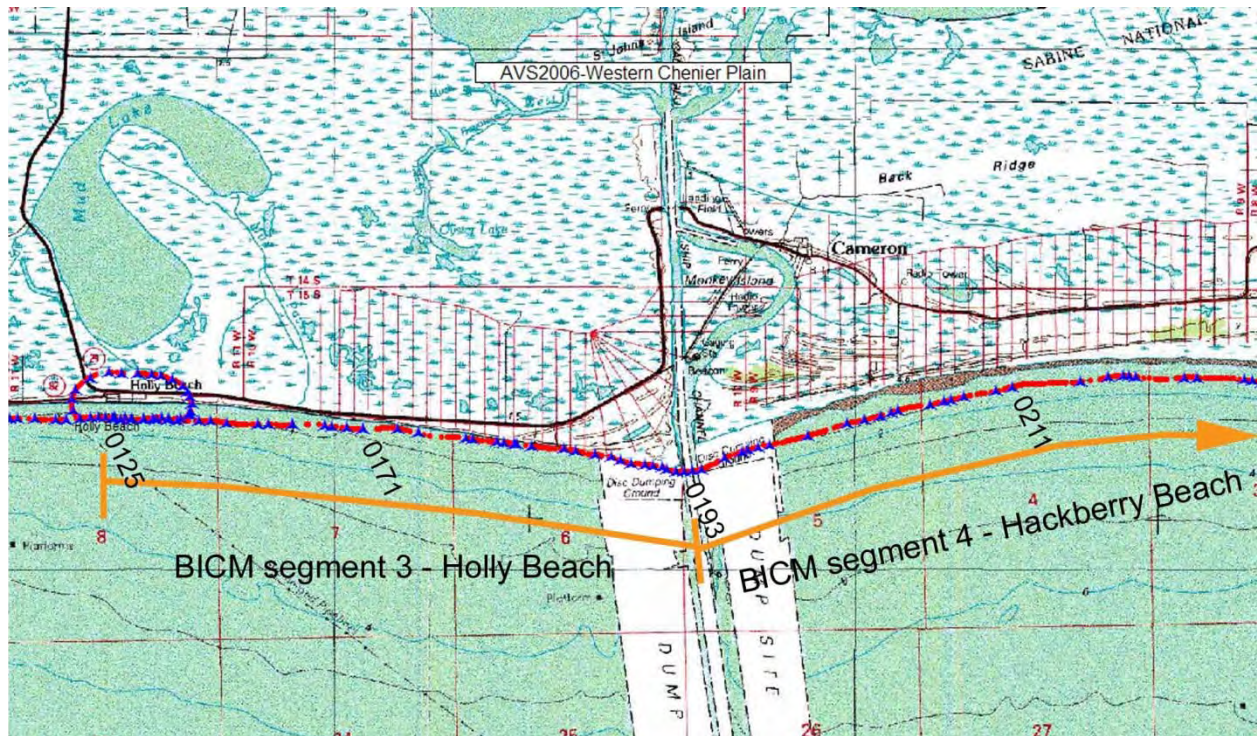


Figure 12. Location of the 2006 digital photos, frames 0099 to 0219, taken November 20, 2006 in BICM segment 3 – “Holly Beach” and segment 4 – “Hackberry Beach,” along the Western Chenier Plain shoreline from Holly Beach to east of Cameron, Louisiana. 4-digit numbers represent photo file-numbers.

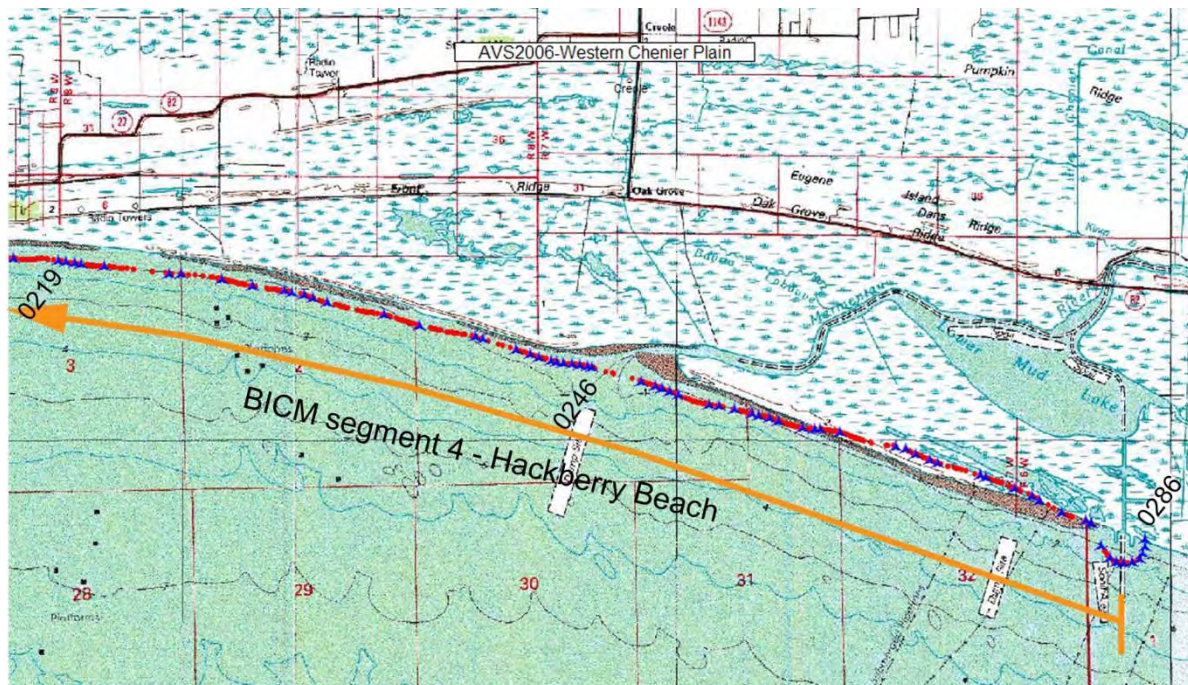


Figure 13. Location of the 2006 digital photos, frames 0219 to 0286, taken November 20, 2006 in BICM segment 4 – “Hackberry Beach” along the Western Chenier Plain from to east of Cameron, Louisiana to Mud Lake Outlet. 4-digit numbers represent photo file-numbers.

Eastern Chenier Plain

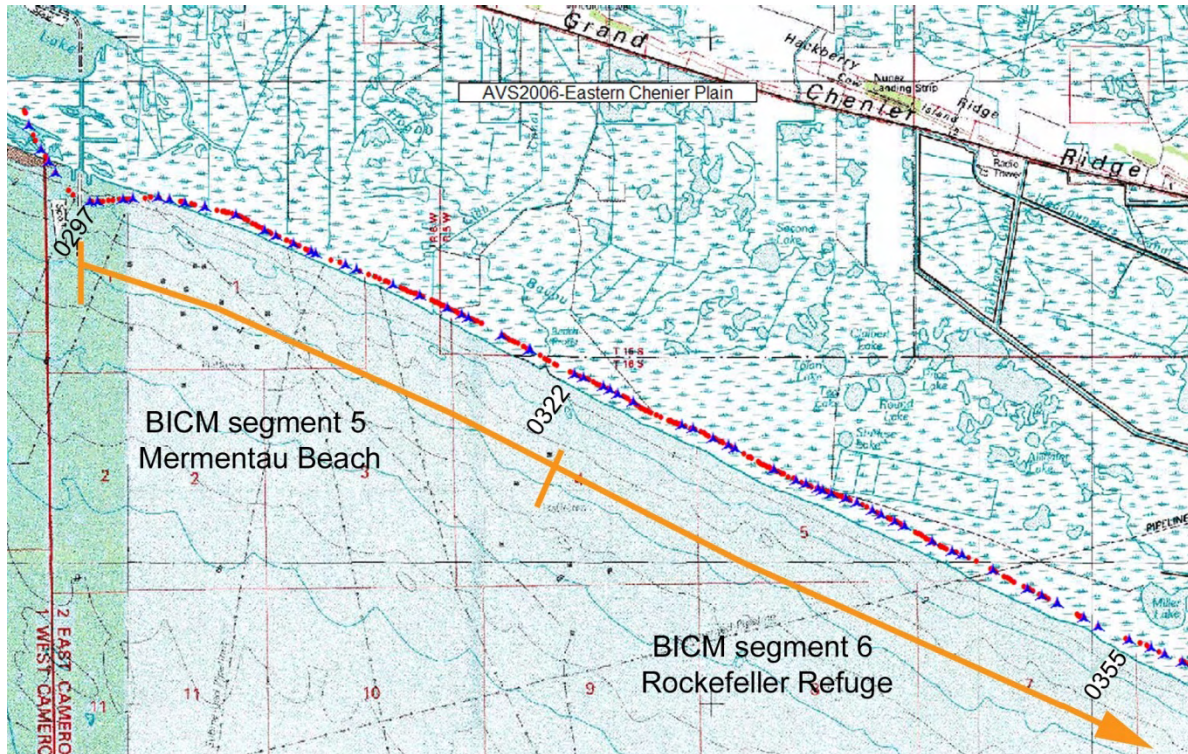


Figure 14. Location of the 2006 digital photos, frames 0294 to 0358, taken November 20, 2006 in BICM segment 5 – “Mermentau Beach” and the western part of segment 6 – “Rockefeller Refuge” along the Eastern Chenier Plain shoreline from Mud Lake Outlet to Miller Lake, Louisiana. 4-digit numbers represent photo file-numbers.

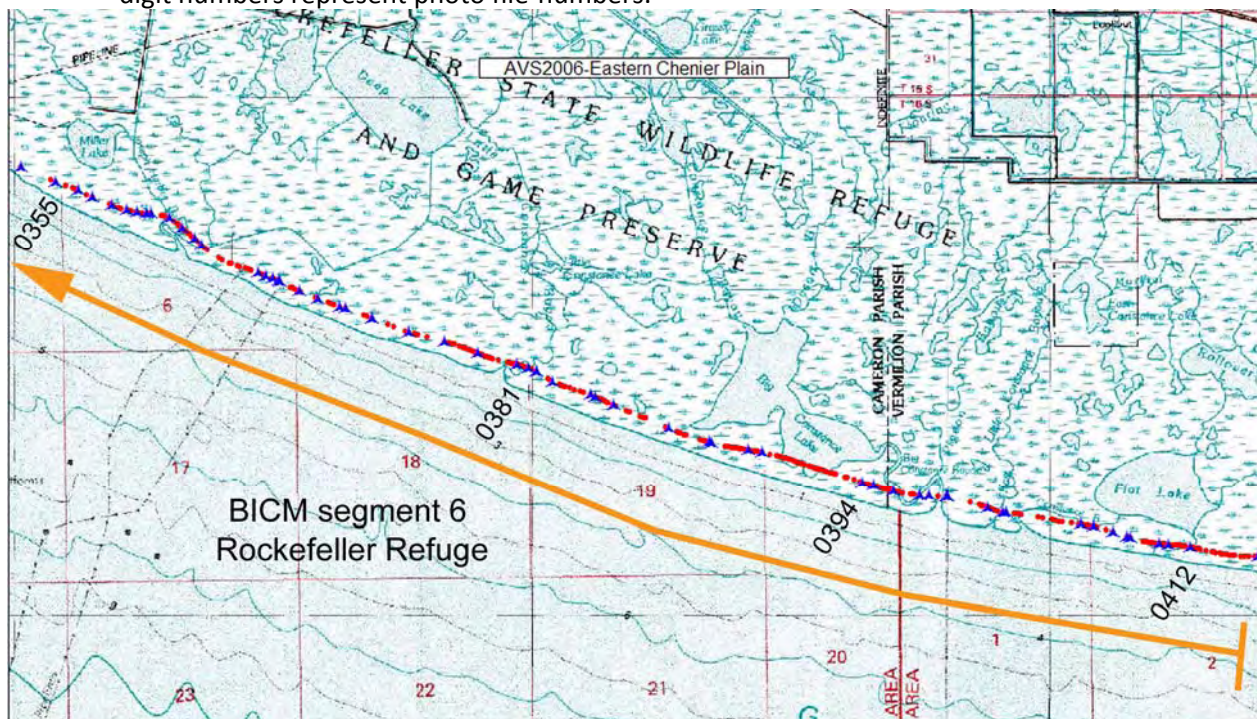


Figure 15. Location of the 2006 digital photos, frames 0355 to 0412, taken November 20, 2006 in the eastern part of BICM segment 6 – “Rockefeller Refuge” along the Eastern Chenier Plain shoreline from Miller Lake to Flat Lake, Louisiana. 4-digit numbers represent photo file-numbers.

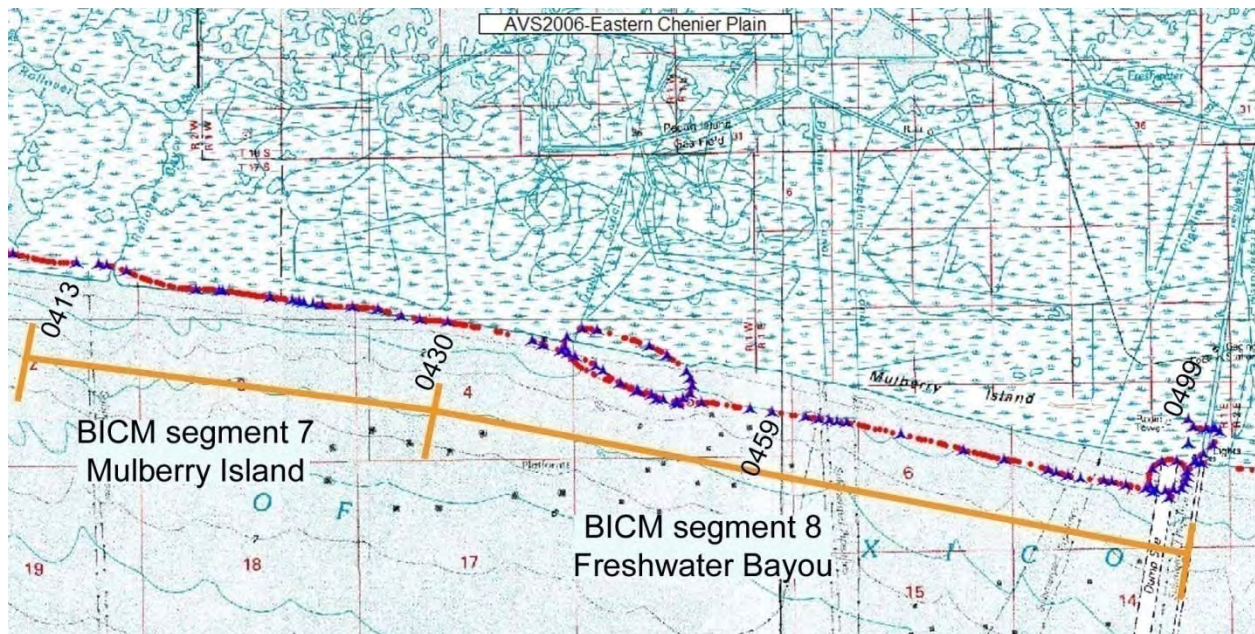


Figure 16. Location of the 2006 digital photos, frames 0413 to 0499, taken November 20, 2006 in BICM segment 7 – “Mulberry Island” and segment 8 – “Freshwater Bayou” along the Eastern Chenier Plain shoreline from Flat Lake to Freshwater Bayou, Louisiana. 4-digit numbers represent photo file-numbers.

