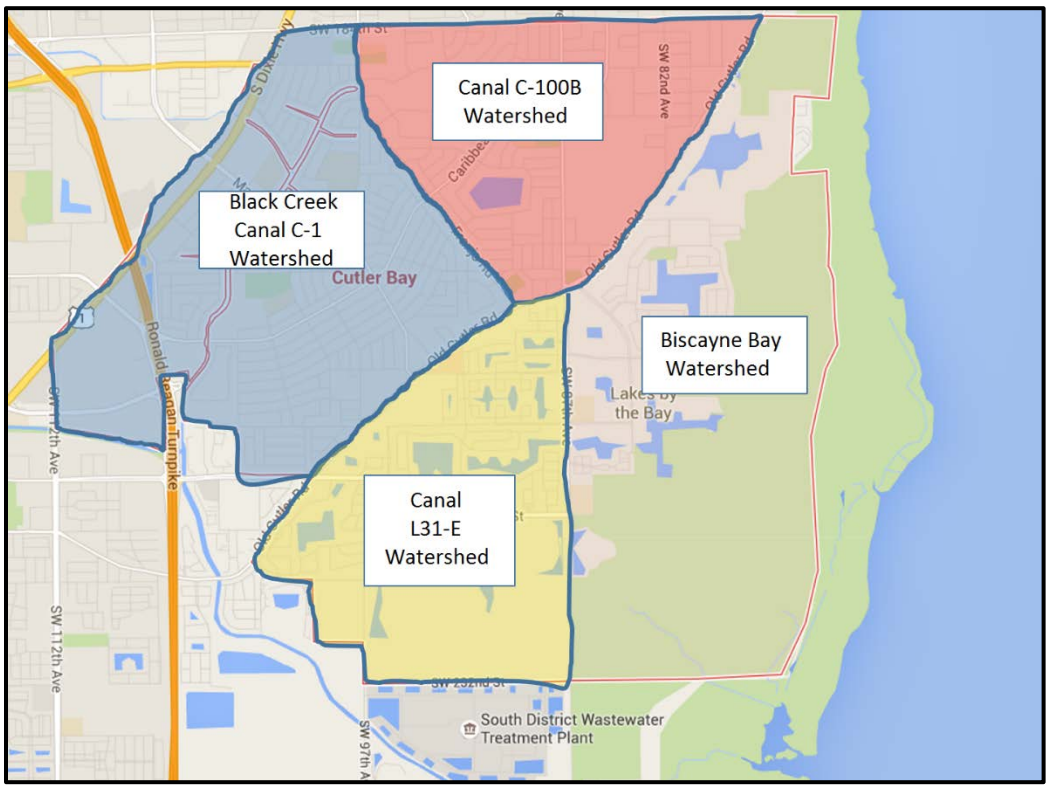
Proposal

Town of Cutler Bay Watershed Master Plan



In Compliance with the Federal Emergency Management Agency (FEMA) National Flood Insurance Program (NFIP) Community Rating System (CRS)

September 2017

amec foster wheeler

Background

The objective of a watershed master plan is to provide Cutler Bay with a tool it can use to make decisions that will reduce the increased flooding from development on a watershed-wide basis. If stormwater runoff is only evaluated on individual parcels, the collective impact of flooding from all of those sites can be greater. Stormwater management regulations can reduce the future flood threat from a developing area, but a watershed master plan goes further in predicting the rainfall/runoff relationships within the watershed, and in locating existing problems and identifying potential future problems. Understanding the watershed's behavior will help to ensure that established stormwater management regulations will prevent flood damage due to future development.

CRS Requirement

In order for a community to advance to a CRS classification 4 or better, they must have in place a watershed master plan for at least 50% of its watersheds and associated stormwater management regulations. At a minimum, a watershed master plan must address the regulatory standards for new development and the modeling may show a need for different standards for different watersheds or for different parts of the watershed. To receive any credit under 452. B. Watershed master plan, a community must base the watershed planning on the 100-year storm. Most communities use various return frequencies for different design and management purposes, but it's important to understand the impact of development on runoff from the 100-year storm.

