

Final Coastal High Water Mark Collection for Hurricane Wilma in Florida

FEMA-1609-DR-FL, Task Order 460

March 30, 2006 (Final)



FEMA

**HAZARD MITIGATION TECHNICAL ASSISTANCE PROGRAM
CONTRACT NO. EMW-2000-CO-0247
TASK ORDER 460
HURRICANE WILMA RAPID RESPONSE
FLORIDA COASTAL HIGH WATER MARK COLLECTION
FEMA-1609-DR-FL**

**FINAL REPORT
MARCH 30, 2006**

SUBMITTED TO:



FEMA

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AUTHORITY AND PURPOSE

This study documents a high water mark (HWM) survey conducted along the Florida coast and streams following Hurricane Wilma, which made landfall on October 21, 2005. The study was performed to assist the Federal Emergency Management Agency (FEMA) Mitigation Program efforts to assess storm conditions and aid people victimized by the storm. Time-sensitive surveys were performed to investigate evidence of high water conditions and to collect coastal and riverine HWMs.

President George W. Bush issued a major disaster declaration on October 24, 2005, under the authority of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), for damage in certain areas in Florida resulting from Hurricane Wilma (FEMA-1609-DR-Florida). The disaster declaration ordered the Federal Government to provide all necessary resources and assets for Florida to aid people devastated by Hurricane Wilma. URS Group, Inc. (URS) was contracted by FEMA under Task Order 460 of the Hazard Mitigation Technical Assistance Program (HMTAP) contract to assist in the disaster recovery by conducting HWM studies for Florida after Hurricane Wilma. The URS team for these Task Orders includes URS and its subconsultants, Dewberry, and PBS&J.

The purpose of this project was to conduct field surveys to find evidence of high water levels in coastal and riverine areas; to document, photograph, and survey HWMs; and to provide a report explaining the work and results. This report includes a summary of Hurricane Wilma storm conditions, descriptions of the disaster declaration and Federal assistance, and descriptions of the HWM study methodologies and results. The information contained in this report is an important step in assisting communities in establishing high water marks to be used in flood hazard mitigation and for further studies for wind and water damage line assessment, flood inundation mapping, and flood frequency analyses. This report supersedes all submissions of preliminary HWM data prepared under this contract for the Florida coast.

BACKGROUND

On October 19, 2005, Hurricane Wilma became the third Category 5 hurricane of the 2005 Atlantic hurricane season. Wilma began as Tropical Depression 24 southeast of the Cayman Islands on October 15. The tropical depression gained tropical storm strength on October 17 and became the first “W” named storm since the alphabetical naming of tropical storms began in 1950. During its intensification on October 19, Wilma strengthened from a tropical storm to a Category 5 hurricane, and the hurricane's eye shrank to as small as 1.5 to 2.0 nautical miles in diameter, becoming one of the smallest eyes ever seen in a tropical cyclone. Hurricane Wilma set the record for the lowest pressure recorded for an Atlantic hurricane and the most intense hurricane ever reported.

Hurricane Wilma made landfall on the Yucatan Peninsula in Mexico as a Category 4 hurricane on October 21. Wilma passed over Cozumel, Mexico and made landfall on October 22 near Playa del Carmen in the state of Quintana Roo. Following a northeastern path, Wilma entered the Gulf Coast as a Category 2 hurricane on October 23. Hurricane Wilma regained strength and made a third landfall on October 24 as a Category 3 hurricane near Cape Romano, Florida with wind speeds of approximately 150 mph. Weakening to a Category 2 hurricane, Wilma swept through southern Florida within 6 hours and exited through the Miami-Fort Lauderdale area. Wilma upgraded again to a Category 3 hurricane over the Bahamas, and then finally weakened to non-tropical strength just south of Nova Scotia on October 25.¹ The path of Hurricane Wilma is shown in Figure 1 (<http://cimss.ssec.wisc.edu/tropic/archive/2005/storms/wilma/wilma.html>).

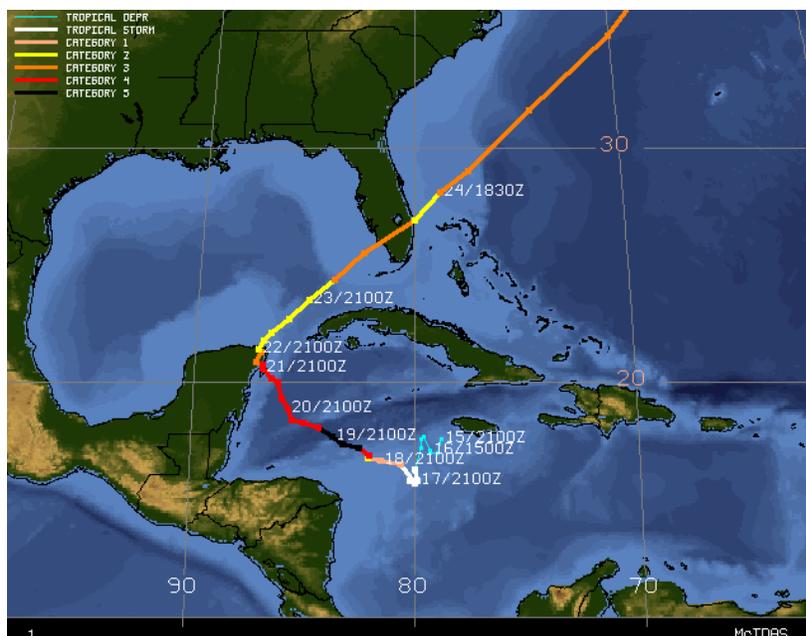


Figure 1. Hurricane Wilma Storm-Track

¹ “Climate of 2005 Summary of Hurricane Wilma,” Revised October 31, 2005, National Climatic Data Center. <<http://www.ncdc.noaa.gov/oa/climate/research/2005/wilma.html>>

Figure 2 shows a composite image of Hurricane Wilma approaching Florida on October 23, 2005. The figure is a copy of a Moderate Resolution Imager Spectroradiometer (MODIS) image from the National Aeronautics and Space Administration's (NASA's) Terra satellite, as provided by NASA's Earth Observatory (http://earthobservatory.nasa.gov/NaturalHazards/natural_hazards_v2.php3?img_id=13221).



Figure 2. Satellite Image of Hurricane Wilma

Hurricane Wilma caused widespread damage in southern Florida. According to the National Oceanic and Atmospheric Administration (NOAA), storm surges of 4 to 8 feet in coastal Collier County, 4 to 5 feet in the Florida Keys, and up to 9 feet in the Marathon area were reported. The storm surge resulted in substantial flooding in the Florida Keys and minor flooding on the Biscayne Bay of Dade County. As Wilma moved quickly across the Florida peninsula, rainfall did not have a significant impact on southern Florida. Storm rainfall totals ranged from 3 to 7 inches overall and only 1 to 2 inches in southeast Florida.²

Federal Assistance

Notice was given in the Federal Register, in a letter to Florida, dated October 24, 2005, that the President declared a major disaster under authority of the Stafford Act for damage in certain

² "Tropical Cyclone Report, Hurricane Wilma, 15-25 October 2005, Richard J. Pasch, Eric S. Blake, Hugh D. Cobb III, and David P. Roberts, National Hurricane Center, 12 January 2006." <http://www.nhc.noaa.gov/pdf/TCR-AL242005_Wilma.pdf>

areas in Florida resulting from Hurricane Rita (FEMA-1609-DR-FL; <http://www.fema.gov/news/dfrn.fema?id=5026>). The declaration provides the necessary Federal assistance to meet immediate needs and to help recover as quickly as possible. The Florida counties that were designated for Disaster Declaration FEMA-1609-DR-FL, as of November 4, 2005, are shown in Figure 3.

FEMA-1609-DR, Florida Disaster Declaration as of 11/04/2005

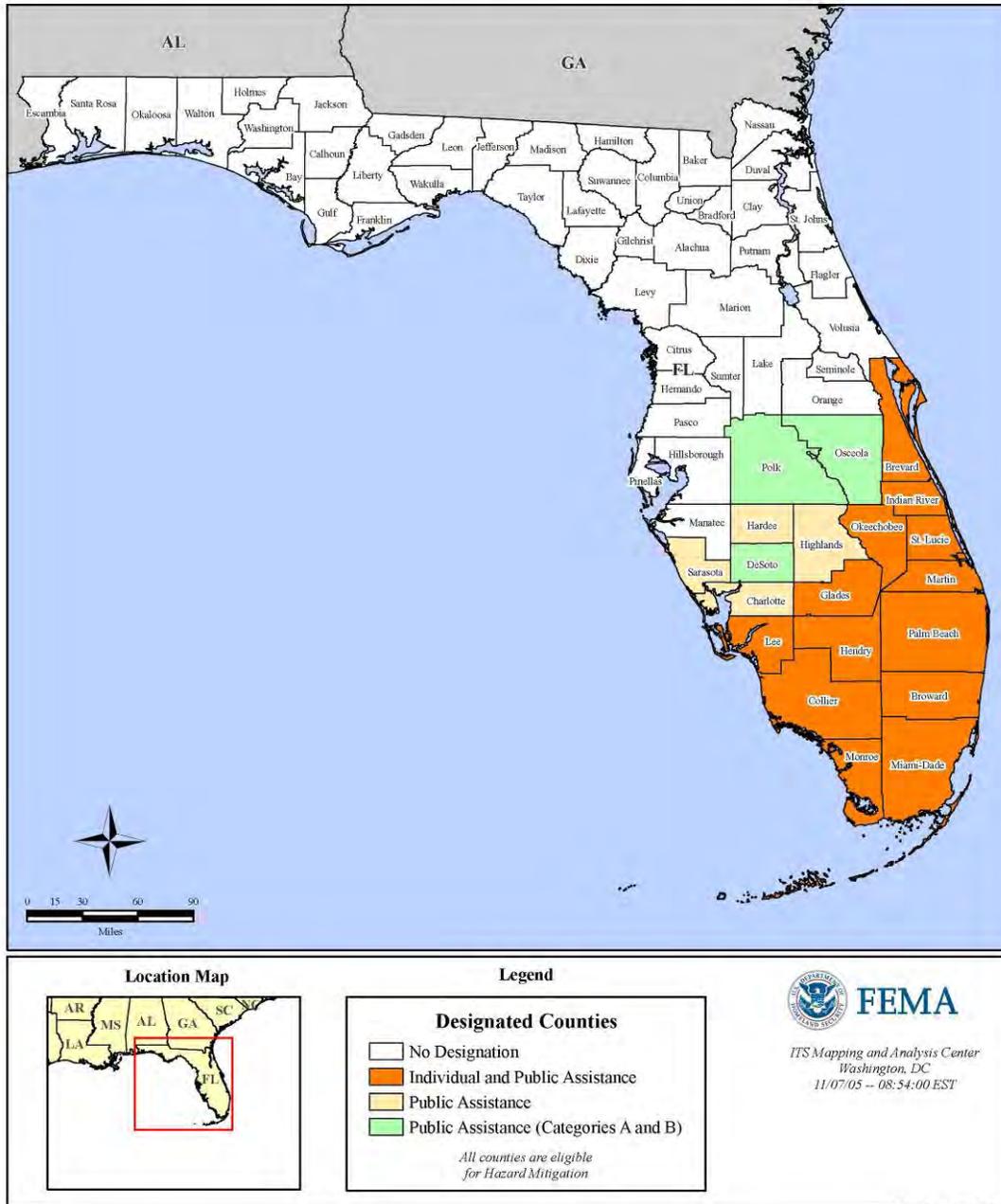


Figure 3. Disaster Declaration Map for Florida

Federal assistance, including Individual Assistance, Public Assistance, and the Hazard Mitigation Grant Program (HMGP), was made available to counties as they are listed in the original declaration and as amendments are made. The declared counties and levels of assistance as of the last update shown on the FEMA Web site on November 15, 2005, (<http://www.fema.gov/news/eventcounties.fema?id=5145>) are described in Table 1.

Table 1. Federal Assistance as of November 15, 2005 – Florida Hurricane Wilma

Federal Assistance	Assistance Provided
Individual Assistance Assistance to individuals and households:	The counties of Brevard, Broward, Collier, Glades, Hendry, Indian River, Lee, Martin, Miami-Dade, Monroe, Okeechobee, Palm Beach, and St. Lucie.
Public Assistance Assistance to State and local governments and certain private nonprofit organizations for the repair or replacement of disaster-damaged facilities:	The counties of Brevard, Broward, Charlotte, Collier, DeSoto, Glades, Hardee, Hendry, Highlands, Indian River, Lee, Martin, Miami-Dade, Monroe, Okeechobee, Osceola, Palm Beach, Polk, St. Lucie, and Sarasota for debris removal and emergency protective measures. Brevard, Charlotte, Indian River, and Lee Counties for Categories C-G.
Hazard Mitigation Grant Program (HMGP) Assistance to State and local governments and certain private nonprofit organizations for actions taken to prevent or reduce long-term risk to life and property from natural hazards:	All counties in the State of Florida are eligible to apply for assistance under the Hazard Mitigation Grant Program.
Other:	Additional designations may be made at a later date after further evaluation.

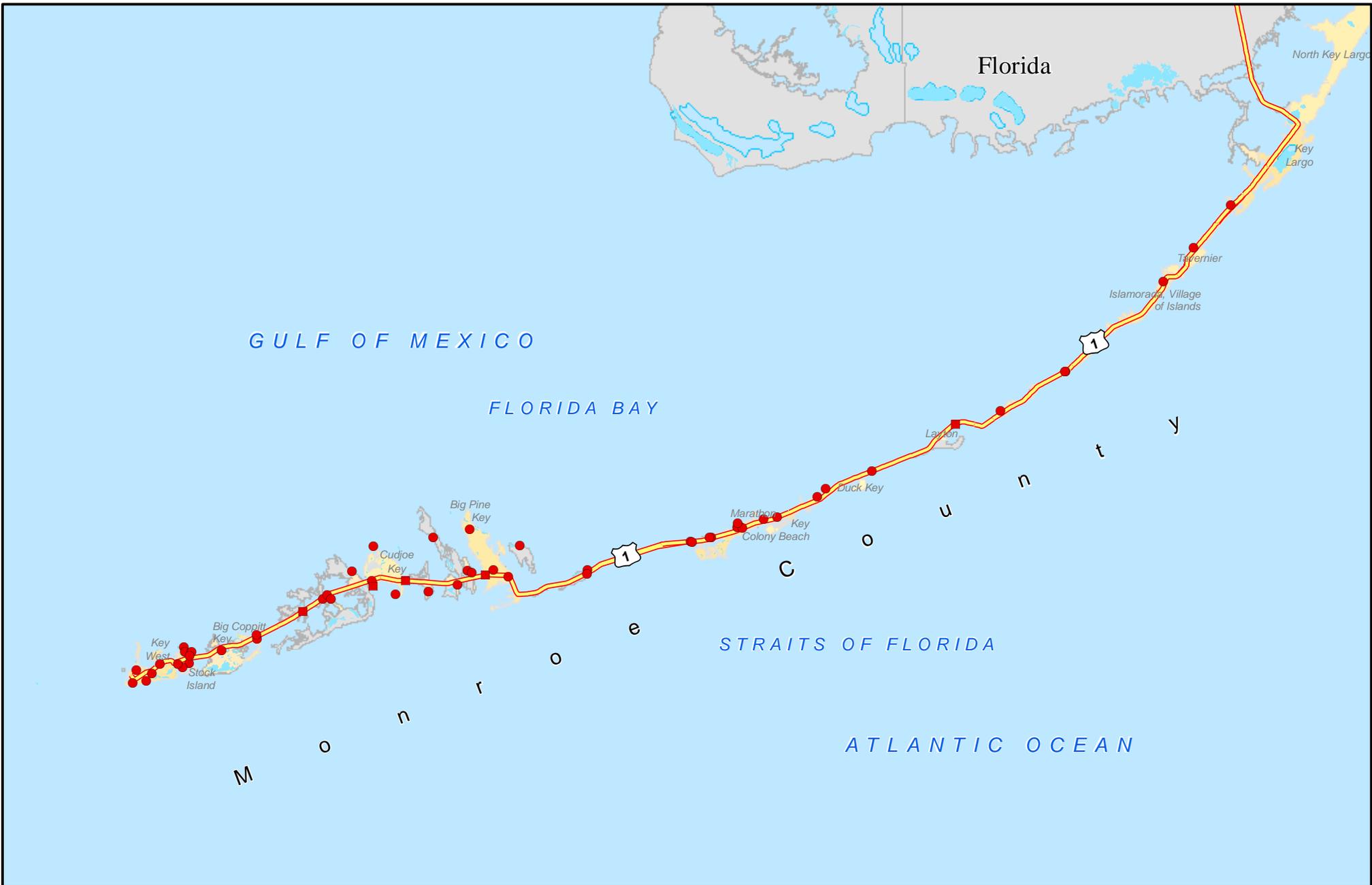
AREA OF STUDY

The area FEMA identified to be covered by the Wilma Florida HWM Study Team extended through the Florida Keys in Monroe County, Florida. Study area selections were based on preliminary water level reports, directions from FEMA, and input from other Federal, State, and local agencies. The spacing of the observation points are irregular due to a number of factors, including the objective to adequately show the surge levels and how they vary across the area. Points are distributed along US Route 1 in the Florida Keys and in accessible coastal areas on larger islands. In coastal marsh areas with limited public roads or access, no HWMs were collected. The 57 HWMs surveyed by the URS team are shown graphically in Figure 4.