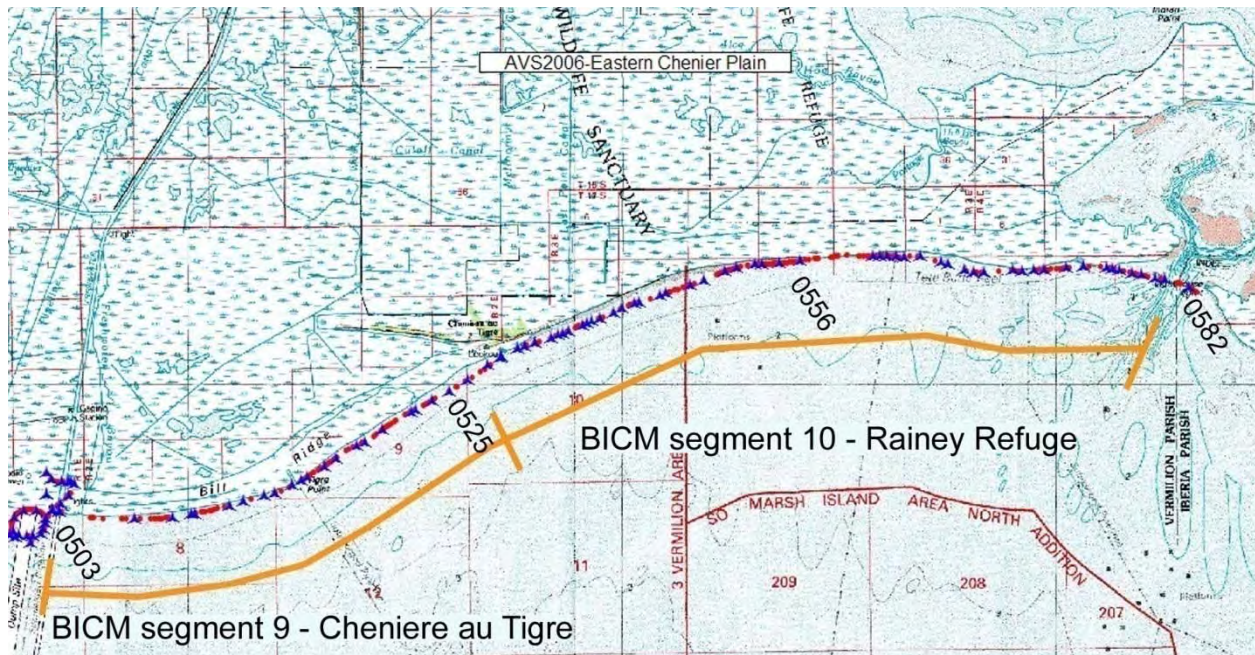


Figure 17. Location of the 2006 digital photos, frames 0500 to 0582, taken November 20, 2006 in BICM segment 9 – “Cheniere au Tigre” and segment 10 – “Rainey Refuge” along the Eastern Chenier Plain shoreline from Freshwater Bayou to Southwest Pass, Louisiana. 4-digit numbers represent photo file-numbers.

Acadiana Bays

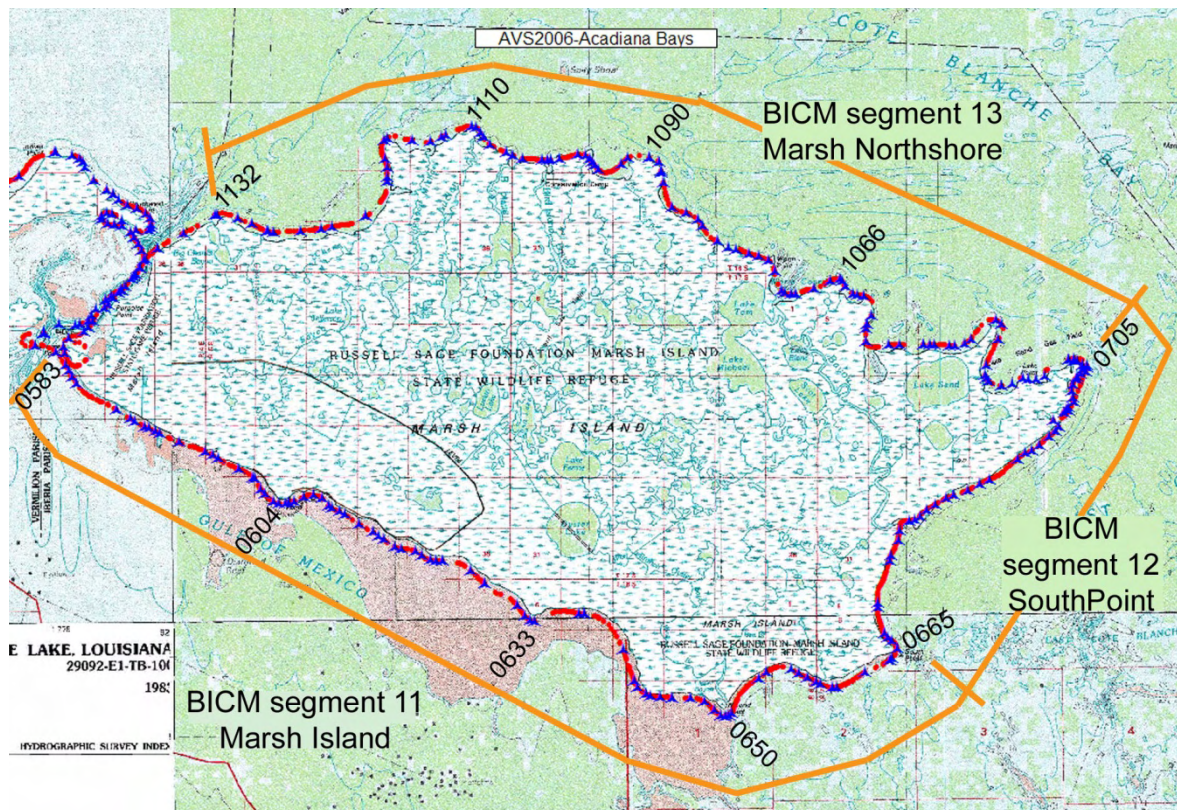


Figure 18. Location of the 2006 digital photos, frames 0583 to 1132, taken November 20, 2006 in BICM segment 11 – “ Marsh Island,” segment 12 – “South Point,” and segment 13 – “Marsh Northshore” along the BICM Acadiana Bays region at Marsh Island, Louisiana. 4-digit numbers represent photo file-numbers.

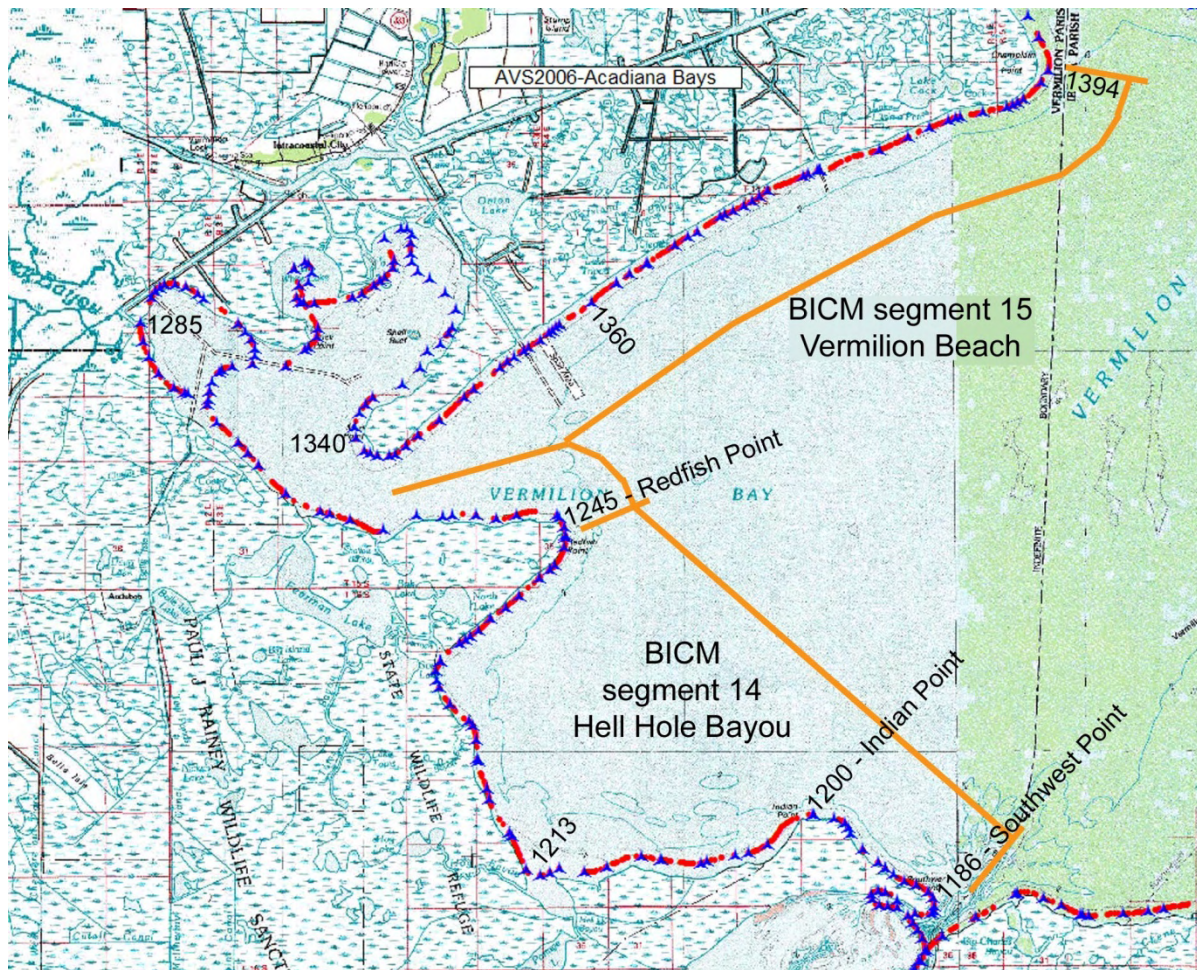


Figure 19. Location of the 2006 digital photos, frames 1186 to 1394 taken November 21, 2006 in BICM segment 14 – “Hell Hole Bayou” and segment 15 – “Vermilion Beach” along the western Acadiana Bays shoreline from Southwest Point to Champlain Point, Louisiana. 4-digit numbers represent photo file-numbers.

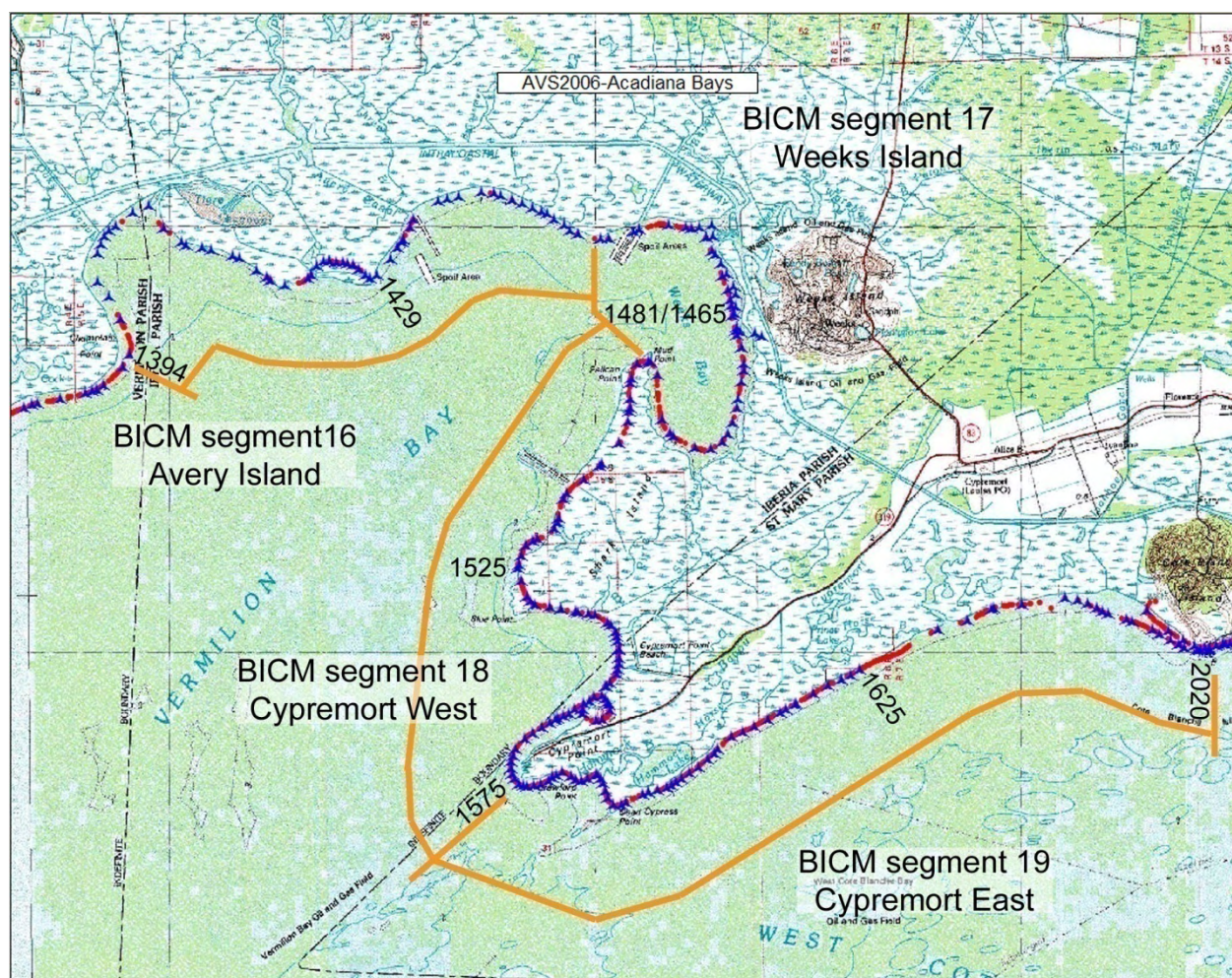


Figure 20. Location of the 2006 digital photos, frames 1294 to 2027, taken November 21, 2006 in BICM segment 16 – “Avery Island,” segment 17 – “Weeks Island,” segment 18 – “Cypremort West,” and segment 19 – “Cypremort East” along the Acadiana Bays shoreline from Champlain Point to Red Bluff, Louisiana. 4-digit numbers represent photo file-numbers.