To qualify under the CRS, a watershed master plan must include the following criteria at a minimum:

- Evaluate future conditions and long-duration storms,
- Evaluate the impact of sea level rise and climate change,
- Identify wetlands and natural areas,
- Address the protection of natural channels,
- Provide a dedicated funding source for the implementation of the plan, and
- Incorporate sea-level rise.

Phase 1: Amec Foster Wheeler will conform to the 2017 CRS guidance for Activity 450 Stormwater Management Planning in preparing a watershed analysis for Cutler Bay. Lump Sum for Phase 1: $24,800.00

Task A. Collection of Data

Amec Foster Wheeler will collect existing stormwater and drainage data, reports and plans from a variety of sources including, but not limited to:

- Town of Cutler Bay
- South Florida Water Management District (SFWMD),
- Miami-Dade County,
- National Oceanic and Atmospheric Administration (NOAA),
- Environmental Protection Agency (EPA) National Pollution Discharge Elimination System (NPDES),
- Comprehensive Everglades Restoration Plan (CERP),
- South Florida Environmental Report (SFER), and
- Biscayne Bay Tier 1 Surface Water Improvement and Management Program (SWIM).

Information collected from these important key sources will provide background data to support the watershed master plan. Therefore; Task A will require a significant amount of time to collect and research all necessary plans, policies, ordinances, and studies along with potential interviews of certain agencies.

Task B. Examining the Impacts of Groundwater, Sea Level Rise and Climate Change on Stormwater System

The South Florida canal system network is a controlled and interlinked surface water management system that has allowed the expansion of urban and agricultural areas in Miami-Dade County. The surface water system has three main purposes:

1. Control urban flooding,
2. Supply recharge to production well fields, and
3. Control sea water intrusion.

To comply with the CRS Class 4 Prerequisite, Amec Foster Wheeler will analyze the impacts of sea level rise and its impact on the watersheds and the various stormwater components using NOAA's intermediate-high projections for the year 2100. Under Task B, Amec Foster Wheeler will provide stormwater runoff calculations which take into account sea level rise and provide data on what additional improvements may be necessary to handle this increased flow. Task B will also be considered under Task C Modeling of the Watersheds.

Task C. Modeling of the Watersheds

The only way to understand the behavior of a watershed or how it responds to rainfall is to complete a detailed analysis (modelling) of runoff under both present and future conditions. Amec Foster Wheeler will model hydrologic conditions to simulate various rainstorms over a watershed based on the amount of land cover, soils and topography and determine the timing and total volume of peak flows. Hydrologic studies can also be used to determine the

appropriate amount of detention or retention necessary to prevent an increase in runoff as future development occurs.

Beyond modeling the three primary canal basin watersheds (C-100, C1 and DA-4) shown on the map on page 4 of this proposal, Amec Foster Wheeler will also develop a modified functional analysis of sub-basins to determine what capital improvements may be necessary to solve future conditions runoff from both new and redevelopment. The sub basins will be prioritized from highest in need to lowest based on agreed upon performance goals.

Potential performance goals will be:

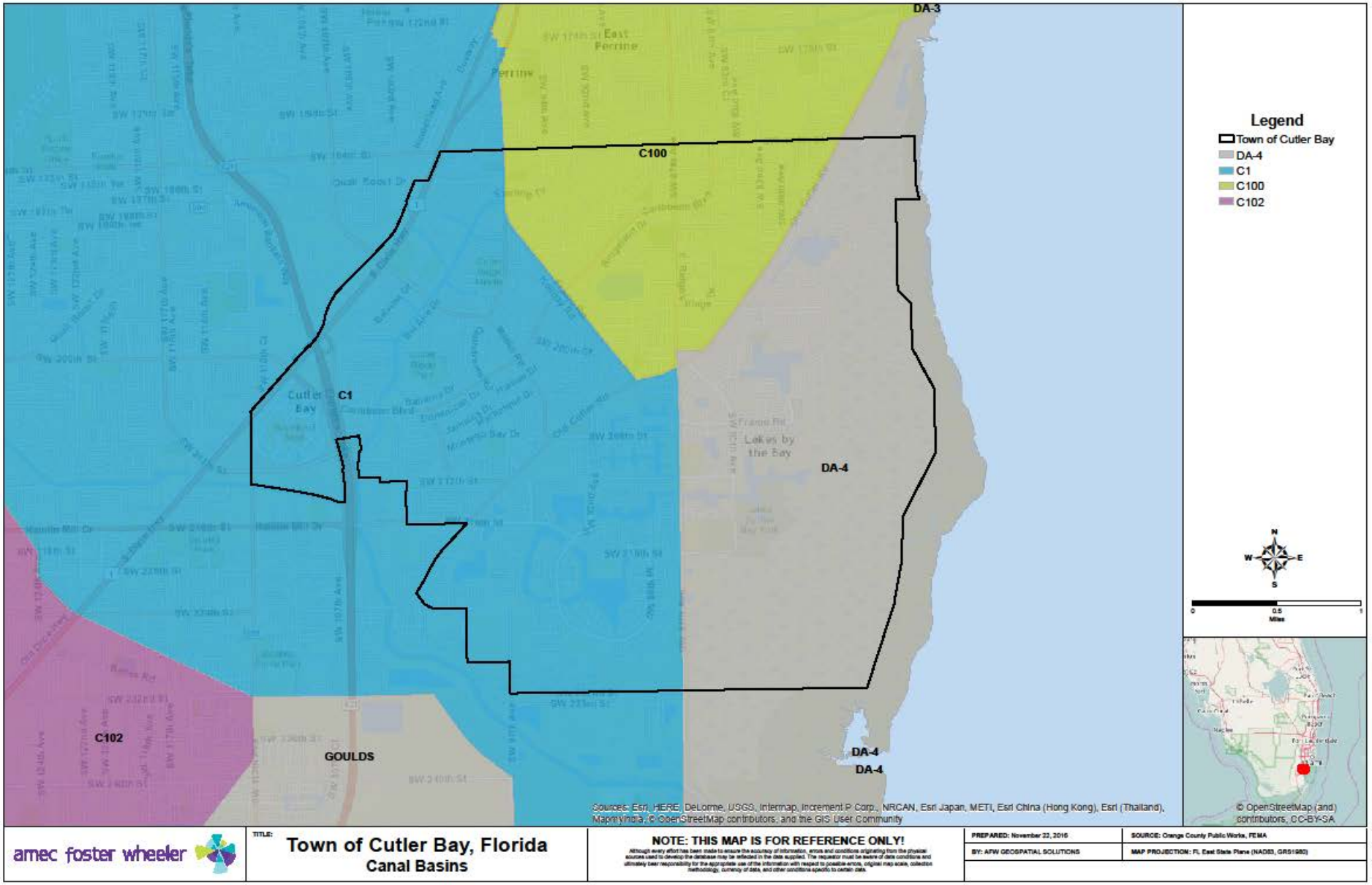
- Water Quality
- 5-Year Storm
- 10-Year Storm
- 25-Year Storm
- 50-Year Storm
- 100-Year Storm
- Observed flooding or complaints
- Impacts of sea level rise

Responsibility of the client:

- Provide access to topographic data,
- Provide access to the appendices from the 2008 Kimley-Horn Stormwater Plan, and
- Provide access to stormwater data from the South Florida Water Management District and Miami-Dade County

Task D. Summary Data

1. Amec Foster Wheeler will prepare an existing development assessment and provide a Report summary of the findings based on items 2 through 4 below.
2. Amec Foster Wheeler will develop existing conditions hydrologic and hydraulic models for the three canal basin watersheds (C1, C100 and DA-4). The three models together will encompass the entire Town limits and will be developed along the major drainage patterns within the Town. Amec Foster will also develop sub basins to examine stormwater infrastructure more closely to align with a capital improvements program.
3. Amec Foster Wheeler will develop future conditions hydrologic and hydraulic models for three watershed areas. The three models together will encompass the entire Town limits and will be developed along the major drainage patterns and sub basins within the Town. (See sub basin discussion in item 2 above).
4. Amec Foster Wheeler will develop and hydrologic and hydraulic evaluation of each of the three watersheds.