Site investigations for high water conditions were also conducted at FEMA Repetitive Loss (Rep Loss) and Mitigation properties. “Repetitive loss structure” is a term that is usually associated with the National Flood Insurance Program (NFIP). For Flood Mitigation Assistance program purposes, this is a structure covered by the NFIP that has suffered flood damage on two or more occasions over a 10-year period, and the cost to repair the flood damage, on average, equals or exceeds 25 percent of the market value of the structure at the time of each flood loss event. For the Community Rating System of the NFIP, a repetitive loss property is any property that the NFIP has paid two or more flood claims of \$1,000 or more in any 10-year period since 1978.

Mitigation properties are those where Federal funding has been requested and granted through the HMGP. Authorized under Section 404 of the Stafford Act, the HMGP is administered by FEMA and provides grants to State and local governments to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the program is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster. FEMA provided a list of mitigation properties for use on this project. It should be noted that the list includes all HMGP properties, but many of the mitigation projects had not been implemented at the time of the hurricane.

A sampling of Rep Loss and Mitigation sites were visited during the HWM flagging operations. Because this sampling was completed prior to the decision not to survey in Collier County, Florida, properties in Collier are listed as having no surveyed HWM. HWMs identified in Monroe County, Florida were flagged and surveyed. Rep Loss sites that were visited, but no HWMs observed, are shown in Table 2. Mitigated property sites visited where HWMs were recorded are shown in Table 3.



**Figure 4: Florida Overview
Hurricane Wilma, Florida
Surveyed High Water Marks**

Flooding Type

- Coastal - Surge Only
- ▲ Coastal - Wave Height
- Coastal - Wave Runup

VERTICAL DATUM: NAVD88
HORIZONTAL DATUM: NAD83

- County
- City

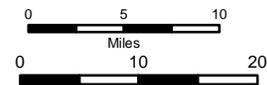


Table 2. FEMA Repetitive Loss Properties Visited, But No Available High Water Mark

Address	Latitude	Longitude	City	County	Comments
5210 Johns St.	26.09217	-81.73233	Naples	Collier	No Noticeable Damage
2195 Harbor Rd.	26.14335	-81.77795	Rock Creek	Collier	Severe structural & utility damage, possible flooding inside house
3505 North Rd	26.14695	-81.7639	Coconut Creek	Collier	House was already cleaned, front portion of house had water inside
311 Connors Ave.	26.26776	-81.82055	Naples	Collier	No noticeable flood damage, structural damage
402 Pine Ave.	26.25877	-81.81856	Naples	Collier	No Damage
27572 Big Bend Dr.	26.33688	-81.82526	Bonita Springs	Collier	No Damage
47 7th St.	26.3243	-81.82102	Bonita Springs	Collier	No Flooding
246 1st St.	26.32943	-81.82957	Bonita Springs	Collier	No Damage
782 107th Ave.	26.26881	-81.80612	Naples	Collier	No Damage
35 Gasparilla Dr	25.08213	-80.45728	Key Largo	Monroe	No Flooding
USCG Key West Thumb Rd.	24.56432	-81.79847	Key West	Monroe	No HWM
Along Beach Road	24.63501	-81.35466	Big Pine Key	Monroe	No Flooding

Table 3. FEMA Mitigation Properties with High Water Marks

Address	Latitude	Longitude	City	County	HWM
1001 James Street	24.56142	-81.79798	Key West	Monroe	WFLC-04-05
Marathon Airport South most hanger	24.72291	-81.0566	Marathon	Monroe	WFLC-05-10
7710 Gulf Stream Boulevard	24.72749	-81.06289	Marathon	Monroe	WFLC-05-11

HIGH WATER MARK TYPES

Description

HWMs were collected for coastal flooding. The conditions that compose these flood types are described in the following sections.

This project was a Rapid Response Task Order and required that the HWMs be flagged, surveyed, and reported on quickly. Flooding types were designated based on observations made during the flagging field work and later reviewed based on mapping the data. A detailed analysis of land conditions, such as topography, bathymetry, locations of dunes, sloped water surface, overwash, or breaching, was not performed; this level of analysis was not part of the scope of work or even possible due to the time limitations. Therefore, all classifications are estimates based on the best available data at the time.

Coastal Flooding

Coastal flooding is caused when coastal waters are driven inland by waves and wind. Coastal flooding conditions are more varied in their origin than those associated with riverine flooding. The coastal flooding types are discussed below and presented graphically in Figures 5 through 11. These figures illustrate ideal situations of coastal flooding, which will not necessarily occur in any one location or one particular storm event. Each of the three basic types of coastal HWMs—surge only, wave height, and wave runup—are often found close to each other, but can differ in elevation. Each coastal flood type provides information that helps characterize the nature and behavior of the coastal flooding event.

It is beneficial to collect HWM for the different types of coastal flooding because each type offers a different set of information. Table 4 shows the typical coastal flooding type needed for each use of the HWM data.

Table 4. Coastal Flooding Type Required For Various Uses of HWM Data

Coastal Flooding Type Required	HWM Data Use
Surge-Only and Wave Height	Quickly estimate event frequency and severity for different areas
Surge-Only and Wave Height	Assess Flood Insurance Rate Maps
Any type	Assist in preparation of wind-water line maps
Surge-Only (typical), Wave Height and Wave Runup	Prepare inundation maps
Wave Height	Share information for building performance assessment
Surge-Only	Share information for modeling
Wave Height	Provide public and agencies with elevations for prioritizing mitigation and benefit/cost analysis
Surge-Only	Determine depth of flooding of structures

Surge-Only

Figure 5 shows the simplest form of coastal flooding (surge-only). In this type of flooding, as the water level during the storm rises to a maximum level, it can leave marks on both the interior and exterior walls of a structure that are of equal elevation. Both of these water marks indicate a coastal flooding level that is not complicated by other factors, such as waves. However, these situations occur only where the structure is at a location sheltered from waves.

Ideally, surge-only flooding has maximum elevations that are either level or have a slight slope that is not easy to detect visually. This is shown schematically in Figure 6. However, this is not always the case in the coastal zone. As shown in Figure 7, coastal surges can also have sloped water surfaces. High water caused by a hurricane storm surge is due to the combination of rapidly changing factors such as wind speed, wind direction, lowered barometric pressure and the storm track. Surge represents the rise in the water level where the location was shielded from waves. In some cases the surge develops in open water areas and spreads inland over large distances because the coastal lands have minimal topographic change. The overland flow can be retarded by inland marsh areas and other obstructions so that the flood water surface slopes downward toward the inland shore, as shown as Case A in Figure 7. Under other circumstances, a strong onshore wind can force the overland coastal flood waters farther inland, forming an upward slope toward the inland shore, as shown in Case B in Figure 7.

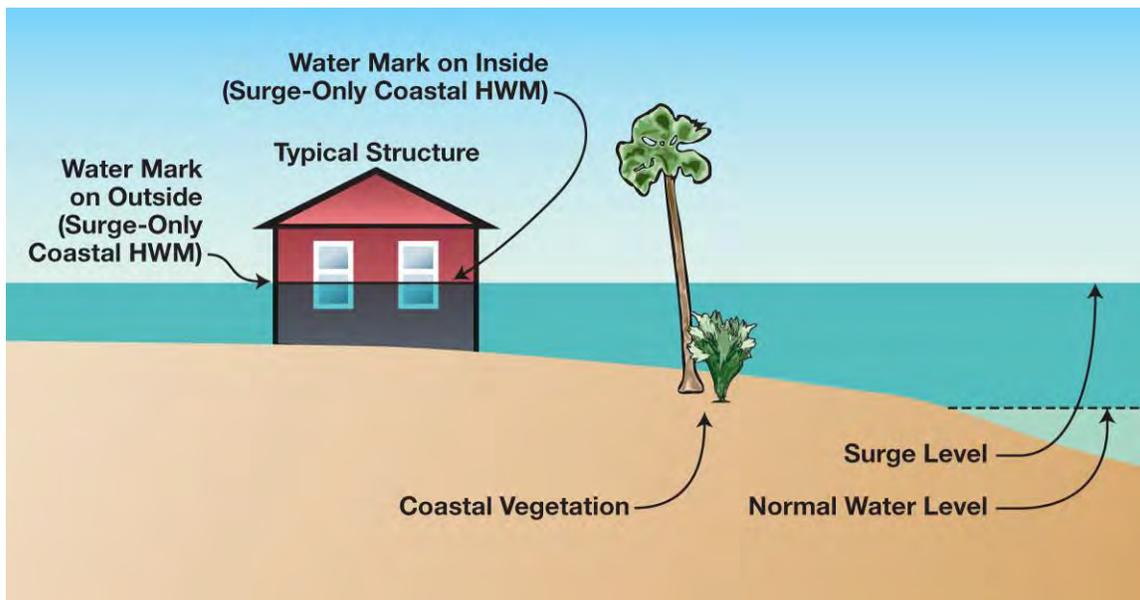


Figure 5. Coastal HWM Resulting from Surge-Only

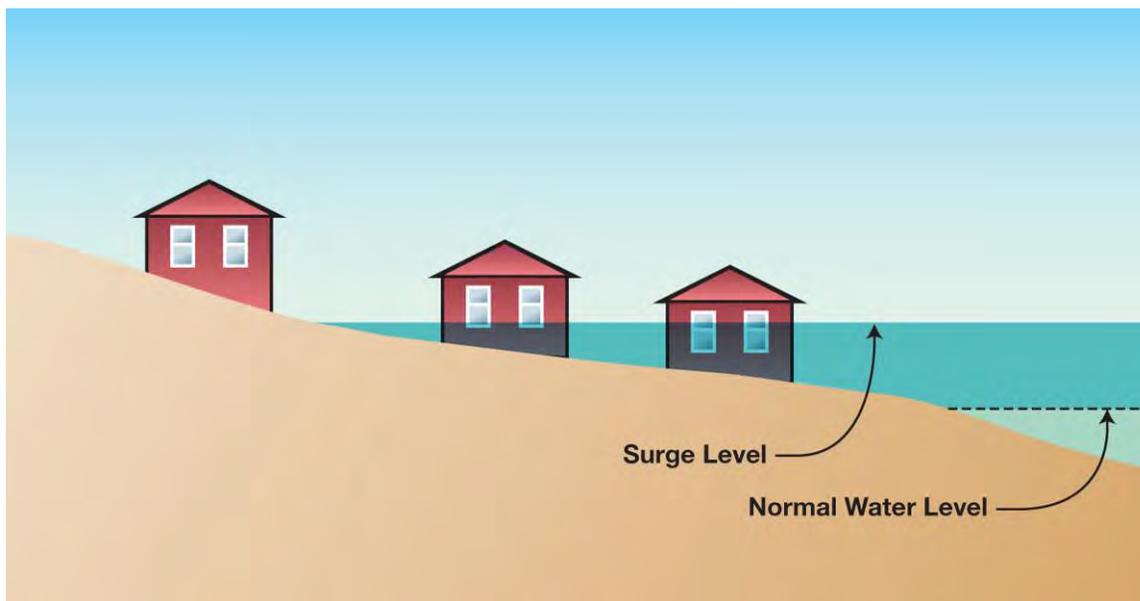


Figure 6. A Coastal Storm Surge With a Level Water Surface

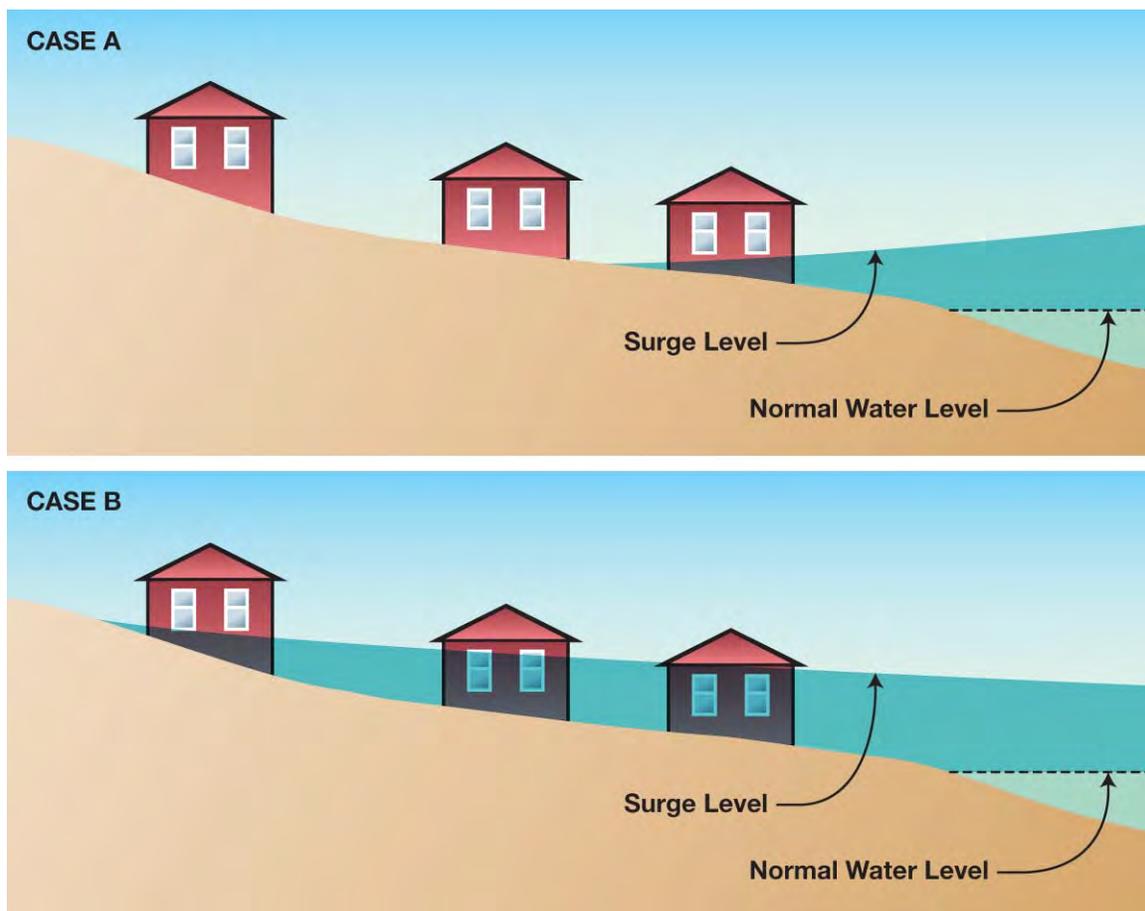


Figure 7. Two Cases of Storm Surges With Sloped Water Surfaces

Wave Height

The second type of coastal flooding includes action due to waves, or coastal wave height flooding. As coastal flood waves propagate, high water conditions on structures and land vary. Coastal wave height flooding is created by the crest of the wave riding on the surge. Figure 8 shows how HWMs found inside and outside of a structure can differ considerably if they are impacted by waves. HWMs corresponding to the conditions shown on the exterior wall in Figure 8 are designated as wave height flooding because the crests of the waves that are riding on the surge leave the highest mark. HWMs corresponding to the situation shown on the interior wall in Figure 8 are designated as surge-only flooding because the structure blocks the wave action, and therefore the HWM corresponds to a water level unaffected by the waves.

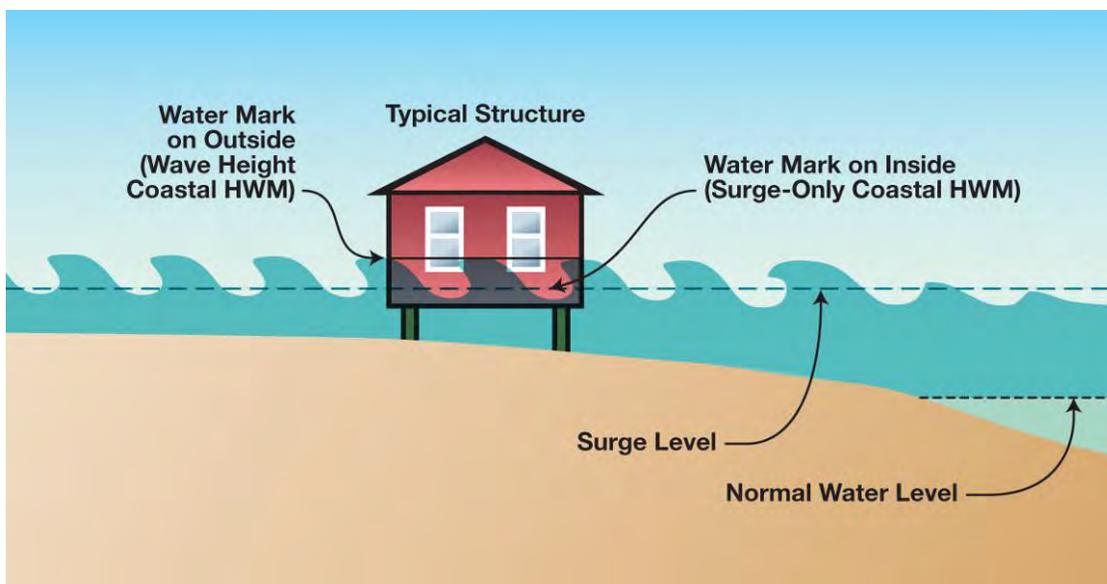


Figure 8. Coastal HWM Resulting from Wave Height

Wave Runup

The third type of coastal flooding includes wave action runup, or coastal wave runup, as illustrated in Figure 9. With coastal wave runup, the situation is complicated by the presence of a surf zone, which is the broad zone of spilling and breaking waves between the open water body and the beach. At the very top of the surf zone, the remaining energy of the wave causes the waves to wash up the beach slope. The result is referred to as wave runup. Wave runup often pushes debris to its maximum limit where it is left as a wrack line. HWMs of this type are designated as wave runup flooding.