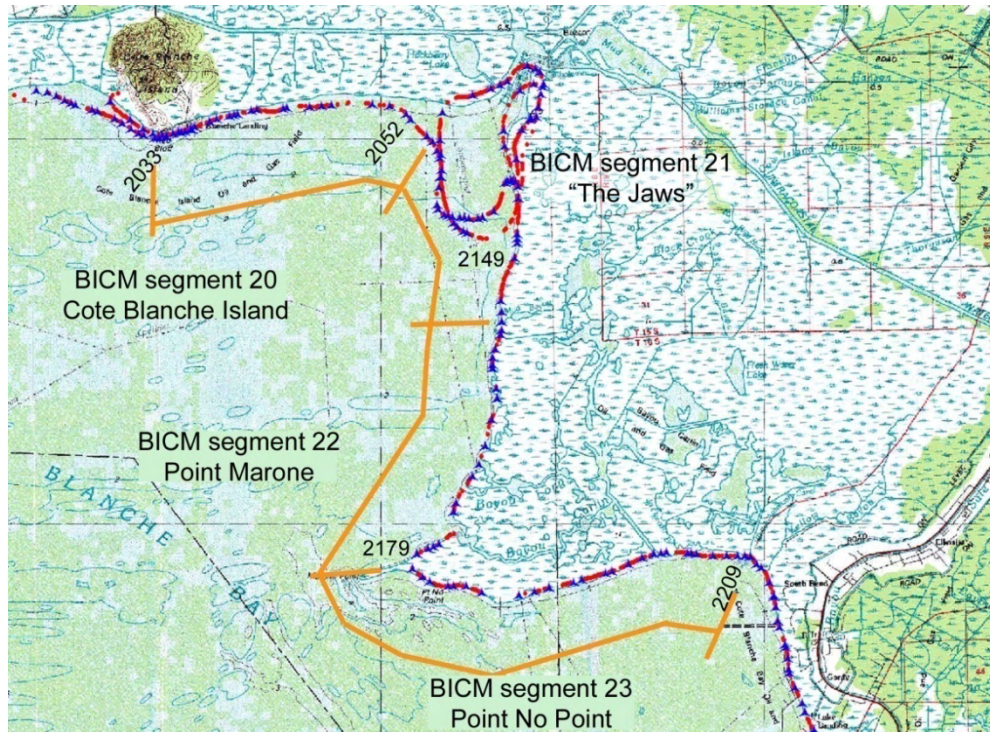


Figure 21. Location of the 2006 digital photos, frames 2006 to 2225 taken November 21, 2006 in BICM segment 20 – “Cote Blanche Island,” segment 21 “The Jaws,” Segment 22 – “Point Marone,” and segment 23 – “Point No Point” along the Acadiana Bays shoreline from Red Bluff to the Wax Lake Delta, Louisiana.

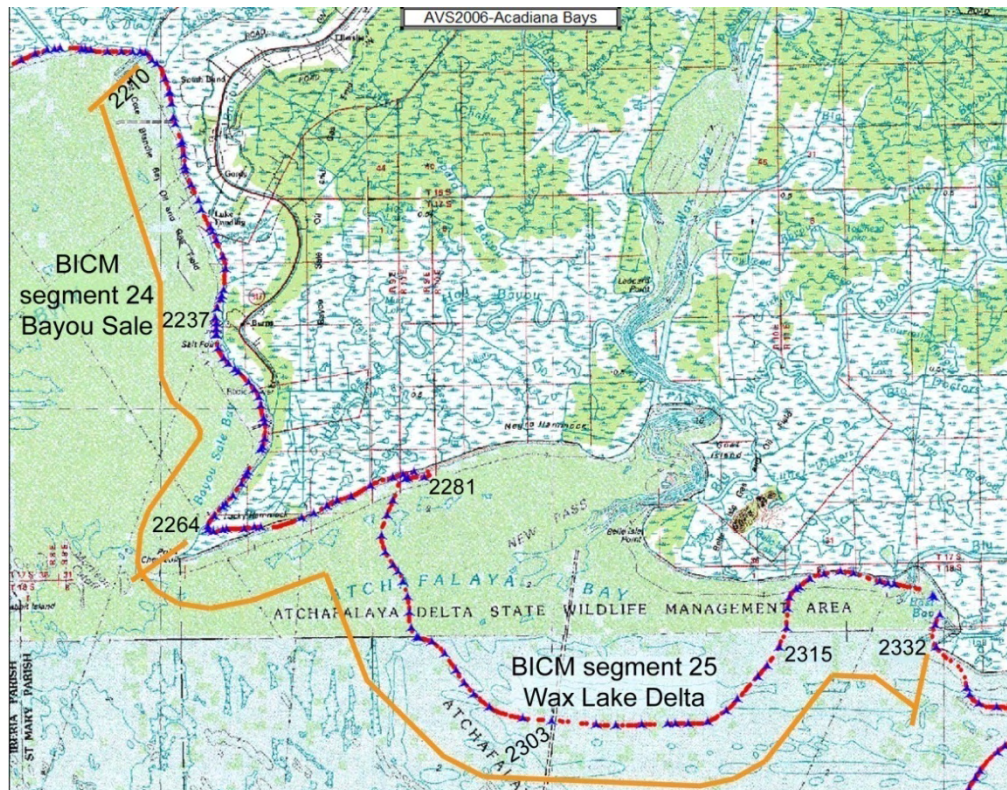


Figure 22. Location of the 2006 digital photos, frames 2196 to 2336, taken November 21, 2006 in BICM segment 24 – “Bayou Sale” and segment 25 – “Wax Lake Delta” along the Acadiana Bays shoreline, Atchafalaya Bay, Louisiana. 4-digit numbers represent photo file-numbers.

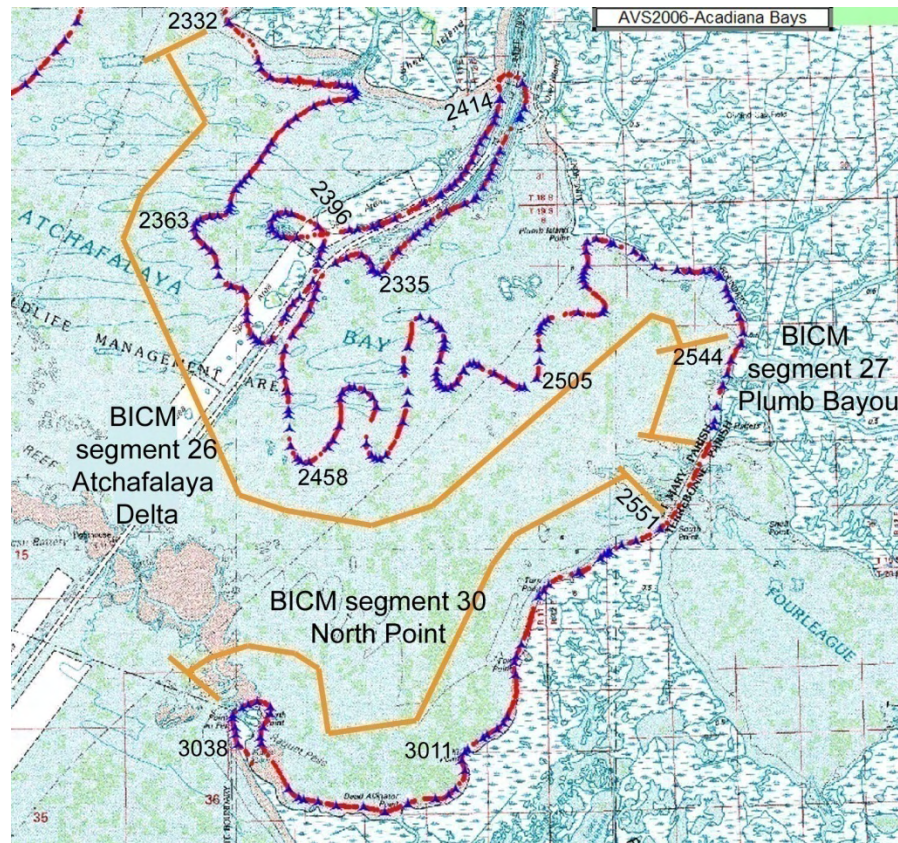


Figure 23. Location of the 2006 digital photos, frames 2332 to 3038, taken November 21, 2006 in BICM segment 24 – “Bayou Sale” and segment 25 – “Wax Lake Delta” along the Acadiana Bays shoreline, Atchafalaya Bay, Louisiana. 4-digit numbers represent photo file-numbers.

Teche Delta

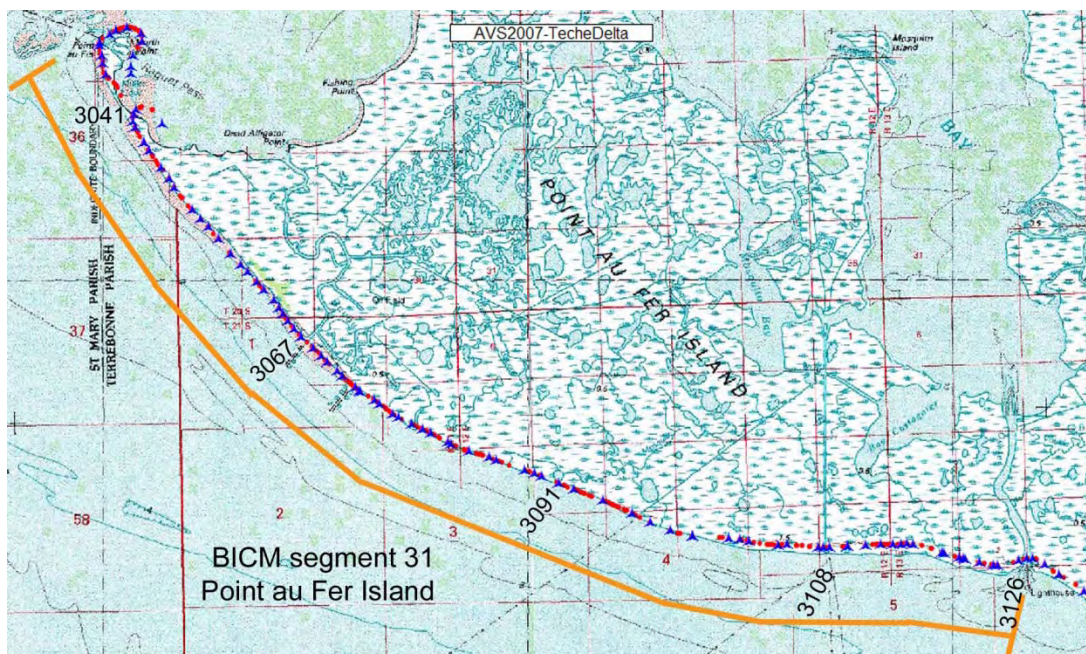


Figure 24. Location of the 2006 digital photos, frames 3025 to 3131, taken November 21, 2006 in BICM segment 31 – “Point au Fer Island” along the Teche Delta shoreline from Pt au Fer to Oyster Bayou, Louisiana. 4-digit numbers represent photo file-numbers.

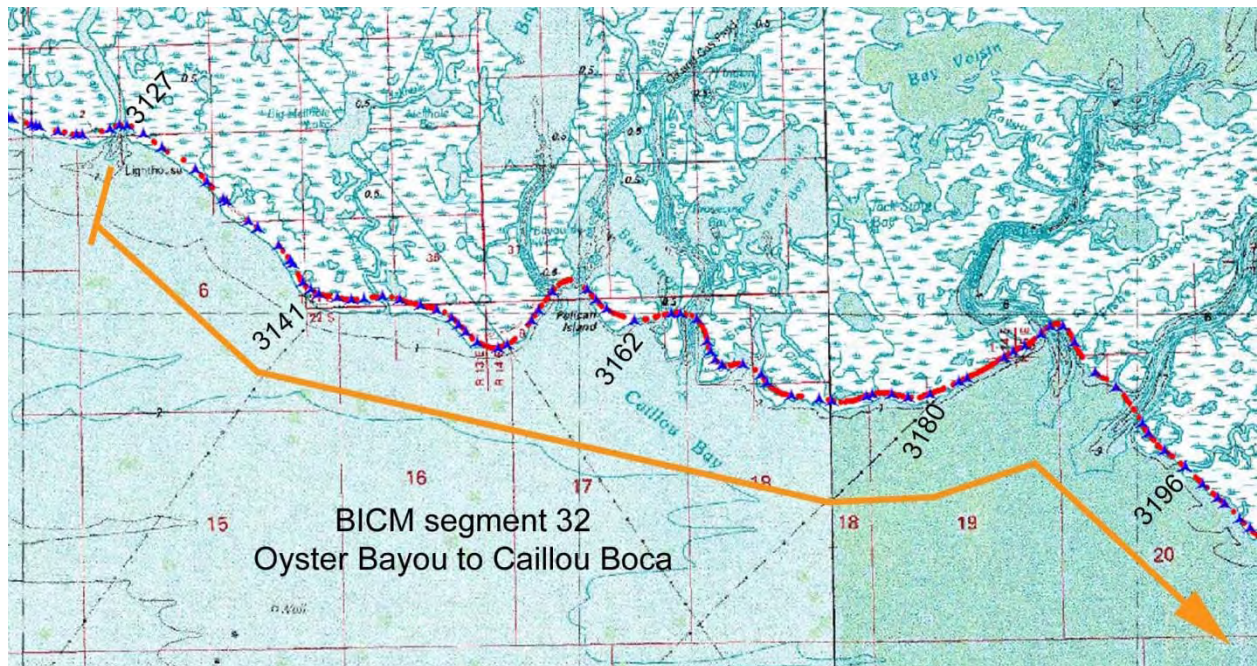


Figure 25. Location of the 2006 digital photos, frames 3127 to 3200, taken November 21, 2006 in western BICM segment 32 – “Oyster Bayou to Caillou Boca” along the Teche Delta shoreline from Oyster Bayou to Turtle Bayou, Louisiana. 4-digit numbers represent photo file-numbers.