DA-3
East Perrine
Perrine
C100
C1
Cutler Bay
Lakes by the Bay
DA-4
C102
GOULDS
DA-4
DA-4
Legend
Town of Cutler Bay
DA-4
C1
C100
C102
N
W
E
S
0
0.5
1
Miles
Sources: Esri, HERE, DeLorme, USGS, Intermap, Increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
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TITLE:
Town of Cutler Bay, Florida
Canal Basins
NOTE: THIS MAP IS FOR REFERENCE ONLY!
PREPARED: November 22, 2016
BY: AFW GEOSPATIAL SOLUTIONS
SOURCE: Orange County Public Works, FEMA
MAP PROJECTION: FL East State Plane (NAD83, GRS1980)

Phase 2: Amec Foster Wheeler will conform to the 2017 CRS guidance for Activity 450 Stormwater Management Planning in preparing a watershed master plan for Cutler Bay. Lump Sum for Phase 2: $37,900.00

Task A. Stormwater Master Plan Preparation

After the modeling of the canal watershed basins, Amec Foster Wheeler will incorporate the modeling data from the existing and future conditions watersheds and sub basins and prepare the final stormwater master plan which will incorporate all required elements necessary for the Town to receive credit in the Community Rating System Program under Activity 450 Stormwater Management Section 452.b. Watershed Master Plan. Amec Foster Wheeler will work with Town Public Works staff to incorporate the final watershed master plan into the capital improvements program.

Task B. Develop Stormwater Regulations

Amec Foster Wheeler will consult with the public works department to develop comprehensive stormwater regulations for both residential and commercial development. Increased stormwater regulations will allow the Town of Cutler Bay to received additional credit under Activity 450 Stormwater Management and have more of a cushion within Class 4. Additionally, there is a minimal amount of credit under Activity 450 Stormwater Management required to meet the Class 4 prerequisite. The Class 4 prerequisite requires the community (before the impact adjustment) to have 90 points under element WMP1 and 30 points under WMP2.

Task C. Develop a Stormwater Manual

Amec Foster Wheeler will develop a stormwater manual for the Town of Cutler Bay. A stormwater manual aims to provide a commonly accepted set of technical standards in addition to providing new design information and new approaches to stormwater management. These stormwater practices if applied to a particular project site should protect receiving waters (both surface and groundwater). A stormwater manual is intended to provide technically sound and realistic guidance on how to properly manage stormwater runoff from individual project sites.

Schedule of Project

Following the notice to proceed, Amec Foster Wheeler will complete Phase 1 of the project within a six-week time frame assuming Amec Foster receives timely access to both topographic data along with necessary data and information from Miami-Dade County and the South Florida Water Management District.

Amec Foster Wheeler will complete Phase 2 of the project (Tasks A and B) within six weeks of the contract change order. The timeframe for optional Task 2 C can be discussed if the Town would like to move forward on that Task.

Cost of Project – Water Shed Master Plan

Phase 1: Includes the following Task(s): (Please refer to above for details)

Task A. Collection of Data

Task B. Examining the Impacts of Groundwater, Sea Level Rise and Climate Change on Stormwater System

Task C. Modeling of the Watersheds

Task D. Summary Data

Amec Foster will prepare Phase 1 of the project for a lump sum fee of **$24,800**.

Phase 2: Includes the following Task(s): (Please refer to above for details)

Task A. - Stormwater Master Plan Preparation

Task B. - Develop Stormwater Regulations

Task C. - Develop a Stormwater Manual

Amec Foster will prepare Phase 2 of the project for a lump sum fee of **$37,900**.

Total for Cost for development of Watershed Master Plan Phase 1 and Phase 2: $62,700