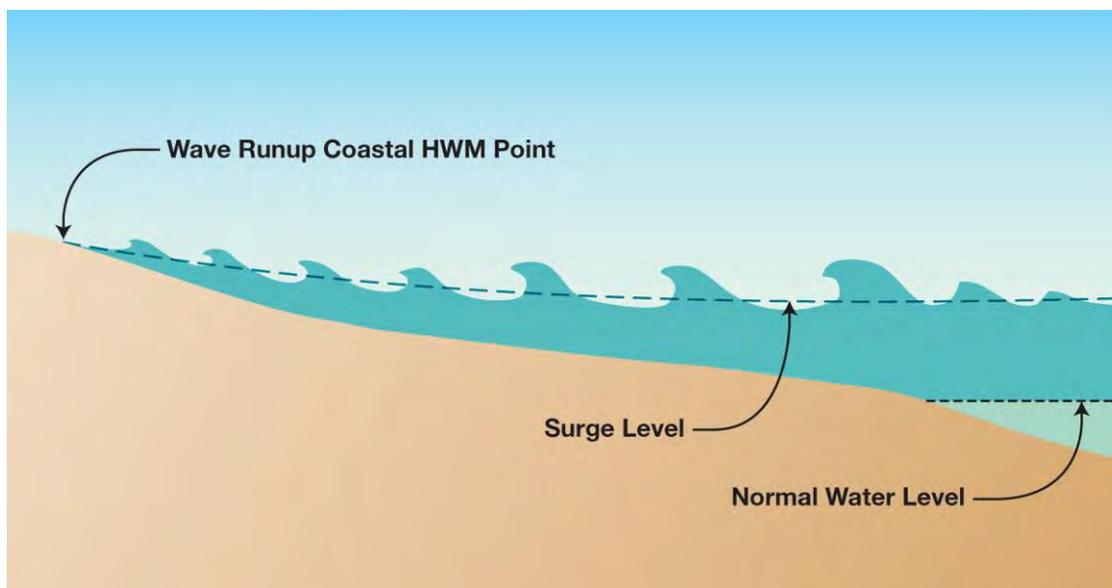


Figure 9. Coastal HWM Resulting from Wave Runup

Impact of Dunes

Figure 10 shows more variable conditions of coastal flooding caused by land conditions, such as sand dunes. It is not uncommon for the wave runup in a storm to be so large that it completely crosses the beach and flows through gaps in the coastal dunes. These are called “washover channels,” and they convey the water over the dunes to low areas behind the dunes. Figure 10 shows three structures at different locations along the dune, each impacted differently by coastal flood waters during the storm. When the corresponding HWMs are found, marked, and surveyed, the elevations can differ up to several feet over a relatively short distance (e.g., 1,000 feet).

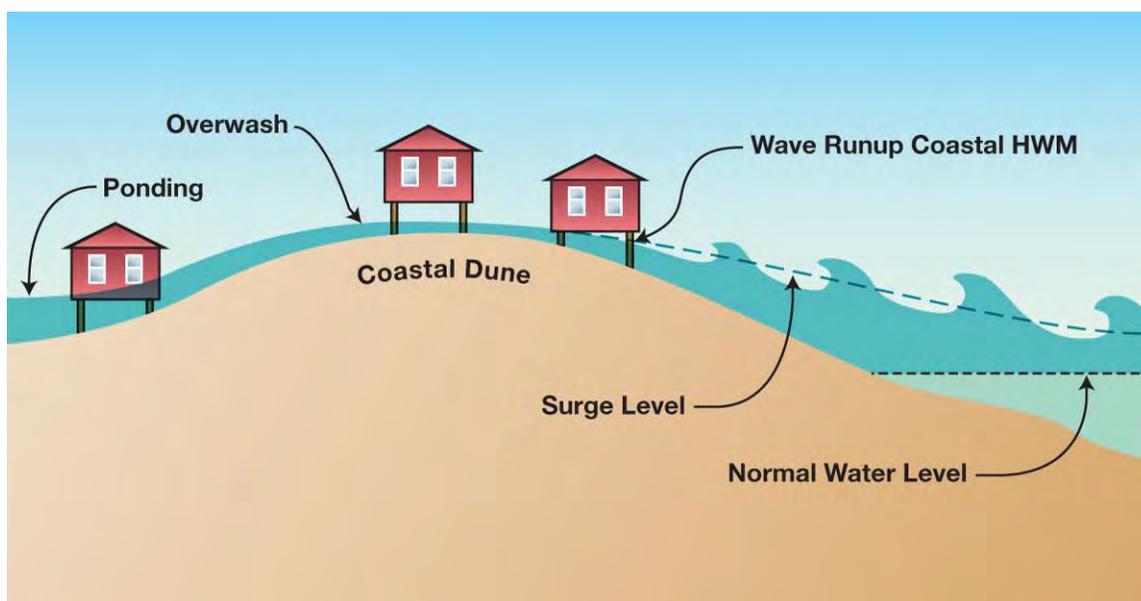


Figure 10. Variations in Coastal Flooding Levels Due to Washover of Coastal Dunes

During some hurricanes, changes in the shape of the beach and dunes can substantially affect the elevation and extent of the coastal flood waters. Typically, storm conditions cause erosion of beaches and dunes. The combined effects of this erosion and the rise of the water levels can substantially reduce the level of coastal protection. This will inevitably result in inland inundation and flooding that would not have occurred if the coastal dunes had not eroded. These conditions are illustrated in Figure 11. Coastal flooding elevations in these areas can depend on how long the dune line held the ocean back compared to the rate at which the storm moved inland. If the dunes held back the ocean long enough, then the backshore flooding may have occurred after the maximum surge height.

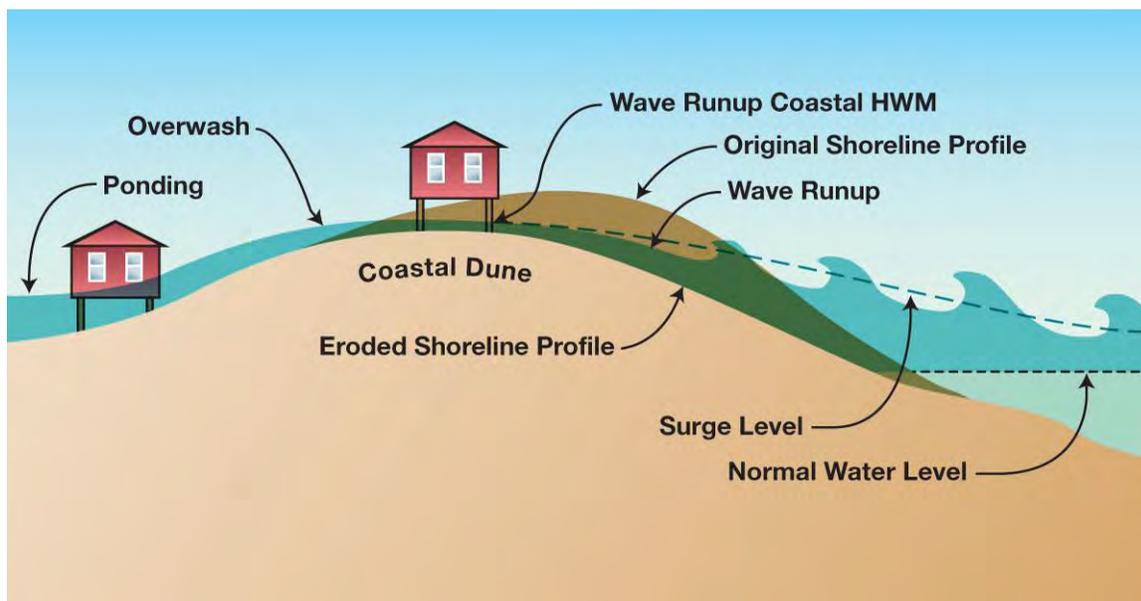


Figure 11. Interaction of Profile Erosion and Coastal Flooding

There are other factors in coastal flooding to consider related to local conditions. On barrier islands, coastal flooding on the seaward side may differ in elevation from those on the bay side because the maximum surge levels formed at different times during the storm. Within bays, the surge may be amplified by the effect of wind acting on broad, shallow areas. In other cases, the tidal inlet may retard the flow of water into the bay so that its level cannot rise to the level of the ocean. Conversely, it is common to find a funneling action that amplifies the surge level where the shorelines of the bay converge toward the head of the bay.

MARKING AND SURVEY METHODOLOGY

The Hurricane Wilma HWMs in Florida were investigated and flagged by URS HWM flagger teams. Flagger teams were mobilized on October 30, 2005, and on October 31, 2005 the teams began to search for, identify, and flag HWMs.

Flagging Methodology

Flaggers investigated high water conditions in coastal and riverine study areas. Two-person flagger teams were used. The teams were given general areas to identify and flag high water marks. The flagger teams visited these areas and searched for structures with mud or waterlines, or areas with debris (man-made material) or wrack (plant material) lines. For each HWM, the flaggers completed a standardized form including detailed information about the data point, as shown in Figure A-1 in Appendix A. To the extent possible, flaggers noted their judgments on the flooding type. HWMs were located with latitude and longitude coordinates using hand-held Global Positioning System (GPS) units. A total of 57 HWMs were flagged by URS teams for Hurricane Wilma in Monroe County, Florida. HWMs are based on the flagger teams' best judgment of height of flood waters at the location. Since the height of floodwaters can be impacted by outside forces such as wind and shielding by other structures, all HWMs should be used to identify trends and not to extrapolate exact height of water throughout the area.

The URS flaggers physically marked the HWM using tape, paint, stake, or other similar marking materials. The URS flaggers also used a tape measure to measure to the nearest inch the HWM's vertical distance above a set point, such as a building slab. URS team survey crews followed the flagging teams to survey the HWMs identified by the flagger teams. When the HWM or physical marking was still visible, the survey team surveyed the HWM or flagger's marking. When the HWM or flagger's marking was no longer visible, the crew surveyed the elevation of the set point identified by the flagger and then added the vertical offset measured by the flagger.

Surveying Methodology

For all HWMs, the survey crews used static GPS methods and conventional leveling to determine an accurate horizontal coordinate (latitude and longitude) and elevation for each HWM. Data were recorded in a standardized format as shown by the example Surveyor High Water Mark Data Collection Report Form, Figure A-2 in Appendix A. HWMs were surveyed horizontally on the North American Datum of 1983 (NAD 83), Florida State Plane Coordinates (South Zone), and vertically in the North American Vertical Datum of 1988 (NAVD 88), both in U.S. survey feet. The HWM elevations were also converted to the National Geodetic Vertical Datum of 1929 (NGVD 29) to aid review of data and maps available only in the NGVD 29 datum. The datum conversion was performed using Corpscon ver. 5.11.08, as described in the following report section. The HWM locations were surveyed to within accuracies of 0.25 foot vertically and 10 feet horizontally with a 95-percent confidence level. Any inclement weather that would have an adverse effect on the GPS surveys was avoided to ensure this level of accuracy. Wherever possible, a building floor elevation of structures was collected. These floor elevations were taken adjacent to the HWM where available and may or may not represent the

first floor of the structure. This information was obtained to possibly be used at a later date for damage assessments or HMGP applications.

Data Compilation

Data collected for the HWMs are stored in a digital database and presented on one-page forms in the appendices of this report. Forms for HWMs flagged and surveyed by URS are included as Appendix C. The HWMs are identified with a unique point number identifier, the High Water Mark Identifier (HWM ID) as shown on the one-page HWM form (e.g., WFLC-05-04). The one-page HWM reports include data for the storm event, flood type, location, point description, surveyed point coordinates (LAT/LON and State Plane), and elevations. A summary of basic data for all HWMs collected is presented in the Findings and Observations section and Appendix B.

The data collected for Hurricane Wilma Florida HWMs are shown graphically on maps in Appendix B, including an overview map, Figure B.1 and detail map Figures B.2 through B.6. Refer also to Table B-1 for a listing of counties and the corresponding figures. These figures present the location, HWM ID and the field-surveyed HWM elevations in feet in the NAVD 88 vertical datum. The symbol representing the HWM point on the map is graphically coded, designating whether the HWM is riverine or coastal (i.e., surge, wave height, or wave runup).

ELEVATION CONVERSION FROM NAVD88 TO NGVD29 USING CORPSCON

The HWM elevations surveyed in NAVD 88 datum were converted to the NGVD 29 datum using the Corpscon program version 5.11.08, <http://www.cae.wisc.edu/site/software/?title=app199>. The Corpscon program utilizes the VERTCON software internally. The VERTCON software was developed by the NGS office to convert data between different vertical data scales. VERTCON is available as an element of the NGS Geodetic Toolkit and can be downloaded from the NGS website: <http://www.ngs.noaa.gov/TOOLS/Vertcon/vertcon.html>.

The VERTCON software allows the user to compute the modeled difference, or datum shift, in orthometric height for a given location specified by its latitude and longitude. Applying the computed datum difference value to a specific elevation converts from one datum to another.

For converting elevations in the NAVD 88 datum to the NGVD 29 datum, the datum shift has to be subtracted from the NAVD 88 elevation. This can be demonstrated by two examples, one with a positive shift and one with a negative shift:

	<u>Case 1</u>	<u>Case 2</u>
NAVD 88 Elevation	5.33	5.33
Datum shift	(+0.50 feet)	(-1.17 feet, negative shift)
NGVD 29 Elevation	5.33 – (0.50 feet) = 4.83	5.33 – (-1.17) = 6.50

OTHER DATA AND STUDIES

Gage data and coastal surge modeling, prepared by other sources, were investigated to help define the conditions experienced with Hurricane Wilma. The reference data collected are presented in this section. It should be noted that many established benchmarks, gages, and other reference points may have elevations surveyed to NAVD 88 and NGVD 29, however, elevations may not adequately address subsidence. Datum references are noted for data sources mentioned in this section.

Tide Gage Data

Tidal data were collected from the NOAA Center for Operational Oceanographic Products and Services (CO-OPS) (<http://co-ops.nos.noaa.gov/>). The CO-OPS stations recorded elevated water levels along the southern shoreline of Florida. Maximum water levels for Hurricane Wilma in Monroe County, Florida are provided in Table 5. All water level observations are measured in the amount above the standard tidal charting datum, Mean Lower Low Water (MLLW), based on the National Tidal Datum Epoch 1983-2001. Reported water levels include highest observed water levels, which is the sum of the storm surge only and the astronomical tide. These measurements are for storm surge only and do not include wave effects.

Table 5. NOAA CO-OPS Maximum Water Levels for Hurricane Wilma, October 2005. All preliminary data is subject to NOS verification.

Station Name	Station ID	Date & Time GMT	Max Water Level (ft above MLLW)
Vaca Key	8723970	10/24/05 15:00	6.678

Surge Models

The NOAA National Hurricane Center (NHC) prepared a preliminary Sea, Lake and Overland Surges from Hurricanes (SLOSH) model of the Hurricane Wilma coastal surge. The NHC provided output from the model shown on Figure 12, which includes graphical, color-designated maximum surge-only levels in feet relative to the NGVD 29 vertical datum that occurred at any time during the modeled storm. The SLOSH model calculations incorporate the unique bay and river configurations, water depths, bridges, roads, and other physical features. The SLOSH model is generally accurate within plus or minus 20 percent. For example, if the model calculates a peak 10-foot storm surge for the event, one can expect the observed peak to range from 8 to 12 feet. The model accounts for astronomical tides (which can add significantly to the water height) by specifying an initial tide level, but does not include rainfall amounts, river flow, or wind-driven waves.

For Hurricane Wilma in Florida, NHC SLOSH model output shows maximum values which reached the figure color chart limit of over 15 feet NGVD 29. Model output values, shown in Figures 12, need to be adjusted before being used for comparison to HWM values in this report. First, NHC SLOSH model values need to be adjusted from the initial NOAA tide level to actual tidal conditions. Then, values need to be converted from the NGVD 29 datum to the study datum of NAVD 88.