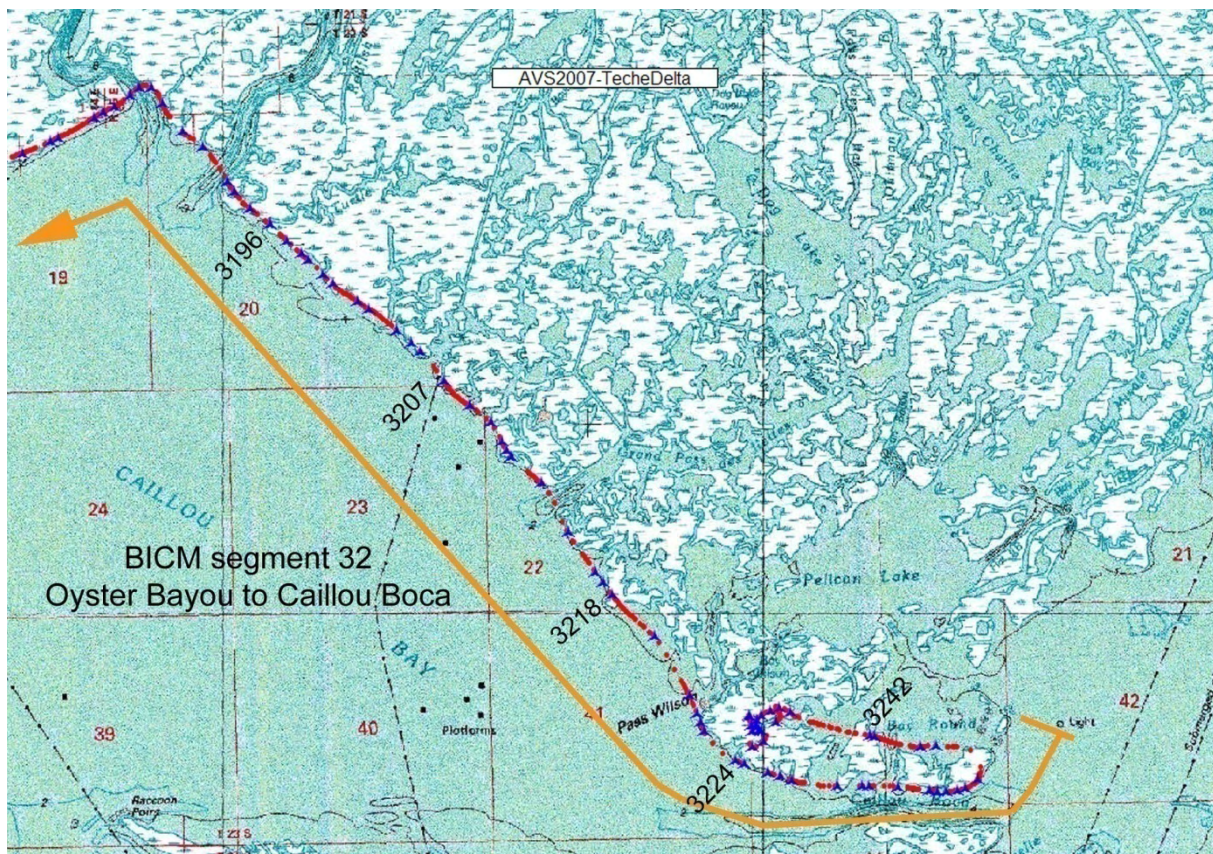


Figure 26. Location of the 2006 digital photos, frames 3180 to 3246, taken November 21, 2006 in eastern BICM segment 32 – “Oyster Bayou to Caillou Boca” along the Teche Delta shoreline from Grand Bayou du Large to Bay Round, Louisiana. 4-digit numbers represent photo file-numbers.

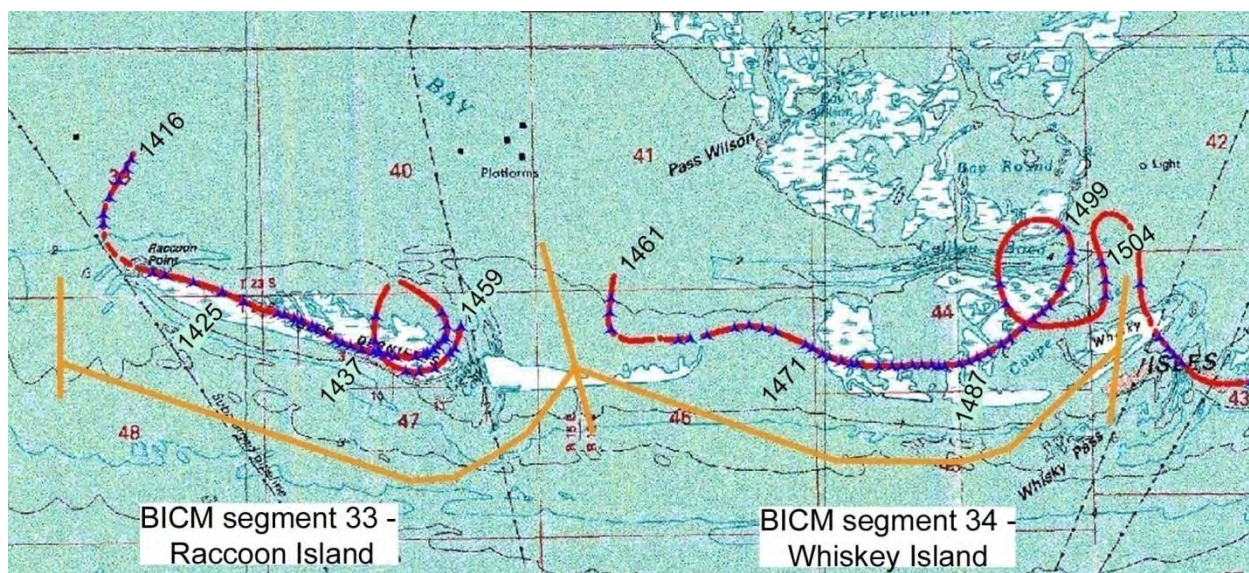


Figure 27. Location of the 2007 digital photos, frames 1416 to 1617 taken April 20, 2007 in BICM segment 33 – “Raccoon Island” and segment 34 – “Whiskey Island” along the Teche Delta shoreline from Raccoon point to Whiskey Pass of the Isles Dernieres, Louisiana. 4-digit numbers represent photo file-numbers.

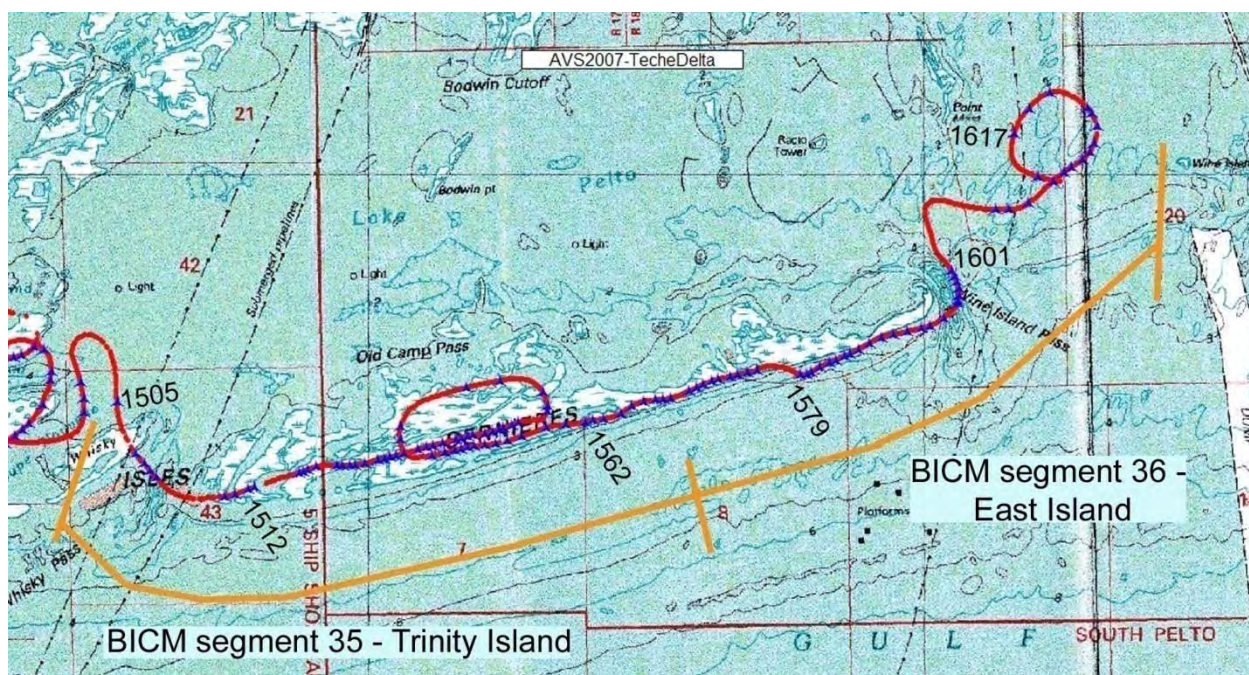


Figure 28. Location of the 2007 digital photos, frames 1505 to 1619 taken April 20, 2007 in BICM segment 35 – “Trinity Island” and segment 36 – “East Island” along the Teche Delta shoreline from Whiskey Pass to Wine Island of the Isles Dernieres, Louisiana. 4-digit numbers represent photo file-numbers.

Lafourche Delta

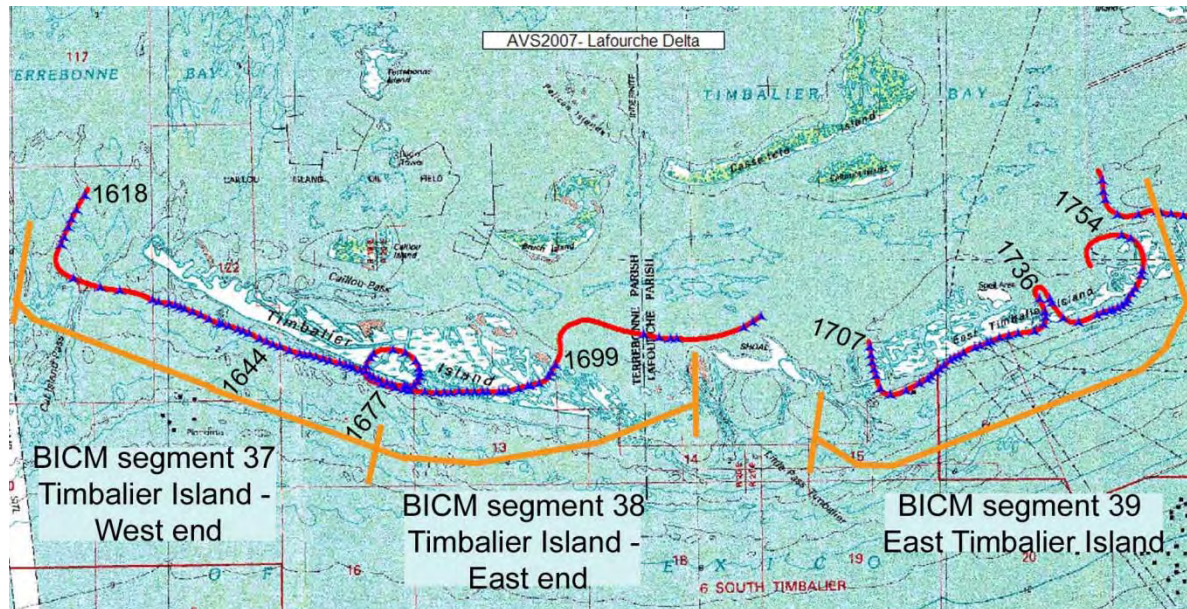


Figure 29. Location of the 2007 digital photos, frames 1618 to 1758 taken April 20, 2007 in BICM segment 37 – “Timbalier Island West End,” segment 38 – “Timbalier Island East End,” and segment 39 – “East Timbalier Island” along the Lafourche Delta shoreline from Timbalier Island to East Timbalier Island, Louisiana. 4-digit numbers represent photo file-numbers.

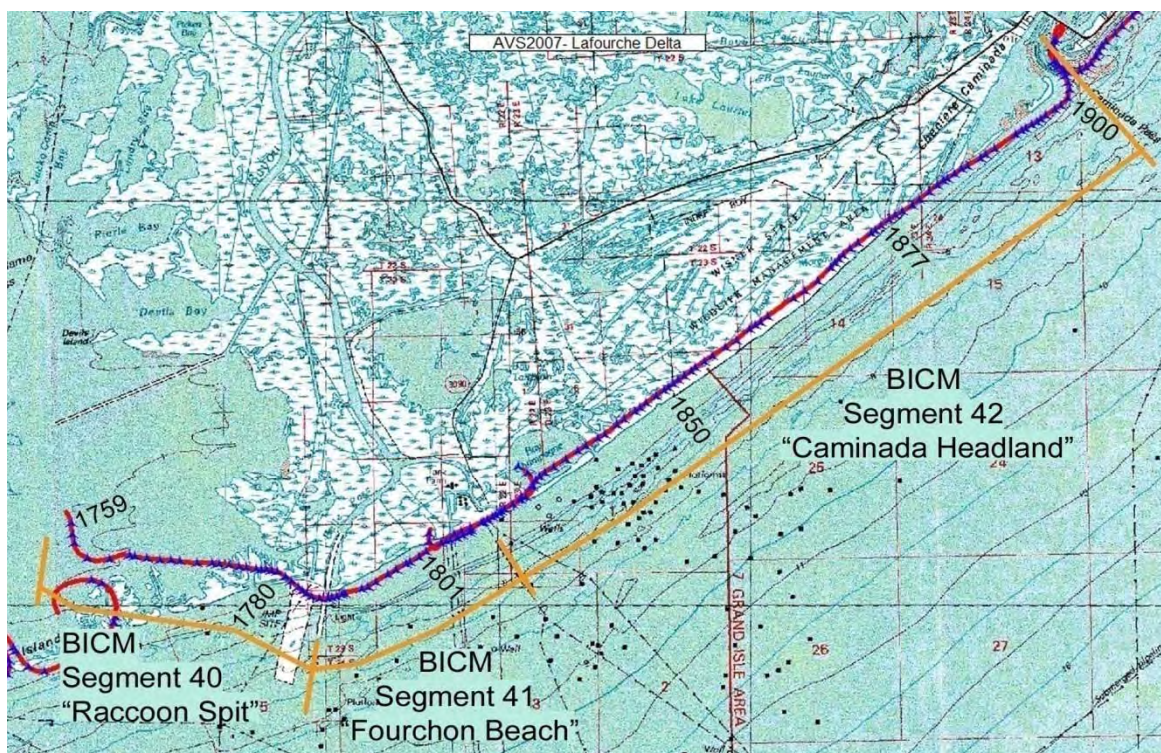


Figure 30. Location of the 2007 digital photos, frames 1759 to 1907 taken April 20, 2007 in BICM segment 40 – “Raccoon Spit,” segment 41 – “Fourchon Beach,” and segment 42 – “Caminada Headland” along the Lafourche Delta shoreline from Belle Pass spit to Elmer’s Island, Louisiana. 4-digit numbers represent photo file-numbers.