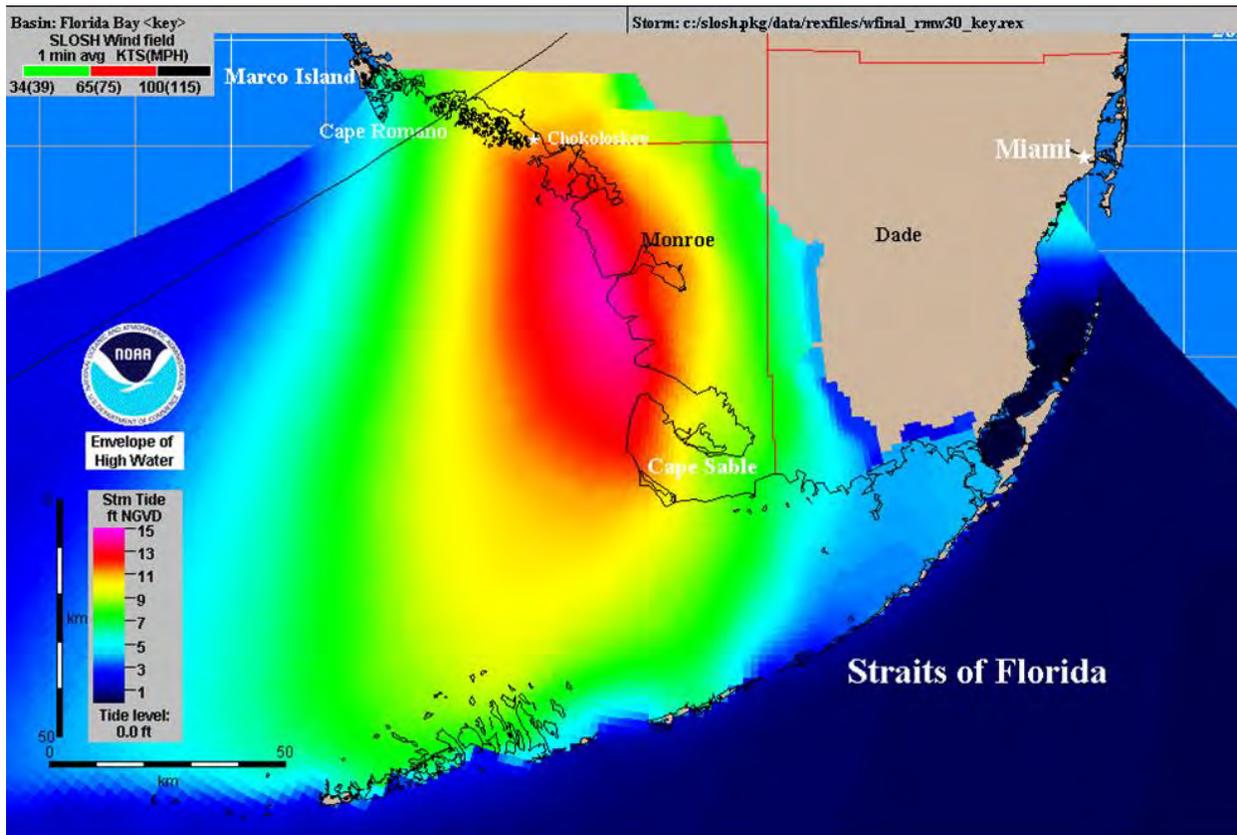


Figure 12. NOAA Wilma Coastal SLOSH Data

FINDINGS AND OBSERVATIONS

Fifty seven (57) HWMs were surveyed along the Straits of Florida in Monroe County, Florida. Site visits were also made to FEMA Repetitive Loss properties and FEMA Mitigated properties, but few resulted in HWMs. The Hurricane Wilma HWM data are summarized in Table 6, where they are sorted by appendix sheet number. For convenience, a second table containing the same data, but sorted by HWM ID number, is presented in Table B-2 in Appendix B. The complete data are presented on the HWM reports in Appendix C.

The locations, elevations, and descriptions of these HWMs have been tabulated into a digital database and are summarized on Figures B.1 through B.6. Here the point number identification (e.g., WFLC-02-01) is given with the surveyed elevation, in feet relative to the NAVD 88 vertical datum, presented below the identification number. The symbol representing the HWM point on the map is coded according to the HWM-type (i.e., surge-only, wave-height, and wave run-up).

Hurricane Wilma's storm surge in Monroe County, Florida was relatively low. The storm advanced on a northeast track across the Gulf of Mexico towards Florida from the Yucatan Peninsula in Mexico. The storm eventually made landfall on the southwest Florida Gulf Coast in Collier County. The path of the storm accompanied by the shift in wind direction resulted in two storm surges in the Florida Keys. The first occurred as the storm approached landfall. At landfall, winds generated in the right front quadrant were blowing from the south, resulting in water being pushed northward from the Atlantic Ocean up to the Keys. As the storm continued its northeastern track across the state, winds generated in the left rear quadrant of the storm moved over Florida Bay. These winds were from the north forcing the water in Florida Bay to be pushed southward onto the Keys. The result of this wind direction shift caused a second storm surge to inundate the Keys from the north.

HWMs found on the eastern or Atlantic side of the Keys had relatively lower elevations than those on the Florida Bay side. This difference in water elevations can be seen along the entire island chain from Key Largo in the north to Key West in the south.

Distinguishing which surge was responsible for a particular HWM was problematic in some areas. Information from residents that could establish the timing of these events was very useful; however, this information was not available for all HWMs. Another method to help distinguish the flooding source of the HWMs was to use US Highway 1, which bisects the entire length of the Keys. In general, the highway rests on an elevated road bed that impeded the higher surge from Florida Bay in the north from reaching the Atlantic side of the islands.

Figure B.1 shows the overall Florida Keys island chain. The Lower Keys extend from Key West, at the extreme western end of the chain, north to Seven Mile Bridge. The Middle Keys extend from Marathon Key north to Layton Key and the Upper Keys extend from Islamorada north to Key Largo.

In the Lower Keys (Figures B.2 and B.3), storm surge elevations on the Florida Bay side of US 1, ranged between 5.4 feet (NAVD 88) on the eastern end of Key West and 3.3 feet on Ohio Key at the south end of Seven Mile Bridge. One outlier, HWM WFLC-03-16, has a surveyed elevation of 8.4 feet (NAVD 88). This HWM was caused by wave runup, which is typically significantly higher than surge only elevations. Storm surge elevations on the Atlantic side of US 1 ranged from 3.6 to 5.9 feet (NAVD 88), with three HWMs caused by wave runup. These are WFLC-03-02 at 7 feet, WFLC-03-05 at 6.8 feet, and WFLC-03-09 at 5.6 feet (NAVD 88).

In the Middle Keys (Figures B.4 and B.5), all HWMs that were flagged were on the Florida Bay side of US 1. Elevations ranged from 4.8 feet to 6.6 feet (NAVD 88). All HWMs flagged were storm surge except for WFLC-05-13, which resulted from wave runup. This HWM was flagged on the north end of Long Key and is in a location where the HWM elevations begin to lessen toward the north.

The area delineated as the Upper Keys also shows the same general pattern of higher elevations on the Florida Bay side and lower elevations on the Atlantic Ocean side (Figures B.5 and B.6). Storm surge elevations range from 2.8 to 3.3 feet on the Bay side and the one HWM collected on the Atlantic side was 1.3 feet (NAVD 88).

In each of the areas discussed above, data outliers may be found. The outliers are anomalies that occur due to local variations in topography and/or coastal HWMs being flagged as a result of personal accounts of residents giving an approximation of surge heights.

Table 6. Hurricane Wilma Florida HWM Data Summary*

HWM_ID	County	FldType	NAVD88	Surv_Lat	Surv_Lon	SheetNum
WFLC-03-01	Monroe	Coastal - Surge Only	4.2	24.662772	-81.510467	Monroe-1
WFLC-03-02	Monroe	Coastal - Wave Runup	7.0	24.656567	-81.508911	Monroe-2
WFLC-03-03	Monroe	Coastal - Surge Only	4.5	24.647814	-81.481256	Monroe-3
WFLC-03-04	Monroe	Coastal - Surge Only	7.7	24.701375	-81.508686	Monroe-4
WFLC-03-05	Monroe	Coastal - Wave Runup	6.8	24.662997	-81.469389	Monroe-5
WFLC-03-06	Monroe	Coastal - Surge Only	3.3	24.675461	-81.246636	Monroe-6
WFLC-03-07	Monroe	Coastal - Surge Only	2.8	24.671406	-81.246931	Monroe-7
WFLC-03-08	Monroe	Coastal - Surge Only	5.8	24.720728	-81.390633	Monroe-8
WFLC-03-09	Monroe	Coastal - Wave Runup	5.6	24.669792	-81.371628	Monroe-9
WFLC-03-10	Monroe	Coastal - Surge Only	4.8	24.672631	-81.388300	Monroe-10
WFLC-03-11	Monroe	Coastal - Surge Only	3.7	24.658892	-81.405350	Monroe-11
WFLC-03-12	Monroe	Coastal - Surge Only	4.5	24.549436	-81.785894	Monroe-12
WFLC-03-13	Monroe	Coastal - Surge Only	2.7	25.082108	-80.457267	Monroe-13
WFLC-03-14	Monroe	Coastal - Surge Only	3.3	25.034992	-80.503119	Monroe-14
WFLC-03-15	Monroe	Coastal - Surge Only	3.2	24.997344	-80.540194	Monroe-15
WFLC-03-16	Monroe	Coastal - Wave Runup	8.4	24.628361	-81.594403	Monroe-16
WFLC-03-17	Monroe	Coastal - Surge Only	5.5	24.641694	-81.570189	Monroe-17
WFLC-03-18	Monroe	Coastal - Surge Only	7.1	24.646672	-81.564989	Monroe-18
WFLC-03-19	Monroe	Coastal - Surge Only	6.8	24.672933	-81.534664	Monroe-19
WFLC-03-20	Monroe	Coastal - Surge Only	5.2	24.642083	-81.560072	Monroe-20
WFLC-04-01	Monroe	Coastal - Surge Only	5.4	24.568689	-81.769233	Monroe-21
WFLC-04-02	Monroe	Coastal - Surge Only	4.9	24.547331	-81.802261	Monroe-22
WFLC-04-03	Monroe	Coastal - Surge Only	5.2	24.557894	-81.779153	Monroe-23
WFLC-04-04	Monroe	Coastal - Surge Only	3.6	24.569758	-81.733403	Monroe-24
WFLC-04-05	Monroe	Coastal - Surge Only	3.8	24.561431	-81.797903	Monroe-25
WFLC-04-06	Monroe	Coastal - Surge Only	6.3	24.587453	-81.740278	Monroe-26
WFLC-04-07	Monroe	Coastal - Surge Only	6.1	24.582114	-81.738808	Monroe-27
WFLC-04-08	Monroe	Coastal - Surge Only	6.0	24.582200	-81.730703	Monroe-28
WFLC-04-09	Monroe	Coastal - Surge Only	5.8	24.577953	-81.733247	Monroe-29
WFLC-04-10	Monroe	Coastal - Surge Only	4.2	24.565172	-81.741472	Monroe-30
WFLC-04-11	Monroe	Coastal - Surge Only	4.2	24.568947	-81.747506	Monroe-31
WFLC-05-01	Monroe	Coastal - Surge Only	4.8	24.707575	-81.120278	Monroe-32
WFLC-05-02	Monroe	Coastal - Surge Only	3.2	24.707128	-81.118453	Monroe-33
WFLC-05-03	Monroe	Coastal - Surge Only	5.8	24.711931	-81.097236	Monroe-34
WFLC-05-04	Monroe	Coastal - Surge Only	5.7	24.712125	-81.095147	Monroe-35
WFLC-05-05	Monroe	Coastal - Surge Only	4.9	24.732797	-81.030672	Monroe-36
WFLC-05-06	Monroe	Coastal - Surge Only	4.4	24.702550	-81.329347	Monroe-37
WFLC-05-07	Monroe	Coastal - Surge Only	3.9	24.675631	-81.361569	Monroe-38
WFLC-05-08	Monroe	Coastal - Surge Only	2.9	24.724406	-81.060083	Monroe-39
WFLC-05-09	Monroe	Coastal - Surge Only	5.1	24.723447	-81.063267	Monroe-40
WFLC-05-10	Monroe	Coastal - Surge Only	6.3	24.722861	-81.056669	Monroe-41
WFLC-05-11	Monroe	Coastal - Surge Only	6.6	24.727508	-81.062914	Monroe-42

* Note – For HWM data summary listing sorted by HWM-ID, refer to Appendix B, Table B-2

HWM_ID	County	FldType	NAVD88	Surv_Lat	Surv_Lon	SheetNum
WFLC-05-12	Monroe	Coastal - Surge Only	4.0	24.667561	-81.343336	Monroe-43
WFLC-05-13	Monroe	Coastal - Wave Runup	4.9	24.838500	-80.795961	Monroe-44
WFLC-05-14	Monroe	Coastal - Surge Only	5.7	24.786208	-80.898000	Monroe-45
WFLC-05-15	Monroe	Coastal - Surge Only	6.4	24.766689	-80.954906	Monroe-46
WFLC-05-16	Monroe	Coastal - Surge Only	6.2	24.757661	-80.965222	Monroe-47
WFLC-05-17	Monroe	Coastal - Surge Only	6.4	24.734728	-81.014647	Monroe-48
WFLC-05-18	Monroe	Coastal - Surge Only	4.6	24.674353	-81.393344	Monroe-49
WFLC-05-19	Monroe	Coastal - Surge Only	6.3	24.711272	-81.435547	Monroe-50
WFLC-05-20	Monroe	Coastal - Surge Only	4.8	24.650750	-81.441158	Monroe-51
WFLC-05-21	Monroe	Coastal - Surge Only	5.9	24.583825	-81.694031	Monroe-52
WFLC-05-22	Monroe	Coastal - Surge Only	4.4	24.597594	-81.650858	Monroe-53
WFLC-05-23	Monroe	Coastal - Surge Only	7.2	24.601214	-81.651353	Monroe-54
WFLC-05-24	Monroe	Coastal - Surge Only	3.0	24.853247	-80.740319	Monroe-55
WFLC-05-25	Monroe	Coastal - Surge Only	1.3	24.897169	-80.660914	Monroe-56
WFLC-05-26	Monroe	Coastal - Surge Only	2.8	24.897378	-80.661208	Monroe-57

APPENDICES

Appendix A. Field Data Collection Forms

Figure A.1

**FLAGGER HIGH WATER MARK – COASTAL and RIVERINE
DATA COLLECTION REPORT FORM**
(For Use By Flaggers) HMTAP TO No. _____

HWM ID (e.g. DFCL-07-01) (Repeat in case forms are separated)	
HWM Street Address	
Rep Loss Number	
Multiple HWM	(Circle One): Yes No
HWM Area Identifier	
Subdivision / Industrial Park	
Date of Flagging/Interview	
Date of Flood Event	
Type/Name of Storm Event	(Circle One): Hurricane, Tropical Storm, Tropical Depression, Other: Name of storm event (e.g., Dennis)
Disaster Number (e.g.: DR-1539-FL)	
Date of Peak	
Source for Date of Peak	
Stream Name/Flood Source (Closest/responsible water body)	
Municipality, City or Town (Circle One: Known, closest)	
County	
State	
Type of HWM – (Circle One) If Personal Account or Other, you MUST provide comment	Mud Line Wrack Line Debris Line Water Line Personal Account Other Comment
Wind Water Debris Line	(Circle One): Yes No
HWM Object, Surface (What object, surface is the HWM on? An interior/exterior wall, tree, fence, etc...)	

Figure A.1 (continued)

**FLAGGER HIGH WATER MARK – COASTAL and RIVERINE
DATA COLLECTION REPORT FORM**
(For Use By Flaggers) HMTAP TO No. _____

HWM ID (e.g. DFCL-07-01) (Repeat in case forms are separated)		
Location/Directions to HWM Object		
Was a Vertical Offset Measurement used for HWM (Circle Yes, No. If Yes, enter data)	Yes No	If Yes: Measurement: Description of offset point:
Vertical Distance HWM to existing ground (feet) (Required)		
HWM Quality – (Circle One)	GOOD	FAIR POOR
Description of Marker Used To Flag HWM (e.g. red paint, tape. NOTE: HWM IS LINE AT BOTTOM OF TAPE OR PAINT. UNLESS the Flagger indicates that there is a vertical offset from the marked point)		
Survey of HWM Needed	YES	NO
Flagger HWM Latitude (Decimal Degrees ex: 29.12345 (5 places))	N	DECIMAL DEGREES
Flagger HWM Longitude (Decimal Degrees ex: 84.12345 (5 places))	W	DECIMAL DEGREES
Flooding Type – (Circle One)	Riverine Choices are: - Riverine - Heavy Rain - Riverine - Hurricane	Coastal Choices are: - Coastal - surge only - Coastal - wave height - Coastal - wave runup Breached Levee
Estimated HWM Surge Level and what is this based on (Coastal HWM Only)	Elevation (Feet) Based On:	
Timestamp of Surge Estimate (Coastal HWM Only)	___ : ___ AM / PM CENTRAL / EASTERN	
Photo ID (HWM ID)-(Photo file name from camera)	Photo 1 (HWM mark from 20 feet away)	Photo 2 (Structure / Area from 50 feet away)
Photos Location/Orientation		
Photos Description/Subject		
Unit Number (2-digit number)		

Figure A.1 (continued)

**FLAGGER HIGH WATER MARK – COASTAL and RIVERINE
DATA COLLECTION REPORT FORM**
(For Use By Flaggers) HMTAP TO No. _____

HWM ID (e.g. DFCL-07-01) <small>(Repeat in case forms are separated)</small>		
Name of Flagger 1/Flagger 2	1	2
Flagger 1 Company/Flagger 2 Company	1	2
Flagger's Comments		
Resident/Eyewitness Information		
Name		
Address		
Obtained Permission to Survey	Yes	No
Phone		
Length of residence or familiarity with area		
Relevant witness Information <small>(Document only if witness is willing to have personal information included in record)</small>		
Wind Damage Data		
Structure Damage (Circle as applicable)	1) No Damage; 2) Structure type (use): residential, commercial, agricultural, mobile home; 3) Cause: wind, fallen objects, blown debris; 4) Severity (subjective): light, moderate, severe	
Tree Damage (Circle as applicable)	1) No Damage; 2) Tree Species: oak, pine, palm, other; 3) Damage: uprooted, snapped, twisted; 4) Severity (subjective): light (single tree), moderate, severe	
Overhead Utility Damage (Circle as applicable)	1) No Damage; 2) Materials: wood, metal, concrete; 3) Utility Type: power, telephone, cable; 4) Cause: wind, fallen objects, blown debris; 5) Severity (subjective): light, moderate, severe	

Figure A.1 (continued)

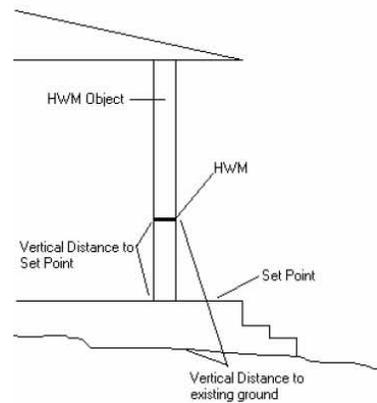
**FLAGGER HIGH WATER MARK – COASTAL and RIVERINE
 DATA COLLECTION REPORT FORM
 (For Use By Flaggers) HMTAP TO No. _____**

HWM ID (e.g. DFCL-07-01) (Repeat in case forms are separated)	
Other Damage/Comments	

Required Plan/ Elevation View Sketches (use back if needed)

- Required: 1) Sketch/Plan of nearest cross roads, directions to get to the HWM
 2) Plan and Elevation views of the HWM

Example Measurements



URS
 Flagger Form Rev September 1, 2005.doc

Storm: _____
FLAGGER FORM Page 4 of 4

Figure A.2

**SURVEYOR'S
 HIGH WATER MARK (HWM) – COASTAL AND RIVERINE
 DATA COLLECTION REPORT FORM HMTAP TO No.**

HWM ID <small>(Repeat in case forms are separated)</small>	
HWM Street Address	
Municipality, City or Town (Known, closest)	
County	
State	
Exact Mark To Survey	
<hr/>	
HWM Flood Elevation (NAVD 88 Datum) (1)	
HWM Flood Elevation (NGVD 29) (1)	
Was Flagger's Vertical Offset Measurement used to survey HWM Elevation (1)	No Yes
If Yes, then:	Flagger Vertical Offset Distance
	Surveyed Elevation of Reference Point (NAVD 88)
Survey Latitude <small>Must Use Decimal Degrees (6 Decimal places)</small>	N
Survey Longitude <small>Must Use Decimal Degrees (6 Decimal places)</small>	W
Northing (feet)	
Easting (feet)	
Approx. First Floor Elevation (NAVD 88)	
Map Projection Used During Survey	
Vertical Datum	NAVD 88 NGVD 29 OTHER:
Horizontal Datum	NAD 83 OTHER:
Survey Crew	
Responsible Licensed Professional Land Surveyor Name and Number	PLS Name:
Survey Company / Office Location	

Figure A.2 (continued)

**SURVEYOR'S
 HIGH WATER MARK (HWM) – COASTAL AND RIVERINE
 DATA COLLECTION REPORT FORM HMTAP TO No. _____**

HWM ID <small>(Repeat in case forms are separated)</small>	
Survey Date (e.g. 07/15/2005)	
Surveyor's Comments	

(1) note that the HWM is the line at the bottom of the tape or paint **UNLESS the Flagger indicates that there is a vertical offset from the marked point**

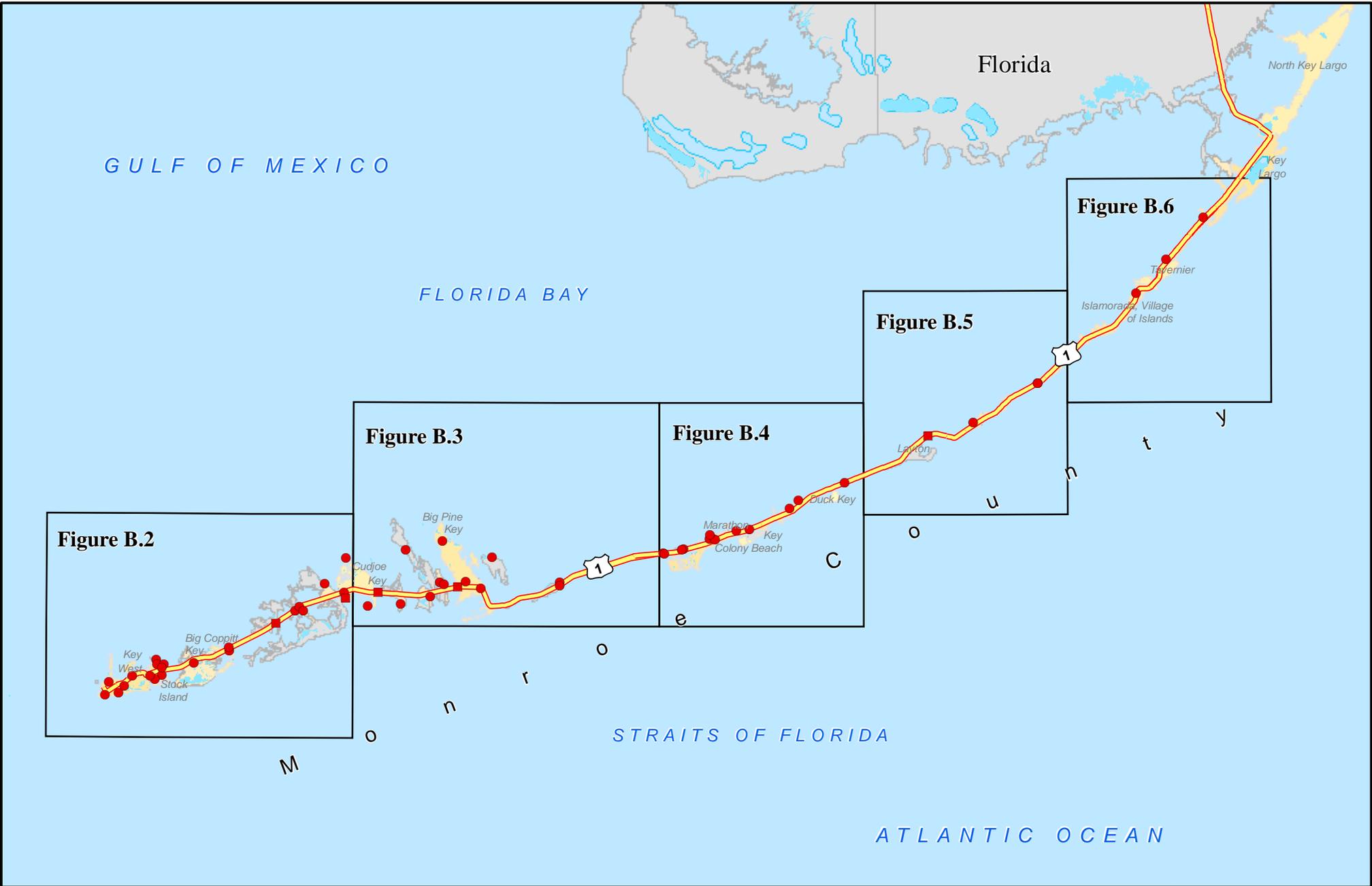
Surveyor Plan/ Elevation View Sketches (if needed)

APPENDICES

Appendix B. Maps and HWM Data Summary

Table B-1. Appendix B Figures

Area of Monroe County	Figure	Page
Overview Map Index	B.1	B-2
Southern Keys	B.2	B-3
South Central Keys	B.3	B-4
Central Keys	B.4	B-5
North Central Keys	B.5	B-6
Northern Keys	B.6	B-7



**Figure B.1: Overview Map Index
Hurricane Wilma, Florida
Surveyed High Water Marks**

Flooding Type

- Coastal - Surge Only
- ▲ Coastal - Wave Height
- Coastal - Wave Runup

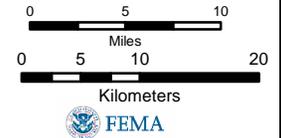
County

City

Road Classification

- ▬ Limited Access Freeway
- ▬ Highway
- ▬ Secondary Roads

VERTICAL DATUM: NAVD88
HORIZONTAL DATUM: NAD83



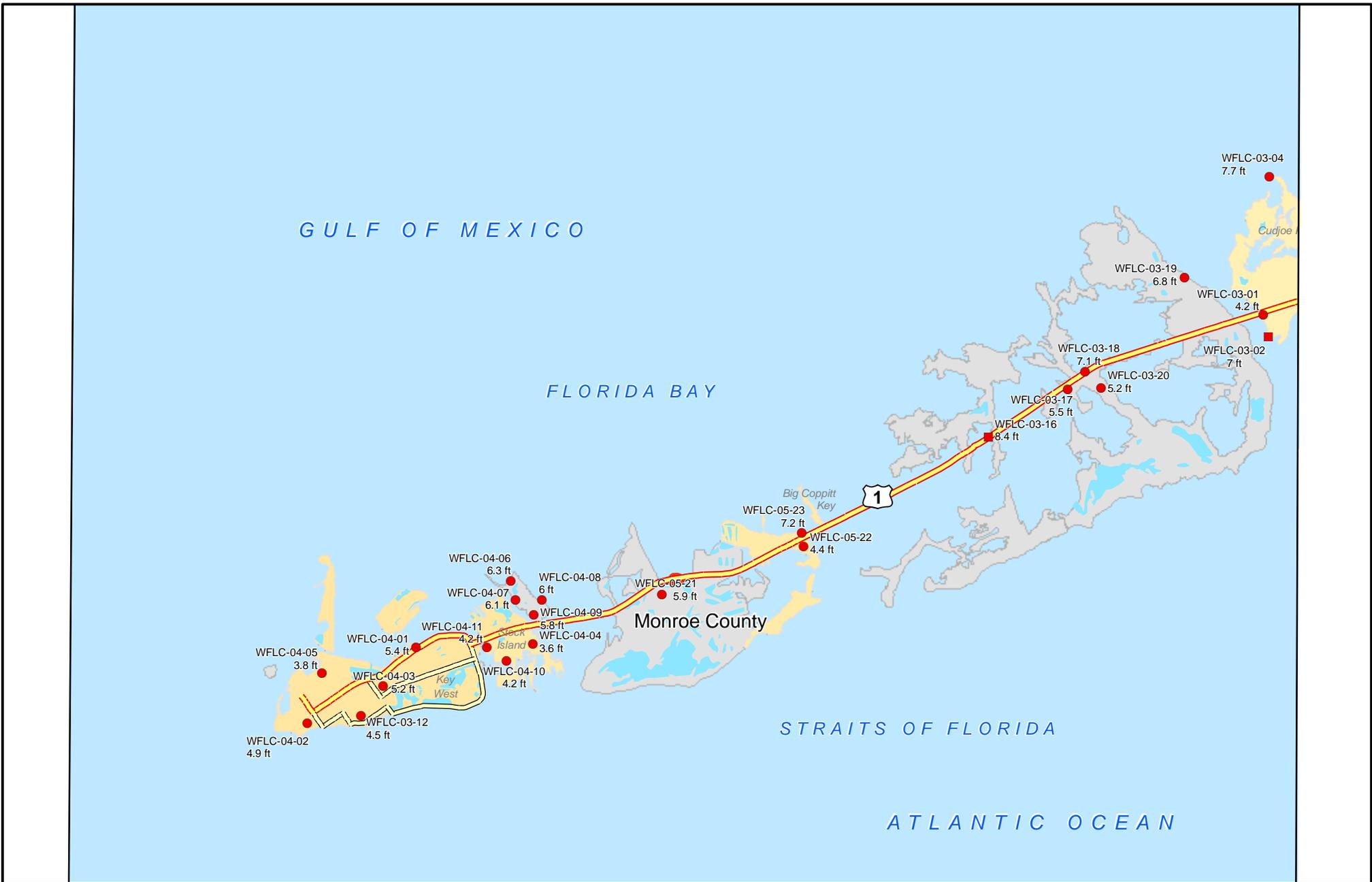


Figure B.2: Hurricane Wilma, Florida Monroe County Surveyed High Water Mark Elevations

Flooding Type

- Coastal - Surge Only
- ▲ Coastal - Wave Height
- Coastal - Wave Runup

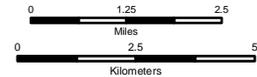
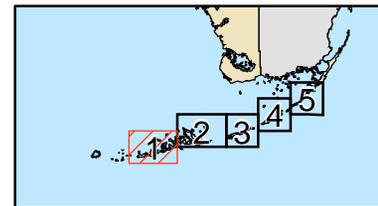
Road Classification

- Limited Access Freeway
- Highway
- Secondary Roads

— County

■ City

VERTICAL DATUM: NAVD88
HORIZONTAL DATUM: NAD83



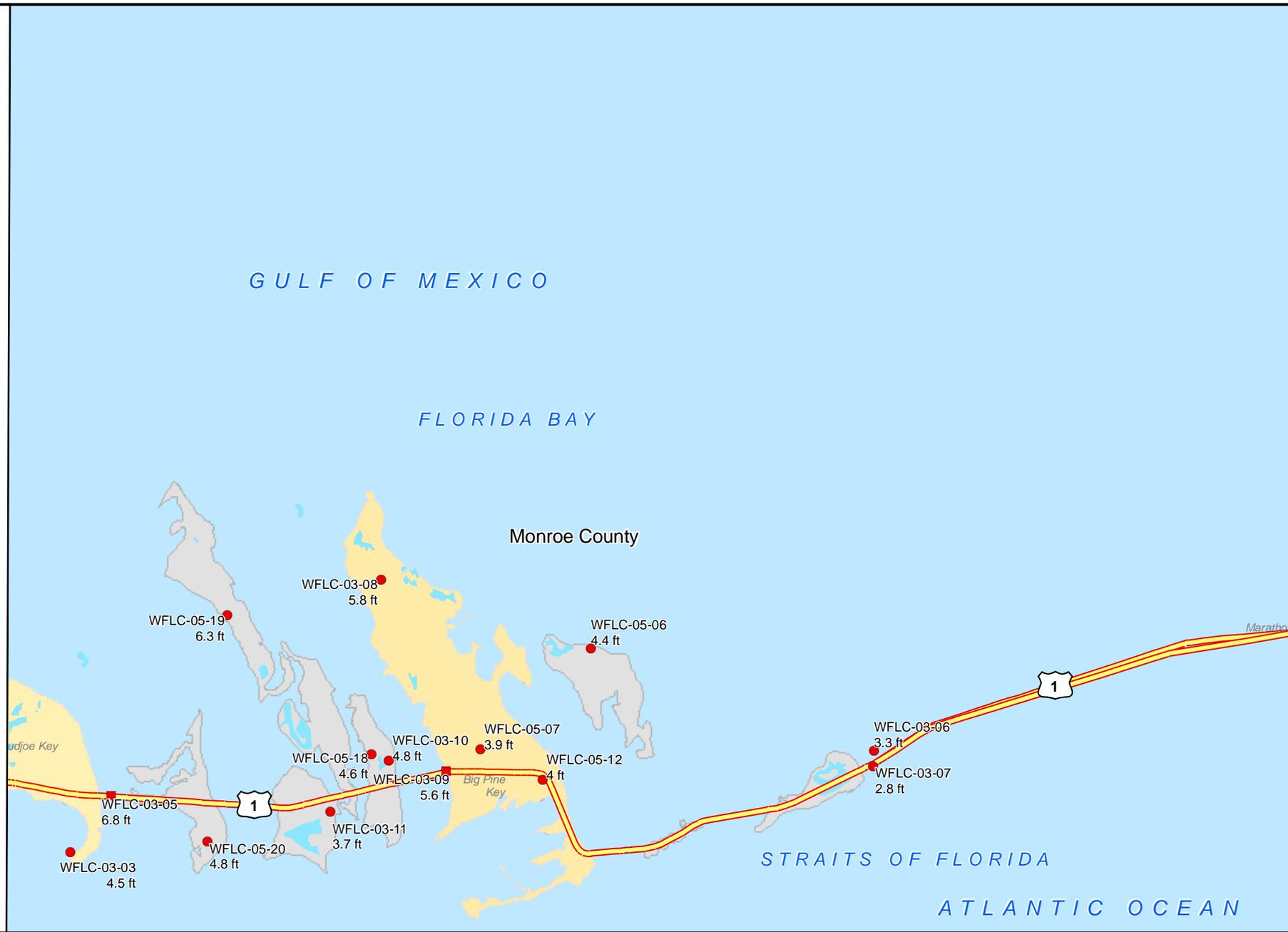


Figure B.3: Hurricane Wilma, Florida Monroe County Surveyed High Water Mark Elevations