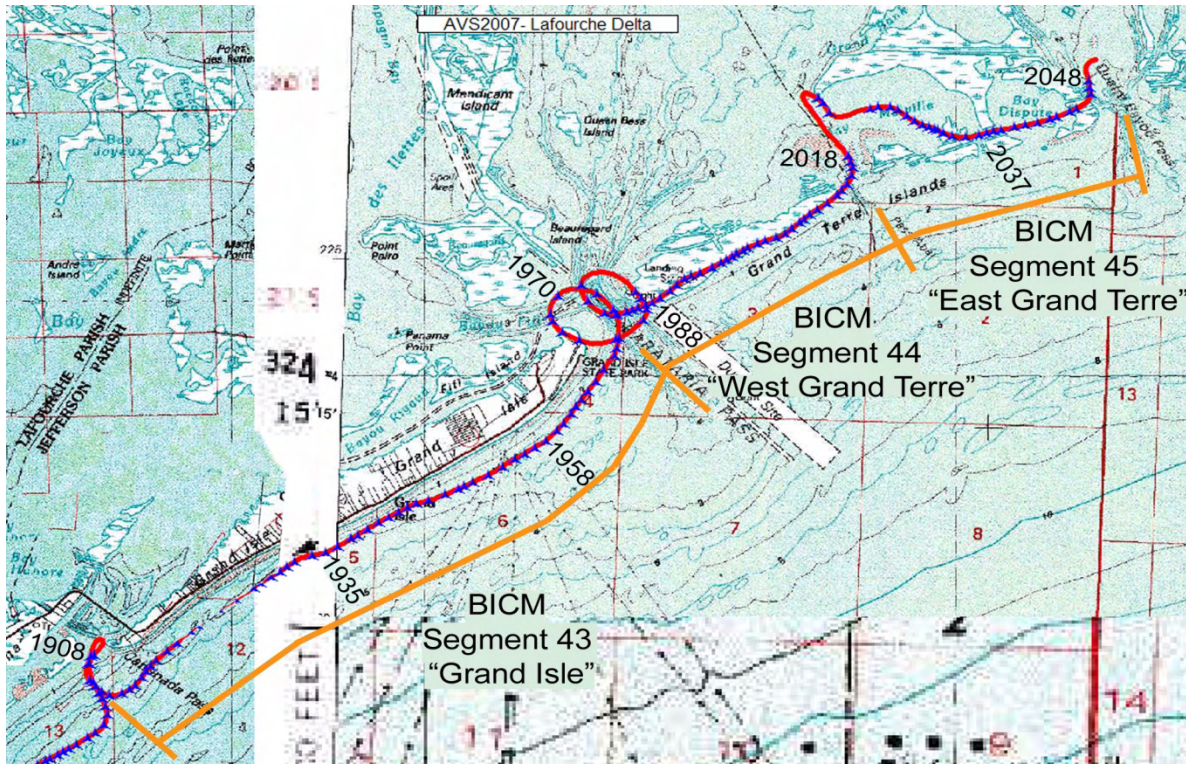


Figure 31. Location of the 2007 digital photos, frames 1908 to 2048, taken April 20, 2007 in BICM segment 43 – "Grand Isle," segment 44 – "West Grand Terre," and segment 45 – "East Grand Terre" along the Lafourche Delta shoreline from Grand Isle to Quatre Bayou Pass, Louisiana. 4-digit numbers represent photo file-numbers.

Modern Delta

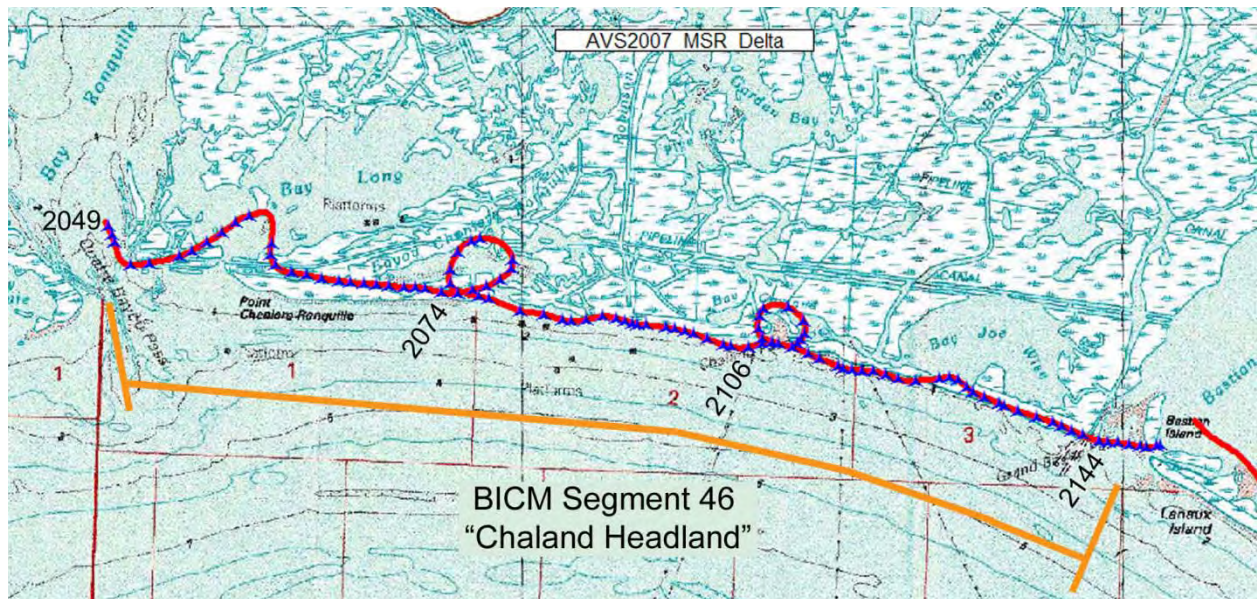


Figure 32. Location of the 2007 digital photos, frames 2049 to 2151, taken April 20, 2007 in BICM segment 46 – "Chaland Headland" along the Modern Delta shoreline from Quatre Bayou Pass to Shell Island, Louisiana. 4-digit numbers represent photo file-numbers.

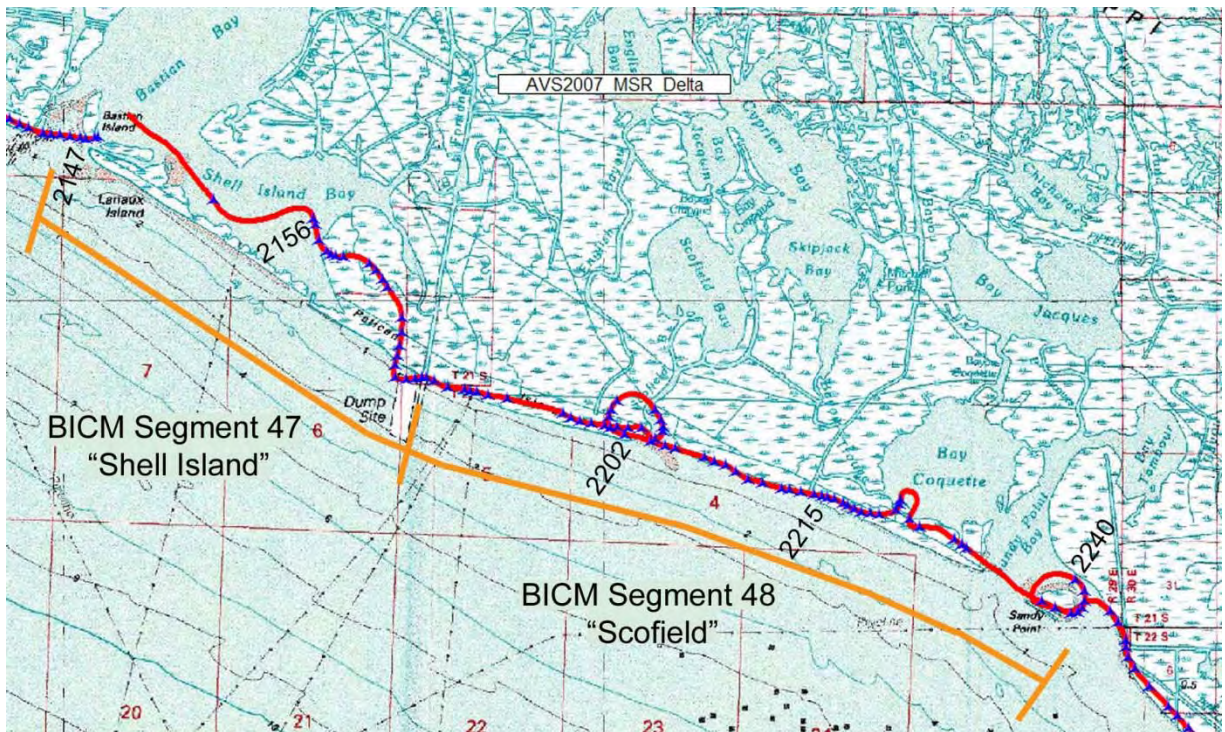


Figure 33. Location of the 2007 digital photos, frames 2147 to 2240, taken April 20, 2007 in BICM segment 47– “Shell Island” and segment 48 – “Scofield” along the Modern Delta shoreline from Shell Island to Sandy Point, Louisiana. 4-digit numbers represent photo file-numbers.

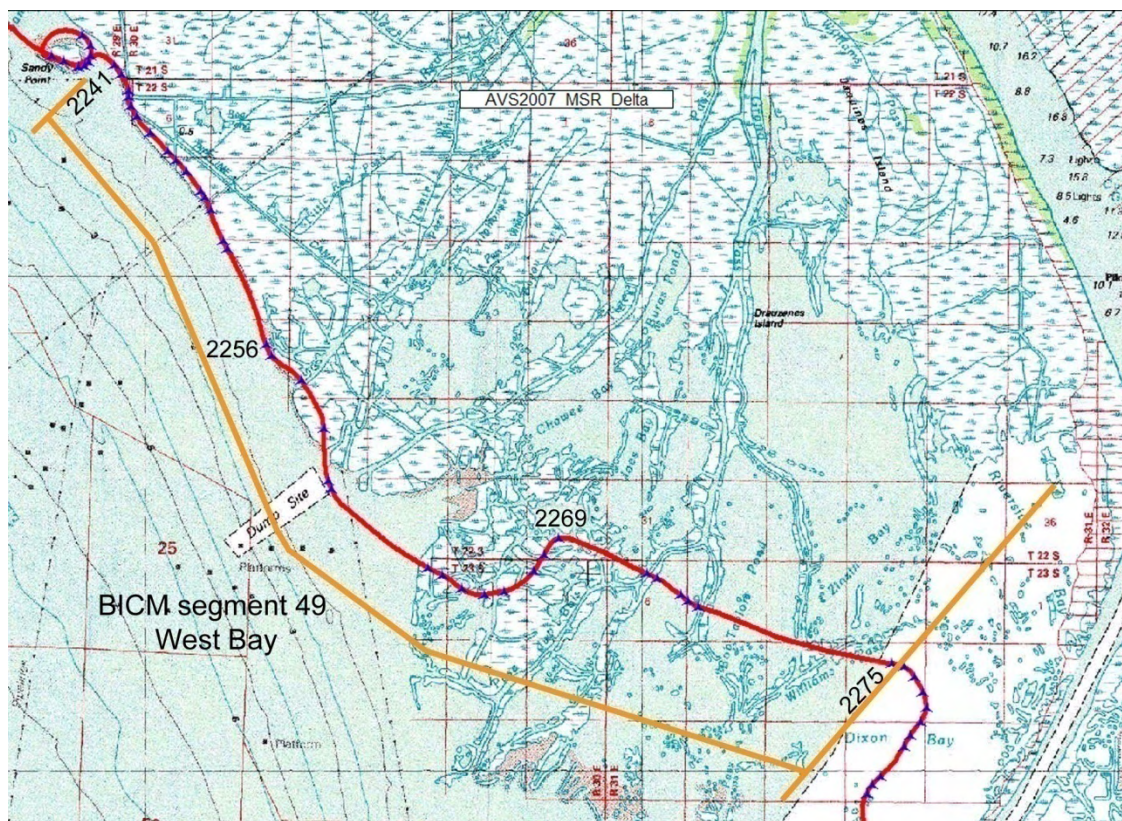


Figure 34. Location of the 2007 digital photos, frames 2241 to 2275, taken April 20, 2007 in BICM segment 49 – “West Bay” in the Modern Delta region along the western shoreline of the Mississippi River delta, Louisiana. 4-digit numbers represent photo file-numbers.

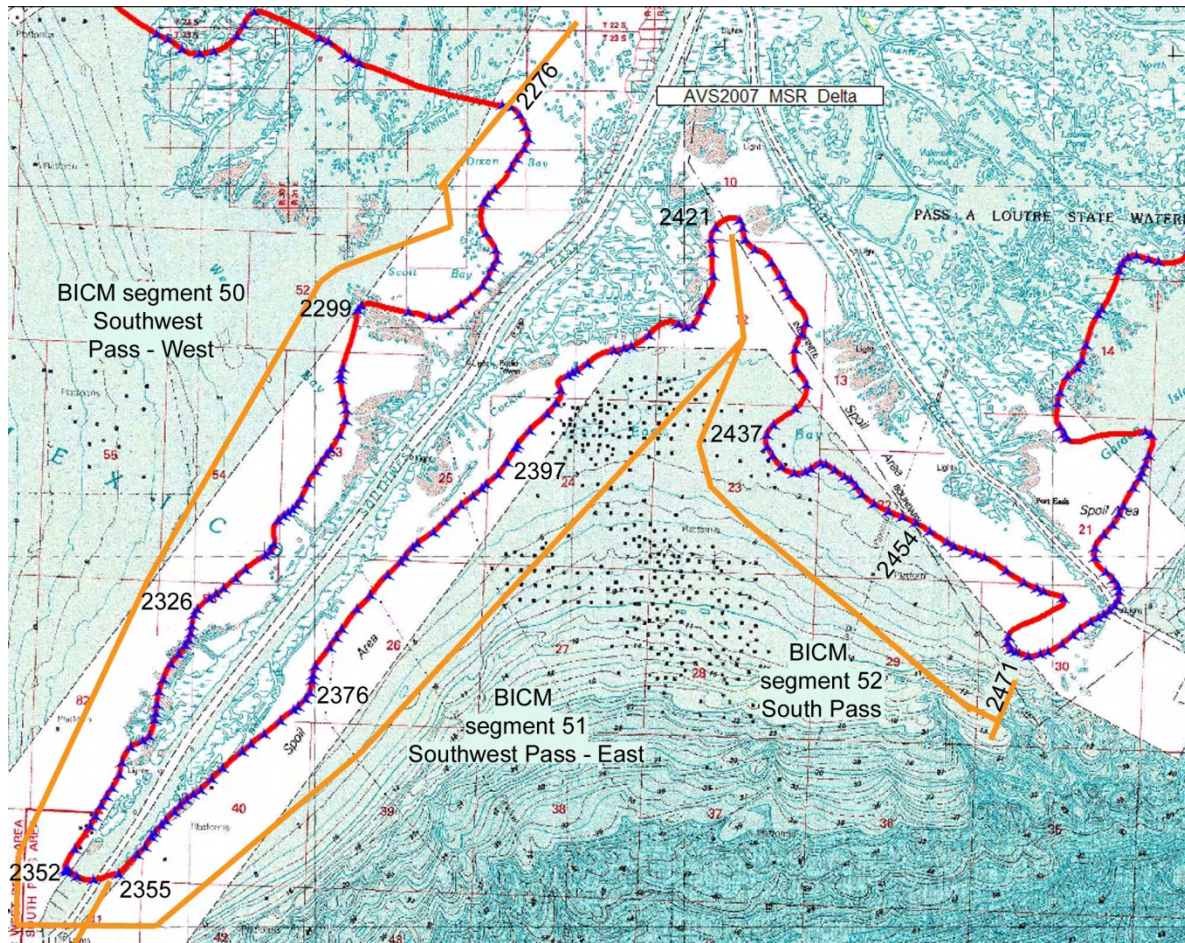


Figure 35. Location of the 2007 digital photos, frames 2276 to 2471, taken April 20, 2007 in BICM segment 50 – “Southwest Pass West,” segment 51 – “Southwest Pass East,” and Segment 52 – “South Pass” in the Modern Delta region along the south shoreline of the Mississippi River delta, Louisiana. 4-digit numbers represent photo file-numbers.