Flooding Type

- Coastal - Surge Only
- ▲ Coastal - Wave Height
- Coastal - Wave Runup

VERTICAL DATUM: NAVD88
HORIZONTAL DATUM: NAD83

- County
- City

- Road Classification**
- Limited Access Freeway
 - Highway
 - Secondary Roads

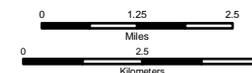
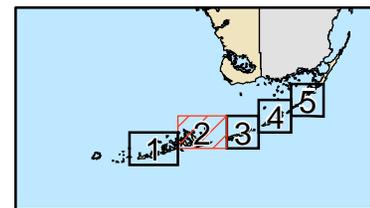




Figure B.4: Hurricane Wilma, Florida Monroe County Surveyed High Water Mark Elevations

Flooding Type

- Coastal - Surge Only
- ▲ Coastal - Wave Height
- Coastal - Wave Runup

VERTICAL DATUM: NAVD88
HORIZONTAL DATUM: NAD83

- County
- City

- Road Classification**
- Limited Access Freeway
 - Highway
 - Secondary Roads

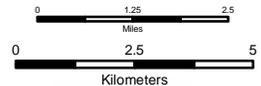
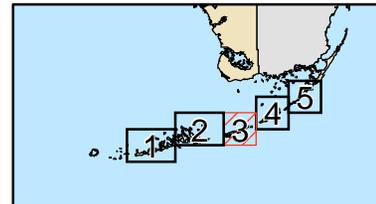


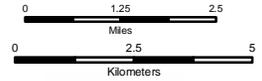
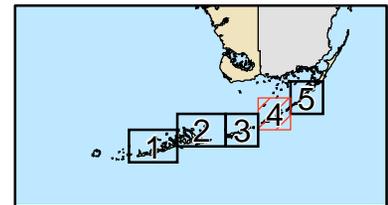


Figure B.5: Hurricane Wilma, Florida Monroe County Surveyed High Water Mark Elevations

- Flooding Type**
- Coastal - Surge Only
 - ▲ Coastal - Wave Height
 - Coastal - Wave Runup

- County
- City
- Road Classification**
- Limited Access Freeway
 - Highway
 - Secondary Roads

VERTICAL DATUM: NAVD88
HORIZONTAL DATUM: NAD83





**Figure B.6: Hurricane Wilma, Florida
Monroe County
Surveyed High Water Mark Elevations**

Flooding Type

- Coastal - Surge Only
- ▲ Coastal - Wave Height
- Coastal - Wave Runup

County

- City

Road Classification

- Limited Access Freeway
- Highway
- Secondary Roads

VERTICAL DATUM: NAVD88
HORIZONTAL DATUM: NAD83

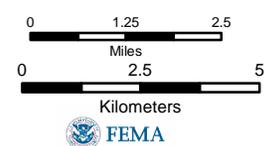
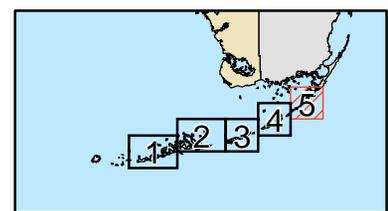


Table B-2. Hurricane Wilma Florida HWM Data Summary*

HWM_ID	County	FldType	NAVD88	Surv_Lat	Surv_Lon	SheetNum
WFLC-03-01	Monroe	Coastal - Surge Only	4.2	24.662772	-81.510467	Monroe-1
WFLC-03-02	Monroe	Coastal - Wave Runup	7.0	24.656567	-81.508911	Monroe-2
WFLC-03-03	Monroe	Coastal - Surge Only	4.5	24.647814	-81.481256	Monroe-3
WFLC-03-04	Monroe	Coastal - Surge Only	7.7	24.701375	-81.508686	Monroe-4
WFLC-03-05	Monroe	Coastal - Wave Runup	6.8	24.662997	-81.469389	Monroe-5
WFLC-03-06	Monroe	Coastal - Surge Only	3.3	24.675461	-81.246636	Monroe-6
WFLC-03-07	Monroe	Coastal - Surge Only	2.8	24.671406	-81.246931	Monroe-7
WFLC-03-08	Monroe	Coastal - Surge Only	5.8	24.720728	-81.390633	Monroe-8
WFLC-03-09	Monroe	Coastal - Wave Runup	5.6	24.669792	-81.371628	Monroe-9
WFLC-03-10	Monroe	Coastal - Surge Only	4.8	24.672631	-81.388300	Monroe-10
WFLC-03-11	Monroe	Coastal - Surge Only	3.7	24.658892	-81.405350	Monroe-11
WFLC-03-12	Monroe	Coastal - Surge Only	4.5	24.549436	-81.785894	Monroe-12
WFLC-03-13	Monroe	Coastal - Surge Only	2.7	25.082108	-80.457267	Monroe-13
WFLC-03-14	Monroe	Coastal - Surge Only	3.3	25.034992	-80.503119	Monroe-14
WFLC-03-15	Monroe	Coastal - Surge Only	3.2	24.997344	-80.540194	Monroe-15
WFLC-03-16	Monroe	Coastal - Wave Runup	8.4	24.628361	-81.594403	Monroe-16
WFLC-03-17	Monroe	Coastal - Surge Only	5.5	24.641694	-81.570189	Monroe-17
WFLC-03-18	Monroe	Coastal - Surge Only	7.1	24.646672	-81.564989	Monroe-18
WFLC-03-19	Monroe	Coastal - Surge Only	6.8	24.672933	-81.534664	Monroe-19
WFLC-03-20	Monroe	Coastal - Surge Only	5.2	24.642083	-81.560072	Monroe-20
WFLC-04-01	Monroe	Coastal - Surge Only	5.4	24.568689	-81.769233	Monroe-21
WFLC-04-02	Monroe	Coastal - Surge Only	4.9	24.547331	-81.802261	Monroe-22
WFLC-04-03	Monroe	Coastal - Surge Only	5.2	24.557894	-81.779153	Monroe-23
WFLC-04-04	Monroe	Coastal - Surge Only	3.6	24.569758	-81.733403	Monroe-24
WFLC-04-05	Monroe	Coastal - Surge Only	3.8	24.561431	-81.797903	Monroe-25
WFLC-04-06	Monroe	Coastal - Surge Only	6.3	24.587453	-81.740278	Monroe-26
WFLC-04-07	Monroe	Coastal - Surge Only	6.1	24.582114	-81.738808	Monroe-27
WFLC-04-08	Monroe	Coastal - Surge Only	6.0	24.582200	-81.730703	Monroe-28
WFLC-04-09	Monroe	Coastal - Surge Only	5.8	24.577953	-81.733247	Monroe-29
WFLC-04-10	Monroe	Coastal - Surge Only	4.2	24.565172	-81.741472	Monroe-30
WFLC-04-11	Monroe	Coastal - Surge Only	4.2	24.568947	-81.747506	Monroe-31
WFLC-05-01	Monroe	Coastal - Surge Only	4.8	24.707575	-81.120278	Monroe-32
WFLC-05-02	Monroe	Coastal - Surge Only	3.2	24.707128	-81.118453	Monroe-33
WFLC-05-03	Monroe	Coastal - Surge Only	5.8	24.711931	-81.097236	Monroe-34
WFLC-05-04	Monroe	Coastal - Surge Only	5.7	24.712125	-81.095147	Monroe-35
WFLC-05-05	Monroe	Coastal - Surge Only	4.9	24.732797	-81.030672	Monroe-36
WFLC-05-06	Monroe	Coastal - Surge Only	4.4	24.702550	-81.329347	Monroe-37
WFLC-05-07	Monroe	Coastal - Surge Only	3.9	24.675631	-81.361569	Monroe-38
WFLC-05-08	Monroe	Coastal - Surge Only	2.9	24.724406	-81.060083	Monroe-39
WFLC-05-09	Monroe	Coastal - Surge Only	5.1	24.723447	-81.063267	Monroe-40
WFLC-05-10	Monroe	Coastal - Surge Only	6.3	24.722861	-81.056669	Monroe-41
WFLC-05-11	Monroe	Coastal - Surge Only	6.6	24.727508	-81.062914	Monroe-42
WFLC-05-12	Monroe	Coastal - Surge Only	4.0	24.667561	-81.343336	Monroe-43

* Note – For HWM data summary listing sorted by County and HWM sheet number, refer to Table 6.

HWM_ID	County	FldType	NAVD88	Surv_Lat	Surv_Lon	SheetNum
WFLC-05-13	Monroe	Coastal - Wave Runup	4.9	24.838500	-80.795961	Monroe-44
WFLC-05-14	Monroe	Coastal - Surge Only	5.7	24.786208	-80.898000	Monroe-45
WFLC-05-15	Monroe	Coastal - Surge Only	6.4	24.766689	-80.954906	Monroe-46
WFLC-05-16	Monroe	Coastal - Surge Only	6.2	24.757661	-80.965222	Monroe-47
WFLC-05-17	Monroe	Coastal - Surge Only	6.4	24.734728	-81.014647	Monroe-48
WFLC-05-18	Monroe	Coastal - Surge Only	4.6	24.674353	-81.393344	Monroe-49
WFLC-05-19	Monroe	Coastal - Surge Only	6.3	24.711272	-81.435547	Monroe-50
WFLC-05-20	Monroe	Coastal - Surge Only	4.8	24.650750	-81.441158	Monroe-51
WFLC-05-21	Monroe	Coastal - Surge Only	5.9	24.583825	-81.694031	Monroe-52
WFLC-05-22	Monroe	Coastal - Surge Only	4.4	24.597594	-81.650858	Monroe-53
WFLC-05-23	Monroe	Coastal - Surge Only	7.2	24.601214	-81.651353	Monroe-54
WFLC-05-24	Monroe	Coastal - Surge Only	3.0	24.853247	-80.740319	Monroe-55
WFLC-05-25	Monroe	Coastal - Surge Only	1.3	24.897169	-80.660914	Monroe-56
WFLC-05-26	Monroe	Coastal - Surge Only	2.8	24.897378	-80.661208	Monroe-57

APPENDICES

Appendix C. Survey Sheets from Monroe County



PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-1

HWM ID: WFLC-03-01
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Atlantic Ocean **Source for Date of Peak:** James Johnson
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 4.2 **NGVD 29:** 5.6 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Ground
HWM Address: 20650 First Avenue West, Cudjoe Key, FL
Location of HWM Object: Facing the house, HWM is on the right side of house near channel
Type of HWM : Wrack Line
Closest Municipality: Cudjoe Key **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Eyra Caldera (2) Paul Comlish **Flagger Company:** (1) URS (2) Dewberry
Date of Flagging/Interview: 10/30/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/7/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 486649
Survey Latitude: 24.662772 **Northing (Feet):** 120026
Survey Longitude: -81.510467 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** N/A



WFLC-03-01-1.jpg



WFLC-03-01-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-2

HWM ID: WFLC-03-02
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Atlantic Ocean **Source for Date of Peak:** James Johnson
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 7.0 **NGVD 29:** 8.4 **HWM Quality:** Good
Flooding Type: Coastal - Wave Runup
HWM Object, Surface: Ground
HWM Address: 20814 9th Ave. West Cudjoe Key, FL 33042
Location of HWM Object: In back yard of house
Type of HWM : Wrack Line
Closest Municipality: Cudjoe Key **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Eyra Caldera (2) Paul Comlish **Flagger Company:** (1) URS (2) Dewberry
Date of Flagging/Interview: 10/30/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/7/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 487158
Survey Latitude: 24.656567 **Northing (Feet):** 117770
Survey Longitude: -81.508911 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** N/A



WFLC-03-02-1.jpg



WFLC-03-02-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-3

HWM ID: WFLC-03-03
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Atlantic Ocean **Source for Date of Peak:** Bela Zeky
Subdivision / Ind. Park: Cutthroat Harbor Estates
Survey Elevation (Feet) NAVD 88: 4.5 **NGVD 29:** 5.8 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Exterior wall
HWM Address: 1125 Hakluyt Lane, Cudjoe Key, FL 33042
Location of HWM Object: Facing the two car garage on the left hand side; on side beam of garage door of home. HWM was transferred to exterior
Type of HWM : Mud Line
Closest Municipality: Cudjoe Key **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Eyra Caldera (2) Paul Comlish **Flagger Company:** (1) URS (2) Dewberry
Date of Flagging/Interview: 10/30/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/7/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 496331
Survey Latitude: 24.647814 **Northing (Feet):** 114556
Survey Longitude: -81.481256 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** 2.19



WFLC-03-03-1.jpg



WFLC-03-03-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-4

HWM ID: WFLC-03-04
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Albert Palladino
Subdivision / Ind. Park: Cudjoe Key Air Force Station
Survey Elevation (Feet) NAVD 88: 7.7 **NGVD 29:** 9.0 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Exterior wall
HWM Address: Building 12923, Cudjoe Key Air Force Station
Location of HWM Object: HWM was transferred to the exterior wall of Building 12923, the Butler Building (paint building).
Type of HWM : Mud Line
Closest Municipality: Cudjoe Key **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Eyra Caldera (2) Paul Comlish **Flagger Company:** (1) URS (2) Dewberry
Date of Flagging/Interview: 10/30/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/7/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 487293
Survey Latitude: 24.701375 **Northing (Feet):** 134053
Survey Longitude: -81.508686 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** 5.53



WFLC-03-04-1.jpg



WFLC-03-04-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-5

HWM ID WFLC-03-05
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Event date
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 6.8 **NGVD 29:** 8.1 **HWM Quality:** Good
Flooding Type: Coastal - Wave Runup
HWM Object, Surface: Ground
HWM Address: Past bridge entering Cudjoe Key, on the right
Location of HWM Object After crossing the bridge going west, HWM is at the beginning of Cudjoe Key on the right-hand side.
Type of HWM : Wrack Line
Closest Municipality: Cudjoe Key **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Eyra Caldera (2) Paul Comlish **Flagger Company:** (1) URS (2) Dewberry
Date of Flagging/Interview: 10/30/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/7/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 500291
Survey Latitude: 24.662997 **Northing (Feet):** 120060
Survey Longitude: -81.469389 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** N/A



WFLC-03-05-1.jpg



WFLC-03-05-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-6

HWM ID: WFLC-03-06
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Event date
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 3.3 **NGVD 29:** 4.7 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Exterior wall
HWM Address: Sunshine Key Trailer Park
Location of HWM Object: HWM is on the water pumping station of Sunshine Key Trailer Park on Ohio Key
Type of HWM : Mud Line
Closest Municipality: Ohio Key **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Eyra Caldera (2) Paul Comlish **Flagger Company:** (1) URS (2) Dewberry
Date of Flagging/Interview: 10/31/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/6/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 574271
Survey Latitude: 24.675461 **Northing (Feet):** 124397
Survey Longitude: -81.246636 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** N/A



WFLC-03-06-1.jpg



WFLC-03-06-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-7

HWM ID: WFLC-03-07
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Atlantic Ocean **Source for Date of Peak:** Event date
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 2.8 **NGVD 29:** 4.1 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Ground
HWM Address: East side of US1 bridge travelling SW
Location of HWM Object: HWM is on left-hand side of bridge entering Ohio Key, across from trailer park.
Type of HWM : Wrack Line
Closest Municipality: Ohio Key **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Eyra Caldera (2) Paul Comlish **Flagger Company:** (1) URS (2) Dewberry
Date of Flagging/Interview: 10/31/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/6/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 574171
Survey Latitude: 24.671406 **Northing (Feet):** 122922
Survey Longitude: -81.246931 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** N/A



WFLC-03-07-1.jpg



WFLC-03-07-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-8

HWM ID: WFLC-03-08
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Event date
Subdivision / Ind. Park: Port Pine Heights
Survey Elevation (Feet) NAVD 88: 5.8 **NGVD 29:** 7.2 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Exterior wall
HWM Address: 3622 Bahama St., Big Pine Key 33042
Location of HWM Object: HWM is next to the shed on the left side of the house. HWM was transferred from the sliding door.
Type of HWM : Mud Line
Closest Municipality: Big Pine Key **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Eyra Caldera (2) Paul Comlish **Flagger Company:** (1) URS (2) Dewberry
Date of Flagging/Interview: 10/31/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/7/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 526504
Survey Latitude: 24.720728 **Northing (Feet):** 140957
Survey Longitude: -81.390633 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** 3.4



WFLC-03-08-1.jpg



WFLC-03-08-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-9

HWM ID WFLC-03-09
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Event date
Subdivision / Ind. Park: North Pine Channel
Survey Elevation (Feet) NAVD 88: 5.6 **NGVD 29:** 7.0 **HWM Quality:** Good
Flooding Type: Coastal - Wave Runup
HWM Object, Surface: Ground
HWM Address: Across bridge crossing North Pine Channel
Location of HWM Object HWM is on the ground on the left-hand side of the bridge crossing North Pine Channel, at the start of Big Pine Key.
Type of HWM : Wrack Line
Closest Municipality: Big Pine Key **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Eyra Caldera (2) Paul Comlish **Flagger Company:** (1) URS (2) Dewberry
Date of Flagging/Interview: 10/31/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/6/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 532763
Survey Latitude: 24.669792 **Northing (Feet):** 122429
Survey Longitude: -81.371628 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** N/A



WFLC-03-09-1.jpg



WFLC-03-09-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-10

HWM ID: WFLC-03-10
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Homeowner
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 4.8 **NGVD 29:** 6.1 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Exterior column
HWM Address: 430 Barry Ave., Little Torch Key, FL
Location of HWM Object: HWM was transferred from interior wall to exterior column.
Type of HWM : Mud Line
Closest Municipality: Little Torch Key **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Eyra Caldera (2) Paul Comlish **Flagger Company:** (1) URS (2) Dewberry
Date of Flagging/Interview: 10/31/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/6/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 527229
Survey Latitude: 24.672631 **Northing (Feet):** 123476
Survey Longitude: -81.3883 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** 1.37



WFLC-03-10-1.jpg



WFLC-03-10-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-11

HWM ID: WFLC-03-11
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Atlantic Ocean **Source for Date of Peak:** Chris Curran
Subdivision / Ind. Park: Breezeway Estates
Survey Elevation (Feet) NAVD 88: 3.7 **NGVD 29:** 5.1 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Exterior wall
HWM Address: 27389 St. Vincent Ln., Ramrod Key, FL 33042
Location of HWM Object: HWM is on the side of garage door if you face north. HWM was transferred from interior wall.
Type of HWM : Mud Line
Closest Municipality: Ramrod Key **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Eyra Caldera (2) Paul Comlish **Flagger Company:** (1) URS (2) Dewberry
Date of Flagging/Interview: 10/31/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/6/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 521553
Survey Latitude: 24.658892 **Northing (Feet):** 118500
Survey Longitude: -81.40535 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** 1.59



WFLC-03-11-1.jpg



WFLC-03-11-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-12

HWM ID: WFLC-03-12
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Atlantic Ocean **Source for Date of Peak:** Martin Maress
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 4.5 **NGVD 29:** 5.9 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Wooden post
HWM Address: 1617 White St., Key West 33040
Location of HWM Object: HWM is on the right column of the carport shed.
Type of HWM : Mud Line
Closest Municipality: Key West **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Eyra Caldera (2) Jovanna Garcia **Flagger Company:** (1) URS (2) URS
Date of Flagging/Interview: 11/1/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/8/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 394946
Survey Latitude: 24.549436 **Northing (Feet):** 79271
Survey Longitude: -81.785894 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** 6.88



WFLC-03-12-1.jpg



WFLC-03-12-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-13

HWM ID: WFLC-03-13
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Event date
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 2.7 **NGVD 29:** 4.2 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Ground
HWM Address: 34 Gasparilla Dr., Key Largo 33037
Location of HWM Object: HWM is on ground along Gasparilla Drive.
Type of HWM : Wrack Line
Closest Municipality: Key Largo **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Eyra Caldera (2) Paul Comlish **Flagger Company:** (1) URS (2) URS
Date of Flagging/Interview: 11/2/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/1/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 835792
Survey Latitude: 25.082108 **Northing (Feet):** 272459
Survey Longitude: -80.457267 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** N/A



WFLC-03-13-1.jpg



WFLC-03-13-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-14

HWM ID: WFLC-03-14
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Homeowner
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 3.3 **NGVD 29:** 4.8 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Concrete column
HWM Address: Sunset Gardens Drive
Location of HWM Object: HWM is on the bottom concrete column of the wood steps.
Type of HWM : Mud Line
Closest Municipality: Key Largo **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Eyra Caldera (2) Paul Comlish **Flagger Company:** (1) URS (2) Dewberry
Date of Flagging/Interview: 11/2/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/1/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 820678
Survey Latitude: 25.034992 **Northing (Feet):** 255278
Survey Longitude: -80.503119 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** 2.57



WFLC-03-14-1.jpg



WFLC-03-14-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-16

HWM ID: WFLC-03-16
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Event date
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 8.4 **NGVD 29:** 9.8 **HWM Quality:** Good
Flooding Type: Coastal - Wave Runup
HWM Object, Surface: Ground
HWM Address: Overseas Hwy (US 1) and West Circle Drive
Location of HWM Object: HWM is on the ground along the right-hand side of US 1 when travelling southwest.
Type of HWM : Wrack Line
Closest Municipality: Sugarloaf Key **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Eyra Caldera (2) Paul Comlish **Flagger Company:** (1) URS (2) Dewberry
Date of Flagging/Interview: 11/3/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/8/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 458721
Survey Latitude: 24.628361 **Northing (Feet):** 107634
Survey Longitude: -81.594403 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** N/A



WFLC-03-16-1.jpg



WFLC-03-16-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-17

HWM ID WFLC-03-17
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Atlantic Ocean **Source for Date of Peak:** Area resident
Subdivision / Ind. Park: South Point Sugar Loaf Shores
Survey Elevation (Feet) NAVD 88: 5.5 **NGVD 29:** 6.9 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Telephone pole
HWM Address: 16640 Cypress Rd., Sugar Loaf Key, FL
Location of HWM Object HWM was transferred from the inner fence to the telephone pole in front of the house.
Type of HWM : Mud Line
Closest Municipality: Sugarloaf Key **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Eyra Caldera (2) Paul Comlish **Flagger Company:** (1) URS (2) Dewberry
Date of Flagging/Interview: 11/3/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/8/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 466784
Survey Latitude: 24.641694 **Northing (Feet):** 112445
Survey Longitude: -81.570189 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** N/A



WFLC-03-17-1.jpg



WFLC-03-17-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-18

HWM ID: WFLC-03-18
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Area resident
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 7.1 **NGVD 29:** 8.4 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Concrete column
HWM Address: 17085 Overseas Hwy., Sugarloaf Key 33042
Location of HWM Object: HWM is in front of First State Bank on the left-hand side.
Type of HWM : Mud Line
Closest Municipality: Sugarloaf Key **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Eyra Caldera (2) Paul Comlish **Flagger Company:** (1) URS (2) Dewberry
Date of Flagging/Interview: 11/3/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/8/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Eastings (Feet): 468519
Northings (Feet): 114247
Survey Latitude: 24.646672
Survey Longitude: -81.564989 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** 5.2



WFLC-03-18-1.jpg



WFLC-03-18-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-19

HWM ID: WFLC-03-19
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Shannon Perkins
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 6.8 **NGVD 29:** 8.2 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Light pole
HWM Address: 1077 Hawksbill Lane, Sugarloaf Key 33042
Location of HWM Object: HWM is on the telephone/light pole on the left/front of home.
Type of HWM : Mud Line
Closest Municipality: Sugarloaf Key **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Eyra Caldera (2) Paul Comlish **Flagger Company:** (1) URS (2) Dewberry
Date of Flagging/Interview: 11/3/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/7/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 478628
Survey Latitude: 24.672933 **Northing (Feet):** 123750
Survey Longitude: -81.534664 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** N/A



WFLC-03-19-1.jpg



WFLC-03-19-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-20

HWM ID WFLC-03-20
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Atlantic Ocean **Source for Date of Peak:** Event date
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 5.2 **NGVD 29:** 6.6 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Exterior wall
HWM Address: 97 Bonefish Lane, Lower Sugarloaf Key 33042
Location of HWM Object HWM is under the power meter of home.
Type of HWM : Mud Line
Closest Municipality: Lower Sugarloaf Key **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Eyra Caldera (2) Paul Comlish **Flagger Company:** (1) URS (2) Dewberry
Date of Flagging/Interview: 11/3/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/8/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 470145
Survey Latitude: 24.642083 **Northing (Feet):** 112572
Survey Longitude: -81.560072 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** 2.29



WFLC-03-20-1.jpg



WFLC-03-20-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-21

HWM ID: WFLC-04-01
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Event date
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 5.4 **NGVD 29:** 6.8 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: White post
HWM Address: Blue Lagoon Motel Room 208
Location of HWM Object: HWM is in front of Room 208, 10 feet from driveway, west of the Blue Lagoon Motel Office, and south of the pool.
Type of HWM : Water Line
Closest Municipality: Key West **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Aylin Borrego (2) Jovanna Garcia **Flagger Company:** (1) URS (2) URS
Date of Flagging/Interview: 10/30/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/8/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 400523
Survey Latitude: 24.568689 **Northing (Feet):** 86237
Survey Longitude: -81.769233 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** 3.33



WFLC-04-01-1.jpg



WFLC-04-01-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-22

HWM ID: WFLC-04-02
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Atlantic Ocean **Source for Date of Peak:** Event date
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 4.9 **NGVD 29:** 6.3 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Exterior wall
HWM Address: 1125 Fort Street, Apt. 7-D Fort Village Apartments
Location of HWM Object: HWM is to the right of front entrance door to Apt. 7-D, approximately 25 feet west of Amelia Street.
Type of HWM : Water Line
Closest Municipality: Key West **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Aylin Borrego (2) Jovanna Garcia **Flagger Company:** (1) URS (2) URS
Date of Flagging/Interview: 10/30/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/8/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 389502
Northing (Feet): 78537
Survey Latitude: 24.547331
Survey Longitude: -81.802261 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** 3.52



WFLC-04-02-1.jpg



WFLC-04-02-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-23

HWM ID: WFLC-04-03
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Event date
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 5.2 **NGVD 29:** 6.5 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Exterior wall
HWM Address: 2100 Harris Ave. & 3rd St.
Location of HWM Object: HWM is 45 feet north of 3rd St. on exterior wall of car garage.
Type of HWM : Water Line
Closest Municipality: Key West **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Jovanna Garcia (2) Aylin Borrego **Flagger Company:** (1) URS (2) URS
Date of Flagging/Interview: 10/30/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/8/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 397205
Survey Latitude: 24.557894 **Northing (Feet):** 82332
Survey Longitude: -81.779153 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** 4.7



WFLC-04-03-1.jpg



WFLC-04-03-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-24

HWM ID: WFLC-04-04
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Atlantic Ocean **Source for Date of Peak:** Event date
Subdivision / Ind. Park: Roy's Trailer Park
Survey Elevation (Feet) NAVD 88: 3.6 **NGVD 29:** 5.0 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Wood post
HWM Address: 6500 Maloney Ave., Lot 41
Location of HWM Object: HWM is on wood post to the left of entrance gate.
Type of HWM : Water Line
Closest Municipality: Stock Island **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Jovanna Garcia (2) Aylin Borrego **Flagger Company:** (1) URS (2) URS
Date of Flagging/Interview: 10/30/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/9/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 412434
Survey Latitude: 24.569758 **Northing (Feet):** 86560
Survey Longitude: -81.733403 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** N/A



WFLC-04-04-1.jpg



WFLC-04-04-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-26

HWM ID: WFLC-04-06
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Event date
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 6.3 **NGVD 29:** 7.6 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Exterior wall
HWM Address: 25 Evergreen Ave.
Location of HWM Object: HWM is on left-hand side of garage entrance, 75 feet west of Evergreen Ave.
Type of HWM : Water Line
Closest Municipality: Raccoon Key **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Aylin Borrego (2) Jovanna Garcia **Flagger Company:** (1) URS (2) URS
Date of Flagging/Interview: 11/3/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/9/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 410183
Survey Latitude: 24.587453 **Northing (Feet):** 93003
Survey Longitude: -81.740278 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** N/A



WFLC-04-06-1.jpg



WFLC-04-06-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-27

HWM ID: WFLC-04-07
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Event date
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 6.1 **NGVD 29:** 7.4 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Exterior wall
HWM Address: 129 Key Haven Rd.
Location of HWM Object: HWM is on an exterior wall of the front of the home, 3 feet from the front door and 65 feet south of road.
Type of HWM : Water Line
Closest Municipality: Raccoon Key **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Aylin Borrego (2) Jovanna Garcia **Flagger Company:** (1) URS (2) URS
Date of Flagging/Interview: 11/3/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/9/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 410661
Survey Latitude: 24.582114 **Northing (Feet):** 91059
Survey Longitude: -81.738808 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** 4.89



WFLC-04-07-1.jpg



WFLC-04-07-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-28

HWM ID: WFLC-04-08
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Event date
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 6.0 **NGVD 29:** 7.3 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Exterior wall
HWM Address: 22 Allamanda Dr., Raccoon Key
Location of HWM Object: HWM was transferred to the exterior wall in front of the 2-car garage, 75 feet from road.
Type of HWM : Water Line
Closest Municipality: Raccoon Key **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Aylin Borrego (2) Jovanna Garcia **Flagger Company:** (1) URS (2) URS
Date of Flagging/Interview: 11/3/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/9/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 413355
Survey Latitude: 24.5822 **Northing (Feet):** 91077
Survey Longitude: -81.730703 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** 7.51



WFLC-04-08-1.jpg



WFLC-04-08-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-29

HWM ID: WFLC-04-09
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Event date
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 5.8 **NGVD 29:** 7.1 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Exterior wall
HWM Address: 20 Key Haven Rd.
Location of HWM Object: HWM is on exterior wall in front of home next to front door entrance.
Type of HWM : Water Line
Closest Municipality: Raccoon Key **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Aylin Borrego (2) Jovanna Garcia **Flagger Company:** (1) URS (2) URS
Date of Flagging/Interview: 11/3/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/9/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 412501
Survey Latitude: 24.577953 **Northing (Feet):** 89537
Survey Longitude: -81.733247 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** 4.32



WFLC-04-09-1.jpg



WFLC-04-09-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-30

HWM ID: WFLC-04-10
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Atlantic Ocean **Source for Date of Peak:** Event date
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 4.2 **NGVD 29:** 5.5 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Exterior wall
HWM Address: 46 E. 12 Ave.
Location of HWM Object: Facing west 55' west from road. HWM is located below home address number.
Type of HWM : Water Line
Closest Municipality: Stock Island **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Aylin Borrego (2) Jovanna Garcia **Flagger Company:** (1) URS (2) URS
Date of Flagging/Interview: 11/3/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/9/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 409743
Survey Latitude: 24.565172 **Northing (Feet):** 84908
Survey Longitude: -81.741472 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** 4.19



WFLC-04-10-1.jpg



WFLC-04-10-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-31

HWM ID: WFLC-04-11
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Atlantic Ocean **Source for Date of Peak:** Event date
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 4.2 **NGVD 29:** 5.5 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Exterior wall
HWM Address: 5031 5 Ave., A-15, Key West 30040
Location of HWM Object: HWM is 1 foot south of front door when facing west in front of trailer home.
Type of HWM : Water Line
Closest Municipality: Stock Island **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Aylin Borrego (2) Jovanna Garcia **Flagger Company:** (1) URS (2) URS
Date of Flagging/Interview: 11/3/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/9/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 407746
Survey Latitude: 24.568947 **Northing (Feet):** 86291
Survey Longitude: -81.747506 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** 2.38



WFLC-04-11-1.jpg



WFLC-04-11-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-32

HWM ID: WFLC-05-01
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Event date
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 4.8 **NGVD 29:** 6.2 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Ground
HWM Address: Beach access road, north of US 1, Knight Key
Location of HWM Object: From Marathon go south on US 1, turn right on unnamed beach access road. HWM is on left.
Type of HWM : Debris Line
Closest Municipality: Marathon **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Jon Skroban (2) James Myre **Flagger Company:** (1) Dewberry (2) URS
Date of Flagging/Interview: 10/30/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/1/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 616239
Survey Latitude: 24.707575 **Northing (Feet):** 136010
Survey Longitude: -81.120278 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** N/A



WFLC-05-01-1.jpg



WFLC-05-01-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-33

HWM ID: WFLC-05-02
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Event date
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 3.2 **NGVD 29:** 4.6 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Ground
HWM Address: Knight Key Blvd, south of intersection with US 1, Knight Key
Location of HWM Object: From Marathon go south on US 1, turn left on Knights Key Blvd. HWM is on left.
Type of HWM : Wrack Line
Closest Municipality: Marathon **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Jon Skroban (2) James Myre **Flagger Company:** (1) Dewberry (2) URS
Date of Flagging/Interview: 10/30/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/1/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 616844
Survey Latitude: 24.707128 **Northing (Feet):** 135847
Survey Longitude: -81.118453 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** N/A



WFLC-05-02-1.jpg



WFLC-05-02-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-34

HWM ID: WFLC-05-03
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Event date
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 5.8 **NGVD 29:** 7.2 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Exterior wall
HWM Address: FL Regional Service Center Bldg.
Location of HWM Object: From intersection of 33rd st. and US1, go south on US1. HWM is on right on FL Regional Service Center Bldg.
Type of HWM : Mud Line
Closest Municipality: Marathon **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Jon Skroban (2) James Myre **Flagger Company:** (1) Dewberry (2) URS
Date of Flagging/Interview: 10/30/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/6/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 623888
Survey Latitude: 24.711931 **Northing (Feet):** 137587
Survey Longitude: -81.097236 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** 7.67