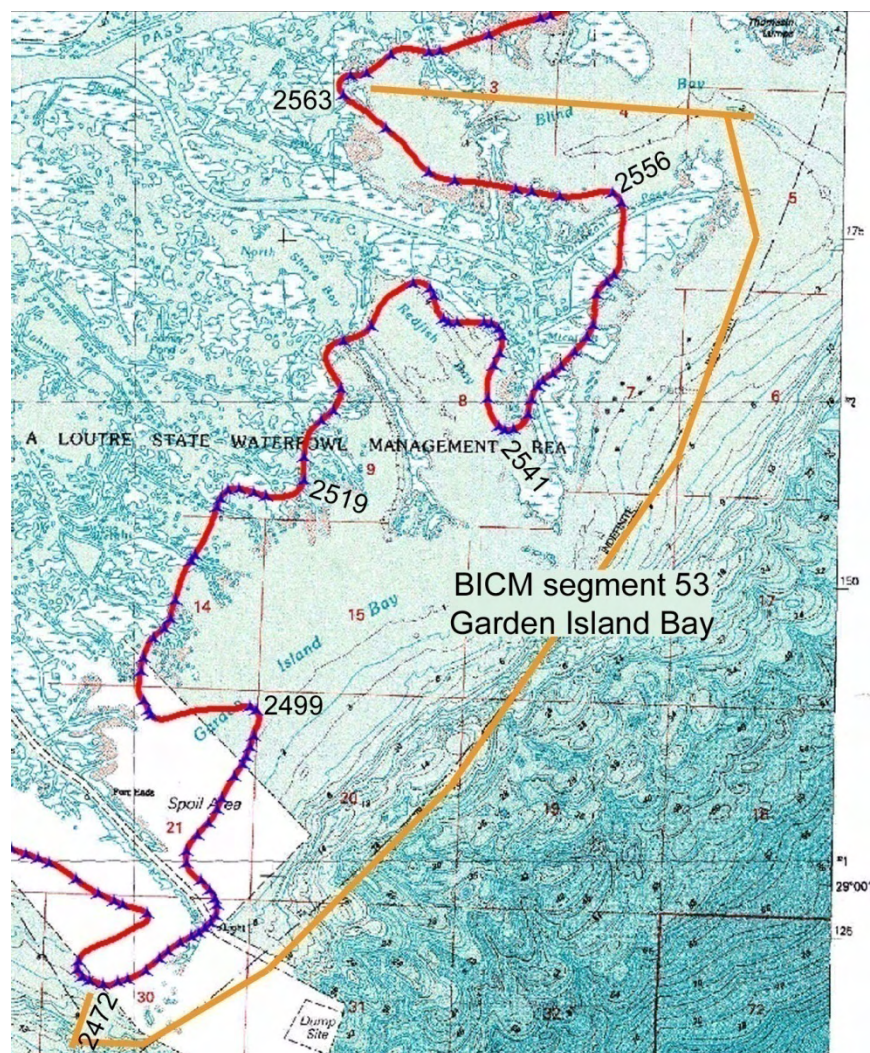


Figure 36. Location of the 2007 digital photos, frames 2472 to 2563, taken April 21, 2007 in BICM segment 53 – “Garden Island Bay” in the Modern Delta region along the eastern shoreline of the Mississippi River Delta, Louisiana. 4-digit numbers represent photo file-numbers.

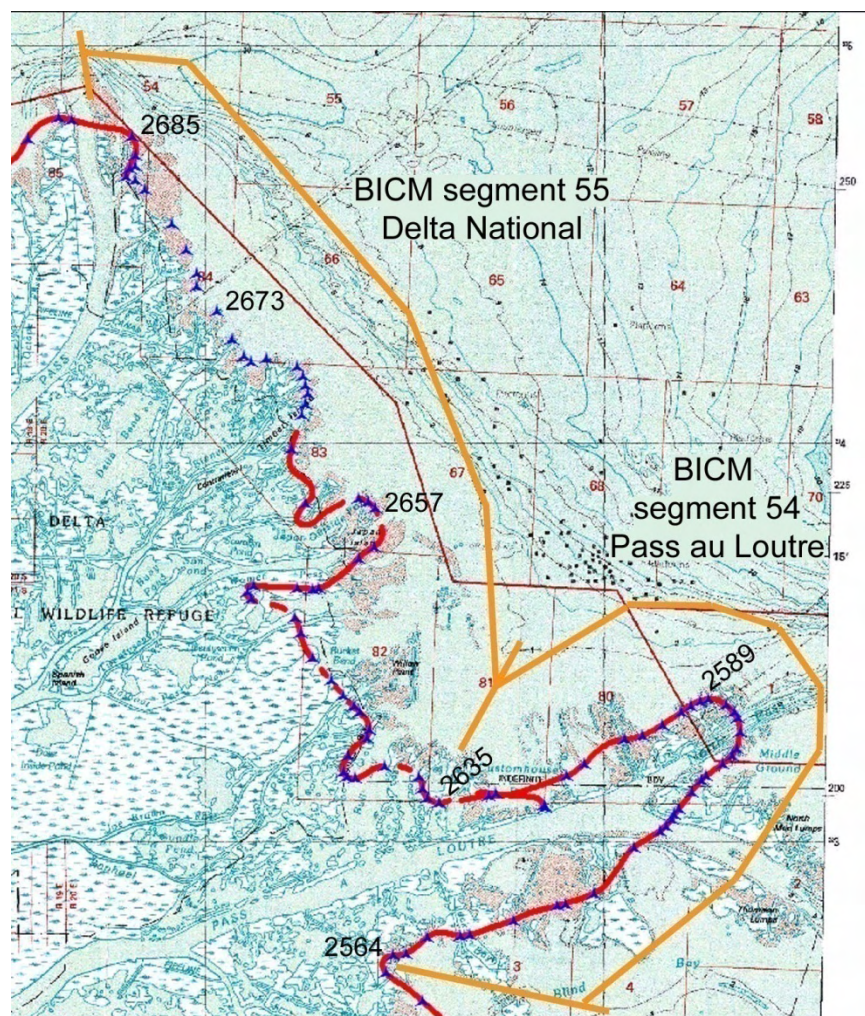


Figure 37. Location of the 2007 digital photos, frames 2564 to 2685, taken April 21, 2007 in BICM segment 54 – “Pass au Loutre” and segment 55 – “Delta National” in the Modern Delta region along the eastern shoreline of the Mississippi River Delta, Louisiana. 4-digit numbers represent photo file-numbers.

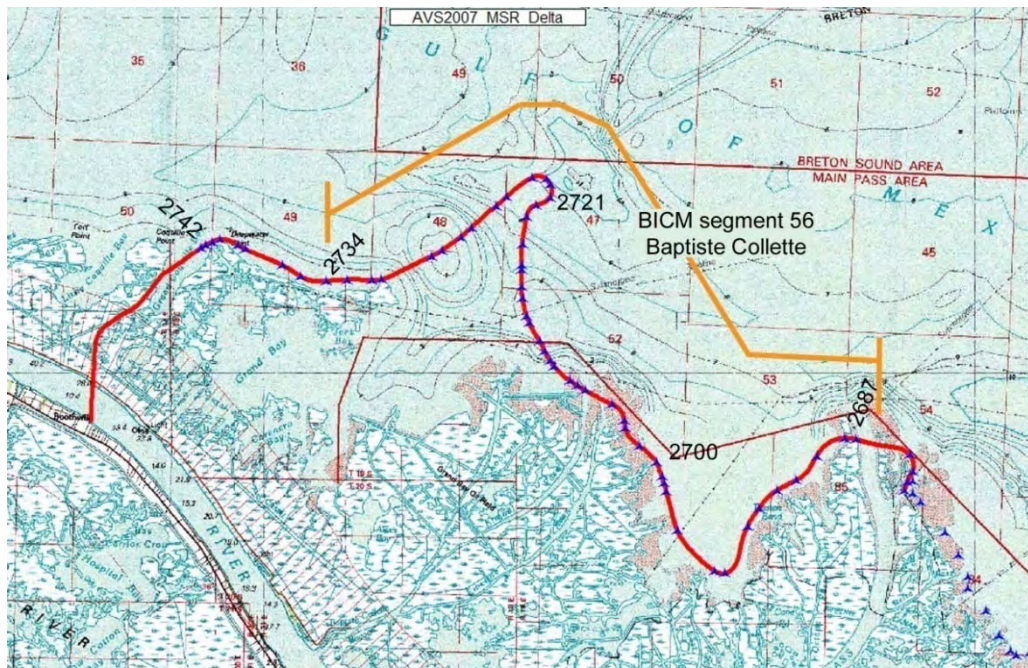


Figure 38. Location of the 2007 digital photos, frames 2687 to 2742, taken April 21, 2007 in BICM segment 56 – “Baptiste Collette” in the Modern Delta region along the eastern shoreline of the Mississippi River Delta, Louisiana. 4-digit numbers represent photo file-numbers.

Chandeleur Islands

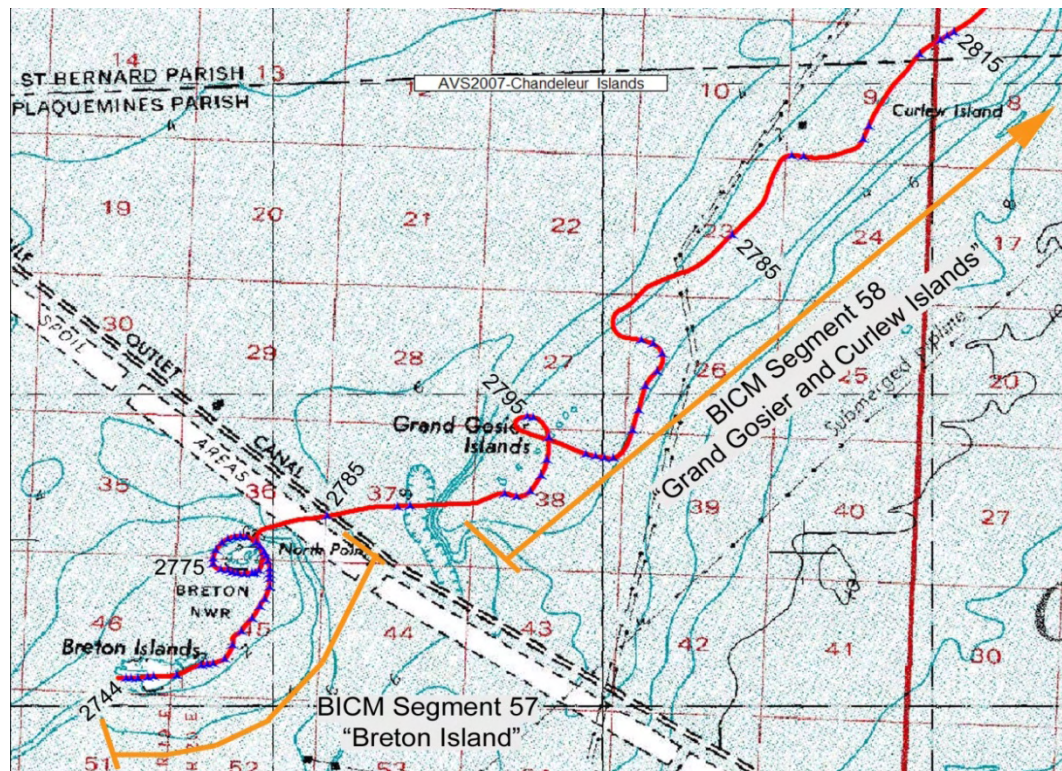


Figure 39. Location of the 2007 digital photos, frames 2744 to 2815, taken April 21, 2007 in BICM segment 57 – “Breton Island” and segment 58 – “Grand Gosier and Curlew Islands” along the Chandeleur Islands Shoreline from Breton Island to the former position of Curlew Island, Louisiana. 4-digit numbers represent photo file-numbers.

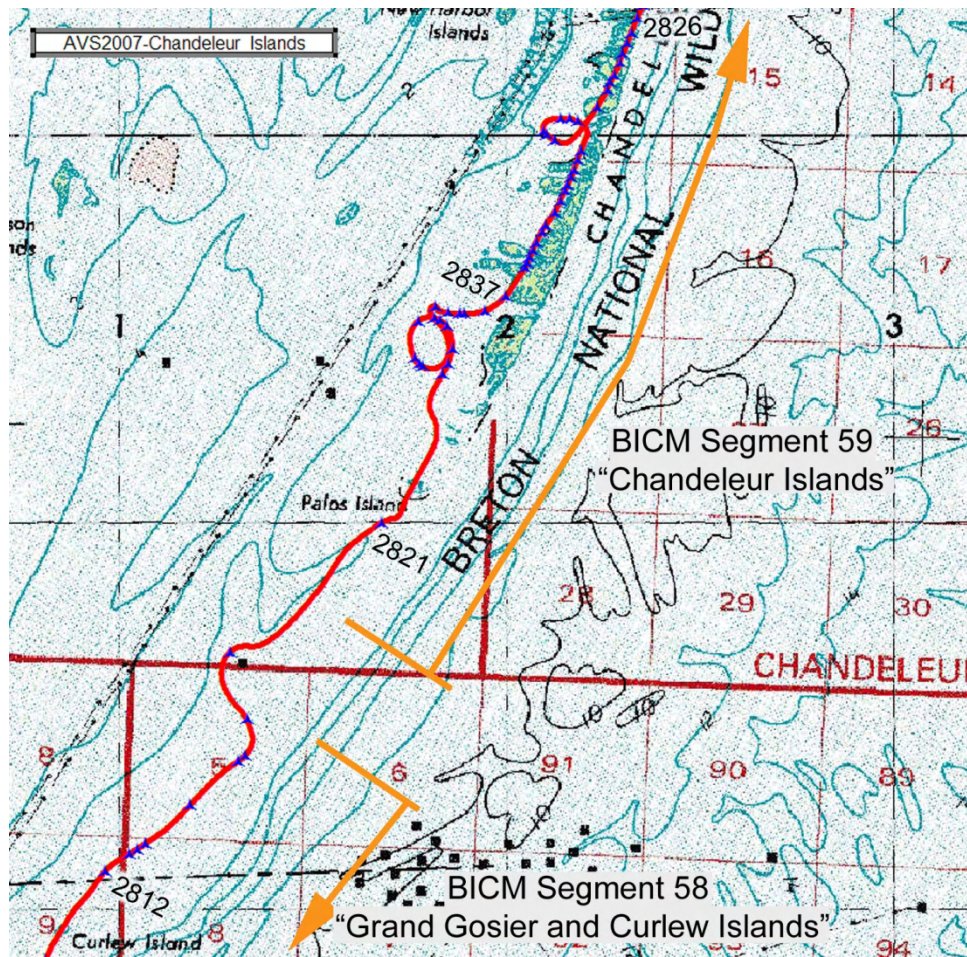


Figure 40. Location of the 2007 digital photos, frames 2812 to 2826 taken April 21, 2007 in northern BICM segment 58 – “Grand Gosier and Curlew Islands” and southern segment 59 – “Chandeleur Islands” along the Chandeleur Islands Shoreline from Curlew Island to south Chandeleur Island, Louisiana. 4-digit numbers represent photo file-numbers.

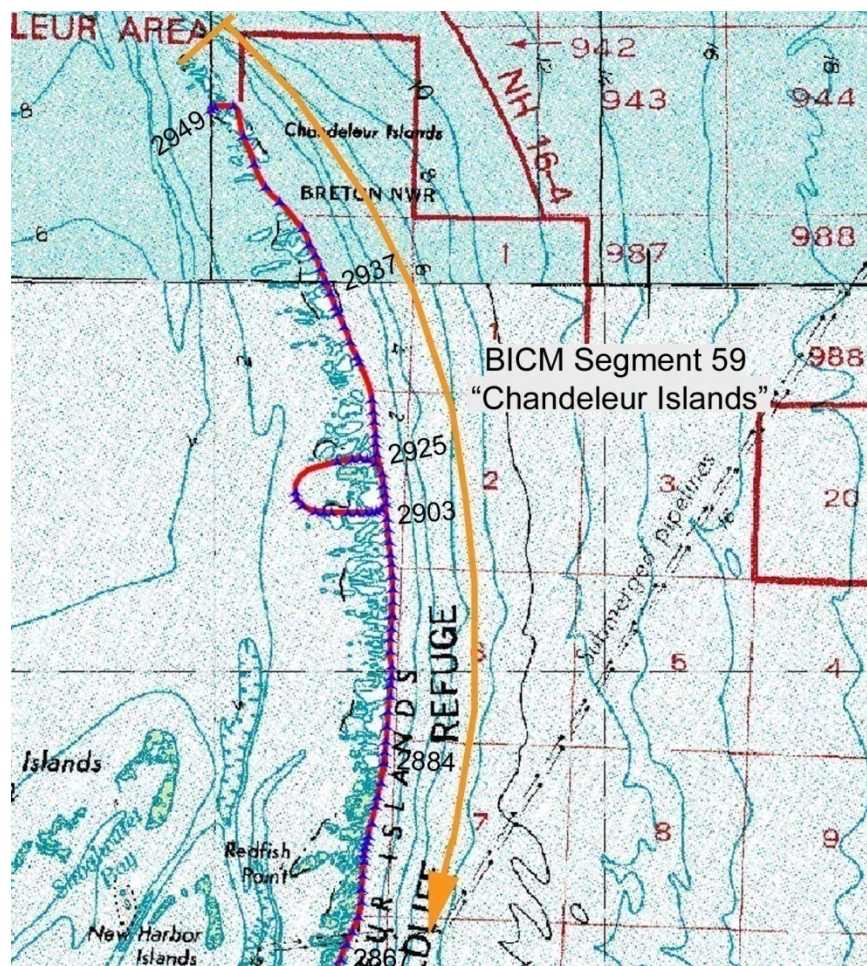
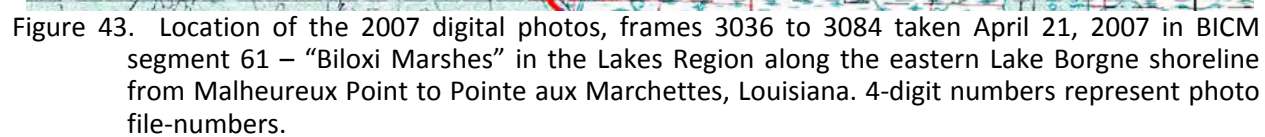
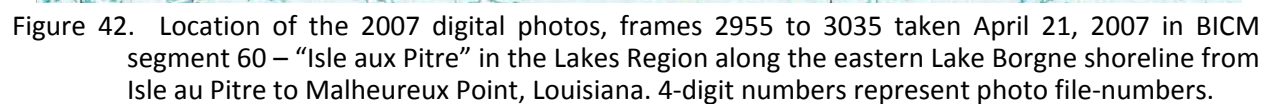


Figure 41. Location of the 2007 digital photos, frames 2867 to 2949 taken April 20, 2007 in northern BICM segment 59 – "Chandeleur Islands" along the north Chandeleur Island shoreline, Louisiana. 4-digit numbers represent photo file-numbers.



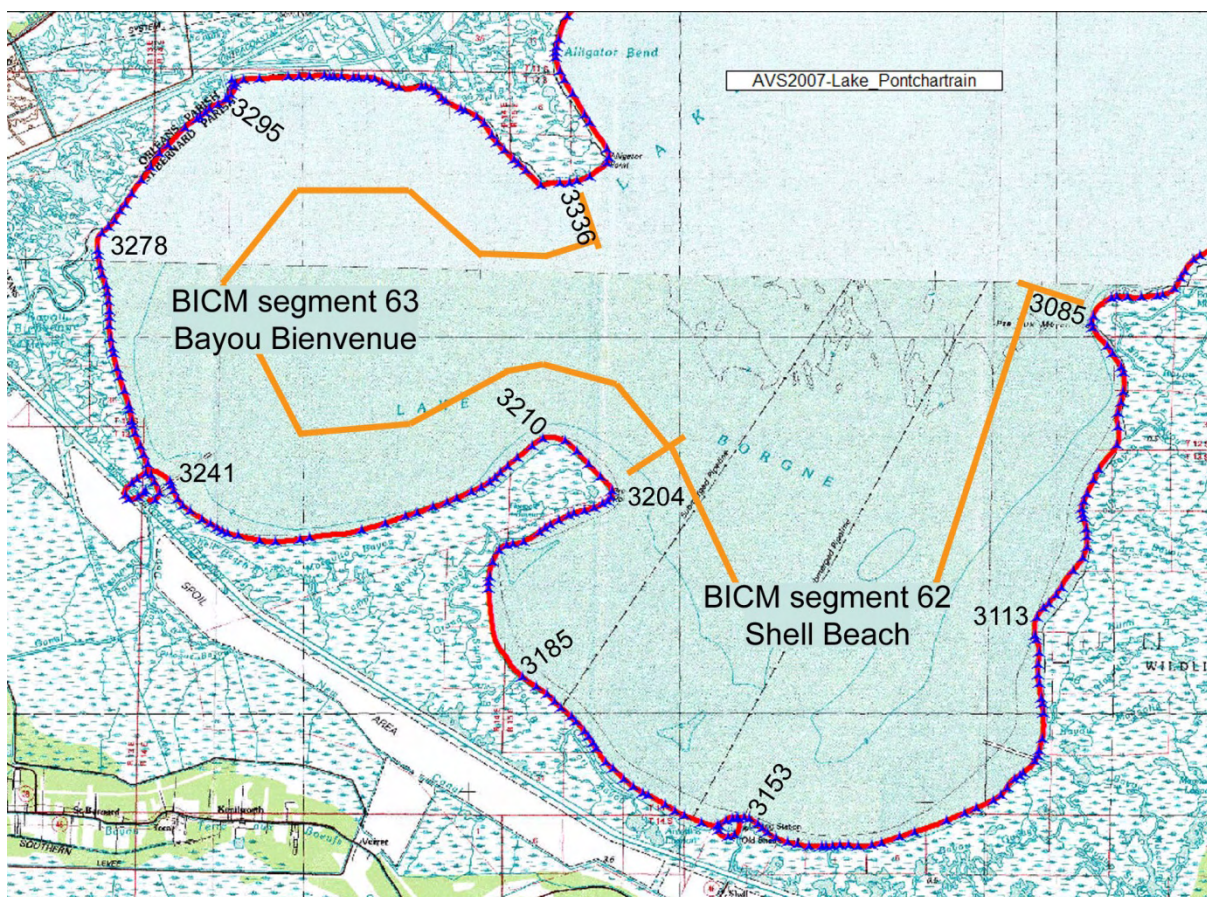


Figure 44. Location of the 2007 digital photos, frames 3085 to 3336 taken April 21, 2007 in BICM segment 62 – “Shell Beach” and segment 63 – “Bayou Bienvenue” in the Lakes Region along the southern Lake Borgne shoreline from Point aux Marchettes to Alligator Point, Louisiana. 4-digit numbers represent photo file-numbers.

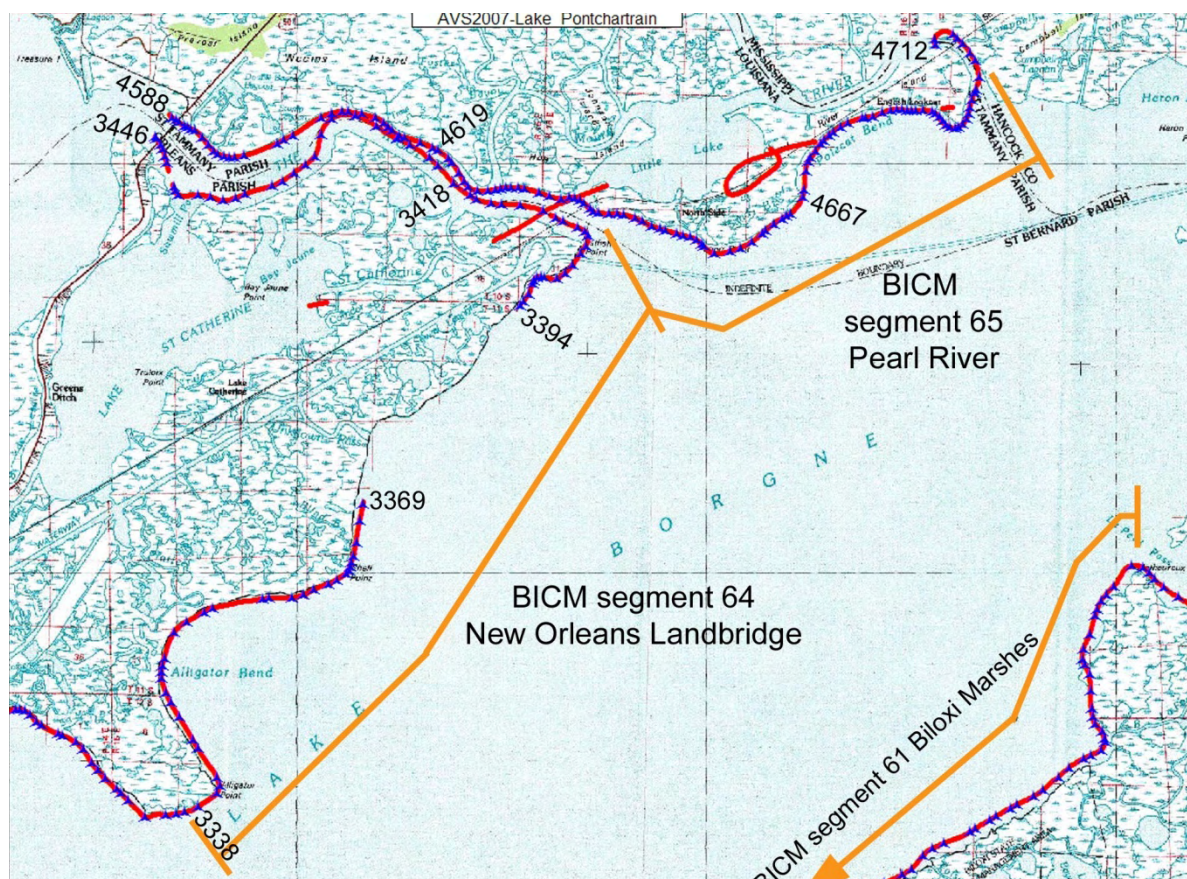


Figure 45. Location of the 2007 digital photos, frames 3338 to 3446 and 4588 to 4712 taken April 21 & 22, 2007 in BICM segment 64 – “New Orleans Landbridge” and segment 65 – “Pearl River” along the Rigolets and the north Lake Borgne shoreline from Alligator Point to the Pearl River, Louisiana. 4-digit numbers represent photo file-numbers.



Figure 46. Location of the 2007 digital photos, frames 3452 to 3626 taken April 21, 2007 in BICM segment 67 – “South Point,” segment 68 – “Little Woods,” and eastern segment 69 – “Orleans Lake Front” in the Lakes Region along the southeast shoreline of Lake Pontchartrain from the Rigolets to City Park, Louisiana. 4-digit numbers represent photo file-numbers.

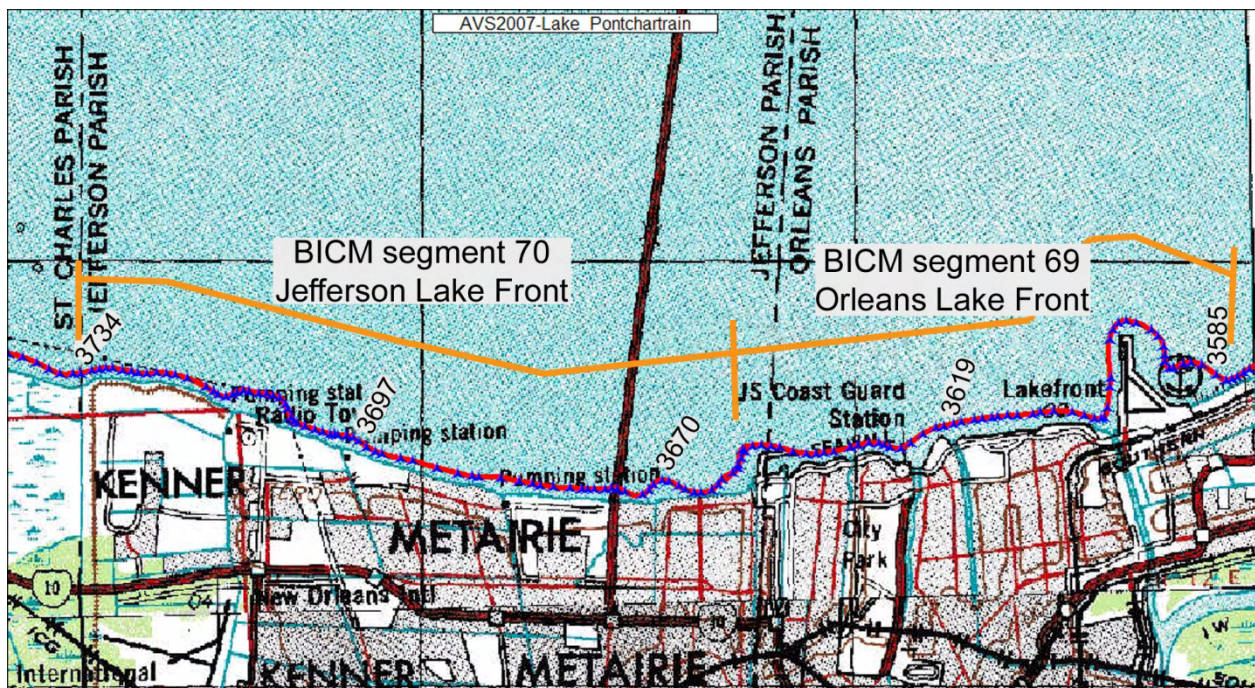


Figure 47. Location of the 2007 digital photos, frames 3585 to 3734 taken April 21, 2007 in BICM segment 69 – “Orleans Lakefront” and segment 70 – “Jefferson Lake Front” in the Lakes Region along the southern shoreline of Lake Pontchartrain from the Lakefront airport to Jefferson Parish line, Louisiana. 4-digit numbers represent photo file-numbers.