WFLC-05-03-1.jpg



WFLC-05-03-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-35

HWM ID WFLC-05-04
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Event date
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 5.7 **NGVD 29:** 7.1 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Exterior wall
HWM Address: US 1 and 33rd St. Gulf - 705 33rd St. Gulf
Location of HWM Object HWM is on Jaycees building on the left.
Type of HWM : Mud Line
Closest Municipality: Marathon **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Jon Skroban (2) James Myre **Flagger Company:** (1) Dewberry (2) URS
Date of Flagging/Interview: 10/30/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/6/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 624582
Survey Latitude: 24.712125 **Northing (Feet):** 137657
Survey Longitude: -81.095147 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** 5.61



WFLC-05-04-1.jpg



WFLC-05-04-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-36

HWM ID WFLC-05-05
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Event date
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 4.9 **NGVD 29:** 6.4 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Exterior wall
HWM Address: US 1 and Unnamed street north of 117th St.
Location of HWM Object HWM is on Guard House on right side of split at Marathon Jaycees Community Center.
Type of HWM : Mud Line
Closest Municipality: Marathon **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Jon Skroban (2) James Myre **Flagger Company:** (1) Dewberry (2) URS
Date of Flagging/Interview: 10/30/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/6/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 645986
Survey Latitude: 24.732797 **Northing (Feet):** 145159
Survey Longitude: -81.030672 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** 3.34



WFLC-05-05-1.jpg



WFLC-05-05-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-37

HWM ID: WFLC-05-06
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Event date
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 4.4 **NGVD 29:** 5.8 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Concrete wall
HWM Address: Property next to 2150 No Name Dr.
Location of HWM Object: HWM is on left on wall in front of house.
Type of HWM : Mud Line
Closest Municipality: No Name Key **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Jon Skroban (2) James Myre **Flagger Company:** (1) Dewberry (2) URS
Date of Flagging/Interview: 10/31/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/7/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 546831
Survey Latitude: 24.70255 **Northing (Feet):** 134298
Survey Longitude: -81.329347 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** N/A



WFLC-05-06-1.jpg



WFLC-05-06-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-38

HWM ID: WFLC-05-07
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Event date
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 3.9 **NGVD 29:** 5.3 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Exterior wall
HWM Address: 4050 Key Deer Blvd.
Location of HWM Object: Big Pine Key Rd Prison Office is on left. Hwm is on front of building to right of door.
Type of HWM : Mud Line
Closest Municipality: Big Pine Key **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Jon Skroban (2) James Myre **Flagger Company:** (1) Dewberry (2) URS
Date of Flagging/Interview: 10/31/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/7/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 536109
Survey Latitude: 24.675631 **Northing (Feet):** 124542
Survey Longitude: -81.361569 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** 4.58



WFLC-05-07-1.jpg



WFLC-05-07-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-39

HWM ID: WFLC-05-08
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Event date
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 2.9 **NGVD 29:** 4.3 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Concrete wall
HWM Address: Aviation Blvd., Vaca Key
Location of HWM Object: Go north on Aviation Blvd toward Harbor Dr. HWM is on wall in front of house.
Type of HWM : Mud Line
Closest Municipality: Marathon **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Jon Skroban (2) James Myre **Flagger Company:** (1) Dewberry (2) URS
Date of Flagging/Interview: 10/31/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/1/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 636224
Survey Latitude: 24.724406 **Northing (Feet):** 142113
Survey Longitude: -81.060083 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** N/A



WFLC-05-08-1.jpg



WFLC-05-08-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-40

HWM ID: WFLC-05-09
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Event date
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 5.1 **NGVD 29:** 6.6 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Exterior wall
HWM Address: Unnamed road north of US1 & Aviation Rd
Location of HWM Object: Coconut Cay Resort/Marina. HWM is on side of Bright Water Bungalo down unnamed road.
Type of HWM : Mud Line
Closest Municipality: Marathon **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Jon Skroban (2) James Myre **Flagger Company:** (1) Dewberry (2) URS
Date of Flagging/Interview: 10/31/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/6/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 635167
Survey Latitude: 24.723447 **Northing (Feet):** 141765
Survey Longitude: -81.063267 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** 2.67



WFLC-05-09-1.jpg



WFLC-05-09-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-41

HWM ID: WFLC-05-10
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Event date
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 6.3 **NGVD 29:** 7.8 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Interior wall
HWM Address: MM 51.5 Overseas Hwy US1 South
Location of HWM Object: From Marathon drive South on US1, turn right into last access road to southernmost hanger. HWM is on exterior wall transferred from interior wall.
Type of HWM : Mud Line
Closest Municipality: Marathon **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Jon Skroban (2) James Myre **Flagger Company:** (1) Dewberry (2) URS
Date of Flagging/Interview: 11/1/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/6/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 637356
Survey Latitude: 24.722861 **Northing (Feet):** 141551
Survey Longitude: -81.056669 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** 3.63



WFLC-05-10-1.jpg



WFLC-05-10-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-42

HWM ID: WFLC-05-11
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Event date
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 6.6 **NGVD 29:** 8.0 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Exterior wall
HWM Address: 7710 Gulf Stream Blvd.
Location of HWM Object: HWM is on garage door at house at Porgy Dr intersection.
Type of HWM : Mud Line
Closest Municipality: Marathon **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Jon Skroban (2) James Myre **Flagger Company:** (1) Dewberry (2) URS
Date of Flagging/Interview: 11/1/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/6/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 635285
Survey Latitude: 24.727508 **Northing (Feet):** 143241
Survey Longitude: -81.062914 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** 5.99



WFLC-05-11-1.jpg



WFLC-05-11-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-43

HWM ID: WFLC-05-12
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Atlantic Ocean **Source for Date of Peak:** Event date
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 4.0 **NGVD 29:** 5.4 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Exterior wall
HWM Address: 31300 Overseas Hwy
Location of HWM Object: St. Peter Church in Big Pine Key. Go past church to pink/teal house. HWM is on support column inside carport.
Type of HWM : Mud Line
Closest Municipality: Big Pine Key **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Jon Skroban (2) James Myre **Flagger Company:** (1) Dewberry (2) URS
Date of Flagging/Interview: 11/1/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/7/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 542155
Survey Latitude: 24.667561 **Northing (Feet):** 121594
Survey Longitude: -81.343336 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** 1.68



WFLC-05-12-1.jpg



WFLC-05-12-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-44

HWM ID: WFLC-05-13
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Event date
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 4.9 **NGVD 29:** 6.5 **HWM Quality:** Good
Flooding Type: Coastal - Wave Runup
HWM Object, Surface: Ground
HWM Address: US1 & Gulf of Mexico between MM 69 & 70
Location of HWM Object: Go north on US1 to Long Key near border with Fiesta Key. HWM is debris line on left side of road.
Type of HWM : Debris Line
Closest Municipality: Long Key **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Jon Skroban (2) James Myre **Flagger Company:** (1) Dewberry (2) URS
Date of Flagging/Interview: 11/2/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/1/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 723828
Survey Latitude: 24.8385 **Northing (Feet):** 183620
Survey Longitude: -80.795961 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** N/A



WFLC-05-13-1.jpg



WFLC-05-13-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-45

HWM ID: WFLC-05-14
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Event date
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 5.7 **NGVD 29:** 7.2 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Ground
HWM Address: US1 & Gulf of Mexico past MM 62
Location of HWM Object: US1 north toward Conch Key past MM 62. HWM is on left side of road near telephone pole.
Type of HWM : Debris Line
Closest Municipality: Conch Key **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Jon Skroban (2) James Myre **Flagger Company:** (1) Dewberry (2) URS
Date of Flagging/Interview: 11/2/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/1/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Eastings (Feet): 690005
Survey Latitude: 24.786208 **Northings (Feet):** 164580
Survey Longitude: -80.898 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** N/A



WFLC-05-14-1.jpg



WFLC-05-14-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-46

HWM ID: WFLC-05-15
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Event date
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 6.4 **NGVD 29:** 7.9 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Exterior wall
HWM Address: 58446 Morton St., Grassy Key, FL
Location of HWM Object: From Marathon go north on US1, left on Guava Ave, right on Morton St. HWM is on right side at pink house.
Type of HWM : Mud Line
Closest Municipality: Grassy Key **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Jon Skroban (2) James Myre **Flagger Company:** (1) Dewberry (2) URS
Date of Flagging/Interview: 11/2/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/1/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 671129
Survey Latitude: 24.766689 **Northing (Feet):** 157476
Survey Longitude: -80.954906 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** 3.61



WFLC-05-15-1.jpg



WFLC-05-15-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-47

HWM ID: WFLC-05-16
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Event date
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 6.2 **NGVD 29:** 7.6 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Exterior wall
HWM Address: 57547 Gibson St.
Location of HWM Object: HWM is to the left of door on exterior wall.
Type of HWM : Mud Line
Closest Municipality: Grassy Key **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Jon Skroban (2) James Myre **Flagger Company:** (1) Dewberry (2) URS
Date of Flagging/Interview: 11/2/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/1/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 667706
Survey Latitude: 24.757661 **Northing (Feet):** 154195
Survey Longitude: -80.965222 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** 5.64



WFLC-05-16-1.jpg



WFLC-05-16-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-48

HWM ID WFLC-05-17
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Event date
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 6.4 **NGVD 29:** 7.8 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Exterior wall
HWM Address: 13688 US1, Marathon Key
Location of HWM Object HWM is by door on right side.
Type of HWM : Mud Line
Closest Municipality: Marathon Key **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Jon Skroban (2) James Myre **Flagger Company:** (1) Dewberry (2) URS
Date of Flagging/Interview: 11/2/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/7/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 651305
Survey Latitude: 24.734728 **Northing (Feet):** 145860
Survey Longitude: -81.014647 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** 4.22



WFLC-05-17-1.jpg



WFLC-05-17-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-49

HWM ID: WFLC-05-18
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Event date
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 4.6 **NGVD 29:** 6.0 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Exterior wall
HWM Address: 620 Carolyn Ave.
Location of HWM Object: HWM on wall under upper level facing Linda St.
Type of HWM : Mud Line
Closest Municipality: Summerland **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Jon Skroban (2) James Myre **Flagger Company:** (1) Dewberry (2) URS
Date of Flagging/Interview: 11/3/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/6/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 525556
Survey Latitude: 24.674353 **Northing (Feet):** 124107
Survey Longitude: -81.393344 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** 2.32



WFLC-05-18-1.jpg



WFLC-05-18-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-50

HWM ID: WFLC-05-19
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Event date
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 6.3 **NGVD 29:** 7.7 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Exterior wall
HWM Address: 5420 Dorn Rd., Big Torch Key
Location of HWM Object: HWM is off Dorn Rd down driveway on garage to left of house.
Type of HWM : Mud Line
Closest Municipality: Big Torch Key **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Jon Skroban (2) James Myre **Flagger Company:** (1) Dewberry (2) URS
Date of Flagging/Interview: 11/3/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/6/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 511585
Survey Latitude: 24.711272 **Northing (Feet):** 137565
Survey Longitude: -81.435547 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** 4.4



WFLC-05-19-1.jpg



WFLC-05-19-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-51

HWM ID: WFLC-05-20
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Atlantic Ocean **Source for Date of Peak:** Event date
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 4.8 **NGVD 29:** 6.2 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Exterior wall
HWM Address: 1143 Caribbean Dr. East
Location of HWM Object: HWM is on exterior wall on house at point where street turns right.
Type of HWM : Mud Line
Closest Municipality: Summerland Key **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Jon Skroban (2) James Myre **Flagger Company:** (1) Dewberry (2) URS
Date of Flagging/Interview: 11/3/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/6/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 509652
Survey Latitude: 24.65075 **Northing (Feet):** 115578
Survey Longitude: -81.441158 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** 3.6



WFLC-05-20-1.jpg



WFLC-05-20-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-52

HWM ID: WFLC-05-21
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Event date
Subdivision / Ind. Park: US Naval Air Station - Key West
Survey Elevation (Feet) NAVD 88: 5.9 **NGVD 29:** 7.2 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Exterior wall
HWM Address: Essex Circle on US Naval Air Station (US1/SR-5)
Location of HWM Object: HWM was transferred from glass front door to exterior wall.
Type of HWM : Mud Line
Closest Municipality: Boca Chica **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Jon Skroban (2) James Myre **Flagger Company:** (1) Dewberry (2) URS
Date of Flagging/Interview: 11/4/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/8/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Eastings (Feet): 425544
Northings (Feet): 91604
Survey Latitude: 24.583825
Survey Longitude: -81.694031 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** 4.38



WFLC-05-21-1.jpg



WFLC-05-21-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-54

HWM ID: WFLC-05-23
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Event date
Subdivision / Ind. Park: Jade Complex
Survey Elevation (Feet) NAVD 88: 7.2 **NGVD 29:** 8.6 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Exterior wall
HWM Address: 28 Jade Drive, Big Coppitt Key
Location of HWM Object: HWM was transferred from inside "open garage" wall to exterior wall between units.
Type of HWM : Mud Line
Closest Municipality: Big Coppitt Key **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Jon Skroban (2) James Myre **Flagger Company:** (1) Dewberry (2) URS
Date of Flagging/Interview: 11/4/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/8/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 439756
Survey Latitude: 24.601214 **Northing (Feet):** 97854
Survey Longitude: -81.651353 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** 5.15



WFLC-05-23-1.jpg



WFLC-05-23-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-55

HWM ID WFLC-05-24
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Event date
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 3.0 **NGVD 29:** 4.5 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Exterior wall
HWM Address: 253 Tollgate Blvd., Lower Matecumbe Key
Location of HWM Object HWM is under carport to right of front doors, on wall.
Type of HWM : Mud Line
Closest Municipality: Lower Matecumbe Key **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Jon Skroban (2) James Myre **Flagger Company:** (1) Dewberry (2) URS
Date of Flagging/Interview: 11/5/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/1/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 742269
Northing (Feet): 189011
Survey Latitude: 24.853247
Survey Longitude: -80.740319 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** 2.63



WFLC-05-24-1.jpg



WFLC-05-24-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-56

HWM ID WFLC-05-25
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Atlantic Ocean **Source for Date of Peak:** Event date
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 1.3 **NGVD 29:** 2.8 **HWM Quality:** Fair
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Ground
HWM Address: US-1 and Atlantic Ocean - west of Tea Table Relief
Location of HWM Object HWM is between Lower and Upper Matecumbe Keys, near paved area, on grass strip between grass and sand area.
Type of HWM : Wrack Line
Closest Municipality: Lower Matecumbe Key **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Jon Skroban (2) James Myre **Flagger Company:** (1) Dewberry (2) URS
Date of Flagging/Interview: 11/5/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/1/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 768559
Northing (Feet): 205030
Survey Latitude: 24.897169
Survey Longitude: -80.660914 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** N/A



WFLC-05-25-1.jpg



WFLC-05-25-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

Roberto Mantecon #4431 State of Florida
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PROJECT: Hurricane Wilma, 1609 DR-Florida (HMTAP Task Orders #459, 460)
CONTENTS: Individual Historic High Water Mark (HWM) Survey Reports
TYPE: Coastal High Water Mark (CHWM) Survey Report
COMM. NO. 125129 **PREL.** 02/06/06 **FINAL** 03/20/06 **SHEET** Monroe-57

HWM ID: WFLC-05-26
Name of Storm Event: Hurricane Wilma **Date of Flood Event:** 10/24/2005
Disaster Number: 1609-DR-Florida **Date of Peak:** 10/24/2005
Stream Name/Flood Source: Gulf of Mexico **Source for Date of Peak:** Event date
Subdivision / Ind. Park: NA
Survey Elevation (Feet) NAVD 88: 2.8 **NGVD 29:** 4.3 **HWM Quality:** Good
Flooding Type: Coastal - Surge Only
HWM Object, Surface: Ground
HWM Address: US-1 and Gulf of Mexico - west of Tea Table Relief
Location of HWM Object: HWM is between Lower and Upper Matecumbe Keys, north of US-1 by paved area between sidewalk and water.
Type of HWM : Wrack Line
Closest Municipality: Lower Matecumbe Key **County:** Monroe **State:** FL
Name of Flagger/Interviewer: (1) Jon Skroban (2) James Myre **Flagger Company:** (1) Dewberry (2) URS
Date of Flagging/Interview: 11/5/2005
Survey Crew: Russell Legacy **Survey Company:** PBSJ/MIAMI
Survey Date: 12/1/2005
Map Projection Used: SPC FL E **Vertical Datum:** NAVD88 **Horizontal Datum:** NAD 83
Easting (Feet): 768461
Northing (Feet): 205106
Survey Latitude: 24.897378
Survey Longitude: -80.661208 **Approx. Bldg. Floor Elevation (Feet) NAVD88:** N/A



WFLC-05-26-1.jpg



WFLC-05-26-2.jpg

Survey Certification: High Water Mark location survey is certified to 0.25 feet vertically and 10 feet horizontally with a 95% accuracy level.

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