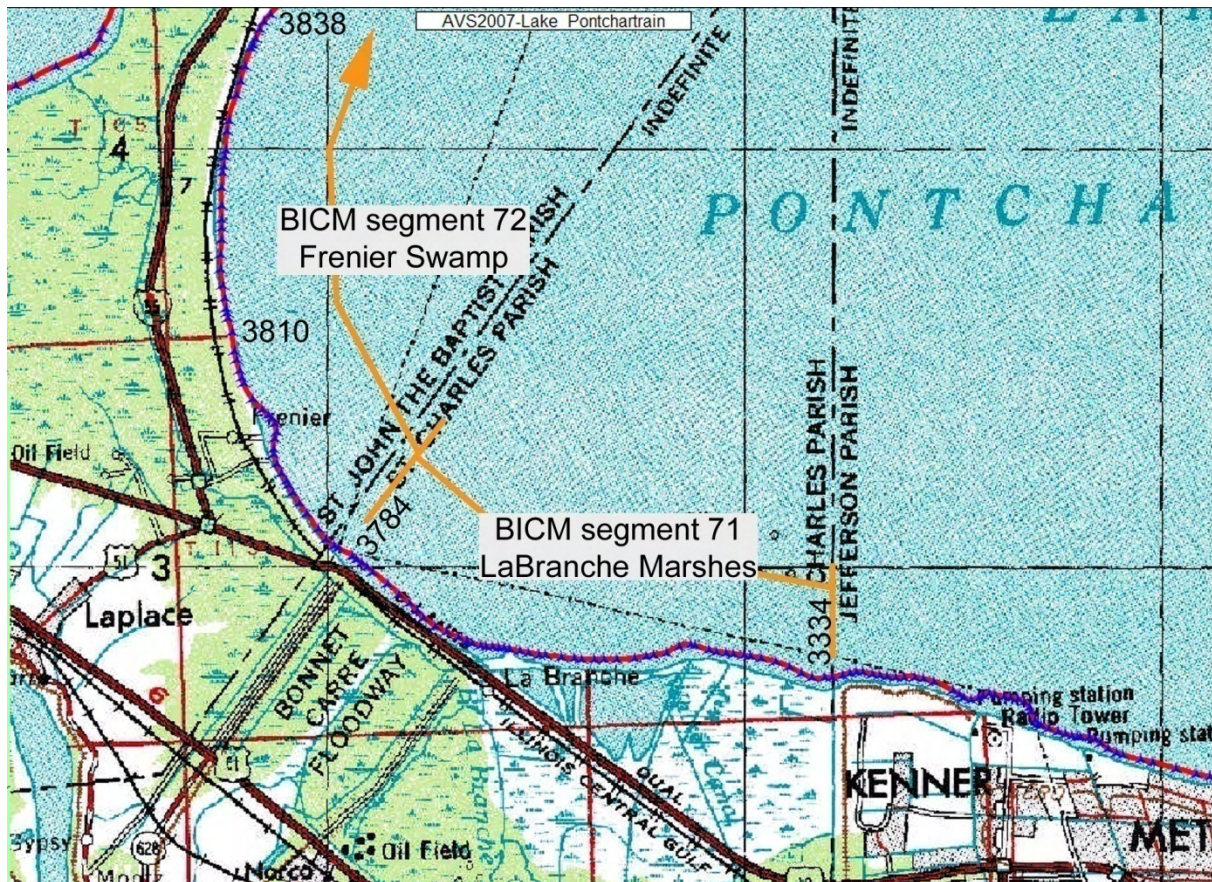


Figure 48. Location of the 2007 digital photos, frames 3334 to 3838 taken April 22, 2007 in BICM segment 71 – “LaBranche Marshes” and southern segment 72 – “Frenier Swamp” in the Lakes Region along the southwest shoreline of Lake Pontchartrain from Kenner to Ruddock, Louisiana. 4-digit numbers represent photo file-numbers.

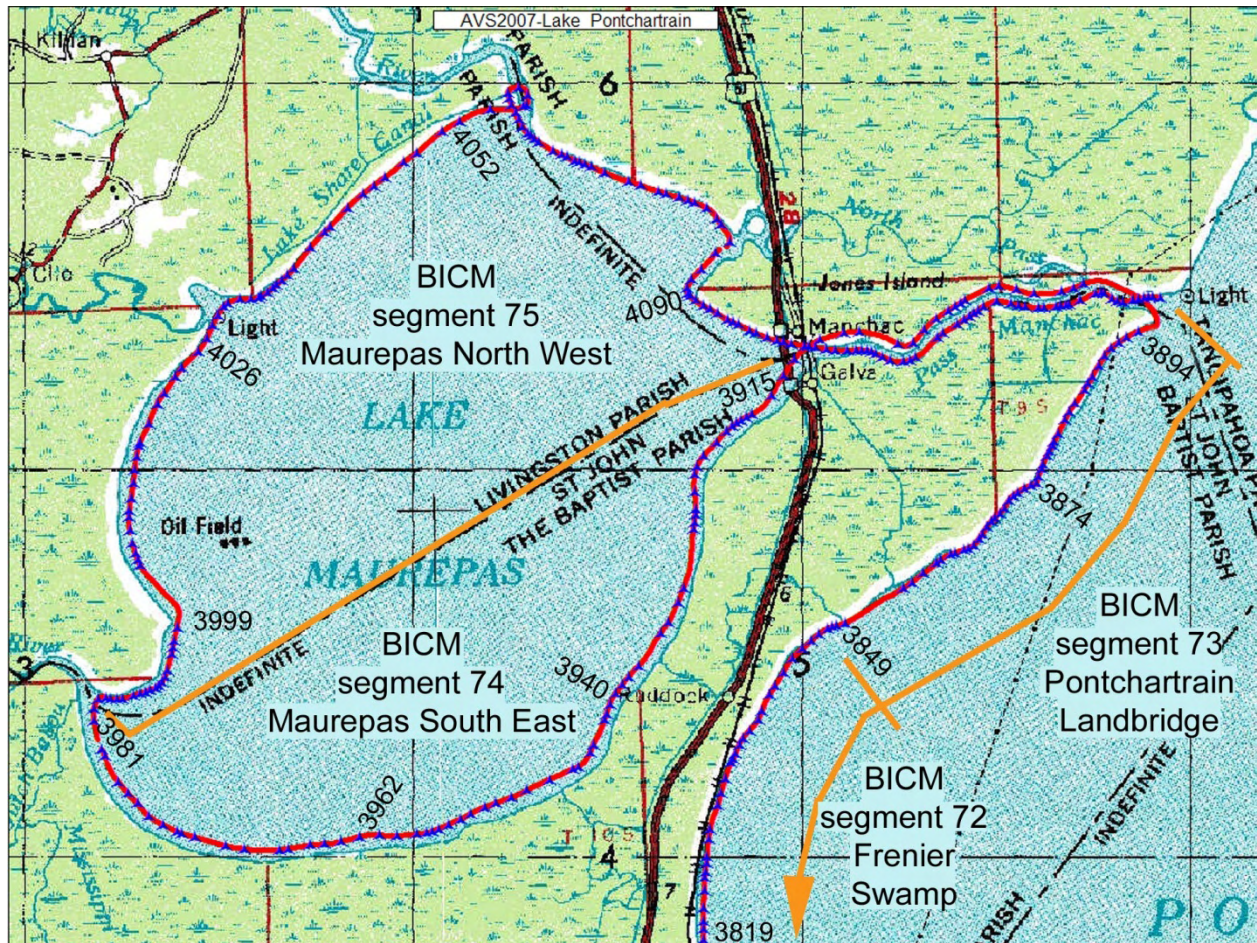


Figure 49. Location of the 2007 digital photos, frames 3819 to 4159 taken April 22, 2007 in northern BICM segment 72 – “Frenier Swamp,” segment 73 – “Pontchartrain Landbridge,” segment 74 – “Maurepas South East,” and segment 75 – “Maurepas North West” in the Lakes Region along western Lake Pontchartrain, both banks of Pass Manchac and the shoreline of Lake Maurepas, Louisiana. 4-digit numbers represent photo file-numbers.



Figure 50. Location of the 2007 digital photos, frames 4160 to 4342 taken April 22, 2007 in BICM segment 76 – “Tangipahoa River,” segment 77 – “Madisonville,” segment 78 – “Mandeville,” and western segment 79 – “Big Branch Marshes” in the Lakes Region along the north shoreline of Lake Pontchartrain from Pass Manchac, to Green Point, Louisiana. 4-digit numbers represent photo file-numbers.

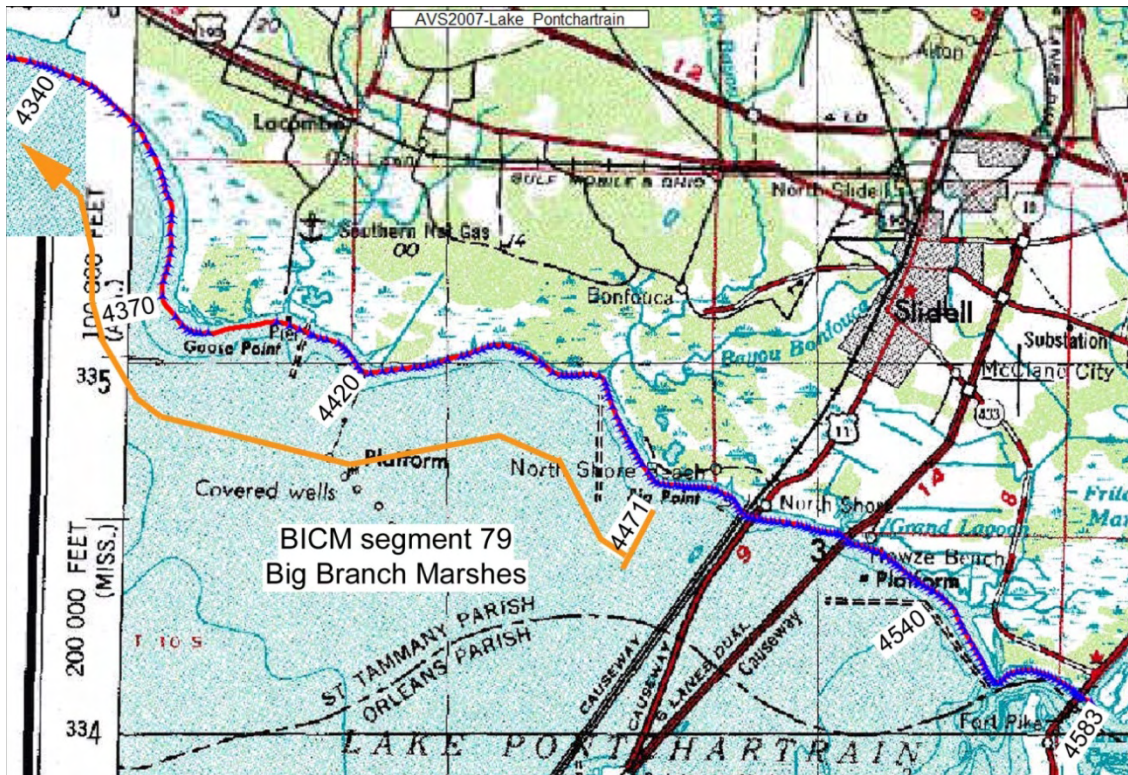


Figure 51. Location of the 2007 digital photos, frames 4340 to 4583 taken April 22, 2007 in eastern BICM segment 79 – “Big Branch Marshes” and “North Shore” in the Lakes Region along the northeast shoreline of Lake Pontchartrain from Cane Bayou to the Rigolets, Louisiana. 4-digit numbers represent photo file-numbers.

Location Data for the 2006/2007 Post-Hurricane Katrina/Rita Photography

The data files were generated by the Media Mapper software and were based upon the video flightlines contained on each DVD. The divisions for the DVDs were based on BICM regions, but several DVDs were included in some regions. One table was generated for each DVD division. The tables included in hardcopy here show: longitude (LON), latitude (LAT), UTM Easting, UTM Northing, altitude (ALT), date and time (UTC), calibrated to GPS (NONGPS - "FALSE" means it has GPS data), and photo name or frame number. The excel files included on a CD have the full complement of data collected from the GPS unit.

The data was manually identified to the approximate BICM segment. Latitude and Longitude was converted by Corpscon6, a conversion software, to UTM Zone 15 North, NAD 83.

- Western Chenier Plain
 - i. DVD 1 - Sabine Pass to Mud Lake Outlet
- Eastern Chenier Plain
 - i. DVD 2 - Mud Lake Outlet to Freshwater Bayou
 - ii. DVD 3 - Freshwater Bayou to Southwest Pass
- Acadiana Bays
 - i. DVD 4 – Marsh Island to Champlain Point
 - ii. DVD 5 – Champlain Point to Red Bluff
 - iii. DVD 6 - Red Bluff to Wax Lake Delta
 - iv. DVD 7 – Wax Lake Delta to Point au Fer
- Teche Delta
 - i. DVD 8 – Point au Fer to Caillou Boca
 - ii. DVD 9 - Isles Dernieres
- Lafourche Delta
 - i. DVD 10 – Timbalier Islands to Grand Terre Islands
- Modern Delta
 - i. DVD 11 – Cheniere Ronquille to Sandy Point and west MSR delta to South Pass
 - ii. DVD 12 – East MSR delta from South Pass to Deepwater Point
- Chandeleur Islands
 - i. DVD 13 – Breton Island to north point of Chandeleur Islands
- Lakes Region
 - i. DVD 14 – Lake Borgne: Isle a Pitre to Alligator Pt
 - ii. DVD 15 – Lake Borgne: Alligator Pt to Pearl River, including Rigolets
 - iii. DVD 16 – South Lake Pontchartrain to Pass Manchac
 - iv. DVD 17 – Lake Maurepas
 - v. DVD 18 – North Lake Pontchartrain from Pass Manchac to the Rigolets